EMERSON ELECTRIC CO.

FORMER ROLLWAY BEARING CORPORATION FACILITY FINAL ENGINEERING REPORT

ONONDAGA COUNTY, NEW YORK

MARCH 7, 2018
NYSDEC SITE NUMBER: V002020

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ONONDAGA COUNTY, NEW YORK

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PROJECT NO.: OUR REF. NO.
DATE: MARCH 7, 2018

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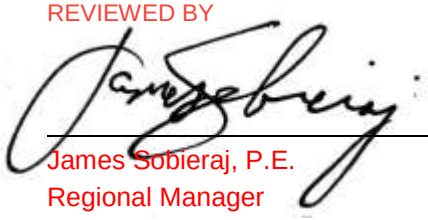

James Sobieraj, P.E.
Regional Manager

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CERTIFICATIONS

I, JAMES SOBIERAJ, am currently a registered professional engineer licensed by the State of New York, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site and required by the Department are contained in (i) a Declaration of Covenants and Restrictions dated November 8, 2017 and recorded as Instrument No. 2017-00043968 in the Onondaga County Clerk's office (Deed Restriction), created and recorded pursuant to the requirements of the Department, and (ii) a Site Management Plan as defined below, and that the municipality in which the land subject to the Deed Restriction is located has been notified that such Deed Restriction has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by the Department.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, JAMES SOBIERAJ, of WSP USA Inc., 75 Arlington Street, 4th Floor, Boston, Massachusetts 02116, am certifying as the Remedial Party's Designated Site Representative for the site.

James Sobieraj, P.E.
NYS Professional Engineer #077394

3/7/18
Date

1 BACKGROUND AND SITE DESCRIPTION

Emerson Electric Co. and Rollway Bearing Corporation entered into a Voluntary Cleanup Agreement (VCA) with the New York State Department of Environmental Conservation (NYSDEC or the Department) in April 2001, to investigate and remediate a 78.326-acre property located in Town of Clay, Onondaga County, Liverpool, New York (Figure 1). The property was remediated to commercial and industrial use.

The site is located in the County of Onondaga, New York and is identified as Section 95 Block 2 and Lot 1 on the Town of Clay Tax Map # 95.-02-01.0. The site is situated on an approximately 78.326-acre area divided into two Parcels. Parcel 1 is bounded by the American Granby, Inc., and LMK Graphics LLC properties to the north, the Paul DeLima Coffee property to the south, railroad tracks and commercial/industrial buildings to the east, and Morgan Road to the west. Parcel 2 is bounded by Buckley Road to the north, Parcel 1 to the south, the Milens, LLC, Chapman Lumber Company, and LMK Graphics, LLC properties to the east, and the KRMS, LLC property to the west (see Figure 2). The boundaries of the site are fully described in Appendix A – Deed Restriction and Metes and Bounds.

An electronic copy of this Final Engineering Report (FER) with all supporting documentation is included as Appendix B.

2 SUMMARY OF SITE REMEDY

2.1 REMEDIAL ACTION OBJECTIVES

As presented in the approved Revised Remedial Action Work Plan (RAWP), dated May 9, 2000, the following Remedial Action Objectives (RAOs) were identified for this site:

- Perform eight quarters of groundwater monitoring for volatile organic compounds (VOCs) to demonstrate that the concentrations of VOCs in groundwater are not increasing and that the area of affected groundwater is not expanding.
- Remove measurable light non-aqueous phase liquid (LNAPL) from the groundwater surface below the former heat treat area. Measurable LNAPL is defined in the approved RAWP as a thickness greater than 0.01 foot.
- Excavate soil from the former gasoline underground storage tank area containing VOCs above the NYSDEC-approved site-specific soil cleanup objectives (SCOs).

The RAWP was prepared by WSP USA Inc.[1] and approved by the NYSDEC.

2.2 DESCRIPTION OF SELECTED REMEDY

The site was remediated in accordance with the remedy selected by the NYSDEC in the RAWP, dated May 9, 2000. The following are the components of the selected remedy:

1. Eight quarters of groundwater monitoring were completed to demonstrate that the concentrations of VOCs in groundwater are not increasing and that the area of affected groundwater is not expanding;
2. Free product recovery pilot test activities were completed and full-scale LNAPL recovery activities were implemented at the site;
3. Excavation of soil exceeding NYSDEC-approved site-specific SCOs (listed in Table 1) from the former gasoline underground storage tank area. Soil was excavated to a depth of 16 feet in the southern portion of the excavation and to a depth of 13 feet in the northern portion of excavation. In total, 230 cubic yards of soil were removed;
4. Maintenance of a soil cover system consisting of an existing 8-inch concrete floor slab to prevent human exposure to remaining contamination remaining at the site;
5. Execution and recording of a Deed Restriction to restrict land use and prevent future exposure to any contamination remaining at the site.
6. Institutional controls:
   - The property may be used for commercial or industrial use.
   - All Engineering Controls (ECs) must be operated and maintained as specified in the Site Management Plan (SMP) for the property.
   - All ECs must be inspected at a frequency and in a manner defined in the SMP.
   - The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or the Onondaga County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
   - Groundwater and other environmental or public health monitoring must be performed as defined in the SMP.
   - Data and information pertinent to site management must be reported at the frequency and in a manner as defined in the SMP.

[1] Former names of WSP USA Inc. include: Environmental Strategies Corporation; Environmental Strategies Consulting LLC; ESC Engineering of New York, P.C.; and WSP Engineering of New York, P.C.

- All future activities that will disturb remaining contaminated material must be conducted in accordance with the SMP.
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP.
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in the SMP.
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Deed Restriction.
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the Institutional Control (IC) boundaries noted on Figure 2, or if the use of tetrachlorethene (PCE) containing materials within the existing building changes (provided the potential for vapor intrusion has not been previously addressed to the department's satisfaction). Any potential impacts that are identified must be monitored or mitigated.
- Vegetable gardens and farming on the site are prohibited.

7 Development and implementation of a SMP for long term management of remaining contamination as required by the Deed Restriction, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

8 Periodic certification of the institutional and engineering controls listed above.

3 INTERIM REMEDIAL MEASURES

The information and certifications made in the June 8, 2009, Interim Remedial Measure (IRM) LNAPL Construction Completion Report (Appendix C) were relied upon to prepare this report and certify that the remediation requirements for the site have been met.

A vacuum-enhanced LNAPL recovery system was installed in 2008 as an IRM to remove measurable LNAPL (i.e., greater than 0.01 foot) under a portion of the former heat treat area of the facility. During installation of the LNAPL recovery system, the NYSDEC provided a field representative during the initial day of the IRM activities, and WSP provided full-time engineering services to observe the work performed by the remedial contractor, Remediation Services, Inc., of Independence, Kansas, and ensure substantial conformance with the NYSDEC and NYSDOH-approved IRM work plan, dated March 10, 2006.

The main components of the vacuum-enhanced recovery system consist of a 30-gallon vapor-liquid separator (VLS), a skid-mounted 2 horsepower vacuum blower, a 5-micron air filter, a dilution valve with 5-micron air filter, inlet and outlet vacuum gauges, exhaust stack pressure gauge, and an exhaust stack temperature gauge. The system components are mounted on a 4-foot by 4-foot skid pre-fabricated by Mid-Atlantic Environmental Equipment, Inc. The equipment skid is within an 8-foot by 10-foot enclosure erected inside the former heat treat area. The enclosure limits access to the equipment and acts as a sound barrier. Subsurface vacuum conveyance piping extends from the LNAPL recovery system enclosure to each of the recovery wells OW-2, RW-1, OW-3, and OW-8 (Figure 3). The recovery wells are accessible through 2-foot by 2-foot, traffic-rated well-vaults. Each well-vault contains a gate valve, ball valve, a flow meter, Teflon® tubing, and a vacuum gauge in line between the header and well. The gate valve and ball valve are used to control the vacuum and flow. The ball valve, or "dilution valve," allows ambient air to enter the system to decrease the flow and vacuum from the respective well, if necessary.

The vacuum blower is capable of producing 40 standard cubic feet per minute (scfm) at 37 inches water column ("WC) for the LNAPL recovery system application. Expected inlet losses through the system were approximately 15" WC, which left an appreciable 27" WC vacuum to be applied to the recovery wells. Inlet and outlet vacuum gauges allow for observation of inlet losses through the 30-gallon VLS and the 5-micron air filter. The dilution valve is used in conjunction with the wellhead equipment to adjust the vacuum at the inlet of the vacuum blower to ensure the blower is operating within the manufacturer's specified vacuum ranges. The exhaust stack pressure is used to indicate if there is back pressure buildup, which normally signifies a blockage in the piping. The exhaust temperature gauge is used to determine whether the vacuum blower is running at manufacturer-specified operating temperatures. Typical operating conditions are provided below:

LNAPL Recovery System

Gauge	Reading	Units
Inlet Vacuum: Before Vapor-Liquid Separator	-58 to -62	"WC
Vacuum Before Air Filter	-66 to -68	"WC
Vacuum After Air Filter/Before Blower Inlet	-86	"WC
Discharge Stack Pressure	2	"WC
Discharge Stack Temperature	120 to138	°F

LNAPL Recovery Wells

Well ID	Vacuum ("WC)	Flow (SCFM)
OW-2	-40 to -54	3 to 7
RW-1	-5 to -11	2 to 3
OW-3	-6 to -10	4 to 11
OW-8	-8 to -10	5.5 to 7

4 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

Remedial activities completed at the site were conducted in accordance with the NYSDEC-approved RAWP, dated May 9, 2000, for the Former Rollway Bearing Corporation Facility. There were no deviations from the RAWP.

4.1 GOVERNING DOCUMENTS

4.1.1 SITE-SPECIFIC HEALTH & SAFETY PLAN

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal Occupational Safety and Health Administration (OSHA).

The site-specific Health and Safety Plan (HASP) was complied with for all remedial and invasive work performed at the site.

4.1.2 SOIL/MATERIALS MANAGEMENT PLAN

A formal soil/materials management plan was not included in the RAWP. However, excavated soils were placed in a temporary stockpile area for characterization prior to disposal. The temporary stockpile area was lined with 2 layers of 6-mil-thick polyethylene sheeting, and the perimeter of the stockpile area was bermed with straw bales. At the end of each work day, stockpiles were covered with polyethylene sheeting and secured. Soil management was performed in compliance with all applicable federal, state, and local laws and regulations.

4.1.3 CONTRACTORS SITE OPERATIONS PLANS

The Remediation Engineer reviewed all plans and submittals for this remedial project (i.e. those listed above plus contractor and subcontractor submittals) and confirmed that they were in compliance with the RAWP. All remedial documents were submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

4.2 REMEDIAL PROGRAM ELEMENTS

The remedial program completed in accordance with the VCA consisted of excavation and disposal of petroleum-affected soil from a former gasoline underground storage tank area and eight quarters of groundwater monitoring.

4.2.1 CONTRACTORS AND CONSULTANTS

Engineering services for the soil excavation and groundwater monitoring were completed by WSP. WSP provided full-time construction oversight for the soil excavation activities and conducted the groundwater monitoring.

Mr. Todd M. Musterait, Professional Engineer registered in the State of New York, was the Engineer of Record that oversaw the implementation of the IRM and soil excavation activities. Mr. Musterait is no longer employed with WSP (Volunteer's Consultant) and his duties have been assumed by James Sobieraj, P.E., Professional Engineer registered in the State of New York. All the remedial action history, current engineering controls, and the SMP that will govern present and future activities, were reviewed by James Sobieraj, P.E., who is certifying this FER.

Soil excavation was completed by Marcor Remediation, Inc., of Syracuse, New York.

Confirmation soil samples collected by WSP for laboratory analysis of VOCs by Environmental Protection Agency (EPA) Method 8021 were submitted to Adirondack Environmental Services, Inc., of Albany, New York.

The excavation was backfilled in 1-foot lifts and compacted. Geotechnical analysis of the backfill material was completed by CME Associates, Inc., of Syracuse, New York.

Stockpiled soil generated from the soil excavation activities was sampled by WSP and analyzed by York Analytical Laboratories, Inc., of York, Pennsylvania.

On December 15, 2001, approximately 105 tons of petroleum-affected soil stockpiled onsite were loaded into dump trucks and transported to and disposed of at High Acres Landfill Recycling Center, located in Fairport, New York, as a non-hazardous waste. Other non-hazardous materials disposed of included disposable equipment, polyethylene sheeting, and personal protective equipment.

4.2.2 SITE PREPARATION

Before commencing with excavation activities, the following mobilization and site preparation activities were performed:

- Located and marked underground utilities near the proposed area of excavation using information provided by facility personnel. The closest underground utility was an 8-inch diameter underground sprinkler system water line that runs parallel to the south side of the building. This pipe was located approximately 25 feet south of the building.
- Constructed staging areas to temporarily stockpile petroleum-affected soil and potentially clean overburden soil excavated from the former tank pit. The staging areas were lined with 2 layers of minimum 6-mil-thick polyethylene sheeting. The staging area for petroleum-affected soil was bermed using straw bales.
- Constructed an equipment decontamination pad consisting of two layers of 6-mil-thick polyethylene sheeting and a berm constructed of wooden planks.
- Installed and maintained temporary fencing to limit unauthorized access, or unknowing access, to any open excavations during periods of inactivity.

4.2.3 GENERAL SITE CONTROLS

Remediation activities were completed on private property. Temporary fencing was used to secure the excavation area during periods of inactivity. Periods of inactivity included at the end of each work day, on weekends, or when waiting for confirmation sampling results. The work was monitored during excavation by WSP oversight personnel.

As part of the site preparation activities, erosion and sedimentation controls were instituted around the stockpile areas. Temporarily stockpiled petroleum-affected soil and potentially clean overburden was placed in staging areas that were lined with 2 layers of minimum 6-mil-thick polyethylene sheeting. The staging area for petroleum-affected soil was also bermed using straw bales.

An equipment decontamination area was constructed that consisted of two layers of 6-mil-thick polyethylene sheeting and a berm constructed of wooden planks.

Daily site activities and job site record keeping was completed by WSP oversight personnel.

4.2.4 NUISANCE CONTROLS

An equipment decontamination area was constructed for the decontamination of excavation equipment. Dust was controlled using water, as needed. The worker breathing zone was monitored with a photoionization detector (PID) to protect human health.

4.2.5 REPORTING

Activities completed for all field activities were recorded by WSP staff in a field book. On completion of the soil excavation, a summary report was prepared and submitted to the NYSDEC.

4.3 CONTAMINATED MATERIALS REMOVAL

4.3.1 SOIL

From November 13 through December 15, 2001, WSP provided oversight for the excavation and offsite disposal of petroleum-affected soil in the former gasoline underground storage tank area east of the main building. During the excavation activities, overburden material that was deemed clean was stockpiled on polyethylene sheeting in a separate staging area, or adjacent to the excavation, for subsequent testing and reuse as backfill.

These soils were identified for segregation based on previous soil sampling data from the area, field observations, and organic vapor screening with a PID. In accordance with the approved RAWP, the excavation did not extend under the building or include load-bearing soil near the building foundation.

A list of the NYSDEC-approved site-specific SCOs for the contaminants of concern for this project is provided in Table 1.

The location of the original source and area where excavation was performed is shown in Figures 2 and 4.

Affected soil in the former gasoline underground storage tank area containing VOC concentrations above the site-specific SCOs was excavated and disposed of offsite in accordance with applicable state and federal regulations. Figure 2 provides the location of the soil excavation activities and Figure 4 shows the limits of the soil excavation.

4.3.1.1 DISPOSAL DETAILS

A composite soil characterization and profiling sample was collected from the stockpile of affected soil. The soil sample was submitted to York Analytical Laboratories, Inc., for analysis of toxicity characteristic leaching procedure (TCLP) VOCs by EPA Method 8260 (i.e., VOCs consisted of only those specified for gasoline contaminated soils in the NYSDEC's Petroleum-Contaminated Soil Guidance Policy (STARS #1), dated August 1992); TCLP lead by EPA Method 1311/6010; flash point by EPA Method 1010M; and free liquids by EPA Method SW-846 Paint Filter Test.

On December 15, 2001, 104.63 tons of petroleum-affected soil stockpiled onsite were loaded into dump trucks and transported to and disposed of at High Acres Landfill Recycling Center, located in Fairport, New York, as a non-hazardous waste. Other non-hazardous materials disposed of included disposable equipment, polyethylene sheeting, and personal protective equipment.

A summary of the sample collected to characterize the waste and associated analytical results is summarized on Table 2. The data from the waste characterization are attached in Enclosure 3 of the Soil Excavation Summary Report, dated April 25, 2002, which is included in Appendix D.

A copy of non-hazardous waste manifests and disposal facility weight tickets are included in Enclosure 4 of the Soil Excavation Summary Report, dated April 25, 2002, which is included in Appendix D.

4.3.1.2 ON-SITE REUSE

Overburden soil from the excavation footprint was used as backfill. Prior to reusing the soil, samples were collected to verify that the VOC concentrations were below the cleanup criteria. For each 50-cubic-yard volume of soil, four samples were collected from representative locations at least 6 inches below the pile surface. Each of the four samples were screened for organic vapors with a PID. Soil from the portion of the pile with the highest organic vapor reading was collected for VOC analysis by EPA Method 8021. Two samples of the overburden stockpiled soil were collected for VOC analysis (sample identification BF-1 and BF-2). No VOCs were detected in the overburden soil.

The analytical results for overburden backfill, in comparison to allowable levels, are provided in Enclosure 1 of the Soil Excavation Summary Report, dated April 25, 2002, which is included in Appendix D.

4.4 REMEDIAL PERFORMANCE/DOCUMENTATION SAMPLING

4.4.1 SOIL EXCAVATION

Verification samples were collected from the bottom and sides of the excavation. One discrete bottom sample (sample identification Bottom-1) was collected from the bottom excavation area (see Figure 4 for excavation limits and approximate soil sample locations). One discrete side sample was collected from each 20-foot length of wall. Based on the average dimensions of the excavation area (18 feet by 19 feet), four discrete side wall samples were collected (sample identifications East-1, West-1, North-1, and South-1). The sampling depth coincided with the depth of maximum VOC concentrations, as indicated by pre-remedial sampling data or organic vapor screening. The samples were placed in laboratory-supplied containers and shipped under chain-of-custody procedures to Adirondack Environmental Services, Inc., of Albany, New York, for laboratory analysis of VOCs by EPA Method 8021. Quality assurance and quality control samples, including trip blanks, equipment blanks, and duplicate samples, were collected and analyzed.

Based on the analytical results, the concentrations of several VOCs exceeded the site-specific SCOs in the sample collected from the eastern sidewall of the excavation (sample identification East-1). Additional soil was excavated to the east from the surface to the bottom of the excavation and another sample was collected from the eastern sidewall (sample identification East-2). The analytical results from sample East-2 indicated the VOC concentrations were below the site-specific SCOs.

A table and figure summarizing all end-point sampling is included in Table 3 and Figure 4, respectively, and all exceedances of SCOs are highlighted in Table 3.

The analytical data are provided in Enclosure 1 of the Soil Excavation Summary Report, dated April 25, 2002, which is included in Appendix D.

4.4.2 GROUNDWATER SAMPLING

In accordance with the RAWP, eight quarters of groundwater samples were collected from five monitoring wells (i.e., MW-2, MW-5, MW-6, MW-7, and MW-8) from October 2001 through August 2003 (Figure 5). As part of the groundwater monitoring program, WSP redeveloped groundwater monitoring wells MW-2, MW-5, and MW-6, in preparation for the first quarterly groundwater sampling event. The wells were redeveloped with a submersible pump until the development water was relatively free of suspended sediment and the pH, temperature, and conductivity had stabilized. Field measurements were considered stable when two successive readings varied by less than 10 percent. The pump and tubing were decontaminated before each use. Approximately 25 gallons of water was generated during the development activities and the water was placed in a 55-gallon U.S. Department of Transportation (DOT)-compliant steel drum for characterization and offsite disposal.

Before sampling, each well was gauged using an electronic water level indicator to determine the depth to water and the total well depth. The water level information was used to calculate the volume of water in each well. To obtain representative groundwater samples, each well was purged by removing a minimum of three well volumes using a bailer. The pH, specific conductance, and temperature were monitored during the purging process to ensure that the groundwater samples were representative of formation water. After the field measurements stabilized (i.e., varied less than 10%), the groundwater samples were collected from each well using a single-use disposable Teflon bailer. The wells were sampled within 2 hours of purging provided the well had sufficiently recharged. Purge water from the sampling activities was contained in DOT-compliant 55-gallon steel drums and transported offsite for disposal as nonhazardous waste. Groundwater samples were placed in the appropriate laboratory-supplied, pre-cleaned glassware, labeled, and packed on ice. The samples were submitted to Adirondack Environmental Services in Albany, New York, for analysis of VOCs by EPA Method 8260.

WSP collected geochemical data from monitoring wells MW-5, MW-7, and MW-8 during the first quarterly sampling event to further document that site conditions are suitable for monitored natural attenuation. In accordance with EPA guidance

(Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, September 1998 [EPA/600/R-98/128]), WSP collected groundwater measurements for temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction potential, ferrous iron, and total organic carbon. Measurements for temperature, pH, specific conductance, dissolved oxygen, and oxidation-reduction potential were collected at the well head using a flow-through cell. Ferrous iron was measured in the field with a colorimetric meter. Total organic carbon was analyzed at an offsite laboratory using EPA Method 9060.

Except for monitoring well MW-7, which was dry during the May 2002 quarterly sampling event, all wells were sampled during the same field event from October 2001 through August 2003. Well MW-7 was also sampled in July 2003 to have eight samples from this location over 2 years. The quarterly sampling results from these five wells are provided in Table 4. The total VOC concentrations in MW-5 decreased from a high of 820 µg/l in January 2002 to 261 µg/l in August 2003. Except for a one-time detection of two VOCs at low levels in MW-7, no VOCs were detected in downgradient wells MW-7 and MW-8. Therefore, the VOC plume was not expanding and the extent of VOCs was defined. The groundwater results from MW-5 indicate the presence of trichloroethene (TCE) and its sequential reductive breakdown products dichloroethene (DCE) and vinyl chloride. The data show that most of the chlorinated VOC mass is now present in the form of DCE and vinyl chloride and very little of the initial contaminant, TCE, is present. These data indicate that natural attenuation is occurring at the site.

WSP performed the Mann-Kendall Test on each of the nine VOCs detected in MW-5 to further document a decrease in the concentrations of these compounds during the 2-year monitoring period. The test was performed in accordance with the EPA's Guidance for Data Quality Assessment (EPA QA/G-9, 2000). The Mann-Kendall Test involves computing a statistic S, which is the difference between the number of pairwise slopes that are positive, minus the number that are negative. If S is a large positive value, then there is evidence of an increasing trend in the data. If S is a negative value, then there is evidence of a decreasing trend in the data. The null hypothesis, or baseline condition, for this test is that there is no temporal trend in the data values. The results of the Mann-Kendall Test indicated downward trends for TCE, 1,2-DCE (total), and vinyl chloride. The remaining compounds were only detected on one occasion and, therefore, the test results indicated no trend.

Geochemical data collected in 2001 indicate that the electron donor concentration (17 mg/l) in the waste storage shed area is sufficient to provide the attenuation microbes with energy to drive the reduction of the more chlorinated VOCs remaining in the groundwater. The lesser chlorinated VOCs, such as vinyl chloride, may be degraded either by further reduction to ethene or by oxidation to carbon dioxide. The 2001 geochemical data showed contradictory results regarding the most likely pathway; dissolved oxygen concentrations (7.6 mg/l) and ferrous iron data (non-detectable levels) indicate oxidative conditions while the low redox potential (19 mV) indicates reductive conditions. Nevertheless, the VOC data show that less chlorinated VOCs are not accumulating as the more chlorinated VOCs are degraded, indicating that contaminants are being mineralized by one of these pathways.

A table and figure summarizing all end-point sampling is included in Table 4 and Figure 5, respectively, and all exceedances of applicable standards, criteria, and guidance values (SCGs) are highlighted.

The groundwater sampling details are provided in the Summary of Voluntary Cleanup Program Activities, dated August 5, 2005, which is in Appendix E.

4.5 IMPORTED BACKFILL

In addition to using excavated soils for backfill as discussed in Section 4.3.1.2, additional clean fill material (crusher-run stone) was transported from an offsite source to complete the backfilling activities. The lower portion of the excavation was backfilled with the imported crusher-run stone and the upper portion was backfilled with native overburden material.

The location where backfill was used at the site is shown in Figures 2 and 4.

4.6 CONTAMINATION REMAINING AT THE SITE

4.6.1 SOIL

Based on confirmation sampling and analyses, soil exceeding the site-specific SCOs were removed from the site within the former gasoline underground storage tank area.

4.6.2 GROUNDWATER

Based on the most recent groundwater data collected from monitoring wells and *in-situ* sample locations at the site, VOCs are present above the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater in monitoring wells MW-4R (abandoned), MW-5, and MW-9D, and in an isolated area near *in-situ* groundwater sample IS-1, collected southeast of the main building (Figure 6; Tables 4 through 6). As depicted in Figure 6, the VOCs detected in groundwater samples above the SCGs are acetone (90.4 µg/l), TCE (5.6 to 42 µg/l), cis-1,2-DCE (96 to 130 µg/l), trans-1,2-DCE (43 µg/l), vinyl chloride (64 µg/l), and xylenes (19 µg/l). The implemented groundwater monitoring program was completed in accordance with the RAOs and provided evidence that the area of affected groundwater is not expanding, VOC concentrations are decreasing, and natural attenuation is occurring at the site.

Tables 4 through 6 and Figures 5 and 6 summarize the groundwater sample results that exceed the SCGs.

On completion of the LNAPL removal activities at the site, a post-remediation groundwater water monitoring program will be implemented in accordance with Section 4.0 of the SMP (Appendix F).

4.6.3 SOIL VAPOR

In June 2006 and March 2007, concurrent indoor air and subslab soil gas samples were collected at two locations (SS-1 and SS-10) in the former manufacturing area of the main plant building. Three compounds (i.e., TCE, tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) with NYSDOH decision matrices were detected in either the indoor air or subslab soil gas samples. The indoor air and subslab soil gas results were evaluated using the NYSDOH decision matrices, which recommended mitigation for TCE and no further action for PCE and 1,1,1-TCA.

In October 2006 and March 2007, subslab soil gas samples were collected from 15 locations below the eastern two-thirds of the main building to evaluate the horizontal extent of VOCs (SS-2 through SS-16). An evaluation of the subslab soil gas results using the NYSDOH decision matrices indicated vapor mitigation was recommended for TCE, PCE, and cis-1,2-DCE at certain sample locations. The highest concentrations of TCE, PCE, and cis-1,2-DCE were detected near the former drum storage area. However, groundwater monitoring wells installed in this area contained only a trace level of TCE (5.7 µg/l) slightly above the groundwater quality standard of 5 µg/l; indicating that there is not a continuing VOC source to groundwater in this area. The horizontal extent of TCE in subslab soil gas was defined to the north, east, and south of the former drum storage area by the perimeter building foundation. The western extent of TCE in soil gas below the former manufacturing area was not defined; however, as discussed below, VOCs were not a concern in subslab soil gas below the office area in the northwest corner of the main building.

During a conference call with the NYSDEC and NYSDOH on October 15, 2009, the use of tetrachloroethene (PCE)-containing materials within the office space or on the plant floor was documented. Therefore, the presence of PCE within the on-site building can be attributed to an occupational exposure (migrating into the office space as doors are opened and closed or drawn into the office space by the heating, ventilation, and cooling system). Based on the use of the PCE at the on-site building, no actions to address potential exposure was pursued at that time. Should the use of PCE-containing materials within the building change, the State will be notified and additional soil vapor intrusion (SVI) sampling will be needed to determine if actions are needed to evaluate potential exposure via SVI at that time.

In August and October 2006, vadose zone soil gas samples (SG-1 through SG-11 and SG-13) were collected at 12 locations around the perimeter of the developed portion of the property to determine if VOCs were migrating offsite in soil gas to the

north, west, and south, or east toward the wetland area. The vadose zone soil gas results indicated the presence of TCE in seven samples at concentrations ranging from 0.33 to 1.6 µg/m^3. The sample results indicated that VOCs were not migrating offsite at levels of concern.

From June 2010 through February 2012, concurrent indoor air and subslab soil gas samples were collected on five occasions from the office area in the northwest corner of the main building. The use of PCE-containing materials within the office space or on the plant floor was documented. Therefore, the presence of PCE within the on-site building can be attributed to an occupational exposure (migrating into the office space as doors are opened and closed or drawn into the office space by the heating, ventilation, and cooling system). Based on the use of the PCE at the on-site building, no actions to address potential exposure was pursued at that time. Should the use of PCE-containing materials within the building change, the State will be notified and additional SVI sampling will be needed to determine if actions are needed to evaluate potential exposure via SVI at that time.

Table 7 summarizes the results from all soil vapor and subslab soil gas samples collected at the site and highlights exceedances of the SCGs. Figure 7 summarizes the results of all VOCs in samples of soil vapor that exceed the SCGs. Figure 8 summarizes the results for the February 2012 indoor air and subslab soil gas sample results from the office area. Table 8 summarizes the results of the February 2012 indoor air and subslab soil gas results from the office area.

4.6.4 LIGHT NON-AQUEOUS PHASE LIQUID

Two wells in the former heat treat area contain measurable LNAPL (i.e., greater than 0.01 foot) based on the most recent measurements obtained on July 6, 2017. The wells that currently contain measurable LNAPL are SB-5 (0.25 foot) and OW-1 (0.03 foot).

Table 9 and Figure 9 summarize LNAPL thickness measurements from July 2017 that exceed the approved remedial action objective of 0.01 foot.

A post-remediation groundwater water monitoring program will be implemented on completion of the LNAPL removal activities, a in accordance with Section 4.0 of the SMP (Appendix F).

Since contaminated groundwater, soil vapor, and LNAPL remain beneath the site after completion of the Remedial Action, ICs and ECs are required to protect human health and the environment. These Engineering and Institutional Controls (EC/ICs) are described in the following sections. Long-term management of these EC/ICs and residual contamination will be performed under the SMP approved by the NYSDEC.

4.7 COVER SYSTEM

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of the existing concrete building floor slab that is approximately 8-inches thick and is located within the former manufacturing area of the main building, which includes the former heat treat area. Figure 10 shows the location of the cover system. The SMP provided in Appendix F outlines the procedures required in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Section 4.0 of the SMP. The cover system will be inspected annually in accordance with the Site Inspection Form, which is in Appendix F of the SMP (see SMP in Appendix F).

4.8 OTHER ENGINEERING CONTROLS

Since remaining contaminated groundwater and soil vapor exists beneath the site, ECs are required to protect human health and the environment. The site has a Cover System described above in Section 4.7 and LNAPL Recovery System described in Section 3.1 of this FER.

Procedures for monitoring, operating and maintaining the Cover System and Vacuum-Enhanced LNAPL Recovery System are provided in the Operation and Maintenance Plan in Sections 3, 4, and 5 of the SMP. A post-remediation groundwater

water monitoring program will be implemented on completion of the LNAPL removal activities, a in accordance with Section 4.0 of the SMP (Appendix F).

The Monitoring Plan also addresses inspection procedures that must occur after any severe weather condition has taken place that may affect on-site ECs.

4.9 INSTITUTIONAL CONTROLS

The site remedy requires that a Deed Restriction be placed on the property to (1) implement, maintain and monitor the Engineering Controls; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to commercial or industrial uses only.

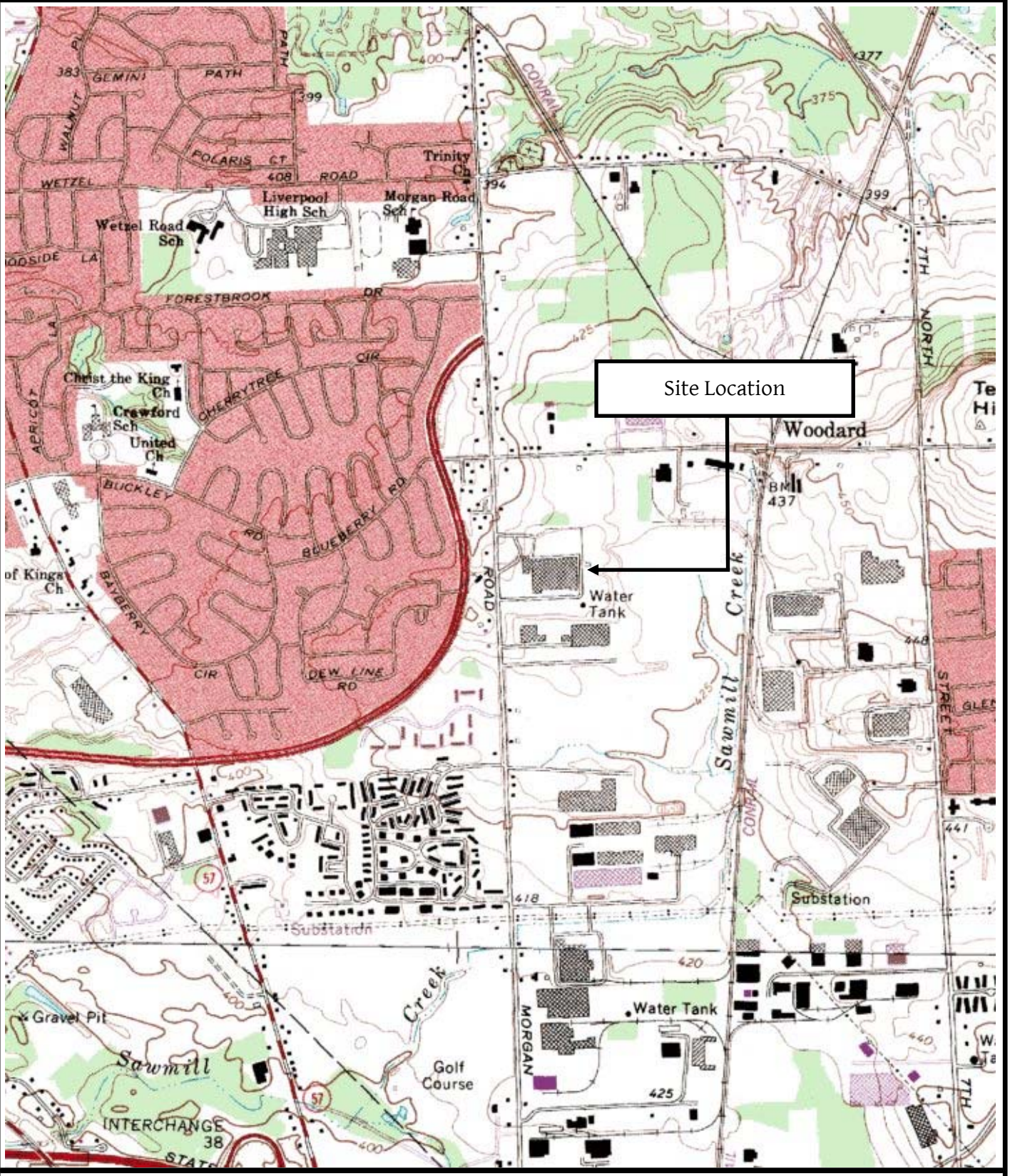
The Deed Restriction for the site was executed by the Department on June 19, 2017, and filed with the Onondaga County Clerk on December 1, 2017. The County Recording Identifier number for this filing is 2017-00043968. A copy of the Deed Restriction and proof of filing is provided in Appendix A.

LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
DCE	Dichloroethene
DOT	U.S. Department of Transportation
ECs	Engineering Controls
EPA	Environmental Protection Agency
FER	Final Engineering Report
HASP	Health and Safety Plan
ICs	Institutional Controls
IRM	Interim Remedial Measure
LNAPL	Light Non-Aqueous Phase Liquid
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OSHA	Occupational Safety and Health Administration
PCE	Tetrachloroethene
PID	Photoionization Detector
RAOs	Remedial Action Objectives
RAWP	Remedial Action Work Plan
SCFM	Standard Cubic Feet per Minute
SCG	Standards, Criteria and Guidance
SCOs	Soil Cleanup Objectives
SMP	Site Management Plan
SOP	Site Operations Plans
TCA	Trichloroethane
TCE	Trichloroethene
VCA	Voluntary Cleanup Agreement
VLS	Vapor-Liquid Separator
VOCs	Volatile Organic Compounds
“WC	Inches of Water Column

FIGURES

DWG Name:	31400435.03
Checked:	EMH 6/5/2012
Approved:	ACS 6/5/2012
Drawn By:	RLO 8/10/2017
A	



REFERENCE:
7.5 MINUTE SERIES TOPOGRAPHIC QUADRANGLE
BREWERTON, NEW YORK
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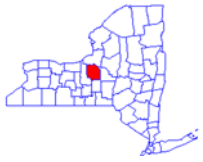

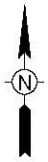

0 1000 2000 4000
SCALE, FEET

WSP USA
5 Sullivan Street
Cazenovia, New York 13035
(315) 655-3900

FIGURE 1

SITE LOCATION MAP

FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

NOTES:

1. GOOGLE EARTH AERIAL PHOTOGRAPH, DATED 04/13/2017.
2. AERIAL PHOTOGRAPHS USED FOR THIS ILLUSTRATION CONTAIN INHERENT DISTORTIONS RESULTING FROM THE PHOTOGRAPHIC PROCESS THAT MAY RESULT IN SLIGHT MISALIGNMENTS WITH THE SURVEYED SITE FEATURES.

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LEGEND

- MW-04 — MONITORING WELL
- PROPERTY LINE AND INSTITUTIONAL CONTROL BOUNDARY
- RAILROAD
- EXISTING SANITARY SEWER

N

0 250 500

SCALE IN FEET

Drawn By: LS/CRB 9/13/17

Checked:

Approved:

DWG Name: 314I0435-004

FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

FIGURE 2

SITE LAYOUT

WSP USA Inc.
5 SULLIVAN STREET
CAZENOVIA, NY 13035
TEL: +1 315.655.3900

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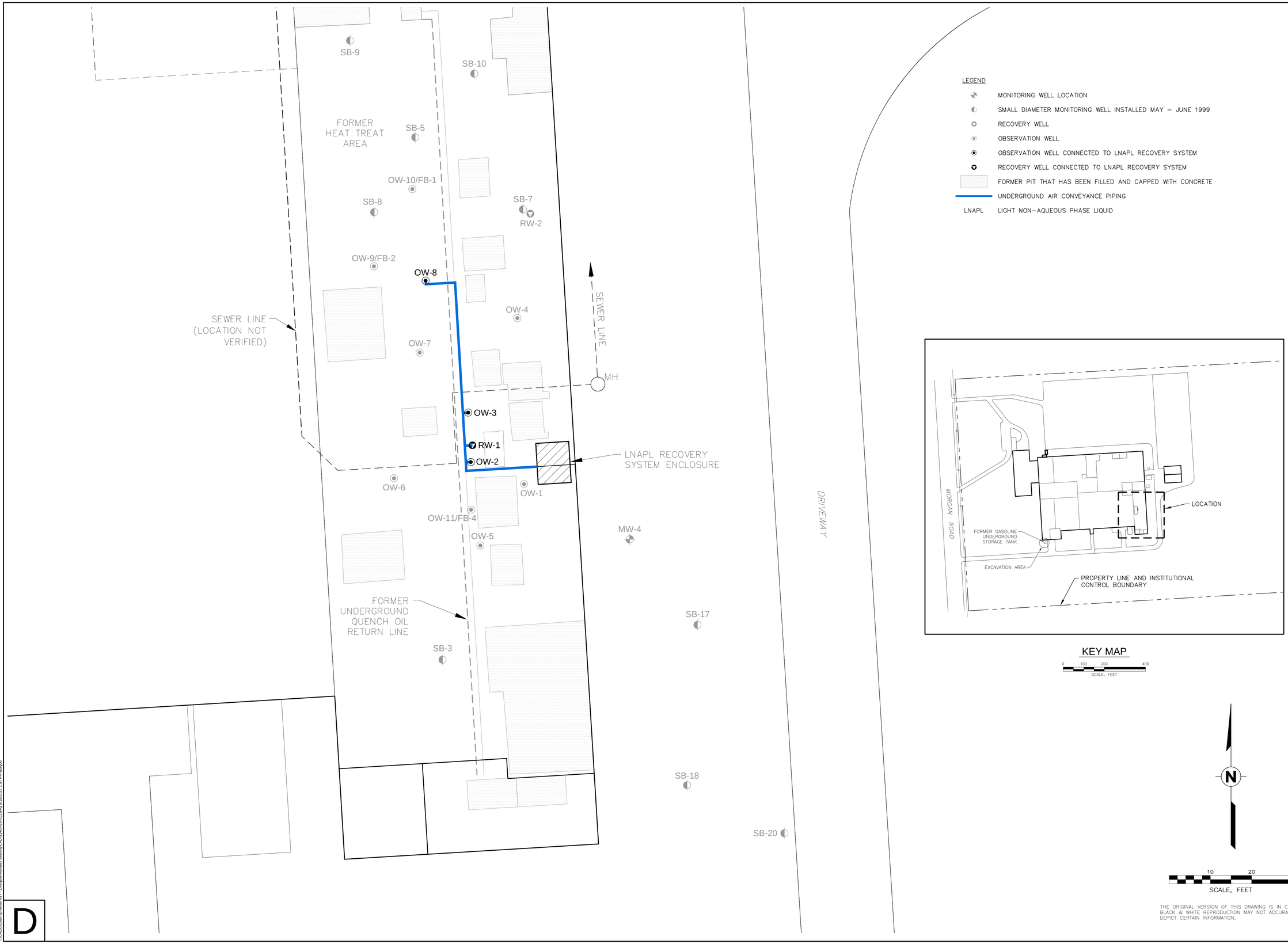

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REVISIONS

REV	DESCRIPTION		
1	Revised	Chkd	Appr
2	Revised	Chkd	Appr
3	Revised	Chkd	Appr

SEAL

DATE

DRAWN BY EGC/CRB 9/18/17

CHECKED

APPROVED

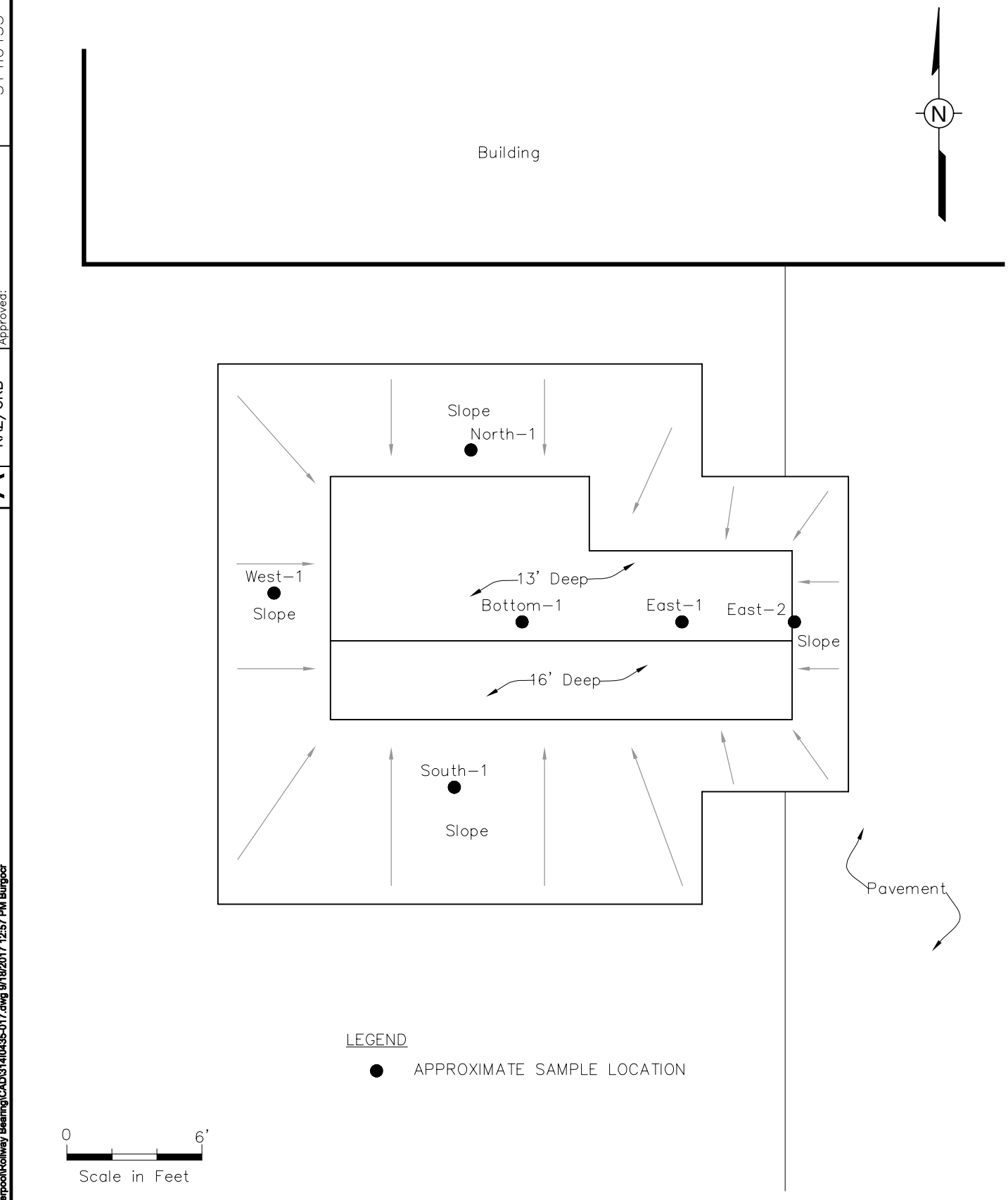
LNAPL RECOVERY SYSTEM LAYOUT
FORMER HEAT TREAT DEPARTMENT
FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

WSP USA Inc.
5 SULLIVAN STREET
CAZENOVIA, NY 13035
TEL: +1 315.655.3900

FIGURE 3

Drawing Number
31410435–011



A

Drawn By: RAZ/CRB

Checked:

Approved:

DWG Name: 3140435-017

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WSP USA Inc.
5 SULLIVAN STREET
CAZENOVIA, NY 13035
TEL: +1 315.655.3900

FIGURE 4

EXCAVATION LIMITS

FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK

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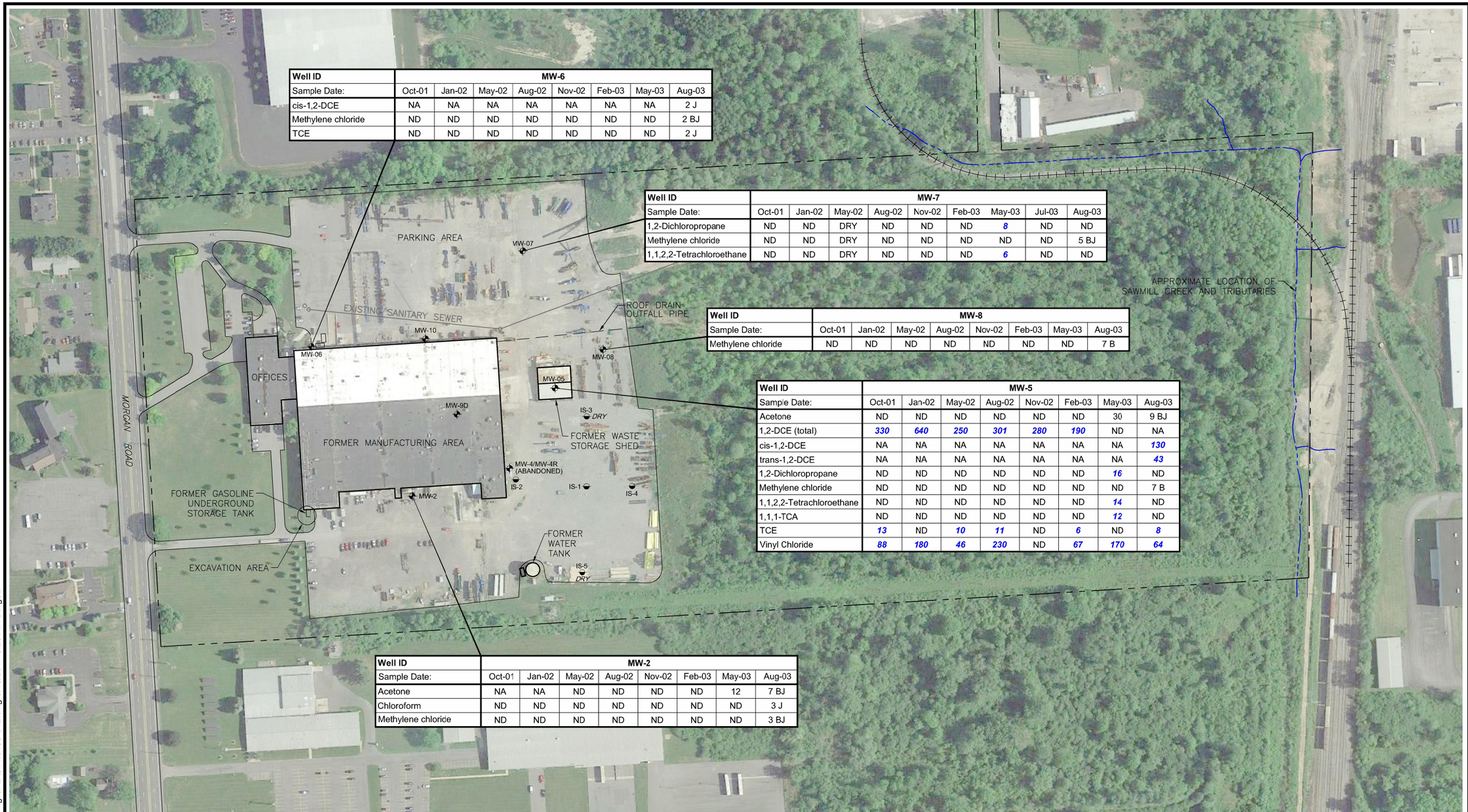
EMERSON
ST. LOUIS, MISSOURI



Well ID	MW-6							
Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03
cis-1,2-DCE	NA	NA	NA	NA	NA	NA	NA	2 J
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	2 BJ
TCE	ND	ND	ND	ND	ND	ND	ND	2 J

Well ID	MW-7								
Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Jul-03	Aug-03
1,2-Dichloropropane	ND	ND	DRY	ND	ND	ND	*8*	ND	ND
Methylene chloride	ND	ND	DRY	ND	ND	ND	ND	ND	5 BJ
1,1,2,2-Tetrachloroethane	ND	ND	DRY	ND	ND	ND	*6*	ND	ND

Well ID	MW-8							
Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	7 B

Well ID	MW-5							
Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03
Acetone	ND	ND	ND	ND	ND	ND	30	9 BJ
1,2-DCE (total)	*330*	*640*	*250*	*301*	*280*	*190*	ND	NA
cis-1,2-DCE	NA	NA	NA	NA	NA	NA	NA	*130*
trans-1,2-DCE	NA	NA	NA	NA	NA	NA	NA	*43*
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	*16*	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	7 B
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	*14*	ND
1,1,1-TCA	ND	ND	ND	ND	ND	ND	*12*	ND
TCE	*13*	ND	*10*	*11*	ND	*6*	ND	*8*
Vinyl Chloride	*88*	*180*	*46*	*230*	ND	*67*	*170*	*64*

Well ID	MW-2							
Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03
Acetone	NA	NA	ND	ND	ND	ND	12	7 BJ
Chloroform	ND	ND	ND	ND	ND	ND	ND	3 J
Methylene chlorice	ND	ND	ND	ND	ND	ND	ND	3 BJ

REFERENCES:

1. GOOGLE EARTH AERIAL PHOTOGRAPH, DATED 05/28/2016.
2. AERIAL PHOTOGRAPHS USED FOR THIS ILLUSTRATION CONTAIN INHERENT DISTORTIONS RESULTING FROM THE PHOTOGRAPHIC PROCESS THAT MAY RESULT IN SLIGHT MISALIGNMENTS WITH THE SURVEYED SITE FEATURES.

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NOTES:

1. CONCENTRATIONS ARE SHOWN IN MICROGRAMS PER LITER.
2. GROUNDWATER CONCENTRATIONS IN BLUE ITALIC ARE ABOVE THE NEW YORK STATE AMBIENT WATER QUALITY STANDARDS OR GUIDANCE VALUE FOR CLASS GA GROUNDWATER PROVIDED IN THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF WATER TECHNICAL AND OPERATIONAL GUIDANCE SERIES (1.1.1), DATED JUNE 1998 AND ADDENDUMS.
3. CONCENTRATIONS QUALIFIED WITH A "B" (i.e., ASSOCIATED WITH BLANK CONTAMINATION) WERE NOT COMPARED TO THE GROUNDWATER STANDARDS OR GUIDANCE VALUES.

LEGEND

	MONITORING WELL
	In-Situ GROUNDWATER SAMPLE (OCTOBER 2006)
	PROPERTY LINE AND INSTITUTIONAL CONTROL BOUNDARY
	RAILROAD
	EXISTING SANITARY SEWER
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS-1,2-DICHLOROETHENE
trans-1,2-DCE	TRANS-1,2-DICHLOROETHENE
TCA	TRICHLOROETHANE
J	ESTIMATED CONCENTRATION
B	ANALYTE DETECTED IN ASSOCIATED BLANK
ND	NOT DETECTED
NA	NOT ANALYZED FOR THIS PARAMETER
VOCs	VOLATILE ORGANIC COMPOUNDS

N

0 250 500
SCALE IN FEET

Drawn By: LS/CRB 9/19/17
Checked:
Approved:
DWG Name: 31410435-012

FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

FIGURE 5

QUARTERLY GROUNDWATER RESULTS
(OCTOBER 2001 TO AUGUST 2003)

WSP USA Inc.
5 SULLIVAN STREET
CAZENOVIA, NY 13035
TEL: +1 315.655.3900

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Well ID	MW-5
Sample Date	Aug-03
cis-1,2-DCE	*130*
trans-1,2-DCE	*43*
TCE	*8*
Vinyl Chloride	*64*

Well ID	MW-9D
Sample Date	May-12
TCE	*5.6*

Well ID	MW-4R
Sample Date	Sep-11
Acetone	*90.4*
Xylenes (total)	*19*

Well ID	IS-1
Depth (ft bgs)	18-22
Sample Date:	Oct-06
cis-1,2-DCE	*96*
TCE	*42*

REFERENCES:

1. GOOGLE EARTH AERIAL PHOTOGRAPH, DATED 05/28/2016.
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NOTES:

1. CONCENTRATIONS ARE SHOWN IN MICROGRAMS PER LITER.
2. THE SAMPLE DEPTH FOR N SITU GROUNDWATER SAMPLE IS–1 IS SHOWN IN FEET BELOW GROUND SURFACE.
3. GROUNDWATER CONCENTRATIONS IN BLLE ITALIC ARE ABOVE THE NEW YORK STATE AMBIENT WATER QUALITY STANDARDS OR GUIDANCE VALUE FOR CLASS GA GROUNDWATER PROVIDED IN THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION DIVISION OF WATER TECHNICAL AND OPERATIONAL GUIDANCE SERIES (1.1.1), DATED JUNE 1998 AND ADDENDUMS.

LEGEND

✦	MONITORING WELL
●	In–Situ GROUNDWATER SAMPLE (OCTOBER 2006)
— — —	PROPERTY LINE AND INSTITUTIONAL CONTROL BOUNDARY
+++++++	RAILROAD
——o——	EXISTING SANITARY SEWER
TCE	TRICHLOROETHENE
cis-1,2-DCE	CIS–1,2–DICHLOROETHENE
trans-1,2-DCE	TRANS–1,2–DICHLOROETHENE
IS-1	IN SITU GROUNDWATER SAMPLE
VOCs	VOLATILE ORGANIC COMPOUNDS
- - - -	EXTENT OF VOCs ABOVE GROUNDWATER CRITERIA

N

0 250 500
SCALE IN FEET

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DWG Name: 31410435–013

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FIGURE 6

VOCs IN GROUNDWATER ABOVE NEW YORK STATE GROUNDWATER CRITERIA

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CAZENOVIA, NY 13035
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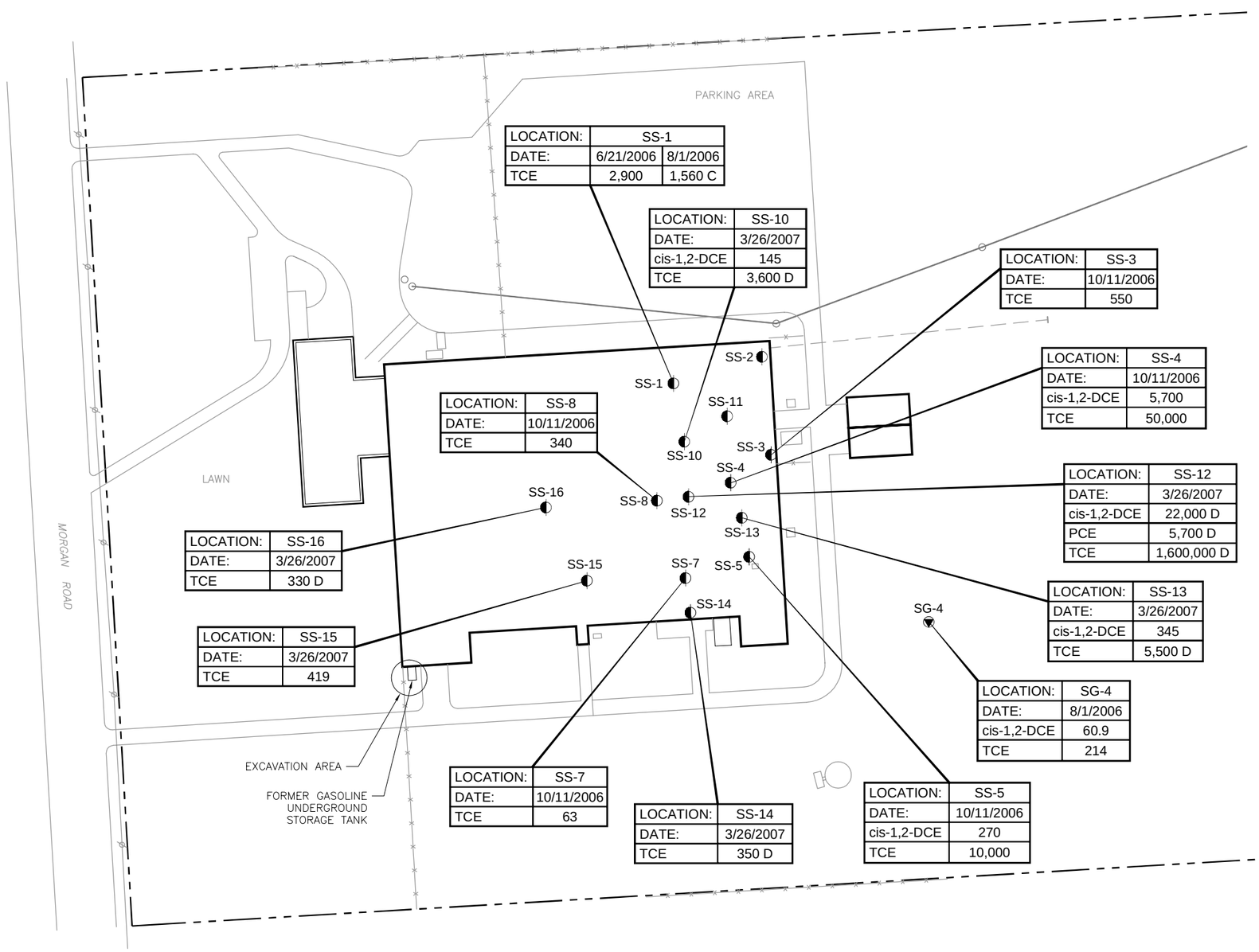

LEGEND

— — —	PROPERTY LINE AND INSTITUTIONAL CONTROL BOUNDARY
▼	VADOSE ZONE SOIL GAS SAMPLE LOCATION
◐	SUBSLAB SOIL GAS SAMPLE LOCATION
cis-1,2-DCE	CIS–1,2–DICHLOROETHENE
PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
D	CONCENTRATION IS A RESULT OF A SECONDARY DILUTION ANALYSIS
C	ANALYTE EXCEEDS CALIBRATION CRITERIA. QUANTITATION ESTIMATED.

NOTES:

1. CONCENTRATIONS ARE SHOWN IN MICROGRAMS PER CUBIC METER (ug/m^3).
2. SOIL VAPOR CONCENTRATIONS DEPICTED ARE ABOVE THE SUBSLAB VAPOR CONCENTRATIONS REQUIRING REMEDIATION IN A RESIDENTIAL SETTING REGARDLESS OF INDOOR AIR CONCENTRATION, AS PROVIDED IN NEW YORK STATE DEPARTMENT OF HEALTH'S FINAL GUIDANCE FOR EVALUATION OF SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK (UPDATED MAY 2017).

0 160 320
SCALE IN FEET

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DWG Name: 3140435-014

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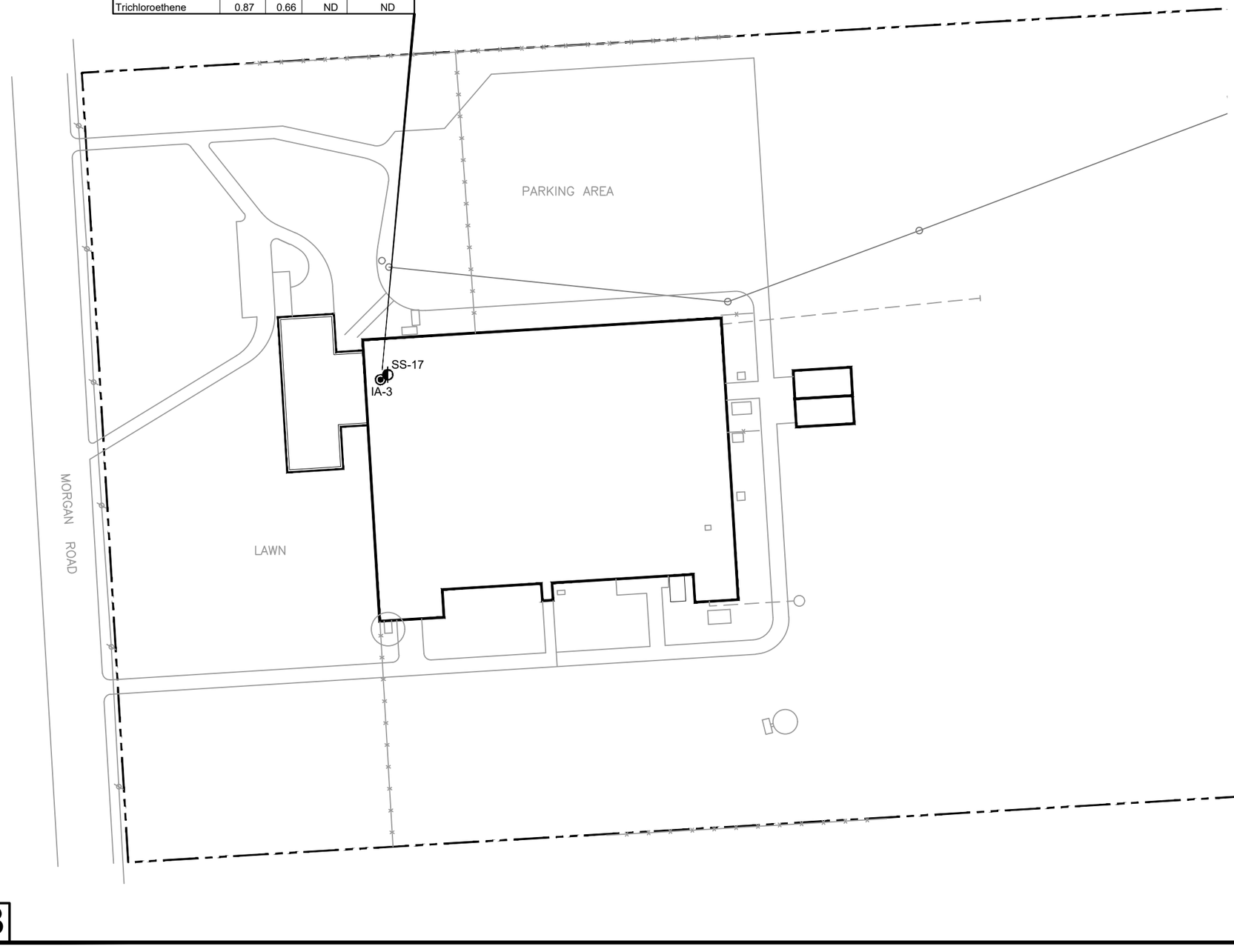
LIVERPOOL, NEW YORK
PREPARED FOR EMERSON
ST. LOUIS, MISSOURI

FIGURE 7

SOIL VAPOR SAMPLING RESULTS ABOVE NEW YORK STATE DEPARTMENT OF HEALTH CRITERIA

WSP USA Inc.
5 SULLIVAN STREET
CAZENOVIA, NY 13035
TEL: +1 315.655.3900

Sample Date:	27-Feb-12			
Sample ID:	SS-17	IA-3	IA-3R	AA022712
Compound (mg/m^3)				
1,1,1-Trichloroethene	0.94	ND	ND	ND
Acetone	24	51	59	6.0 J
Benzene	3.5	1.3	1.1	0.91
Chloroform	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND
Freon 113	1.1 J	ND	ND	ND
Tetrachloroethylene	33	3.2	2.6	ND
Trichloroethene	0.87	0.66	ND	ND



LEGEND

- INDOOR AIR SAMPLE LOCATION
- SUBSLAB SOIL GAS SAMPLE LOCATION

ND NOT DETECTED
J ESTIMATED CONCENTRATION
IA INDOOR AIR SAMPLE
SS SUBSLAB SOIL GAS SAMPLE

NOTES:

1. CONCENTRATIONS ARE SHOWN IN MICROGRAMS PER CUBIC METER (ug/m^3).
2. SAMPLE IA-3R IS A DUPLICATE OF SAMPLE IA-3.
3. SAMPLE AA022712 IS AN AMBIENT OUTDOOR AIR SAMPLE.

Drawn By: RAE 01222018
Checked:
Approved:
DWG Name: 314V0435-008

FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

FIGURE 8

INDOOR AIR SAMPLING RESULTS – OFFICE AREA – FEBRUARY 2012

WSP USA Inc.
5 SULLIVAN STREET
CAZENOVIA, NY 13035
TEL: +1 315.655.3900

B

SB-9

SB-10
[NM]

FORMER HEAT TREAT AREA

SB-5
[0.25]

OW-10/FB-1
[NM]

SB-8
[NM]

SB-7
[NM] [NM]
RW-2

OW-9/FB-2
[NM]

OW-8
[NM]

SEWER LINE (LOCATION NOT VERIFIED)

OW-4
[NM]

SEWER LINE

OW-7

MH

OW-3
[NM]

RW-1
[NM]

OW-2 [NM]

LNAPL RECOVERY SYSTEM ENCLOSURE

OW-6

OW-1
[0.03]

OW-11/FB-4
[NM]

MW-4R (ABANDONED)

OW-5
[0.01]

DRIVEWAY

FORMER UNDERGROUND QUENCH OIL RETURN LINE

SB-17

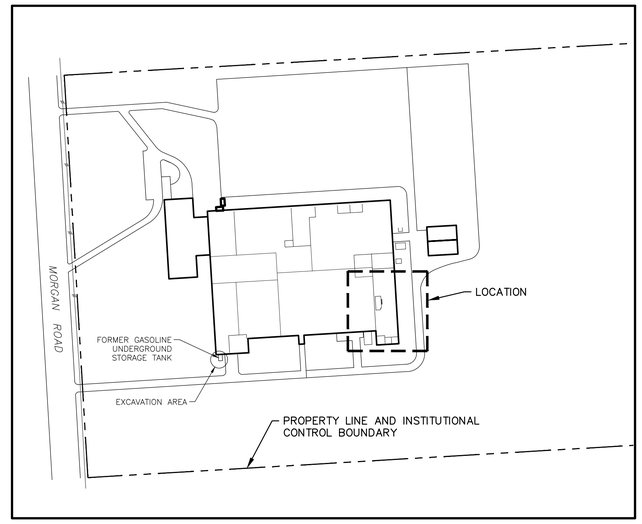
SB-3

SB-18

SB-20

LEGEND

- MONITORING WELL LOCATION
- SMALL DIAMETER MONITORING WELL INSTALLED MAY – JUNE 1999
- RECOVERY WELL
- OBSERVATION WELL
- OBSERVATION WELL CONNECTED TO LNAPL RECOVERY SYSTEM
- RECOVERY WELL CONNECTED TO LNAPL RECOVERY SYSTEM
- FORMER PIT THAT HAS BEEN FILLED AND CAPPED WITH CONCRETE
- UNDERGROUND AIR CONVEYANCE PIPING
- [0.06] LNAPL THICKNESS IN FEET (DECEMBER 2016)
- LNAPL THICKNESS IN WELL ABOVE REMEDIAL ACTION OBJECTIVE (>0.01 FOOT)
- NM NO MEASUREABLE PRODUCT DETECTED IN WELL
- LNAPL LIGHT NON–AQUEOUS PHASE LIQUID



KEY MAP

0 100 200 400
SCALE, FEET

N

0 10 20 30
SCALE, FEET

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REVISIONS

REV	DESCRIPTION	Drwn:	Appr.:
1	Revised:	Drwn:	Appr.:
2	Revised:	Drwn:	Appr.:
3	Revised:	Drwn:	Appr.:

SEAL:

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LNAPL THICKNESS MEASUREMENTS JULY 2017 – FORMER HEAT TREAT DEPARTMENTS

FORMER ROLLWAY BEARING CORPORATION FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

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FIGURE 9

Drawing Number
314P0435–D01

TABLES

Table 1

Site-Specific Soil Cleanup Objectives
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

VOCs	Site-Specific SCOs (b) (μg/kg)
Benzene	4,600
Ethylbenzene	9,300
Toluene	12,300
o-Xylene	20,600
m,p-Xylene	20,600
Isopropylbenzene	2,900
n-Propylbenzene	198,000
1,2,4-Trimethylbenzene	220,000
1,3,5-Trimethylbenzene	53,200
n-Butylbenzene	198,000
Napthalene	22,300
tert-Butylbenzene	5,681,000

a/ VOCs = volatile organic compounds; SCO = soil cleanup objective; μg/kg = micrograms per kilogram.

b/ Cleanup criteria are the lowest of the concentrations listed in Table 7 in Apendix A of the Revised Remedial Action Work Plan, dated May 9, 2000.

Table 2

Soil Characterization Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

Sample Location:	Staged Soil Pile
Sample Date:	12/3/2001
TCLP VOCs (μg/l) (b)	
1,2,4-Trimethylbenzene	1 U
1,3,5-Trimethylbenzene	1 U
Benzene	1 U
Ethylbenzene	1 U
Isopropylbenzene	1 U
Methyl-tert-butyl ether	1 U
Naphthalene	1 U
n-Butylbenzene	1 U
n-Propylbenzene	1 U
o-Xylene	2 U
m,p-Xylene	2 U
p-Isopropyltoluene	1 U
sec-Butylbenzene	1 U
tert-Butylbenzene	1 U
Toluene	1 U
Total Xylenes	2 U
TCLP Metals (mg/l)	
Lead	0.019
Other Chemistry	
Flash Point, F	> 200

a/ TCLP = toxicity characteristic leaching procedure; VOCs = volatile organic compounds; μg/l = micrograms per liter; mg/l - milligrams per liter; F = degrees Fahrenheit; U = compound not detected.

b/ VOCs are those listed for Gasoline Contaminated Soil in Table 1 of Appendix B of the New York State Department of Environmental Conservation Petroleum-Contaminated Soil Guidance Policy (STARS #1), dated August 1992.

Table 3

Soil Excavation Confirmation Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Sample ID:	Bottom-1	West-1	North-1	East-1	South-1	East-2	BF-1	BF-2
	Depth (feet bgs):	13	12	11	11	11	11		
	Sample Date:	11/13/2001	11/13/2001	11/13/2001	11/13/2001	11/13/2001	11/15/2001	11/13/2002	11/13/2002
VOCs (µg/kg)	**Site-Specific SCOs (b)**								
Benzene	4,600	500 U	10 U	1,000 U	2,000 U	10 U	11	10 U	10 U
Ethylbenzene	9,300	1,100	20 U	2,000 U	**24,000**	20 U	27	20 U	20 U
Toluene	12,300	1,000 U	20 U	2,000 U	**77,000**	20 U	20 U	20 U	20 U
o-Xylene	20,600	1,000 U	20 U	3,400	**71,000**	20 U	39	20 U	20 U
m,p-Xylene	20,600	2,300	24	11,000	**180,000**	20 U	220	20 U	20 U
Isopropyl Benzene	2,900	1,000 U	20 U	2,000 U	**6,900**	20 U	20 U	20 U	20 U
n-Propylbenzene	198,000	1,500	20 U	3,400	18,000	20 U	70	20 U	20 U
1,2,4-Trimethylbenzene	220,000	12,000	20 U	26,000	140,000	20 U	790	20 U	20 U
1,3,5-TMB	53,200	3,900	20 U	8,400	53,000	20 U	310	20 U	20 U
n-Butylbenzene	198,000	5,400	20 U	11,000	38,000	20 U	380	20 U	20 U
Naphthalene	22,300	5,000 U	100 U	10,000 U	20,000 U	100 U	100 U	100 U	100 U
tert-Butylbenzene	5,681,000	1,000 U	20 U	2,000 U	4,000 U	20 U	20 U	20 U	20 U

a/ VOCs = volatile organic compounds; SCO = soil cleanup objective; bgs = below ground surface; µg/kg = micrograms per kilogram; U = compound not detected.

b/ Cleanup criteria are the lowest of the concentrations listed in Table 7 in Appendix A of the Revised Remedial Action Work Plan, dated May 9, 2000.
Bolded concentration in shaded cell exceeds SCO.

Table 4

Quarterly Groundwater Monitoring Well Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Well ID:	MW-2								MW-5										
	Sample ID:	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-2	MW-5	MW-15 (c)	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-50 (c)	MW-5	MW-50 (b)
	Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03	Oct-01	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	May-03	Aug-03	Aug-03
VOCs (µg/l)	**SCG (b)**																			
Acetone	50	NA	NA	ND	ND	ND	ND	12	7 BJ	ND	ND	ND	ND	ND	ND	ND	30	ND	5 BJ	9 BJ
2-Butanone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	3 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	5	ND	ND	ND	ND	ND	ND	NA	NA	**290**	**330**	**640**	**250**	**301**	**280**	**190**	ND	ND	NA	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	**130**	**130**
trans-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	**41**	**43**
1,2-Dichloropropane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16**	**15**	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	3 BJ	ND	ND	ND	ND	ND	ND	ND	ND	ND	6 B	7 B
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**14**	**12**	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12**	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	**11**	**13**	ND	**10**	**11**	ND	**6**	ND	ND	**7**	**8**
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	**88**	**80**	**180**	**46**	**230**	ND	**67**	**130**	**170**	**54**	**64**
Xylenes (total)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Total VOCs:	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*12*	*13*	*389*	*423*	*820*	*306*	*542*	*280*	*263*	*190*	*209*	*243*	*261*

Table 4

Quarterly Groundwater Monitoring Well Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Well ID:	MW-6								MW-7										
	Sample ID:	MW-6	MW-6	MW-6	MW-6	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	MW-7	MW-7	MW-70 (c)	MW-7	MW-70 (c)	MW-7	MW-7	MW-7
	Sample Date:	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03	Oct-01	Jan-02	May-02	Aug-02	Nov-02	Nov-02	Feb-03	Feb-03	May-03	Jul-03	Aug-03
VOCs (µg/l)	**SCG (b)**																			
Acetone	50	NA	NA	ND	ND	ND	ND	ND	ND	NA	NA	(d)	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	5	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	2 J	NA	NA	(d)	NA	NA	NA	NA	NA	NA	NA	ND
trans-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	ND	NA	NA	(d)	NA	NA	NA	NA	NA	NA	NA	ND
1,2-Dichloropropane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	**8**	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	2 BJ	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	5 BJ
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	**6**	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	2 J	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	(d)	ND	ND	ND	ND	ND	ND	ND	ND
	Total VOCs:	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*6*	*ND*	*ND*	*(d)*	*ND*	*ND*	*ND*	*ND*	*ND*	*14*	*ND*	*5*

Table 4

Quarterly Groundwater Monitoring Well Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Well ID:	MW-8										
	Sample ID:	MW-8	MW-8	MW-80 (c)	MW-8	MW-80 (c)	MW-8	MW-80 (c)	MW-8	MW-8	MW-8	MW-8
	Sample Date:	Oct-01	Jan-02	Jan-02	May-02	May-02	Aug-02	Aug-02	Nov-02	Feb-03	May-03	Aug-03
VOCs (µg/l)	**SCG (b)**											
Acetone	50	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
cis-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
trans-1,2-Dichloroethene	5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
1,2-Dichloropropane	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7 B
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Total VOCs:	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*7*

a/ VOCs = volatile organic compounds; µg/l = micrograms per liter; SCG = standards, criteria, and guidance; ND = not detected; NA = not analyzed;
Data qualifiers: J = estimated concentration; B = analyte was detected in an associated blank.
b/ SCG are the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater provided in the New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance Series (1.1.1), dated June 1998, and addendums.
Bolded concentration in shaded cell exceeds SCG. (Concentrations qualified with a "B" (i.e., associated with blank contamination) were not compared to the SCG.)
c/ MW-15 is a duplicate sample of MW-5.
MW-50 is a duplicate sample of MW-5.
MW-70 is a duplicate sample of MW-7.
MW-80 is a duplicate sample of MW-8.
d/ Well was dry during this sampling event.

Table 5

Additional Groundwater Monitoring Well Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Well ID:	MW-04		MW-4R	MW-9D	
	Sample ID:	MW-4	MW-99 (c)	MW-4R	MW-9D	MW-9D
	Sample Date:	Nov-07	Nov-07	Sep-11	Sep-11	May-12
VOCs (µg/l)	**SCG (b)**					
Acetone	50	**440**	**400**	**90.4**	ND	ND
2-Butanone	50	**140**	**130**	ND	ND	ND
2-Hexanone	50	**64**	**51**	ND	ND	ND
cis-1,2-Dichloroethene	5	ND	ND	ND	1.7	1.4
trans-1,2-Dichloroethene	5	ND	ND	ND	ND	ND
Methylene chloride	5	**13**	**13**	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	1.3 J	ND
1,1,1-Trichloroethane	5	ND	ND	ND	1.0	1.2
Trichloroethene	5	ND	ND	ND	**5.7**	**5.6**
Xylenes (total)	5	ND	ND	**19**	ND	ND

a/ VOCs = volatile organic compounds; µg/l = micrograms per liter; SCG = standards, criteria, and guidance; ND = not detected.
Data qualifiers: J = estimated concentration.

b/ SCG are the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater provided in the New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance Series (1.1.1), dated June 1998, and addendums.
Bolded concentration in shaded cell exceeds SCG. (Concentrations qualified with a "B" (i.e., associated with blank contamination) were not compared to the SCG.)

c/ MW-99 is a duplicate sample of MW-4.

Table 6

***In-Situ* Groundwater Sampling Results**
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Sample Location:	**IS-1**	**IS-2**		**IS-3**	**IS-4**	**IS-5**
	Sample ID:	IS-1	IS-2-105	IS-299-105 (c)	NS	IS-4-110	NS
	Depth (ft bgs):	18-22	10.5-14.5		--	11-15	--
	Sample Date:	Oct-06	May-07	May-07	May-07	May-07	May-07
VOCs (µg/l)	**SCG (b)**						
Acetone	50	5.6	6.6	5.6	NS	ND	NS
cis-1,2-Dichloroethene	5	**96**	ND	ND	NS	ND	NS
Trichloroethene	5	**42**	ND	ND	NS	ND	NS

a/ VOCs = volatile organic compounds; ft bgs = feet below ground surface; µg/l = micrograms per liter;
SCG = standards, criteria, and guidance; ND = not detected; NS = not sampled, no groundwater encountered above bedrock.

b/ SCG are the New York State Ambient Water Quality Standards or Guidance Values for Class GA groundwater provided in the New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance Series (1.1.1), dated June 1998, and addendums.
Bolded concentration in shaded cell exceeds SCG.

c/ IS-299-105 is a duplicate sample of IS-2-105.

Table 7

Subslab Soil Vapor and Soil Gas Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Sample Type:	Subslab Soil Vapor																
	Sample Location:	SS-1	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9		SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16
	Sample ID:	SS062106	SS080106	SS2-101106	SS3-101106	SS4-101106	SS5-101106	SS6-101106	SS7-101106	SS8-101106	SS9-101306	SS9R-101306 (c)	SS10-032607	SS11-032607	SS12-032607	SS13-032607	SS14-032607	SS15-032607	SS16-032607
	Sample Date:	June 21, 2006	August 1, 2006	October 11, 2006							October 13, 2006		March 26, 2007						
VOCs (µg/m³)	**SCG (b)**																		
cis-1,2-Dichloroethene	60	ND	ND	ND	2.1	**5,700**	**270**	ND	ND	ND	ND	ND	**145**	ND	**22,000 D**	345	7.13	2.5	7.58
Methylene chloride	1,000	1.27	1.17	1.0 J	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,000	29	27	9.8	20	ND	ND	2.6	ND	ND	ND	ND	8.76	11.7	**5,700 D**	3.24	2.48	10.3	141
1,1,1-Trichloroethane	1,000	14.4	6.93	60	29	ND	ND	2.4	ND	ND	ND	ND	68.8	4.77	7.93	4.44	ND	ND	0.943
Trichloroethene	60	**2,900**	**1,560 C**	19	**550**	**50,000**	**10,000**	13	**63**	**340**	ND	ND	**3,600 D**	41	**1,600,000 D**	**5,500 D**	**350 D**	**419**	**330 D**
Vinyl chloride	60	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND C	ND C	3.95 C	ND C	ND C	ND C	ND C
Acetone	No value listed	1,590 C	86.9	190	130	ND	120	240 E	200	ND	38	41	89.8	880 E	1,200 JD	218 E	264 E	81.1	149
Benzene	No value listed	2.18	1.82	0.82	1.5	ND	ND	0.66	ND	ND	ND	ND	2.08	12	49	5.97	0.942	1.53	1.36
Carbon disulfide	No value listed	1.8	1.61	ND	ND	ND	ND	20	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Chloroform	No value listed	1.94	1.84	ND	ND	ND	190	ND	ND	ND	ND	ND	87.4	ND	ND	214	67.5	ND	ND
Chloromethane	No value listed	ND	0.336	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	No value listed	1.43	0.77	2.0	1.6	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	No value listed	0.725	0.524 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.07	ND	1,500 D	21 J	ND	ND	ND
Ethylbenzene	No value listed	1.37	3.05 C	1.6	2.4	ND	ND	6.4	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
4-Ethyltoluene	No value listed	1.85	1.45 C	10	9.2	ND	ND	7.1	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Freon 11	No value listed	25.1	23.8	200	5.1	ND	ND	1.9	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Freon 113	No value listed	3,370	779	60	530	1,100,000	11,000	52	4,100	22,000	430	420	43,000 D	370 D	2,100,000 D	7,300 D	293	333	170 D
Freon 12	No value listed	ND	3.92	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Heptane	No value listed	5.12	3.21	4.1	3.2	ND	ND	2.2	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Hexane	No value listed	4.19	ND	2.2	1.8	ND	ND	0.76	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Isopropyl alcohol	No value listed	35.2	ND	33	180	ND	ND	7.6	33	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Methyl butyl ketone	No value listed	8.37	1.08 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Methyl ethyl ketone	No value listed	30.6	10.1	8.9	13	ND	36	7.5	8.2	ND	ND	2.4	NA	NA	NA	NA	NA	NA	NA
Methyl isobutyl ketone	No value listed	3.79	1.87	5.6	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Styrene	No value listed	0.649 J	0.736 C	2.0	3.0	ND	ND	4.8	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Toluene	No value listed	11.1	9.81	14	21	ND	ND	28	20	ND	ND	3.8	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	No value listed	8.69	3.55	34	35	ND	ND	10	9.2	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	No value listed	2.8	3.1 C	12	10	ND	ND	3.2	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	No value listed	4.9	9	5.4	8.3	ND	ND	19	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
o-Xylene	No value listed	1.9 J	2.87	3.4	3.1	ND	ND	7.5	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA

Table 7

Subslab Soil Vapor and Soil Gas Sampling Results
Former Rollway Bearing Corporation Facility
Liverpool, New York (a)

	Sample Type:	Soil Gas													
	Sample Location:	SG-1		SG-2	SG-3	SG-4	SG-5	SG-6	SG-7	SG-8	SG-9	SG-9	SG-10	SG-11	SG-13
	Sample ID:	SG1080206	SG1080206DUP (d)	SG2080106	SG3080106	SG4080106	SG5080206	SG6080306R	SG7080206	SG8080206R	SG9080106	SG9-101306	SG10-101306	SG11-101106	SG13-101306
	Sample Date:	August 1-3, 2006										October 11-13, 2006			
VOCs (µg/m³)	**SCG (b)**														
cis-1,2-Dichloroethene	60	ND	ND	ND	0.927	**60.9**	ND	ND	ND	0.564 J	ND	ND	ND	ND	ND
Methylene chloride	1,000	0.565	0.636	0.494 J	0.353 J	0.459 J	0.353 J	0.706	ND	0.847	ND	ND	ND	ND	ND
Tetrachloroethene	1,000	0.689 J	0.758 J	ND	ND	ND	ND	ND	ND	ND	0.827 J	ND	ND	ND	ND
1,1,1-Trichloroethane	1,000	ND	ND	ND	ND	9.04	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	60	1.2	0.983	0.601	7.1	**214**	0.601	0.492	0.328	1.64	0.71	ND	ND	1.4	ND
Vinyl chloride	60	ND	ND	ND	ND	0.702	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	No value listed	126	125	2,600	796	595	155	819	286	419	834	90	ND	11	69
Benzene	No value listed	35.1	37	1.33	0.714	1.17	0.649	0.812	0.779	1.62	1.82	1.2	ND	5.2	0.79
Carbon disulfide	No value listed	14.6	15.5	2.12	1.36	2.03	1.33	0.95	1.23	1.14	14.4	ND	ND	45	ND
Chloroform	No value listed	1.54	1.49	ND	ND	ND	ND	0.596 J	ND	ND	ND	ND	ND	18	ND
Chloromethane	No value listed	0.273 J	0.294 J	1.09	0.798	0.336	0.714	0.924	0.798	0.84	ND	ND	ND	ND	ND
Cyclohexane	No value listed	5.25	2.41	ND	ND	0.84	ND	ND	ND	ND	2.2	0.99	ND	2.2	ND
trans-1,2-Dichloroethene	No value listed	ND	ND	ND	ND	1.09	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	No value listed	38.8	39.3	0.794	0.53 J	1.32	0.441 J	0.53 J	0.53 J	4.41	3.75	ND	ND	ND	0.66 J
4-Ethyltoluene	No value listed	12	11.5	0.849	0.65 J	1.45	0.6 J	ND	0.65 J	3.4	2.2	ND	ND	ND	ND
Freon 11	No value listed	1.09	1.2	1.09	0.971	ND	1.09	0.971	1.03	1.31	ND	ND	1.3	2.5	1.4
Freon 113	No value listed	0.935 J	0.935 J	ND	ND	ND	ND	ND	ND	0.779 J	ND	ND	ND	15	ND
Freon 12	No value listed	0.754 J	0.754 J	ND	1.96	ND	2.11	ND	2.21	2.06	2.11	ND	ND	ND	ND
Heptane	No value listed	11.7	13.3	5.29	2.37	3.75	1.17	1	1.25	1.58	1.79	ND	ND	ND	1.7
Hexane	No value listed	13.6	16.1	ND	ND	49.3	ND	ND	ND	ND	ND	ND	ND	ND	0.64
Isopropyl alcohol	No value listed	ND	ND	42.2	9.49	ND	8.24	ND	31	18	ND	ND	ND	ND	4.0
Methyl butyl ketone	No value listed	ND	ND	36.6	7.49 J	ND	5.75	1.67	6.87	4.95	ND	ND	ND	ND	ND
Methyl ethyl ketone	No value listed	ND	ND	297	8.69 J	ND	10.2	15.8	23.1	29.4	10.1	5.1	ND	1.1	7.8
Methyl isobutyl ketone	No value listed	1.67	1.67	1.58	0.625 J	ND	ND	ND	ND	ND	0.749 J	ND	ND	ND	2.7
Styrene	No value listed	4.81	7.88	0.866	ND	ND	ND	ND	ND	1.82	ND	ND	ND	ND	ND
Toluene	No value listed	316	326	3.87	2.18	2.83	2.26	3.06	2.49	14.6	10.4	0.72	0.77	5.2	4.0
1,2,4-Trimethylbenzene	No value listed	20.5	19.5	3.15	2.4	5.4	2.1	1.4	1.8	10.2	4.75	ND	ND	ND	1.2
1,3,5-Trimethylbenzene	No value listed	7.05	8.94	2.7	1.45	2.15	1.8	0.7 J	1.25	3.4	2.05	ND	ND	ND	ND
m,p-Xylene	No value listed	150	164	2.87	1.68	4.68	1.59	1.54	1.77	14.6	13.1	0.87	ND	1.2	2.7
o-Xylene	No value listed	36.6	36.6	1.24	0.75	1.77	0.662 J	0.574 J	0.706	6.53	3.44	ND	ND	ND	0.89

a/ VOCs = volatile organic compounds; mg/m˜ = micrograms per cubic meter; ND = not detected; NA = not analyzed; SCG = standards, criteria, and guidance.
Data Qualifiers: J = estimated concentration; E = reported value exceeds instrument calibration range; C = analyte exceeds calibration criteria. Quantitation estimated; D = concentration is a result of a secondary dilution analysis.
b/ SCG = subslab vapor concentration requiring vapor mitigation in the residential setting regardless of indoor air concentration as provided in New York State Department of Health's Final Guidance for Evaluation Soil Vapor Intrusion in the State of New York (updated May 2017).
Bolded concentration in shaded cell exceeds SCG.
c/ SS9R-101306 is a field-collected duplicate sample of SS9-103006.
d/ SG1080206DUP is a field-collected duplicate sample of SG1080206.

Table 8

Indoor Air and Sublsab Soil Gas Results - Office Area
Former Rollway Bearing Facility
Liverpool, New York
February 2012 (a)

Sample Date:	27-Feb-12			
Sample ID:	SS-17	IA-3	IA-3R (c)	AA022712 (b)
Compound ($\mu g/m^3$)				
1,1,1-Trichloroethene	0.94	ND	ND	ND
Acetone	24	51	59	6.0 J
Benzene	3.5	1.3	1.1	0.91
Chloroform	ND	ND	ND	ND
cis-1,2-Dichloroethene	ND	ND	ND	ND
Freon 113	1.1 J	ND	ND	ND
Tetrachloroethylene	33	3.2	2.6	ND
Trichloroethene	0.87	0.66	ND	ND

a/ $\mu g/m^3$ = micrograms per cubic meter; SS = subslab soil vapor sample; IA = indoor air sample; AA = ambient (outdoor) air sample.
ND = not detected at the reporting limit; UJ = not detected, uncertainty in reporting limit; J = estimated value.
b/ Outdoor results represent ambient air concentrations near the building on the date of sampling.
c/ IA-3R is a blind duplicate of IA-3 collected on February 27, 2012.

Table 9

LNAPL Thickness Measurements
Former Rollway Bearing Corporation Facility
Liverpool, New York
December 2016 (a)

Well ID	LNAPL Thickness (b) (foot)
OW-1	**0.03**
OW-2	NM
OW-3	NM
OW-4	NM
OW-5	0.01
OW-8	NM
OW-9/FB-2	NM
OW-10/FB-1	NM
OW-11/FB-4	NM
RW-1	NM
RW-2	NM
SB-5	**0.25**
SB-7	NM
SB-8	NM
SB-10	NM

a/ LNAPL = light non-aqueous phase liquid.

b/ Bold concentration in shaded cell is LNAPL thickness measurement that exceeds the Remedial Action Objective of greater than 0.01-foot LNAPL.

APPENDIX

A DEED RESTRICTION AND METES AND BOUNDS

Lisa Dell, County Clerk
401 Montgomery Street
Room 200
Syracuse, NY 13202
(315) 435-2226

Onondaga County Clerk Recording Cover Sheet

Received From :
FIRST AMERICAN TITLE
666 THIRD AVE 5TH FL
NEW YORK, NY 10017

Return To :
FIRST AMERICAN TITLE
666 THIRD AVE 5TH FL
NEW YORK, NY 10017

First PARTY 1
TDJ PROPERTIES LLC

First PARTY 2
TDJ PROPERTIES LLC

Index Type : Land Records
Instr Number : 2017-00043968
Book : **Page :**

Type of Instrument : Restrictive Covenant
Type of Transaction : Declaration
Recording Fee: $96.00

Recording Pages : 11

Recorded Information

State of New York

County of Onondaga

I hereby certify that the within and foregoing was recorded in the Clerk's office for Onondaga County, New York

On (Recorded Date) : 12/01/2017

At (Recorded Time) : 12:16:27 PM

Doc ID - 0258238400011

Lisa Dell, County Clerk

This sheet constitutes the Clerks endorsement required by Section 319 of Real Property Law of the State of New York

Entered By: RSWEENIE Printed On : 12/04/2017 At : 1:30:34PM

3020-879683

10/

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made this 9 day of November 2017, by TDJ Properties, LLC, a limited liability company organized and existing under the laws of the State of New York and having an office for the transaction of business at 7600 Morgan Road, Liverpool, New York, 13090 ("Grantor").

WHEREAS, Former Rollway Bearing Site (Site #V00202) is the subject of a Voluntary Cleanup Agreement executed June 14, 2001 by Emerson Electric Co. and Rollway Bearing Corp. as part of the New York State Department of Environmental Conservation's (the "Department's) Voluntary Cleanup Program, namely that parcel of real property located at the address of 7600 Morgan Road in the Village of Liverpool, County of Onondaga, State of New York, being the same as (or part of) that property conveyed to Grantor by The Northern Trust Company, as Trustee of the Emerson Charitable Trust, by deed(s) dated June 17, 2005 and recorded on June 20, 2005 in Onondaga County Clerk's Office in Instrument No. 0721705, and being more particularly described in Schedule "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Property"; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants (the "Remedy").

NOW, THEREFORE, Grantor, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which engineering controls are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for commercial or industrial use without the express written waiver of such prohibition by the Department or Relevant Agency; provided, however, notwithstanding the

foregoing, the owner of the Property shall also prohibit the Property from ever being used for day care/child care facilities, health care facilities or eating establishments without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health or the Onondaga County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department or Relevant Agency.

Sixth, the owner of the Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency, and the owner of the Property shall comply with and abide by the terms and conditions of the SMP and shall cause any and all third parties to comply with and abide by the terms and conditions of the SMP.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

Tenth, Grantor represents, agrees and acknowledges that, other than the consent of NBT Bank, N.A., a national banking association, mortgagee with respect to the Property (which consent Grantor covenants and agrees to obtain, in the form attached hereto as Schedule "C" and incorporated herein by reference, on or prior to the date hereof), there are no third parties (including, without limitation, any lender and/or insurance company) (i) whose consent is required in connection with Grantor entering into this Declaration of Covenants and Restrictions and/or (ii) who hold a deed of trust, mortgage or other lien affecting all or any portion of the Property.

[Signature page follows.]

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

TDJ Properties, LLC (Grantor)

By: Tony Dardis

Print Name: TONY DARDIS

Title: Principal Date: November 8th 2017

Grantor's Acknowledgment

STATE OF New York)

) s.s.:

COUNTY OF Onondaga)

On the 8th day of November, in the year 2017, before me, the undersigned, personally appeared Anthony Dardis, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Martina St. Leger

Notary Public State of New York

MARTINA ST LEGER
Notary Public, State of New York
No. 01ST6313556
Qualified in Onondaga County
Commission Expires Oct. 20, 2018

SCHEDULE "A"

LEGAL DESCRIPTION

PARCEL I:

ALL THAT TRACT OR PARCEL OF LAND, situate in the Town of Clay, County of Onondaga and State of New York, being part of Subdivision No. 2 of Military Lot No. 76 in said Town, bounded and described as follows:

(SUB 2)

BEGINNING at a point in the center line of Morgan Road, (formerly Euclid Road), S. 2 Degrees 30' W., 836.4 feet from the intersection of said center line with the center line of Buckley Road;

Thence S. 2 Degrees 30' W., along the center line of Morgan Road, 1127.6 feet to a point which is about 2450 feet northerly from the south line of said Lot no. 76;

Thence S. 87 Degrees 32' 20" E., 2957.4 feet to the southwesterly corner of lands conveyed by Robert C. Melvin and Clara Melvin, his wife, to the Salmon River Power Company by Deed dated April 30, 1913 and recorded in the Onondaga County Clerk's Office May 9,1913 in book 424 of Deeds at page 341 &c;

Thence N. 6 Degrees 25' East, along the Salmon River Power Company's westerly line, 1120.3 feet to the southerly line of lands of the Rome, Watertown & Ogdensburg Railroad Company;

Thence N. 87 Degrees 21' W., 3033.9 feet to the point and place of beginning.

EXCEPTING AND RESERVING THEREFROM,

ALL THAT TRACT OR PARCEL OF LAND, situate in Lot No. 76, Town of Clay, County of Onondaga, State of New York, to be acquired in fee for the improvement of Morgan Road, C.R. No. 47, bounded and described as follows:

BEGINNING at the intersection of the division line of Crouse-Hinds Co. (reputed owner) on the south and Lipe - Rollway Corp. (reputed owner) on the north and the easterly R.O.W. line of Morgan Road, County of Onondaga, Road No. 47, at a point 25' +/- measured easterly at right angles from station 78+49+/- of the 1963 survey base line for Morgan Road, C.R. No. 47;

Thence northerly 1128' +/- along said R.O.W. line to the division line between the lands of Lipe - Rollway Corp. (reputed owner) on the south and Liverpool Central Schools, District No. 16 (reputed owner) on the north at a point 25' +/- measured easterly at right angles from said base line at station 89+77+/-;

Thence easterly along this division line 40' +/- to a point 65' +/- measured easterly at right angles from station 89+77 +/- of said base line;

Thence southerly on a line parallel with abovementioned R.O.W. line 1128' +/- to a point on the division line first mentioned above 65' +/- measured easterly at right angles from station 78+49 +/- of said base line;

Thence westerly along this division line 40' +/- to the point of beginning.

PARCEL II:

ALL THAT TRACT OR PARCEL OF LAND, situate in the town of Clay, County of Onondaga and State of New York, being part of Lot No. 3 in the Subdivision of Great Lot No. 76, and being bounded and described as follows:

(53)

BEGINNING at a point in the southerly line of Buckley Road, formerly known as Salina Clay County Highway, where the same is intersected by the westerly line of the premises conveyed by Deed from Evin F. Reese and Mary A. Reese, his wife, to The Syracuse Northern Railroad Company dated September 27, 1870, recorded in the Office of the Clerk of said County of Onondaga in Book 187 of Deeds at Page 77; and running

Thence southerly, along said westerly line of premises conveyed by Deed dated and recorded as aforesaid, eight hundred thirty (830) feet, more or less, to the southwesterly corner thereof;

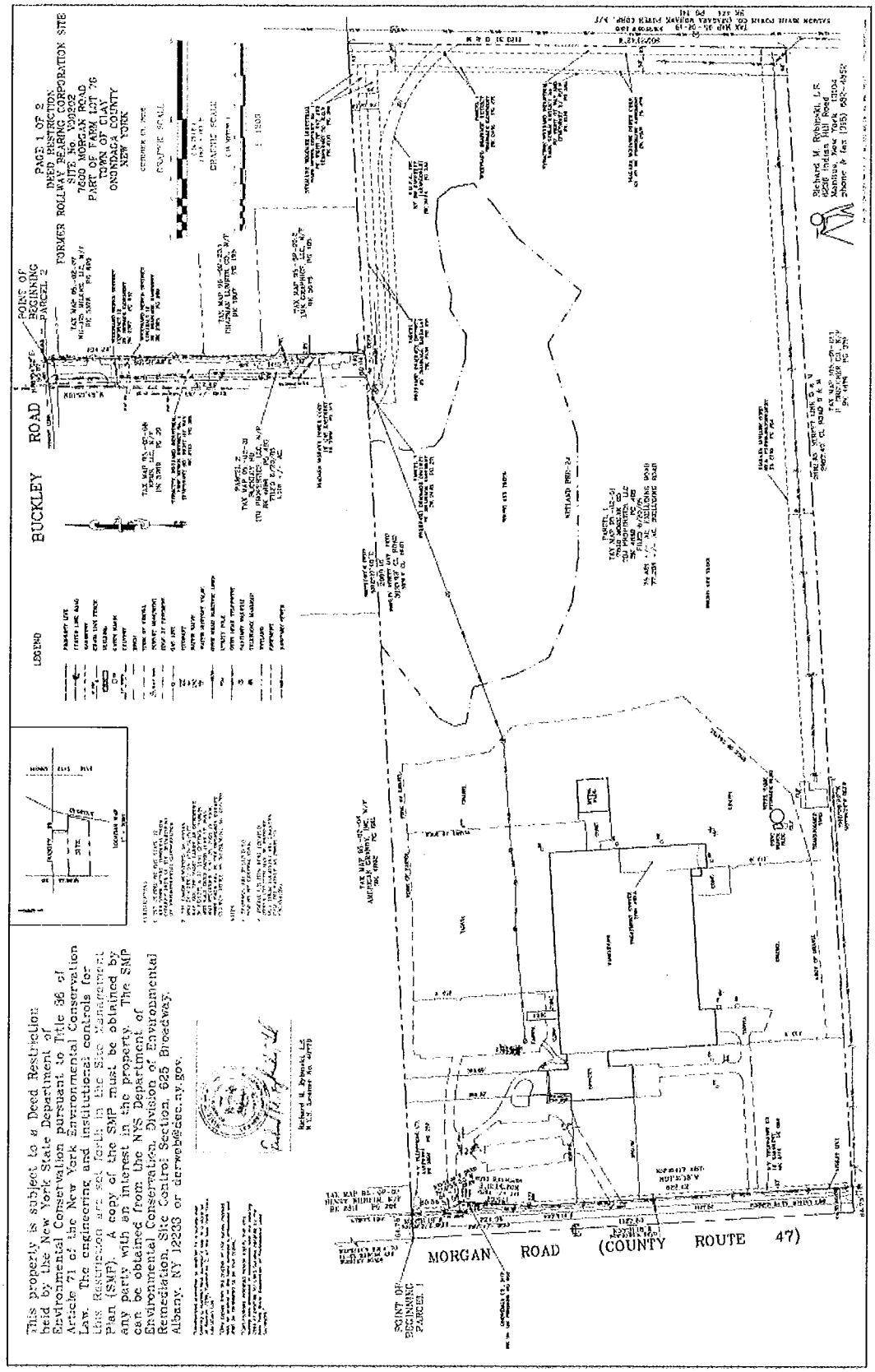
Thence easterly along the southerly line of said premises conveyed by deed dated and recorded aforesaid, sixty (60) feet, more or less, to a point distant easterly sixty (60) feet measured at right angles from the last preceding course;

Thence northerly, parallel with and distant easterly sixty (60) feet measured at right angles from the westerly line of said premises conveyed by deed and dated and recorded as aforesaid, eight hundred twenty (820) feet, more or less, to the southerly line of Buckley Road;

Thence westerly, along the southerly line of Buckley Road, sixty (60) feet, more or less, to the point and place of beginning.

SCHEDULE "B"

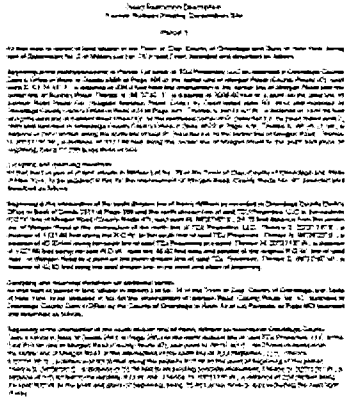
[Map of Property—Attached]

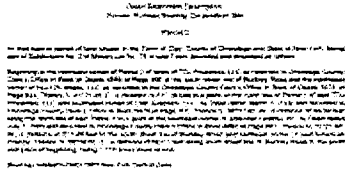


6672727.13

[Schedule "B" to Declaration of Covenants and Restrictions]

This property is subject to a Deed Restriction held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law. The engineering and institutional controls for this Restriction are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from the NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or derweb@dec.ny.gov.





Richard M. Kennedy, L.S.
5536 Fenton Hill Road
Manlius, New York 13104
Phone: (315) 682-4152

[Schedule "B" to Declaration of Covenants and Restrictions]

SCHEDULE "C"

Consent of Mortgagee

WHEREAS, NBT Bank, N.A., a national banking association ("Lender"), is the mortgagee and lender under that certain Consolidation, Extension and Modification Agreement dated March 24, 2017 and recorded in the Office of the Clerk of Onondaga County (the "Official Records"), Book 18254, Page 278 and that certain Assignment of Rents dated March 24, 2017 and recorded in the Official Records at Book 18254, Page 324, both executed by TDJ Properties, LLC ("Mortgagor"), a New York limited liability company, as the borrower; as affected by that certain Subordination, Nondisturbance and Attornment Agreement dated March 24, 2017 and recorded in the Official Records at Book 18254, Page 336, that certain Subordination, Nondisturbance and Attornment Agreement dated March 17, 2017 and recorded in the Official Records at Book 18260, Page 645, that certain Subordination, Nondisturbance and Attornment Agreement dated March 27, 2017 and recorded in the Official Records at Book 18260, Page 653; and that certain UCC Financing Statement filed under File No. 2017-00185, as amended by that certain UCC Financing Statement Amendment filed under File No. 2017-0000405 (collectively, the "Mortgage"), which Mortgage Lender represents and warrants is the only deed of trust or mortgage held by Lender and affecting the property.

NOW THEREFORE, Lender hereby consents to the covenants described in the Declaration of Covenants and Restrictions (the "Declaration") to which this Consent is attached on the terms and conditions contained in such Declaration, and hereby subordinates its interest in the property described in the Mortgage to the interests created by such Declaration. Nothing herein shall be deemed to affect, modify, amend or limit any and all other rights and/or remedies of Lender under the terms of the Mortgage or any related documentation, including without limitation, Lender's right to foreclose or otherwise execute upon the property; provided, however, that none of Mortgagor's rights or obligations under the Declaration will be divested, disturbed, diminished, reduced or otherwise adversely affected by such foreclosure or execution.

[Signature page follows.]

IN WITNESS WHEREOF, Lender has caused these presents to be executed on its behalf as of this 31st day of October, 2017.

NBT Bank, N.A.

By: _____

Name: Robert Vertucci

Title: Vice President

Lender's Acknowledgment

STATE OF New York)

) s.s.:

COUNTY OF ONONDAGA)

On the 31ST day of October, in the year 2017, before me, the undersigned, personally appeared Robert L. Vertucci, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Theresa A Keller

Notary Public State of New York

THERESA L. KELLER
Notary Public, State of New York
No. 01KE6001531
Qualified in Onondaga County
Commission Expires January 20, 2018

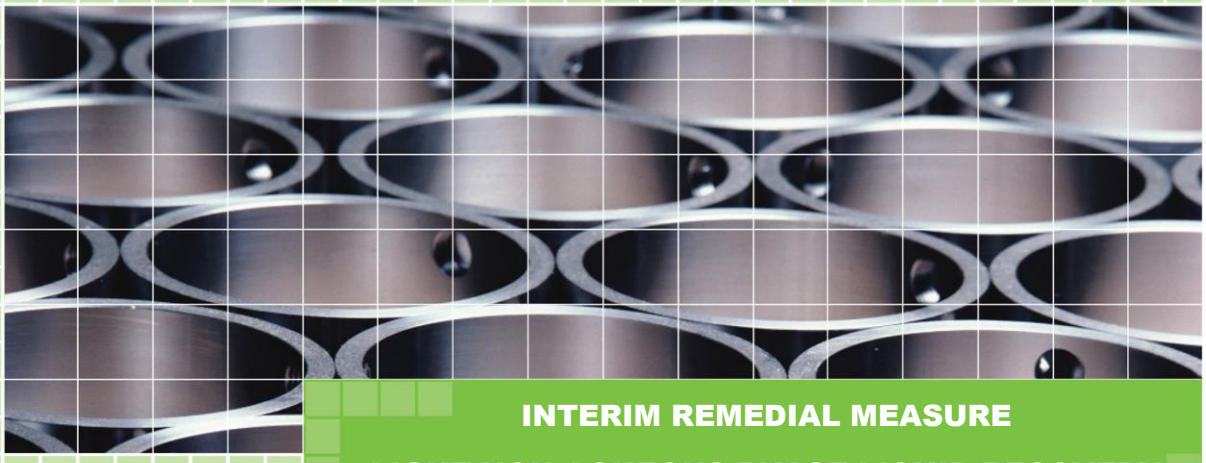
APPENDIX

B

ELECTRONIC COPY OF FINAL ENGINEERING REPORT

APPENDIX

C INTERIM REMEDIAL MEASURE LIGHT NON-AQUEOUS PHASE LIQUID CONTSTRUCTION COMPLETION REPORT



INTERIM REMEDIAL MEASURE
LIGHT NON-AQUEOUS PHASE LIQUID RECOVERY
CONSTRUCTION COMPLETION REPORT
FORMER ROLLWAY BEARING CORP. FACILITY
LIVERPOOL, NEW YORK

Site No. V-1007-96-10

June 8, 2009

WSP Engineering of New York, P.C.
5 Sullivan Street
Cazenovia, NY 13035

Tel: +1 315 655 3900
Fax: +1 315 655 3907

WSP Engineering of New York, P.C.

QM

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks				
Date	5/1/09	5/15/09	6/5/09	
Prepared by	BES	BES		
Checked by	BDW	BDW	SLP	
Authorized by				
Project number	133928		133928	
File reference	K:\Emerson\Rollway Bearing\CCR-Rollway 050109.doc		K:\Emerson\Rollway Bearing\LIVERPOOL\Task 15\6_Reporting\Reports\CCR-Rollway 060509 with BES Comments.doc	

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Engineering Certification

ENGINEER'S CERTIFICATION

INTERIM REMEDIAL MEASURE

LIGHT NON-AQUEOUS PHASE LIQUID RECOVERY

CONSTRUCTION COMPLETION REPORT

FORMER ROLLWAY BEARING CORPORATION FACILITY

LIVERPOOL, NEW YORK

SITE NO. V-1007-96-10

I, Todd M. Musterait, P.E., hereby certify, as a Professional Engineer registered in the State of New York, that based on WSP Engineering of New York, P.C.'s observation of the remedial construction activities conducted by the remedial contractor, Remediation Services, Inc., the remedial construction activities were completed in substantial conformance with the requirements presented in the following documents and/or approved field changes detailed in this Construction Completion Report:

- Voluntary Cleanup Agreement (VCA), No. V7-1007-96-10, April 24, 2001.

- NYSDEC and NYSDOH-approved IRM Work Plan (ESC Engineering, 2006).

Todd M. Musterait, P.E.
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1 Introduction

1.1 GENERAL

On behalf of Emerson Electric Co., WSP Engineering of New York, P.C. (WSP Engineering) has prepared this Construction Completion Report for the Interim Remedial Measure (IRM) installed at the former Rollway Bearing facility in Liverpool, New York (Figure 1). This report is being submitted to the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) to serve as documentation that the IRM activities were completed in substantial conformance with the requirements identified in the following documents and approved field changes detailed in this report:

- The April 24, 2001, Voluntary Cleanup Agreement (No. V7-1007-96-10) between Emerson Electric Company, Rollway Bearing Corporation, and the NYSDEC.
- The NYSDEC and NYSDOH-approved IRM Work Plan (ESC Engineering, 2006); and the NYSDEC's approval letter, dated May 24, 2006.

The IRM consisted of installing a Light Non-Aqueous Phase Liquid (LNAPL) recovery system to facilitate the removal of measurable LNAPL in the subsurface of the former heat treat area of the facility (Figure 2). The LNAPL recovery system was designed to, and will be operated and maintained to, attempt to meet this cleanup goal. The system currently includes four wells that exhibited the greatest volume of recoverable LNAPL during previous pilot testing activities. However, WSP Engineering will continue to monitor and remove measurable LNAPL from surrounding wells in the heat treat area, per the NYSDEC's approval letter. Based on the LNAPL measurements from these wells, WSP Engineering will evaluate whether additional wells should be incorporated into the system to achieve the remedial objective. Emerson considered the possibility that it may be technically impracticable to meet a cleanup objective of no measurable LNAPL when the remedial action work plan for the site was submitted to the NYSDEC in May 2000. The work plan, which was approved by the NYSDEC, stated that Emerson reserved the right to petition the NYSDEC for site closure if the application of available technologies is unable to remove all measurable LNAPL.

All construction and site work associated with the IRM was completed in accordance with applicable federal, state, and local laws and regulations. All monitoring activities discussed herein were conducted in accordance with WSP Engineering's standard operating procedures.

The purpose and organization of this IRM Construction Completion Report is described below, followed by a discussion of general background information relating to the site and the IRM activities.

1.2 PURPOSE AND ORGANIZATION OF REPORT

This Construction Completion Report provides a detailed description of the construction activities and as-built engineering drawings of the LNAPL recovery system installed at the site. The report has been organized into the following sections:

- Section 1 – Introduction
- Section 2 – Description of IRM Activities
- Section 3 – Operation and Maintenance
- Section 4 – References
- Section 5 – Acronyms

In addition to the above, as-built drawings are presented in Appendix A.

1.3 SITE LOCATION AND DESCRIPTION

The former Rollway Bearing facility is located at 7600 Morgan Road in Liverpool, New York, and consists of a plant building with 220,000 square feet of space on an 80-acre site (Figure 2). Approximately 40 acres of the site are undeveloped and include woods, brush, and a wetland area. The developed 40 acres contain the plant building, parking lots, lawn areas, and a former hazardous waste storage shed. The plant was constructed in 1963 for Rollway Bearing. Before 1963, the property was reportedly used for agriculture. The former heat treat department area is located in the southeastern portion of the plant building (Figure 2). Emerson terminated site operations in the fall of 2002 and sold the Rollway Bearing property to Emerald Equipment Systems, Inc., in the summer of 2005.

The former Rollway Bearing property is located in an area characterized primarily by commercial and light industrial properties. North of the property are a residential property, American Granby (distributor of pump, well, irrigation, plumbing and pool products), Family Video (video tape and disc rental), vacant land, Wine Merchants Ltd (wine and distilled alcoholic beverage wholesaler), General Interior Systems (interior design services), Hertz Equipment Rental (commercial and industrial machinery and equipment rental and leasing company), a construction company, and Buckley Road. East of the property are railroad tracks, National Tractor Training School, a beverage distributor, and Macsteel (producer and distributor of stainless, aluminum, and carbon flat rolled metal). South of the property are Drescher Corp. (food redistribution company), Warner Energy (technical consulting services), Paul De Lima Company, Inc. (headquarters for a coffee and tea manufacturing company), and vacant land. West of the property is Morgan Road, and further west are residences, a credit union, an elementary school, dentist offices, a church, Ryco Information Services (a title abstract office), EOS Software (computer programming services), apartments, and a gas station and convenience store.

1.4 PREVIOUS INVESTIGATIONS

1.4.1 Site Geology

The subsurface geology below the heat treat area is complex. Approximately 8 to 12 feet of unconsolidated sediments overlie approximately 4 to 7 feet of weathered shale. The weathered shale transitions to more competent shale bedrock at depths from 8 to 15 feet below ground surface (bgs). The unconsolidated sediments consist primarily of discontinuous layers of silt and silt with gravel. However, a thin layer of organic-rich silt was identified in borings SB-3 and SB-4, which may represent the original grade before the site was developed. Gravelly sand fill material was identified in SB-1 that extends from the base of the concrete slab to a depth of approximately 7 feet bgs. The fill material may be related to the installation of below grade piping in the area. Cross-sections showing the subsurface geology below the heat treat area are presented in Figures 5 and 6. Perched groundwater is present within the weathered shale in the vicinity of the heat treat department at depths from approximately 12 to 14 feet bgs. Wells within the heat treat contain less than 1.5 feet of water. In addition, the depth to groundwater varies over short horizontal distances, which indicates that fractures within the weathered shale are not laterally continuous.

1.4.2 Historical Light Non-Aqueous Phase Liquid Delineation Activities

In April 1999, WSP Engineering observed a thin layer of LNAPL (i.e., less than 2 inches) on the groundwater surface in MW-4 (Figure 3). To evaluate the potential source of the LNAPL, WSP Engineering reviewed architectural drawings for the heat treat department, interviewed facility personnel, and inspected visible portions of the quench oil system. During the interviews, facility personnel reported that a quench oil release occurred from the gravity return line during the first 2 or 3 years that the facility was in operation (i.e., 1963-66). The quench oil return line is located 6 to 8 feet bgs and slopes toward

the sump pits in the southern portion of the former heat treat department (Figure 3). Reportedly, the release was caused by the failure of the seals between sections of the return line. The return line was reportedly excavated and repaired or replaced; however, no remediation was conducted. Currently, two joints in the return line are enclosed in cinderblock vaults, which were recently filled with concrete during renovation of the former heat treat area.

In May and June 1999, WSP Engineering drilled 26 soil borings to delineate the extent of LNAPL in the heat treat area (Figure 3). Small-diameter monitoring wells (i.e., miniwells) were installed in 12 borings that encountered perched water or LNAPL above the competent bedrock. The miniwells consisted of 5 to 10-foot-long threaded sections of 1-inch inside diameter (ID) machine-slotted (0.010-inch) schedule 40 polyvinyl chloride (PVC) screen and blank casing. The wells were completed with flush-mount protective covers. Based on the results of the delineation activities, LNAPL was observed only within the weathered shale at depths from 10.8 feet (SB-3) to 15.5 feet (SB-10) bgs. Typically, the perched water and LNAPL were encountered in two separate 6 to 10-inch-thick zones in the lower portion of the weathered shale, approximately 2 to 3 feet above the competent bedrock. These zones were often highly fractured and separated by dense weathered shale or a clayey silt layer. WSP Engineering measured the apparent LNAPL thickness in the 12 miniwells on three occasions in May and June 1999. The apparent LNAPL thickness ranged from less than 0.01 foot in SB-3 to 1.19 feet in SB-4. The measurements indicated that measurable LNAPL was present under a portion of the heat treat department and in a limited area outside the building in the vicinity of MW-4. The greatest apparent thickness was observed near the quench oil return line.

1.4.3 Initial LNAPL Recovery Pilot Test Activities

In July 2003, WSP Engineering submitted a Pilot Test Summary Report to the NYSDEC that provided a detailed summary of the LNAPL recovery pilot test activities performed at the site from September 2001 through February 2003. The pilot test activities summarized in the July 2003 report included baildown tests to assess LNAPL recovery rates within the LNAPL plume area, installing recovery wells RW-1 and RW-2, installing observation wells OW-1 through OW-3, conducting tests to evaluate the performance of LNAPL recovery systems manufactured by Xitech Instruments, Inc., and QED Environmental Systems, Inc., evaluating vacuum radius of influence in the RW-1 area, and measuring LNAPL thicknesses on numerous occasions. Based on the results of the initial pilot test activities, WSP Engineering developed the following conclusions:

- The subsurface geology below the heat treat area is complex. Approximately 8 to 12 feet of unconsolidated sediments overlie approximately 4 to 7 feet of weathered shale. The weathered shale transitions to more competent shale bedrock at depths from 8 to 15 feet bgs.
- Perched groundwater and LNAPL occur along fractures and partings within the weathered shale interval at depths from approximately 12 to 14 feet bgs. Because the LNAPL occurs in fractures and partings, rather than as a “pool” of LNAPL on the water table, LNAPL is likely present in only a small fraction of the total “plume” area.
- Based on the vacuum test results and the observed difference in groundwater elevations and LNAPL thicknesses over short horizontal distances, fractures within the weathered shale are not laterally continuous. As a result, LNAPL may occur as isolated pockets with limited volumes.
- The vacuum test results indicate that no appreciable radius of influence (i.e., greater than approximately 1.5 feet) can be established in the RW-1 and RW-2 areas. Therefore, it may not be practical to create overlapping areas of influence throughout the entire area containing measurable LNAPL.
- No appreciable vacuum (i.e., less than 2 inches of water) could be applied to OW-2 and OW-3 using a blower with a maximum vacuum of 28.3 feet of water. Therefore, these wells appear to penetrate highly permeable materials that may be short-circuiting to the atmosphere.

- An applied vacuum enhanced the flow of LNAPL into wells RW-1, OW-2, OW-3, and SB-4.
- Only trace LNAPL entered recovery well RW-2 under gravity conditions and no increase in LNAPL thickness was noted as a result of an applied vacuum. Therefore, no further remediation is warranted in the RW-2 area.
- The Xitech pump was not an appropriate recovery technology for the site because the float mechanism could not be accurately adjusted to remove a thin layer of LNAPL.
- The QED Ferret Pump showed initial promise in recovering LNAPL under gravity conditions and under an applied vacuum. However, as discussed below, subsequent pilot tests indicated that the QED system would not reliably recover LNAPL due to fluctuations in the groundwater table and difficulties in positioning the pump intake.

Based on the results of the initial pilot test activities, WSP Engineering recommended conducting additional investigation and pilot test activities at the site. These activities included pumping and bailing LNAPL from RW-1, OW-2, OW-3, and SB-4 and monitoring LNAPL recovery to verify that sufficient LNAPL was present near these wells to warrant incorporating them into the full-scale system. In addition, four observation wells were installed to further define the horizontal extent of LNAPL in the vicinity of RW-1. As discussed above, only trace LNAPL entered RW-2 under vacuum conditions or under an applied vacuum. In addition, only a very thin layer of LNAPL (i.e., 0.03 foot) was present in nearby SB-7. Therefore, WSP Engineering concluded that no further remediation is warranted at RW-2. The recommended additional investigation and pilot test activities were conducted from August 2003 through October 2004. A description of the activities and a discussion of the results are presented below.

1.4.4 Additional LNAPL Recovery Pilot Test Activities

On August 26 and 27, 2003, WSP Engineering installed four 2-inch ID PVC observation wells in the heat treat area at the locations designated OW-4 through OW-7 on Figure 3. The monitoring wells were installed to further delineate the horizontal extent of LNAPL in the vicinity of recovery well RW-1. The monitoring wells were installed to depths of 16.5 to 18 feet below grade with 5 feet of 0.040-inch continuous wrap PVC screen and a no. 2 sand filter pack. The screened intervals of the observation wells were consistent with RW-1 and SB-1. Each well was constructed with a 2.5 to 3-foot-long section of blank casing below the screen to serve as a sump so that the pump intake could be positioned at the water table when the water level was near the bottom of the screened interval. The annular space between the PVC sump and surrounding bedrock was sealed with bentonite pellets hydrated with potable water. Each well was completed with a flush-mounted protective manhole cover. Boring logs and as-built diagrams for OW-4, OW-5, OW-6, and OW-7 are included in Appendix B.

On September 4, 2003, WSP Engineering measured the depth-to-LNAPL and depth-to-water in SB-1, SB-3, SB-4, SB-5, SB-7, SB-8, SB-9, SB-10, MW-4, RW-1, RW-2, and OW-1 through OW-7 to determine the distribution and thickness of LNAPL under the heat treat area (Table 1). The LNAPL measurements indicated that no measurable LNAPL was present in SB-3, RW-2, OW-1, OW-2, OW-4, OW-5, OW-6, and OW-7. The apparent LNAPL thickness in the remaining wells ranged from 0.01 foot in SB-7 and SB-9 to 0.92 foot in OW-3. As discussed in the pilot test summary report, LNAPL occurs primarily in the vicinity of SB-4 and RW-1.

On September 11 and 15, 2003, WSP Engineering attempted to apply a vacuum to RW-1, SB-4, OW-2, and OW-3 and initiate manual LNAPL removal from these wells. The purpose of the LNAPL removal activities was to verify that sufficient LNAPL was present in the vicinity of these wells to warrant incorporating them into the full-scale system. These wells were identified during the first phase of testing as the wells containing the greatest volume of recoverable LNAPL. However, the LNAPL removal activities were suspended in September 2003 because the regional groundwater table had dropped to a level below the screened intervals of the wells. On January 9, 2004, WSP Engineering resumed the pilot test activities by applying a vacuum to RW-1 (5 inches of water), SB-4 (1.5 inches of water), OW-2 (2

inches of water), and OW-3 (3 inches of water) using a vacuum blower. WSP Engineering then periodically measured the LNAPL thickness in each well with an electronic oil/water interface probe and measured the vacuum influence in nearby wells OW-1, OW-4 through OW-7, and SB-1. WSP Engineering visited the site on January 15 and 22, February 4, 12, 15, and 25, 2004, to measure the LNAPL thickness and vacuum influence. After measuring the LNAPL thickness during each visit, a bailer or peristaltic pump was used to remove as much LNAPL as possible from the wells and then the vacuum was re-connected to the wells. The LNAPL thickness measurements from each well are presented in Table 1.

As reported in the First Quarter 2004 Progress Report, dated May 17, 2004, WSP Engineering initiated LNAPL recovery at the site on April 19, 2004, by re-installing the QED product-skimming pump in RW-1. All vacuum and LNAPL tubing and LNAPL containment drums were placed above grade in the heat treat department. WSP Engineering periodically visited the site during April, May, and June 2004 to monitor the performance of the LNAPL recovery system. Initially, the pump performed as expected and removed only LNAPL. However, the pump began to recover primarily water and the position of the pump intake could not be accurately adjusted to reliably recover LNAPL. After several discussions with the manufacturer, and the cleaning and replacement of select parts, the pump was shipped back to the manufacturer in late July 2004 for further troubleshooting. The pump was reinstalled in RW-1 in late August 2004 and continued to operate until October 2004 when additional equipment problems occurred and the pilot test activities were terminated. Based on the results of the additional pilot tests, WSP Engineering concluded that the QED pump is not applicable to the Rollway site. Furthermore, WSP Engineering conducted a literature review and determined that no other LNAPL-only pumping systems are commercially available that would reliably recover LNAPL at the site.

2 Description of IRM Activities

2.1 IRM OBJECTIVE AND COMPONENTS

The objective of the IRM at the site as, identified in the IRM Work Plan consists of removing measurable LNAPL from the subsurface in the former heat treat area of the facility. Presented below are the main components of the IRM activities that were implemented at the former Rollway Bearing facility to achieve this objective:

- installed observation well OW-8 adjacent to SB-4 to allow LNAPL removal in this area using a vacuum truck
- installed a centralized vacuum blower system in an 8-foot by 10-foot enclosure erected inside the former heat treat area
- installed subsurface vacuum conveyance piping from the LNAPL recovery system enclosure to recovery wells OW-2, RW-1, OW-3, and OW-8 (Sheet 2)
- managed and disposed of waste materials generated during implementation of the IRM activities in accordance with applicable rules and regulations
- conducted system start-up and operation and maintenance activities

A detailed description of each of these IRM activities is presented below.

2.2 LNAPL RECOVERY SYSTEM INSTALLATION

This section presents a detailed description of the LNAPL recovery system installation activities. During installation of the LNAPL recovery system, the NYSDEC provided a field representative during the initial day of the IRM activities, and WSP Engineering provided full-time engineering services to observe the work performed by the remedial contractor, Remediation Services, Inc. (RSI), and ensure substantial conformance with the NYSDEC and NYSDOH-approved IRM Work Plan.

WSP Engineering conducted the following activities during the installation of the LNAPL recovery system:

- reviewed contractor submittals for adequacy relative to the requirements presented in the NYSDEC and NYSDOH-approved IRM Work Plan
- coordinated with Emerson, NYSDEC, Emerald, and contractors, as detailed herein, regarding the IRM activities
- maintained detailed written records of the field activities performed by the contractor, including documentation of field conditions encountered
- observed the work performed by the contractor for the duration of the IRM for substantial conformance with the NYSDEC and NYSDOH-approved IRM Work Plan
- conducted air monitoring in accordance with the procedures and requirements set forth in WSP Engineering's Health and Safety Plan
- characterized waste generated during implementation of the IRM for offsite disposal
- signed bills-of-lading on behalf of Emerson

2.2.1 Well Installation

A 4-inch ID PVC observation well, OW-8, was installed to facilitate the recovery of LNAPL in the area of the 1-inch ID well, SB-4 (Sheet 2). The well boring was advanced to a depth of 17.5 feet bgs using

hollow-stem auger and air rotary drilling techniques. The well was constructed with a 3-foot-long section of blank casing below the screen to serve as a sump so that LNAPL can continue to accumulate in the well when the groundwater level is near the bottom of the screened interval. The annular space between the PVC sump and surrounding bedrock was sealed with bentonite pellets hydrated with potable water. The observation well was installed with 5 feet of 0.040-inch continuous wrap PVC screen from 9.5 feet to 14.5 feet bgs to correspond with the construction of SB-4. A no. 2 sand filter pack was placed from 15 feet to 8 feet bgs followed by hydrated bentonite pellets from 8 feet to 1 foot bgs. After the bentonite pellets were allowed to hydrate, a concrete flush-mount protective cover was completed around OW-8. Due to approximately 3.5 feet of oily residue observed on the augers after reaming the borehole, the decision was made to forgo the development of the well. The soil boring log and as-built diagram for OW-8 is presented in Appendix B.

2.2.2 LNAPL Recovery System Piping Installation

The piping layout for the LNAPL recovery system was based on existing concrete-lined floor trenches in close proximity to the recovery wells and the LNAPL recovery system enclosure location designated by Emerald. In addition, sections of concrete-lined trenches previously backfilled and capped with concrete by Emerald were excavated for reuse. Excavation was completed using a mini-excavator and skid-steer. After excavating the trenches, the main vacuum conveyance pipe header was installed between OW-8 and the vacuum blower on the LNAPL recovery system skid. The main conveyance pipe header from the OW-8 lateral to the vacuum blower measured approximately 108-feet in length. Each extraction well was connected to the main header by an approximately 3-foot long lateral. The galvanized steel conveyance piping was underlain by 4-inches of sand, overlain by approximately 4-inches of crusher-run stone, and capped with approximately 4-inches of concrete (Sheet 4). Exhaust piping was routed from the outlet of the LNAPL recovery skid to approximately 1.5-feet above the facility roof-line. All vacuum conveyance and exhaust piping consisted of 1.5-inch nominal diameter galvanized steel. The 1.5-inch nominal diameter steel piping was chosen to maximize in-pipe velocities while minimizing the total dynamic head for the conveyed air from the recovery wells to the vacuum blower. As a result, the design vacuum for each recovery well was met and adequate vacuum is available if an addition recovery well(s) is necessary.

2.2.3 Well-Vault and Wellhead Installation

Due to the current heavy equipment traffic in the former heat treat area, 2-foot by 2-foot, traffic-rated well-vaults were installed at each extraction well. Each well-vault contains a gate valve, ball valve, a flow meter, Teflon® tubing, and a vacuum gauge in line between the header and well (Sheet 4). The gate valve and ball valve are used to control the vacuum and flow. The ball valve, or “dilution valve,” allows ambient air to enter the system to decrease the flow and vacuum from the respective well, if necessary. Similarly, the gate valve restricts the flow and vacuum on the wellhead by reducing the lateral conveyance pipe diameter at the entrance to each well vault. In conjunction, the two valves allow WSP Engineering to precisely adjust the vacuum applied to each extraction well.

Vacuum gauges, 0 to 15-inches of water column (WC), were installed on the well casing to observe the vacuum applied to each extraction well. Flow meters, 2 to 20 standard cubic feet per minute (scfm), were also installed between the wellhead and ball valve. Both the vacuum gauges and flow meters are used to regulate the applied vacuum to each wellhead. The fabricated PVC well-caps are equipped with compression fittings to allow the 0.5-inch ID Teflon® tubing to quickly disconnect from the well-cap prior to product pump-outs. Teflon® tubing was installed because of its semi-rigidity and flexibility which allows for easy use of the quick disconnect. A 1.25-inch ID plug in the center of the well-cap provides access for pump-outs.

2.2.4 LNAPL Recovery System Skid Installation

On completion of the pipe installation activities, an 8-foot by 10-foot LNAPL recovery system enclosure was constructed around the 4-foot by 4-foot LNAPL recovery system skid pre-fabricated by Mid-Atlantic Environmental Equipment, Inc. (Sheet 4). The LNAPL recovery system enclosure was built to limit access to the equipment and act as a sound barrier. The LNAPL recovery system is comprised of a 30-gallon vapor-liquid separator (VLS), a 2 horsepower vacuum blower, a 10-micron air filter, a dilution valve with 10-micron air filter, vacuum indicators, a temperature indicator, and a pressure indicator.

A vacuum blower capable of producing 40 scfm at 37" WC was installed for the LNAPL recovery system application. Expected inlet losses through the system were approximately 15" WC, which left an appreciable 27" WC vacuum to be applied to the recovery wells. Inlet and outlet vacuum gauges allow for observation of inlet losses through the 30-gallon VLS and the 10-micron air filter. The dilution valve is used in conjunction with the wellhead equipment to adjust the vacuum at the inlet of the vacuum blower to ensure the blower is operating within the manufacturer's specified vacuum ranges. The exhaust stack pressure is used to indicate if there is back pressure buildup which normally signifies a blockage in the piping. The exhaust temperature gauge is used to determine whether or not the vacuum blower is running at manufacturer specified operating temperatures.

2.2.5 Waste Material Management

Approximately 40 cubic yards of soil and concrete debris were generated from the trenching activities. The soil and concrete debris were temporarily stockpiled inside the facility on poly-sheeting and were then loaded into a roll-off container with a skid-steer. A composite sample was collected on May, 14, 2008, to characterize the material for offsite disposal or treatment. The sample was submitted to TestAmerica Laboratories, Inc., in Buffalo, New York, for analysis of VOCs by the Toxicity Characteristic Leaching Procedure (TCLP), metals by TCLP, polychlorinated biphenyls (PCBs), and percent moisture. The analytical results demonstrated that the material did not exhibit a hazardous characteristic. A copy of the analytical results is presented in Appendix C. Based on the analytical results, the excavated soil and concrete debris was transported to the High Acres Landfill in Fairport, New York, for disposal as a non-hazardous waste. A copy of the non-hazardous waste bill-of-lading is provided in Appendix D.

2.2.6 Site Restoration

The surface of the LNAPL recovery system trenches were restored by pouring 4-inches of concrete level with the surrounding concrete and sealing the seams with polyurethane sealant. The concrete floors in the former heat treat area were thoroughly swept to remove soil and concrete debris. All debris was then transferred to the roll-off container for subsequent offsite disposal with the soil and concrete debris.

3 Operation and Maintenance

After installing the LNAPL recovery system, start-up and testing activities were performed on May 20, 2008, before initiating full-scale (normal) operations. A description of the start-up activities is presented below followed by a discussion of the operation and maintenance activities.

3.1 SYSTEM START-UP

After the vacuum system was installed, each system component, as well as the entire system, was inspected and tested to ensure proper performance. The vacuum blower and appurtenances were tested on May 16, 2008, to ensure proper rotation of the blower. The vacuum was then introduced through the vacuum line. WSP Engineering observed that the vacuum indicators and flow meters were operational and that there were no leaks in the system. Following the systematic check of the system, WSP Engineering shut the system down.

On May 20, 2008, WSP Engineering personnel adjusted the system to minimize groundwater upwelling while maximizing product recovery. Before the system was restarted, WSP Engineering obtained initial water level and LNAPL thickness measurements from the extraction wells and surrounding wells (RW-1, RW-2, OW-1 through OW-7, replacement well OW-8, SB-1, SB-3, SB-7 through SB-10, and MW-4). After completing the measurements, WSP began adjustment of each extraction well. Using the gate and ball valves, each well was set at a vacuum which upwelled the groundwater no more than 6-inches below the top of the screened interval. If the groundwater was significantly below the top of the screen, WSP limited the amount of upwelling to 6-inches above the static groundwater level measured prior to startup. WSP restricted the upwelling in each well to prevent the creation of a steep hydraulic gradient which would inhibit the recovery of LNAPL from the surrounding formation.

Once all four extraction wells were set at the preliminary vacuum, WSP personnel rechecked the vacuum and flow readings at each extraction well and made adjustments as necessary. Final vacuum and flow readings at each extraction well, and system telemetry readings, were then recorded and the system was left operational overnight. On May 21, 2008, WSP obtained post-startup water level and LNAPL thickness measurements from the extraction wells and surrounding wells. The extraction wells were measured after the system had been off for approximately 15 minutes. After measurements were completed, the system was restarted and remained operational until the first product pump-out.

3.2 SYSTEM OPERATION AND PERFORMANCE MONITORING

After completing the start-up activities, the LNAPL recovery system was operated under full-scale conditions until June 27, 2008, when the first vacuum truck pump-out was performed. Weekly water level and LNAPL thickness measurements were collected between startup and the first pump-out.

On a monthly basis, WSP Engineering personnel inspects the system and completes an operation and maintenance log sheet that includes vacuum and flow readings at each wellhead, vacuum, pressure, and temperature readings on the recovery skid, and power consumption from the system (Appendix E). In addition, water level and LNAPL thickness measurements are collected at each of the product recovery wells (i.e., RW-1, OW-2, OW-3, and OW-8) and any surrounding monitoring wells that contained measurable LNAPL during the initial 6-months of operation. WSP Engineering may elect to adjust the site visit frequency based on the performance of the system and the observed LNAPL recovery rates. However, WSP Engineering will conduct site visits no less frequently than once per month without NYSDEC approval.

When sufficient LNAPL is present in the recovery wells, WSP Engineering subcontracts a vacuum truck service to physically remove the LNAPL from the extraction wells and from any surrounding wells that

contain measurable LNAPL. The waste stream will be transported offsite for recycling or disposal in accordance with federal, state, and local requirements.

4 References

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5 Acronyms

bgs	below ground surface
ID	inside-diameter
IRM	Interim Remedial Measure
LNAPL	light non-aqueous phase liquid
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	polychlorinated biphenyls
PVC	polyvinyl chloride
RSI	Remediation Services, Inc.
scfm	standard cubic feet per minute
TCLP	Toxicity Characteristic Leaching Procedure
VCA	Voluntary Cleanup Agreement
VLS	vapor-liquid separator
WC	water column

Figures

Tables

Appendix A – As-Built Engineering Drawings

Appendix B – Boring Logs and Monitoring Well Construction Logs

Appendix C – Waste Characterization Laboratory Analytical Data

Appendix D – Waste Disposal Documentation

Appendix E – Operation and Maintenance Log Sheet

INDEX OF DRAWINGS

DRAWING NUMBER	SHEET NUMBER	DESCRIPTION
133928216	1	TITLE SHEET
133928216	2	SITE PLAN
133928216	3	PROCESS & INSTRUMENTATION DIAGRAM
133928216	4	EQUIPMENT ENCLOSURE, PIPING, AND WELL VAULT DETAILS

INTERIM REMEDIAL MEASURE
LNAPL RECOVERY SYSTEM
AS-BUILT

FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR

EMERSON

REVISIONS

REV	DESCRIPTION	DRAWN	APPR.
1	Revised		
2	Revised		
3	Revised		

SEAL

DATE

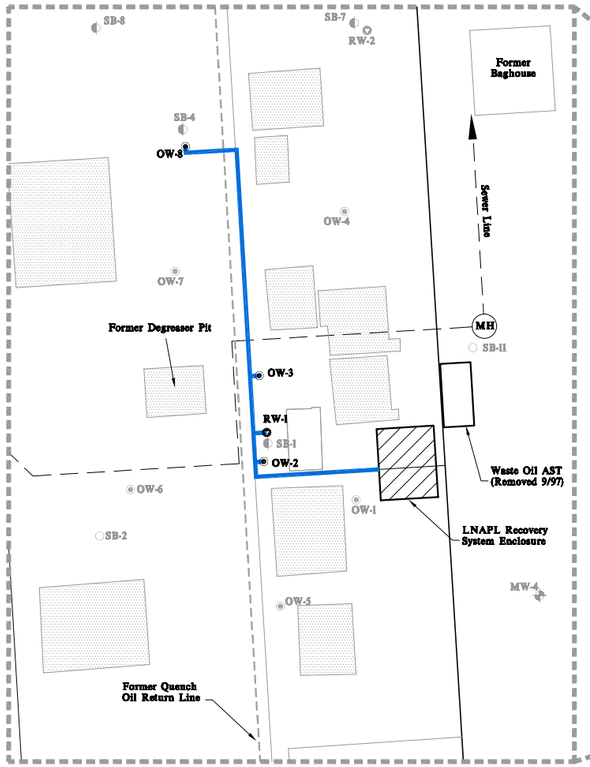
DRAWN BY	EGC
CHECKED	SBP
APPROVED	TMM

TITLE SHEET
AS-BUILT
FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK
PREPARED FOR
EMERSON

WSP
Engineering of
New York, P.C.
5 Sullivan Street
Cazenovia, New York 13035
(315) 655-3900

SHEET 1

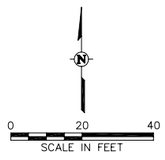
Drawing Number
133928216



Detailed Area
Scale 1"=10'

Legend

- Monitoring Well Location
- Dry Soil Boring Drilled May - June 1999
- Small Diameter Monitoring Well Installed May - June 1999
- Recovery Well
- Observation Well
- Observation Well Connected to LNAPL Recovery System
- Recovery Well Connected to LNAPL Recovery System
- Former Pit that has been Filled and Capped with Concrete
- Air Conveyance Piping



LOCATION MAP
SCALE: 1"=200'

REVISIONS

REV	DESCRIPTION			
1	Revised	Date	Appr.	
2	Revised	Date	Appr.	
3	Revised	Date	Appr.	

SEAL

DATE

DRAWN BY	EGC
CHECKED	SBP
APPROVED	TMM

SITE PLAN
AS-BUILT

FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON

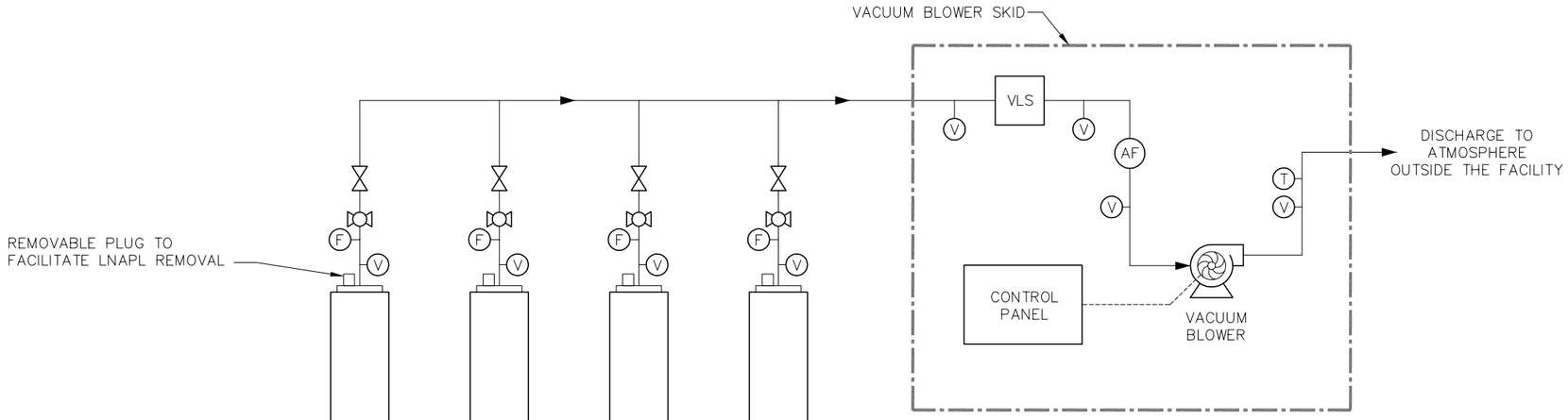
WSP Engineering of New York, P.C.
5 Sullivan Street
Cazenovia, New York 13035
(315) 655-3900

SHEET 2

Drawing Number
133928216

LEGEND

- AIR LINE
- (V) VACUUM GAUGE
- (F) FLOW METER
- (T) TEMPERATURE GAUGE
- GATE VALVE
- INSTRUMENTATION WIRING
- VLS — VAPOR–LIQUID SEPARATOR
- (AF) AIR FILTER
- BALL VALVE



LNAPL RECOVERY WELLS

REVISIONS

REV	DESCRIPTION			
1	Revised	Dfld	Appr.	
2	Revised	Dfld	Appr.	
3	Revised	Dfld	Appr.	

SEAL

DATE

DRAWN BY EGC
CHECKED SBP
APPROVED TMM

PROCESS & INSTRUMENTATION DIAGRAM AS–BUILT

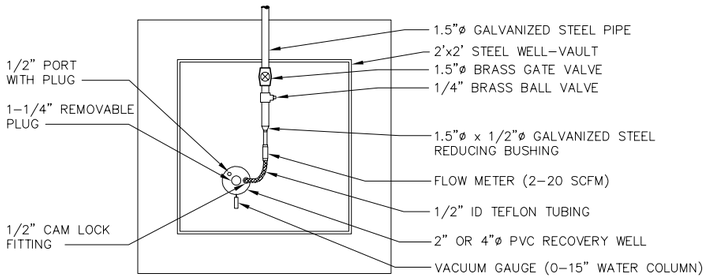
FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON

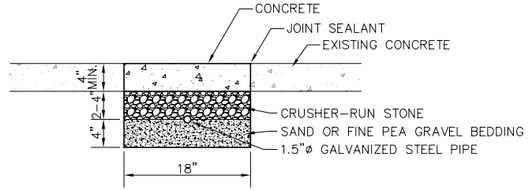
WSP Engineering of New York, P.C.
5 Sullivan Street
Cazenovia, New York 13035
(315) 655-3900

SHEET 3

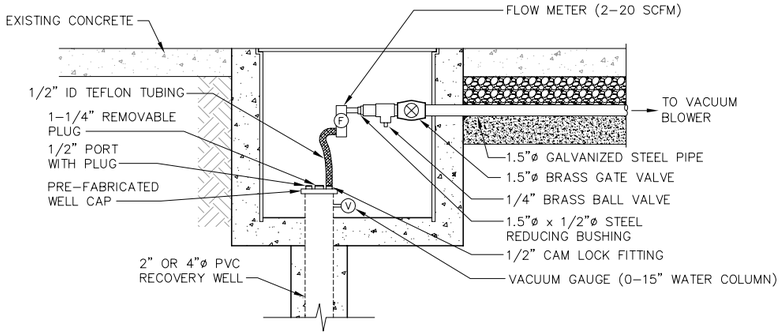
Drawing Number
133928216



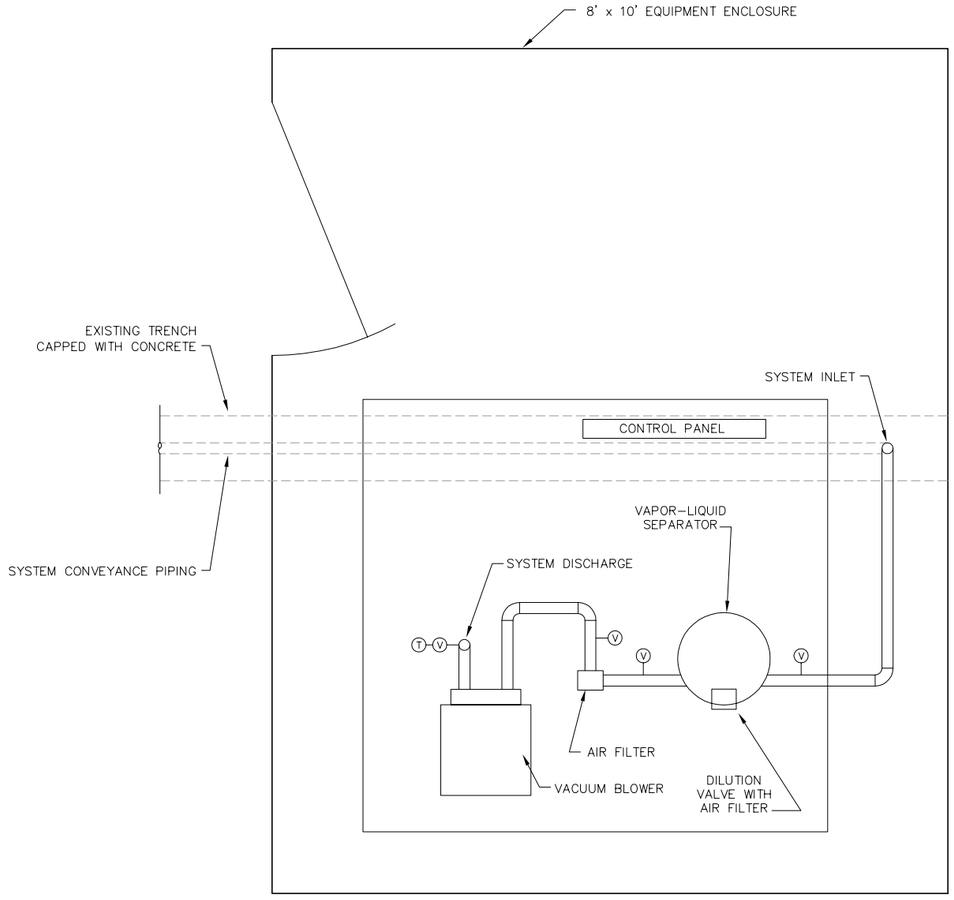
WELL-VAULT COMPLETION - PLAN VIEW
NOT TO SCALE



HEADER/LATERAL TRENCH DETAIL
SCALE: 1"=1'-0"



WELL-VAULT COMPLETION - SECTION VIEW
NOT TO SCALE



LNAPL RECOVERY SYSTEM ENCLOSURE LAYOUT
NOT TO SCALE

LEGEND
(V) VACUUM GAUGE
(T) TEMPERATURE GAUGE

REVISIONS

REV.	DESCRIPTION	
1	Revised	Appr.
2	Revised	Appr.
3	Revised	Appr.

SEAL

DATE

DRAWN BY EGC
CHECKED SBP
APPROVED TMM

EQUIPMENT ENCLOSURE, PIPING, AND WELL-VAULT DETAILS - AS-BUILT
FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK
PREPARED FOR
EMERSON

WSP Engineering of New York, P.C.
5 Sullivan Street
Cazenovia, New York 13035
(315) 655-3900

SHEET 4

Drawing Number
133928216

Boring Log: OW-1

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 19.8

Completion Date: Nov. 22, 2002 **Borehole Diameter (inches):** 8.25/4.0

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
						Concrete	
						Not Sampled	
8	1	52.5	NA	50		***Silt (ML)*** Brown (7.5YR4/3) silt, little to some clay, trace gravel; dense; dry.	
10	2	71.8	NA	25		***Weathered Bedrock*** Olive (5Y5/3) weathered shale, little clay, friable, some partings visible; dense to very dense; dry becoming moist between 13.1 and 13.2 feet bgs and wet between 14.0 and 14.8 feet bgs; faint oil odor.	
12	3	NR	NA	75		**Convert from 4.25-inch ID HSA to 4.0-inch OD Downhole Air Hammer.**	
14	4	54.2	NA	100			
						Not Sampled	
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Ian Grassy

** AMSL = Above mean sea level*

Boring Log: OW-2

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 19.5

Completion Date: Nov. 22, 2002 **Borehole Diameter (inches):** 8.25/4.0

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
						Concrete	
						Not Sampled	
8							
	1	425	NA	75		***Sand (SP)*** Strong brown (7.5YR4/6) fine-grained sand, little gravel; loose to medium dense; dry.	
10						***Silt (ML)*** Pale yellow(2.5Y7/3) silt, little to some clay, trace gravel; dense; dry.	
	2	8.1	NA	75		***Weathered Bedrock*** Olive (5Y5/3) shale, little clay, friable, some partings visible; medium denseto very dense; dry; faint oil and solvent-type odor.	
12							
	3	1.6	NA	75		**Convert from 4.25-inch ID HSA to 4.0-inch OD Downhole Air Hammer.**	
14							
	4	527	NA	100			
16						***Not Sampled***	
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Ian Grassy

** AMSL = Above mean sea level*

Boring Log: OW-3

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 19.0

Completion Date: Nov. 21, 2002 **Borehole Diameter (inches):** 8.25/4.0

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
						Concrete	
						Not Sampled	
8	1	0.0	NA	25			
10						***Silt (ML)*** Dark yellowish-brown silt, little to some clay, trace gravel; dense to very dense; dry.	
	2	1.9	NA	75		***Weathered Bedrock*** Olive (5Y5/3) weathered shale, friable, some partings visible; medium dense to dense; dry becoming moist between 11.5 and 12.0 and 12.5 and 12.6 feet bgs; moderate oil odor.	
12	3	0.0	NA	100		**Convert from 4.25-inch ID HSA to 4.0-inch OD Downhole Air Hammer.**	
14						***Not Sampled***	
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Ian Grassy

** AMSL = Above mean sea level*

Boring Log: OW-4

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 18

Completion Date: Aug. 27, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
	1	0.5	NA	100		***Concrete***	
2	2	0.1	NA	100		***Silt with Gravel (ML)*** Red (10YR 4/6) silt, some clay, trace to little gravel; very dense; dry.	
4	3	0.2	NA	50		***Silt (ML)*** Olive yellow (2.5Y 6/6) silt, some clay; dense; dry.	
6	4	0.1	NA	50		***Silt with Gravel (ML)*** Red (10R 4/6) silt, some clay; trace to little gravel; very dense; dry.	
8	5	0.2	NA	50		***Silt (ML)*** Pale yellow (5Y 7/3) silt, some clay, some residual shale partings; dense; dry.	
10	6	0.9	NA	50		***Weathered Bedrock and Silt (ML)*** Greenish-gray (10Y 6/1) weathered shale; dense, friable; dry, moist between 11.0 and 11.2 feet and also between 13.0 and 13.4 feet; faint oil odor between 11.0 and 11.2 feet and also between 13.0 and 13.4 feet; interbedded with thin (0.25 to 0.5-inch thick) layers of silt, some clay; very dense; dry.	
12	7	0.8	NA	50			
14	8	0.3	NA	25		***Weathered bedrock*** Gray (10YR 6/1) weathered shale; very dense, friable; dry. **Spoon refusal at 14.5 feet.**	
16	9	NA	NA	50		***Silt (ML)*** Greenish-gray (10BG 5/1) silt, some clay, laminated/mottled appearance; very dense; dry.	
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☐

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-5

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 16.5

Completion Date: Aug. 26, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
						Ground Surface	
0						***Concrete***	
	1	0.0	NA	100		***Sand (SP)*** Brown (10YR 4/3) to dark brown (10YR 3/3) fine to medium-grained sand, little silt, trace to little gravel; loose; dry; faint oil odor between 6.5 feet and 7.4 feet.	
2	2	0.1	NA	25			
4	3	0.6	NA	25			
6	4	1.6	NA	75			
8	5	14.2	NA	100		***Silt (ML)*** Olive (5Y 5/4) silt, some clay, trace remnant shale partings; medium dense to dense, no cohesiveness, non-plastic when wetted; dry, moist to wet between 8.0 and 9.1 feet; faint to moderate oil odor.	
10	6	12.2	NA	100		***Weathered Bedrock*** Greenish-gray (5GY 5/1) weathered shale; dense, friable; dry; moderate oil odor. Alternates with thin (0.5 to 0.75-inch thick) bands of greenish-gray clay with residual shale partings; moist.	
12						***Not Sampled*** **Convert from 4.25-inch ID HSA to 3.75-inch OD Downhole Air Hammer.** **Advanced 4.25 inch ID HSA to 16.5 feet to clear bridged bentonite at interface between Downhole Air Hammer and HSA.**	
14							
16							
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-6

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 18

Completion Date: Aug. 26, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
						Ground Surface	
0	1	NA	NA	NA		***Concrete***	
2	2	1.5	NA	25		***Silty Sand (SM)*** Brown (10YR 4/3) fine to medium-grained sand, trace to little silt and gravel; loose; dry.	
4	3	1.4	NA	50			
6	4	1.5	NA	50		***Silt (ML)*** Very dark grayish-brown (10YR 3/2) silt, little clay, trace organic material; medium dense; dry.	
8	5	-	NA	35		***Silt (ML)*** Olive (5Y 5/3) silt, some clay, some shale fragments and distinct partings; medium dense to very dense; dry. **Spoon refusal at 7.0 feet.**	
10	6	1.2	NA	100		***Weathered Bedrock*** Greenish-gray (5GY 6/1) weathered shale; very hard, friable; dry; faint oil odor. **Spoon refusal at 8.7 feet.**	
12	7	1.0	NA	25		***Silt (ML)*** Olive (5Y 4/3) silt, some clay; moist; medium dense.	
14	8	-	NA	100		***Weathered Bedrock*** Greenish-gray (5GY 6/1) weathered shale with distinct partings, some weak red (10 R 4/4) 0.5 to 1.0-inch diameter clay nodules (sapprolites?) between 11.5 and 12.0 feet; dense to very dense, friable; dry; faint oil odor.	
16	9	-	NA	100			
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☐

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-7

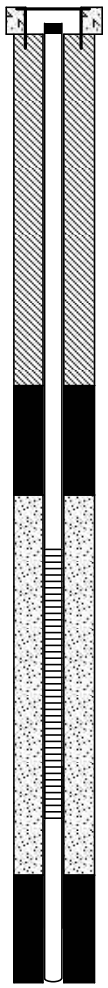
Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 18

Completion Date: Aug. 27, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
	1	0.2	NA	100		***Concrete***	
2	2	0.4	NA	100		***Silt (ML)*** Light olive brown (2.5Y 5/3) silt, some clay, trace to little shale fragments between 6.5 and 7.0 feet, massive to laminated; dense to very dense, friable between 6.5 and 7.0 feet; dry.	
4	3	0.4	NA	50			
6	4	0.3	NA	50			
8	5	0.7	NA	75		***Weathed Bedrock*** Gray (5Y 6/1) weathered shale; dense, friable; dry; occasional 0.25 to 0.5-inch thick clay layers; dense to very hard, friable; dry, moist between 11.2 and 11.4 feet; faint to moderate oil odor, trace free product (?) visible in some partings between 11.2 and 11.4 feet.	
10	6	3.2	NA	50			
12	7	3.6	NA	75			
14	8	2.0	NA	100			
16	9	NA	NA	50			
18						***Weathered Bedrock*** Reddish-gray (5YR 5/2) to light yellowish-brown (2.5 Y 6/4) weathered shale; dense, friable; dry.	
20							



Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☐

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-08

Project: Former Rollway Bearing
Project No.: 133928
Location: Liverpool, New York
Completion Date: June 22, 2006

Surface Elevation (feet AMSL*): 446.43
TOC Elevation (feet AMSL*): 446.01
Total Depth (feet): 17.5
Borehole Diameter (inches): 10.25

**AMSL = Above mean sea level*

Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Ground Surface	
						Concrete	
2	1	0.0	- - -	100		***Silt (ML)*** Reddish-brown (2.5YR 4/3) silt, some clay, trace to little gravel; very dense; dry.	
4	2	0.0	- - - -	75			
6	3	0.0	- - - -	75		***Silt (ML)*** Light yellowish-brown (2.5Y 6/3) laminated silt, some clay; very dense; dry.	
8	4	0.0	- - - -	100		***Lean Clay (CL)*** Dark yellowish-brown (10YR 3/4) clay; non-plastic, hard; dry.	
10	5	0.0	- - - -	10		***Silt (ML)*** Light yellowish-brown (2.5Y 6/3) laminated silt, some clay; dense to very dense; dry.	
12	6	0.0	- - - -	100		***Weathered Shale*** Olive (5Y 5/3) weathered shale; medium dense, friable; dry.	
14	7	1.8	- - - -	50		***Lean Clay (CL)*** Olive (5Y 5/3) clay, some silt; non-plastic, stiff; dry.	
16	8	0.8	- - - -	100		***Weathered Shale*** Olive (5Y 5/3) weathered shale; residual partings visible, friable; dry; weak petroleum-like odor between 10 and 12 feet; trace oil-like substance in shale partings between 11.4 and 11.6 feet.	
18						***Weathered Shale*** Olive (5Y 5/3) weathered shale; moderately competent, highly fractured between 14 and 14.5 feet; wet; some greenish-brown staining between 13.0 and 13.2 feet, trace brown staining between 14.0 and 14.5 feet; trace oil-like substance in shale partings between 12.0 and 13.3 feet, between 13.6 and 13.7 feet, and between 14.0 and 14.5 feet; moderate petroleum-like odor.	
20						***Weathered Shale and Lean Clay*** Grayish-brown (10YR 5/2) interbedded clay and weathered shale; hard; moist; moderate petroleum-like odor.	

Geologist(s): David P. Bouchard
Subcontractor: Parratt Wolff, Inc.
Driller/Operator: Jim Lansing
Method: Hollow Stem Auger

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

Boring Log: OW-08

Project: Former Rollway Bearing
Project No.: 133928
Location: Liverpool, New York
Completion Date: June 22, 2006

Surface Elevation (feet AMSL*): 446.43
TOC Elevation (feet AMSL*): 446.01
Total Depth (feet): 17.5
Borehole Diameter (inches): 10.25

**AMSL = Above mean sea level*

Sample Data					Subsurface Profile		
Depth	Sample/Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Details
						Shale Greenish-gray (10Y 5/1) shale; friable; dry.	
22						Bottom of Boring at 17.5 feet	
24							
26							
28							
30							
32							
34							
36							
38							
40							

Geologist(s): David P. Bouchard
Subcontractor: Parratt Wolff, Inc.
Driller/Operator: Jim Lansing
Method: Hollow Stem Auger

WSP Environment & Energy
5 Sullivan Street
Cazenovia, New York 13035
315-655-3900

ANALYTICAL REPORT

Job#: A08-5477

Project#: NY4A9171
Site Name: Environmental Strategies Corporation
Task: Emerald Screening

Mr. Brian Silfer
Environmental Strategies Corp.
5 Sullivan Street
Cazenovia, NY 13035

TestAmerica Laboratories Inc.

Candace L. Fox
Project Manager

05/20/2008

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Buffalo
Current Certifications

As of 6/15/2007

STATE	Program	Cert # / Lab ID
Arkansas	SDWA, CWA, RCRA, SOIL	88-0686
California*	NELAP CWA, RCRA	01169CA
Connecticut	SDWA, CWA, RCRA, SOIL	PH-0568
Florida*	NELAP CWA, RCRA	E87672
Georgia*	SDWA,NELAP CWA, RCRA	956
Illinois*	NELAP SDWA, CWA, RCRA	200003
Iowa	SW/CS	374
Kansas*	NELAP SDWA, CWA, RCRA	E-10187
Kentucky	SDWA	90029
Kentucky UST	UST	30
Louisiana*	NELAP CWA, RCRA	2031
Maine	SDWA, CWA	NY0044
Maryland	SDWA	294
Massachusetts	SDWA, CWA	M-NY044
Michigan	SDWA	9937
Minnesota	SDWA,CWA, RCRA	036-999-337
New Hampshire*	NELAP SDWA, CWA	233701
New Jersey*	NELAP,SDWA, CWA, RCRA,	NY455
New York*	NELAP, AIR, SDWA, CWA, RCRA,CLP	10026
Oklahoma	CWA, RCRA	9421
Pennsylvania*	Registration, NELAP CWA,RCRA	68-00281
Tennessee	SDWA	02970
USDA	FOREIGN SOIL PERMIT	S-41579
USDOE	Department of Energy	DOECAP-STB
Virginia	SDWA	278
Washington	CWA,RCRA	C1677
West Virginia	CWA,RCRA	252
Wisconsin	CWA, RCRA	998310390

*As required under the indicated accreditation, the test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

SAMPLE SUMMARY

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	SAMPLED DATE	SAMPLED TIME	RECEIVED DATE	RECEIVED TIME
A8547701	ROLLWAY-051408A	SOIL	05/14/2008	13:42	05/15/2008	09:30

METHODS SUMMARY

Job#: A08-5477

Project#: NY4A9171
Site Name: Environmental Strategies Corporation

PARAMETER	ANALYTICAL METHOD
METHOD 8260 - TCLP VOLATILES	SW8463 8260
METHOD 8082 - POLYCHLORINATED BIPHENYLS	SW8463 8082
Arsenic - Total	SW8463 6010
Barium - Total	SW8463 6010
Cadmium - Total	SW8463 6010
Chromium - Total	SW8463 6010
Lead - Total	SW8463 6010
Mercury - Total	SW8463 7470
Selenium - Total	SW8463 6010
Silver - Total	SW8463 6010
Total Moisture Content	ASTM D2216-90
Toxicity Characteristic Leaching Procedure	SW8463 1311

References:

ASTM "Annual Book of ASTM Standards", American Society for Testing and Materials, Philadelphia, PA.

SW8463 "Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, 9/86; Update I, 7/92; Update IIA, 8/93; Update II, 9/94; Update IIB, 1/95; Update III, 12/96.

SDG NARRATIVE

Job#: A08-5477

Project#: NY4A9171
Site Name: Environmental Strategies Corporation

General Comments

The enclosed data may or may not have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual, Dissolved Oxygen, Sulfite, and Temperature analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A08-5477
Sample Cooler(s) were received at the following temperature(s); 4.0 °C
All samples were received in good condition.

GC/MS Volatile Data

No deviations from protocol were encountered during the analytical procedures.

GC Extractable Data

No deviations from protocol were encountered during the analytical procedures.

Metals Data

The analyte Barium was detected in the TCLP Extractor Blank (A8B1534901) at a level above the project established reporting limit. However, the sample had a level of Barium greater than ten times that of the TCLP Extractor Blank value, therefore, no corrective action was necessary.

The analyte Lead was detected in the TCLP Extractor Blank (A8B1534901) at a level above the project established reporting limit. The sample was non-detect for this analyte, therefore, no corrective action was necessary.

Wet Chemistry Data

No deviations from protocol were encountered during the analytical procedures.

****

Client Sample ID	Lab Sample ID	Parameter (Inorganic)/Method (Organic)	Dilution	Code
ROLLWAY-051408A	A8547701	8260	10.00	007

Dilution Code Definition:

002 - sample matrix effects
003 - excessive foaming
004 - high levels of non-target compounds
005 - sample matrix resulted in method non-compliance for an Internal Standard
006 - sample matrix resulted in method non-compliance for Surrogate
007 - nature of the TCLP matrix
008 - high concentration of target analyte(s)
009 - sample turbidity
010 - sample color
011 - insufficient volume for lower dilution
012 - sample viscosity
013 - other

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DATA QUALIFIER PAGE

These definitions are provided in the event the data in this report requires the use of one or more of the qualifiers. Not all qualifiers defined below are necessarily used in the accompanying data package.

ORGANIC DATA QUALIFIERS

ND or U	Indicates compound was analyzed for, but not detected.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
C	This flag applies to pesticide results where the identification has been confirmed by GC/MS.
B	This flag is used when the analyte is found in the associated blank, as well as in the sample.
E	This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.
D	This flag identifies all compounds identified in an analysis at the secondary dilution factor.
N	Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where the identification is based on the Mass Spectral library search. It is applied to all TIC results.
P	This flag is used for CLP methodology only. For Pesticide/Aroclor target analytes, when a difference for detected concentrations between the two GC columns is greater than 25%, the lower of the two values is reported on the data page and flagged with a "P".
A	This flag indicates that a TIC is a suspected aldol-condensation product.
[1]	Indicates coelution.
*	Indicates analysis is not within the quality control limits.

INORGANIC DATA QUALIFIERS

ND or U	Indicates element was analyzed for, but not detected. Report with the detection limit value.
J or B	Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
N	Indicates spike sample recovery is not within the quality control limits.
S	Indicates value determined by the Method of Standard Addition.
E	Indicates a value estimated or not reported due to the presence of interferences.
H	Indicates analytical holding time exceedance. The value obtained should be considered an estimate.
G	Indicates a value greater than or equal to the project reporting limit but less than the laboratory quantitation limit
*	Indicates the spike or duplicate analysis is not within the quality control limits.
+	Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.

Environmental Strategies Corporation
Emerald Screening
METHOD 8260 - TCLP VOLATILES

Client ID		ROLLWAY-051408A							
Job No	Lab ID	A08-5477	A8547701						
Sample Date		05/14/2008							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	MG/L	ND	0.050	NA		NA		NA	
2-Butanone	MG/L	ND	0.25	NA		NA		NA	
Carbon Tetrachloride	MG/L	ND	0.050	NA		NA		NA	
Chlorobenzene	MG/L	ND	0.050	NA		NA		NA	
Chloroform	MG/L	ND	0.050	NA		NA		NA	
1,2-Dichloroethane	MG/L	ND	0.050	NA		NA		NA	
1,1-Dichloroethene	MG/L	ND	0.050	NA		NA		NA	
Tetrachloroethene	MG/L	ND	0.050	NA		NA		NA	
Trichloroethene	MG/L	ND	0.050	NA		NA		NA	
Vinyl chloride	MG/L	ND	0.050	NA		NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	92	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	101	50-200	NA		NA		NA	
1,4-Dichlorobenzene-D4	%	94	50-200	NA		NA		NA	
Toluene-D8	%	97	71-126	NA		NA		NA	
p-Bromofluorobenzene	%	94	73-120	NA		NA		NA	
1,2-Dichloroethane-D4	%	100	66-137	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Environmental Strategies Corporation
Emerald Screening
METHOD 8082 - POLYCHLORINATED BIPHENYLS

Client ID		ROLLWAY-051408A							
Job No	Lab ID	A08-5477	A8547701						
Sample Date		05/14/2008							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	18	NA		NA		NA	
Aroclor 1221	UG/KG	ND	18	NA		NA		NA	
Aroclor 1232	UG/KG	ND	18	NA		NA		NA	
Aroclor 1242	UG/KG	ND	18	NA		NA		NA	
Aroclor 1248	UG/KG	38	18	NA		NA		NA	
Aroclor 1254	UG/KG	46	18	NA		NA		NA	
Aroclor 1260	UG/KG	22	18	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	67	35-134	NA		NA		NA	
Decachlorobiphenyl	%	121	34-148	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID		ROLLWAY-051408A							
Job No	Lab ID	A08-5477	A8547701						
Sample Date		05/14/2008							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/L	ND	0.010	NA		NA		NA	
Barium - Total	MG/L	0.43	0.0020	NA		NA		NA	
Cadmium - Total	MG/L	0.0046	0.0010	NA		NA		NA	
Chromium - Total	MG/L	0.018	0.0040	NA		NA		NA	
Lead - Total	MG/L	ND	0.0050	NA		NA		NA	
Mercury - Total	MG/L	ND	0.00020	NA		NA		NA	
Selenium - Total	MG/L	ND	0.015	NA		NA		NA	
Silver - Total	MG/L	ND	0.0030	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Environmental Strategies Corporation
Emerald Screening
WET CHEMISTRY ANALYSIS

Client ID		ROLLWAY-051408A							
Job No	Lab ID	A08-5477	A8547701						
Sample Date		05/14/2008							
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Total Moisture Content	%	6.4	0	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Chronology and QC Summary Package

Client ID		VBLK85		Z-1906					
Job No	Lab ID	A08-5477	A8B1546004	A08-5477	A8B1535001				
Sample Date									
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	MG/L	ND	0.0050	ND	0.050	NA		NA	
2-Butanone	MG/L	ND	0.025	ND	0.25	NA		NA	
Carbon Tetrachloride	MG/L	ND	0.0050	ND	0.050	NA		NA	
Chlorobenzene	MG/L	ND	0.0050	ND	0.050	NA		NA	
Chloroform	MG/L	ND	0.0050	ND	0.050	NA		NA	
1,2-Dichloroethane	MG/L	ND	0.0050	ND	0.050	NA		NA	
1,1-Dichloroethene	MG/L	ND	0.0050	ND	0.050	NA		NA	
Tetrachloroethene	MG/L	ND	0.0050	ND	0.050	NA		NA	
Trichloroethene	MG/L	ND	0.0050	ND	0.050	NA		NA	
Vinyl chloride	MG/L	ND	0.0050	ND	0.050	NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	92	50-200	95	50-200	NA		NA	
1,4-Difluorobenzene	%	102	50-200	103	50-200	NA		NA	
1,4-Dichlorobenzene-D4	%	94	50-200	93	50-200	NA		NA	
Toluene-D8	%	97	71-126	96	71-126	NA		NA	
p-Bromofluorobenzene	%	99	73-120	94	73-120	NA		NA	
1,2-Dichloroethane-D4	%	103	66-137	100	66-137	NA		NA	

NA = Not Applicable ND = Not Detected

Client ID		MSB85							
Job No	Lab ID	A08-5477	A8B1546003						
Sample Date									
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Benzene	MG/L	0.026	0.0050	NA		NA		NA	
2-Butanone	MG/L	0.12	0.025	NA		NA		NA	
Carbon Tetrachloride	MG/L	0.028	0.0050	NA		NA		NA	
Chlorobenzene	MG/L	0.025	0.0050	NA		NA		NA	
Chloroform	MG/L	0.025	0.0050	NA		NA		NA	
1,2-Dichloroethane	MG/L	0.025	0.0050	NA		NA		NA	
1,1-Dichloroethene	MG/L	0.028	0.0050	NA		NA		NA	
Tetrachloroethene	MG/L	0.026	0.0050	NA		NA		NA	
Trichloroethene	MG/L	0.027	0.0050	NA		NA		NA	
Vinyl chloride	MG/L	0.023	0.0050	NA		NA		NA	
IS/SURROGATE(S)									
Chlorobenzene-D5	%	101	50-200	NA		NA		NA	
1,4-Difluorobenzene	%	101	50-200	NA		NA		NA	
1,4-Dichlorobenzene-D4	%	102	50-200	NA		NA		NA	
Toluene-D8	%	96	71-126	NA		NA		NA	
p-Bromofluorobenzene	%	92	73-120	NA		NA		NA	
1,2-Dichloroethane-D4	%	95	66-137	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID		Method Blank							
Job No	Lab ID	A08-5477	A8B1530902						
Sample Date									
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	ND	16	NA		NA		NA	
Aroclor 1221	UG/KG	ND	16	NA		NA		NA	
Aroclor 1232	UG/KG	ND	16	NA		NA		NA	
Aroclor 1242	UG/KG	ND	16	NA		NA		NA	
Aroclor 1248	UG/KG	ND	16	NA		NA		NA	
Aroclor 1254	UG/KG	ND	16	NA		NA		NA	
Aroclor 1260	UG/KG	ND	16	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	72	35-134	NA		NA		NA	
Decachlorobiphenyl	%	90	34-148	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID		Matrix Spike Blank							
Job No	Lab ID	A08-5477	A8B1530901						
Sample Date									
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aroclor 1016	UG/KG	160	16	NA		NA		NA	
Aroclor 1221	UG/KG	ND	16	NA		NA		NA	
Aroclor 1232	UG/KG	ND	16	NA		NA		NA	
Aroclor 1242	UG/KG	ND	16	NA		NA		NA	
Aroclor 1248	UG/KG	ND	16	NA		NA		NA	
Aroclor 1254	UG/KG	ND	16	NA		NA		NA	
Aroclor 1260	UG/KG	180	16	NA		NA		NA	
SURROGATE(S)									
Tetrachloro-m-xylene	%	76	35-134	NA		NA		NA	
Decachlorobiphenyl	%	92	34-148	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client ID		J-2358		Method Blank		Method Blank			
Job No	Lab ID	A08-5477	A8B1534901	A08-5477	A8B1541102	A08-5477	A8B1541202		
Sample Date									
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/L	ND	0.010	ND	0.010	NA		NA	
Mercury - Total	MG/L	ND	0.00020	NA		ND	0.00020	NA	
Barium - Total	MG/L	0.027	0.0020	ND	0.0020	NA		NA	
Cadmium - Total	MG/L	ND	0.0010	ND	0.0010	NA		NA	
Chromium - Total	MG/L	ND	0.0040	ND	0.0040	NA		NA	
Lead - Total	MG/L	0.012	0.0050	ND	0.0050	NA		NA	
Selenium - Total	MG/L	ND	0.015	ND	0.015	NA		NA	
Silver - Total	MG/L	ND	0.0030	ND	0.0030	NA		NA	

NA = Not Applicable ND = Not Detected

Client ID		LCS		LCS					
Job No	Lab ID	A08-5477	A8B1541101	A08-5477	A8B1541201				
Sample Date									
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Arsenic - Total	MG/L	1.0	0.010	NA		NA		NA	
Cadmium - Total	MG/L	1.0	0.0010	NA		NA		NA	
Mercury - Total	MG/L	NA		0.0066	0.00020	NA		NA	
Barium - Total	MG/L	1.0	0.0020	NA		NA		NA	
Chromium - Total	MG/L	0.98	0.0040	NA		NA		NA	
Lead - Total	MG/L	1.0	0.0050	NA		NA		NA	
Selenium - Total	MG/L	1.0	0.015	NA		NA		NA	
Silver - Total	MG/L	1.0	0.0030	NA		NA		NA	

NA = Not Applicable ND = Not Detected

Client Sample ID: VBLK85 MSB85
Lab Sample ID: A8B1546004 A8B1546003

Analyte	Units of Measure	Concentration Blank Spike	Concentration Spike Amount	% Recovery Blank Spike	QC LIMITS
METHOD 8260 - TCLP VOLATILES					
Benzene	MG/L	0.0260	0.0250	104	77-123
2-Butanone	MG/L	0.121	0.125	97	67-131
Carbon Tetrachloride	MG/L	0.0275	0.0250	110	75-128
Chlorobenzene	MG/L	0.0250	0.0250	100	77-121
Chloroform	MG/L	0.0249	0.0250	100	78-120
1,2-Dichloroethane	MG/L	0.0254	0.0250	102	74-126
Tetrachloroethene	MG/L	0.0265	0.0250	106	77-120
Trichloroethene	MG/L	0.0268	0.0250	107	77-123
Vinyl chloride	MG/L	0.0232	0.0250	93	67-127

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Detected

Client Sample ID: Method Blank Matrix Spike Blank
Lab Sample ID: A8B1530902 A8B1530901

Analyte	Units of Measure	Concentration Blank Spike	Concentration Spike Amount	% Recovery Blank Spike	QC LIMITS
METHOD 8082 - POLYCHLORINATED BIPHENYLS					
Aroclor 1260	UG/KG	176	162	109	52-140
Aroclor 1016	UG/KG	156	162	96	59-154

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Detected

Client Sample ID: J-2358 LCS
Lab Sample ID: A8B1534901 A8B1541101

Analyte	Units of Measure	Concentration Blank Spike	Spike Amount	% Recovery Blank Spike	QC LIMITS
TCLP METALS TESTING					
TCLP TOTAL ARSENIC	MG/L	1.03	1.00	103	80-120
TCLP TOTAL BARIUM	MG/L	1.00	1.00	98	80-120
TCLP TOTAL CADMIUM	MG/L	1.00	1.00	101	80-120
TCLP TOTAL CHROMIUM	MG/L	0.985	1.00	98	80-120
TCLP TOTAL LEAD	MG/L	1.02	1.00	101	80-120
TCLP TOTAL SELENIUM	MG/L	1.03	1.00	103	80-120
TCLP TOTAL SILVER	MG/L	1.02	1.00	102	80-120

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Detected

Client Sample ID: J-2358 LCS
Lab Sample ID: A8B1534901 A8B1541201

Analyte	Units of Measure	Concentration Blank Spike	Spike Amount	% Recovery Blank Spike	QC LIMITS
TCLP METALS TESTING					
TCLP TOTAL MERCURY	MG/L	0.00657	0.00666	98	80-120

* Indicates Result is outside QC Limits
NC = Not Calculated ND = Not Detected

METHOD 8260 - TCLP VOLATILES

Client Sample ID Job No & Lab Sample ID	ROLLWAY-051408A A08-5477 A8547701				
Sample Date	05/14/2008 13:42				
Received Date	05/15/2008 09:30				
TCLP Date/Time	05/16/2008 10:45				
Extraction Date					
Analysis Date	05/17/2008 00:46				
TCLP Extraction HT Met?	YES				
Extraction HT Met?	-				
Analytical HT Met?	YES				
Sample Matrix	SOIL LOW				
Dilution Factor	10.0				
Sample wt/vol	0.005 LITERS				
% Dry					

NA = Not Applicable

METHOD 8260 - TCLP VOLATILES

Client Sample ID	MSB85				
Job No & Lab Sample ID	A08-5477 A8B1546003				
Sample Date					
Received Date					
TCLP Date/Time	-				
Extraction Date					
Analysis Date	05/16/2008 21:57				
TCLP Extraction HT Met?	-				
Extraction HT Met?	-				
Analytical HT Met?	-				
Sample Matrix	SOIL LOW				
Dilution Factor	1.0				
Sample wt/vol	0.005 LITERS				
% Dry					

NA = Not Applicable

METHOD 8260 - TCLP VOLATILES

Client Sample ID Job No & Lab Sample ID	VBLK85 A08-5477 A8B1546004	Z-1906 A08-5477 A8B1535001			
Sample Date					
Received Date					
TCLP Date/Time	-	05/16/2008 10:45			
Extraction Date					
Analysis Date	05/16/2008 23:21	05/17/2008 00:23			
TCLP Extraction HT Met?	-	YES			
Extraction HT Met?	-	-			
Analytical HT Met?	-	-			
Sample Matrix	SOIL LOW	SOIL LOW			
Dilution Factor	1.0	10.0			
Sample wt/vol	0.005 LITERS	0.005 LITERS			
% Dry					

NA = Not Applicable

METHOD 8082 - POLYCHLORINATED BIPHENYLS

Client Sample ID Job No & Lab Sample ID	ROLLWAY-051408A A08-5477 A8547701				
Sample Date	05/14/2008 13:42				
Received Date	05/15/2008 09:30				
Extraction Date	05/15/2008 15:00				
Analysis Date	05/16/2008 08:43				
Extraction HT Met?	YES				
Analytical HT Met?	YES				
Sample Matrix	SOIL LOW				
Dilution Factor	1.0				
Sample wt/vol	30.57 GRAMS				
% Dry	91.32				

NA = Not Applicable

METHOD 8082 - POLYCHLORINATED BIPHENYLS

Client Sample ID Job No & Lab Sample ID	Matrix Spike Blank A08-5477 A8B1530901				
Sample Date					
Received Date					
Extraction Date	05/15/2008 15:00				
Analysis Date	05/16/2008 08:14				
Extraction HT Met?	-				
Analytical HT Met?	-				
Sample Matrix	SOIL LOW				
Dilution Factor	1.0				
Sample wt/vol	30.86 GRAMS				
% Dry	100.00				

NA = Not Applicable

METHOD 8082 - POLYCHLORINATED BIPHENYLS

Client Sample ID Job No & Lab Sample ID	Method Blank A08-5477 A8B1530902				
Sample Date					
Received Date					
Extraction Date	05/15/2008 15:00				
Analysis Date	05/16/2008 08:29				
Extraction HT Met?	-				
Analytical HT Met?	-				
Sample Matrix	SOIL LOW				
Dilution Factor	1.0				
Sample wt/vol	30.76 GRAMS				
% Dry	100.00				

NA = Not Applicable

ENVIRONMENTAL STRATEGIES CORPORATION
SAMPLE CHRONOLOGY

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8547701	ROLLWAY-051408A	MG/L	Arsenic - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL
		MG/L	Barium - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL
		MG/L	Cadmium - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL
		MG/L	Chromium - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL
		MG/L	Lead - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL
		MG/L	Mercury - Total	7470	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/16 18:14	Yes	SOIL
		MG/L	Selenium - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL
		MG/L	Silver - Total	6010	1.00	05/14/2008 13:42	05/15 09:30	05/16 10:45	Yes	05/19 14:25	Yes	SOIL

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8B1541102	Method Blank	MG/L	Arsenic - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
		MG/L	Barium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
		MG/L	Cadmium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
		MG/L	Chromium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
		MG/L	Lead - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
		MG/L	Selenium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
		MG/L	Silver - Total	6010	1.00	-	- 09:30	NA	NA	05/19 12:59	Yes	WATER
A8B1541202	Method Blank	MG/L	Mercury - Total	7470	1.00	-	- 09:30	NA	NA	05/16 18:20	Yes	WATER
A8B1534901	J-2358	MG/L	Arsenic - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
		MG/L	Barium - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
		MG/L	Cadmium - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
		MG/L	Chromium - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
		MG/L	Lead - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
		MG/L	Mercury - Total	7470	1.00	-	- 09:30	05/16 10:45	Yes	05/16 18:17	Yes	SOIL
		MG/L	Selenium - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
		MG/L	Silver - Total	6010	1.00	-	- 09:30	05/16 10:45	Yes	05/19 13:10	Yes	SOIL
A8B1541101	LCS	MG/L	Arsenic - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
		MG/L	Barium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
		MG/L	Cadmium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
		MG/L	Chromium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
		MG/L	Lead - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
		MG/L	Selenium - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
		MG/L	Silver - Total	6010	1.00	-	- 09:30	NA	NA	05/19 13:04	Yes	WATER
A8B1541201	LCS	MG/L	Mercury - Total	7470	1.00	-	- 09:30	NA	NA	05/16 18:18	Yes	WATER

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

Lab ID	Sample ID	Units	Analyte	Method	Dilution Factor	Sample Date	Receive Date	TCLP Date	THT	Analysis Date	AHT	Matrix
A8547701	ROLLWAY-051408A	%	Total Moisture Content	D2216-90	1.00	05/14/2008 13:42	05/15 09:30	NA	NA	05/16 09:55	Yes	SOIL

AHT = Analysis Holding Time Met
THT = TCLP Holding Time Met
NA = Not Applicable

CHAIN OF CUSTODY RECORD

Project Number:	Site and Location:
133928.15	Rollway, Liverpool, NY
Contact Name:	**Contact Email:** (Notice Spelling)
Scott Petersen	Scott-petersen@wsp-usa.com
Sampler's Name:	**Sampler's Signature:**
Scott Petersen	Scott Petersen

Matrices: S = Soil; Aq = Water; A = Air; Bu = Bulk; W = Wipe; Bi = Biota; OW = Oily Waste; O = Other

№ 002122

Requested Analyses

Sample Identification:	Date	Time	Matrix	Number of Containers	TCLP VOA's	TCLP Metals	PCBs	% Moisture	Remarks
Rollway - LNAPL System Spoils - 051408A	5/14/08	1342	S	1 16oz		X	X	X	
Rollway - LNAPL System Spoils - 051408B	5/14/08	1342	S	1 40z	X				

Relinquished by (Signature): Scott Petersen	5/14/08 1514 Date | Time	Received by (Signature):	Laboratory Name: Test America
Relinquished by (Signature):	5/15/08 0930 Date | Time	Received by (Signature):	Laboratory Location: Buffalo, NY
			Custody Seal Numbers: 19499
Turn-Around Time: 48-hr		Tracking Number:	Method of Shipment:

WSP ENVIRONMENTAL STRATEGIES

☐ Reston Office: 11911 Freedom Dr, # 900, Reston, VA 20190
Tel: (703) 709-6500, Fax: (703) 709-8505

☐ Pittsburgh Office: 750 Holiday Dr., #410, Pittsburgh, PA 15220
Tel: (412) 604-1040, Fax: (412) 604-1055

☐ Denver Office: 4600 South Ulster, # 930, Denver, CO 80237
Tel: (303) 850-9200, Fax: (303) 850-9214

☐ Minneapolis Office: 123 North 3rd St, #706, Minneapolis, MN 55401
Tel: (612) 343-0510, Fax: (612) 343-0506

☒ Cazenovia (315)655-3900

4.0°C

33/33

SCPPW6/2/2008

SY1910213-003

WORK ORDER NO. _____

DOCUMENT NO. 208033 **STRAIGHT BILL OF LADING**

TRANSPORTER 1 Clean Harbors Environmental Services VEHICLE ID # T310078 IL

EPA ID # _____ TRANS. 1 PHONE _____

TRANSPORTER 2 _____ VEHICLE ID # _____

EPA ID # _____ TRANS. 2 PHONE _____

DESIGNATED FACILITY	SHIPPER
WM I High Acres Landfill	Rollway Bearing Corp
FACILITY EPA ID # NYSDEC80870765	SHIPPER EPA ID # NYD002228419
ADDRESS 425 Perinton Parkway	ADDRESS ~~5 Sullivan Street~~ 7600 Morgan Rd.
CITY Fairport STATE NY ZIP 14450	CITY ~~Geneseo~~ Liverpool STATE NY ZIP ~~13095~~ 13090

CONTAINERS NO. & SIZE	TYPE	HM	DESCRIPTION OF MATERIALS	TOTAL QUANTITY	UNIT WT/VOL
001/25y	CM		A. NONE, NON-REGULATED MATERIAL, (SOIL, DEBRIS), N/A	EST -12-	T
			B.		
			C.		
			D.		
			E. CAN # CHRT 25670		
			F.		
			G.		
			H.		

SPECIAL HANDLING INSTRUCTIONS A. T02255NY EMERGENCY PHONE #: (800) 483-3718

PO# WO8CU52809

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

	PRINT	SIGN	DATE
SHIPPER	[illegible]	[signature]	[illegible]
TRANSPORTER 1	LARRY SALISBURY	[signature]	6/6/08
TRANSPORTER 2	PRINT	SIGN	DATE
RECEIVED BY	PRINT	SIGN	DATE

4

CHI 107

Checklist
LNAPL Recovery System
Former Rollway Bearing Facility
Liverpool, NY

Date: _____ Inspector (print): _____
Arrival Time: _____ Inspector (sign): _____
Departure Time: _____ Weather Conditions: _____

Reason for Visit: _____

LNAPL Recovery System Skid

Gauge	Reading	Units
Inlet Vacuum: Before Vapor-Liquid Separator		Inches of H_2O
Vacuum Before Air Filter		Inches of H_2O
Vacuum After Air Filter/Before Blower Inlet		Inches of H_2O
Discharge Stack Pressure		Inches of H_2O
Discharge Stack Temperature		°F
Kilowatt Hour Meter		kWh

LNAPL Recovery Wells

Well ID	Vacuum (Inches of H_2O)	Flow (scfm)
OW-2		
RW-1		
OW-3		
OW-8		

Notable Observations:

_____

_____

_____

System Maintenance:

Description of Maintenance Needed:

_____

_____

Date of Maintenance Completion:

_____

APPENDIX

D SOIL EXCAVATION SUMMARY REPORT

ESC

ENVIRONMENTAL STRATEGIES CORPORATION

11911 Freedom Drive ▪ Reston, Virginia 20190 ▪ (703) 709-6500 ▪ Fax (703) 709-8505

April 25, 2002

Client File

Mr. Richard Brazell, P.E.
Regional Spill Engineer
New York State Department of Environmental Conservation
615 Erie Boulevard West
Syracuse, New York 13204-2400

Re: Soil Excavation Summary Report
Rollway Bearing Corporation Facility, Liverpool, New York
Agreement Index Number: V7-1007-96-10

Dear Mr. Brazell:

On behalf of Emerson and Rollway Bearing Corporation, Environmental Strategies Corporation (ESC) is submitting this summary report for the soil excavation activities conducted at the Rollway Bearing facility in Liverpool, New York (Figure 1). The soil removal activities were conducted from November 13, 2001, through December 15, 2001, by Marcor Remediation, Inc., (Marcor) in accordance with the New York State Department of Environmental Conservation-(NYSDEC-) approved Revised Remedial Action Work Plan, dated May 9, 2000, prepared by ESC. During implementation of the soil removal activities, ESC provided full-time engineering services to observe the work performed by Marcor for substantial conformance with the approved work plan.

In accordance with the approved work plan, affected soil in the former gasoline underground storage area containing volatile organic compound (VOC) concentrations above the evaluation criteria for protection of groundwater was excavated and disposed of offsite in accordance with applicable state and federal regulations. The evaluation criteria for protection of groundwater are provided in Appendix A of the approved work plan. A detailed description of the soil removal activities is presented below.

Mobilization/Site Preparation Activities

Before commencing work activities, the following mobilization and site preparation activities were performed:

- Located and marked underground utilities near the proposed area of excavation using information provided by facility personnel. The closest underground utility was an 8-inch diameter underground sprinkler system water line that runs parallel to the south side of the building. This pipe was approximately 25 feet south of the building.

- Constructed staging areas to temporarily stockpile petroleum-affected soil and potentially clean overburden soil excavated from the former tank pit. The staging areas were lined with 2 layers of minimum 6-mil-thick polyethylene sheeting. The staging area for petroleum-affected soil was bermed using straw bales.
- Constructed an equipment decontamination pad consisting of two layers of 6-mil-thick polyethylene sheeting and a berm constructed of wooden planks.
- Installed and maintained temporary fencing to limit unauthorized access, or unknowing access, to any open excavations during periods of inactivity.

Soil Excavation and Handling

Soil was removed from the excavation, using an excavator, and was stockpiled in staging areas designated by ESC. During the excavation activities, overburden material that was deemed clean was stockpiled in a separate staging area or on polyethylene sheeting adjacent to the excavation for subsequent testing and reuse as backfill. This determination was made by using previous sampling data, field observations, and organic vapor screening with a photoionization detector (PID).

To protect the building foundation, a 1 to 1 slope was maintained from the base of the building footer to the bottom of the excavation. In accordance with the approved work plan, the excavation did not extend under the building or include load-bearing soil near the building foundation.

On removal of the clean overburden material, petroleum-affected soil was removed, stockpiled in the designated staging area and covered with polyethylene sheeting anchored with clean soil. Soil samples were collected frequently from the excavation for organic vapor screening. The organic vapor levels were used to guide the excavation. Once organic vapor levels indicated that the affected soil was removed, one set of verification samples was collected. Verification samples were collected from the bottom and sides of the excavation. One discrete bottom sample (sample identification Bottom-1) was collected from the approximate 200-square-foot bottom excavation area (see Figure 2 for excavation limits). One discrete side sample was collected from each 20-foot length of wall. Based on the average dimensions of the excavation area (18 feet by 19 feet), four discrete side wall samples were collected (sample identifications East-1, West-1, North-1, and South-1). The sampling depth coincided with the depth of maximum VOC concentrations, as indicated by pre-remedial sampling data or organic vapor screening. In order to ensure a representative sample, a 1-foot thickness of exposed soil was removed with the excavator at the sample location before the sample was collected. ESC collected samples directly from the excavator bucket using decontaminated stainless steel spoons. The samples were placed in laboratory-supplied containers and shipped under chain of custody procedures to Adirondack Environmental Services, Inc., of Albany, New York, for laboratory analysis of VOCs by Environmental Protection Agency (EPA) Method 8021. Quality assurance and quality control samples, including trip blanks, equipment blanks, and duplicate samples, were collected and analyzed. The laboratory analytical results are presented in Table 1. A copy of the laboratory analytical report is provided as Enclosure 1.

The analyses were performed on an expedited turnaround time to allow a prompt decision on whether to conduct additional excavation. During this time, the excavation was left open, and construction fencing was placed around the perimeter of the excavation. Based on the analytical results, the concentrations of several VOCs (Table 1) exceeded the cleanup criteria in the sample collected from the eastern sidewall of the excavation (sample identification East-1). To facilitate additional excavation to the east, asphalt pavement was saw cut and removed along the eastern boundary of the excavation. Additional soil was excavated to the east from the surface to the bottom of the excavation and another sample was collected from the eastern sidewall (sample identification East-2). The analytical results from sample East-2 indicated the VOC concentrations were below the cleanup criteria. The final excavation limits are shown on Figure 2. A total of approximately 230 cubic yards (cy) of material was removed from the excavation.

Backfilling and Site Restoration

Before reusing the stockpiled overburden soil as backfill, samples were collected to verify that the VOC concentrations were below the cleanup criteria. For each 50-cubic yard volume of soil, 4 samples were collected from representative locations at least 6 inches below the pile surface. Each of the four samples was screened for organic vapors with a PID. Soil from the portion of the pile with the highest organic vapor level was collected for VOC analysis by EPA Method 8021. Two samples of the overburden stockpiled soil were collected for VOC analysis (sample identification BF-1 and BF-2). No VOCs were detected in the overburden soil and, thus, the soils were suitable for onsite reuse. The laboratory analytical results are presented on Table 1. A copy of the laboratory analytical report is presented in Enclosure 1.

In addition to using excavated soils for backfill, additional clean fill material (crusher-run) was transported from an offsite source to complete the backfilling activities. A sample of this material was collected by CME Associates, Inc. (CME), and a standard Proctor test was performed to determine the maximum dry density of this material. The backfill was placed in the excavation in 1-foot-thick loose lifts and was compacted with the bucket of the excavator. The lower portion of the excavation was backfilled with imported clean fill material, and the upper portion was backfilled with native overburden material, with the exception of the area excavated under the pavement. The majority of this area was backfilled with crusher-run material as a sub-base for the new pavement.

Backfill material near the surface of the excavation was compacted to a minimum of 90 percent of the standard Proctor maximum dry density, in accordance with ASTM standard D698 or equivalent. Three in-place field density tests were performed by CME using a nuclear density gauge. One test was performed on the lift placed at 3 feet below ground surface (bgs), at 2 feet bgs, and at final grade. Copies of the standard Proctor test and in-place density tests are provided in Enclosure 2.

The disturbed pavement will be replaced in the spring, and the excavation area will be seeded to restore the area to pre-excavation conditions.

Waste Characterization and Disposal

For profiling and waste characterization purposes, Marcor collected a soil sample from the stockpile of affected soil. The soil sample was submitted to York Analytical Laboratories, Inc., for analysis of toxicity characteristic leaching procedure VOCs, ignitability, and free liquids. A copy of the laboratory analytical report is presented in Enclosure 3.

On December 15, 2001, 104.63 tons of petroleum-affected soil stockpiled onsite were loaded into dump trucks and transported to and disposed of at High Acres Landfill Recycling Center, located in Fairport, New York, as a non-hazardous waste. Other non-hazardous materials disposed of included disposable equipment, polyethylene sheeting, and personal protective equipment. Copies of certificates of disposal, non-hazardous waste manifests, and weight tickets from High Acres are provided as Enclosure 4.

Please do not hesitate to contact me at (315) 655-3900 or John Simon of ESC at (703) 709-6500, if you have any questions or comments regarding this report.

Sincerely yours,

Brian E. Silfer (sej)

Brian E. Silfer
Project Director

BES:tmm:sej

g:\emerson\liperollway\soilremival\soilreport.doc

Enclosures

cc: Mr. John A. Simon, ESC
Mr. Todd M. Musterait, P.E., ESC

Tables

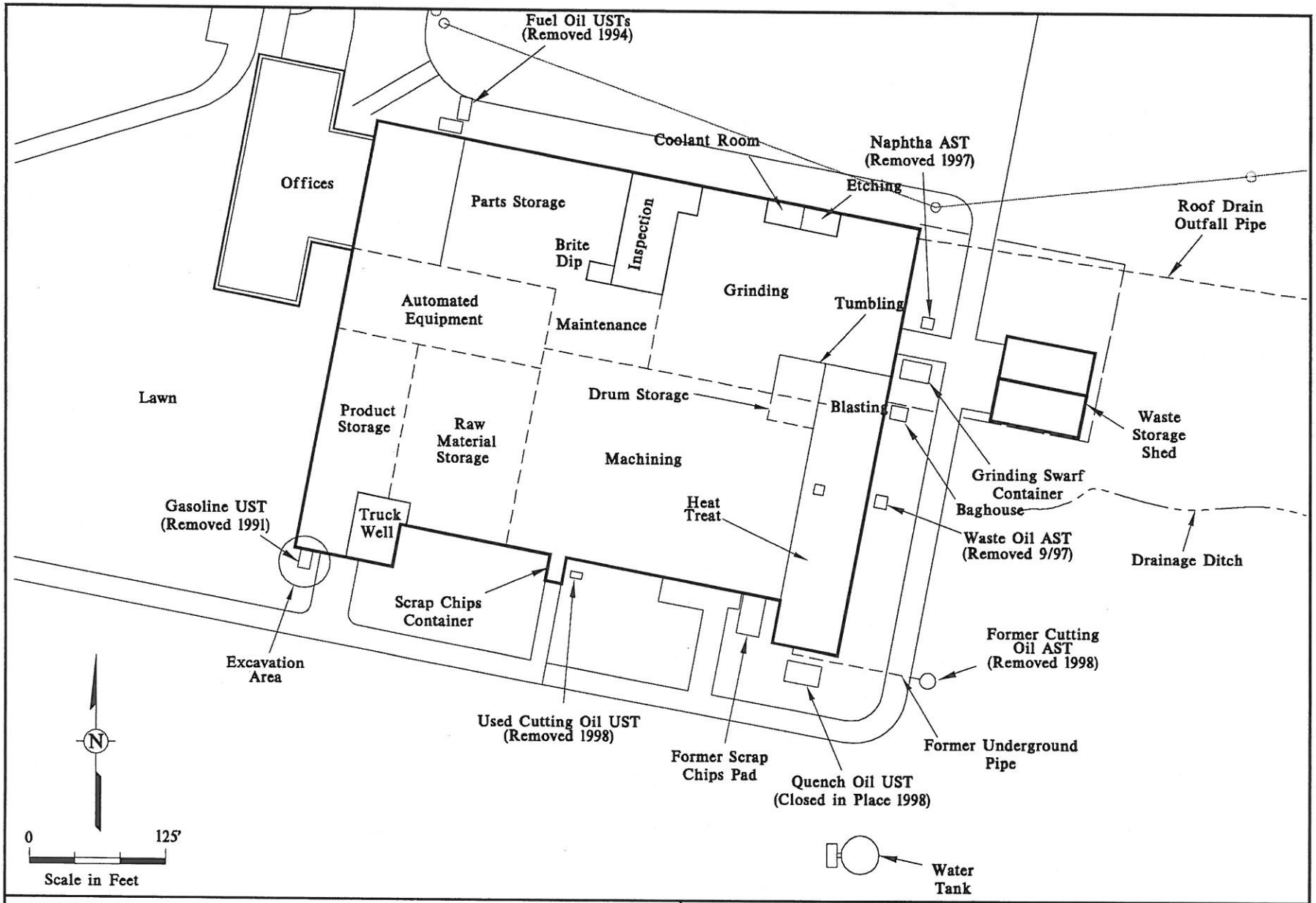
Table 1

Verification and Backfill Soil Sample Results
Rollway Bearing Corporation Facility
Liverpool, New York
November 13 and 15, 2001(a)

Compound	Bottom-1	West-1	North-1	East-1	South-1	East-2	BF-1	BF-2	Cleanup Criteria
Depth (feet bgs)	13	12	11	11	11	11			
Sample Date	11/13/2001	11/13/2001	11/13/2001	11/13/2001	11/13/2001	11/15/2001	11/13/2002	11/13/2002	
VOCs									
Benzene	500 U	10 U	1,000 U	2,000 U	10 U	11	10 U	10 U	4,600
Ethylbenzene	1,100	20 U	2,000 U	24,000	20 U	27	20 U	20 U	9,300
Toluene	1,000 U	20 U	2,000 U	77,000	20 U	20 U	20 U	20 U	12,300
o-Xylene	1,000 U	20 U	3,400	71,000	20 U	39	20 U	20 U	20,600
m,p-Xylene	2,300	24	11,000	180,000	20 U	220	20 U	20 U	20,600
Isopropyl Benzene	1,000 U	20 U	2,000 U	6,900	20 U	20 U	20 U	20 U	2,900
n-Propylbenzene	1,500	20 U	3,400	18,000	20 U	70	20 U	20 U	198,000
p-Cymene	1,000 U	20 U	2,000 U	4,000 U	20 U	20 U	20 U	20 U	NS
1,2,4-Trimethylbenzene	12,000	20 U	26,000	140,000	20 U	790	20 U	20 U	220,000
1,3,5-TMB & Sec-BB Total	3,900	20 U	8,400	53,000	20 U	310	20 U	20 U	53,200
n-Butylbenzene	5,400	20 U	11,000	38,000	20 U	380	20 U	20 U	198,000
Napthalene	5,000 U	100 U	10,000 U	20,000 U	100 U	100 U	100 U	100 U	22,300
Methyl-t-Butyl Ether	2,000 U	40 U	4,000 U	8,000 U	40 U	40 U	40 U	40 U	NS
t-Butylbenzene	1,000 U	20 U	2,000 U	4,000 U	20 U	20 U	20 U	20 U	5,681,000

a/ All concentrations in micrograms per kilogram; bgs = below ground surface; VOCs = Volatile organic compounds; NS = no standard.
volatile organic compounds; J = Estimated concentration below reporting limit; E = Concentration exceeds the calibration limit.
b/ Cleanup criteria are from Appendix A (Table 7) of the revised Remedial Action Work Plan, dated May 9, 2000.

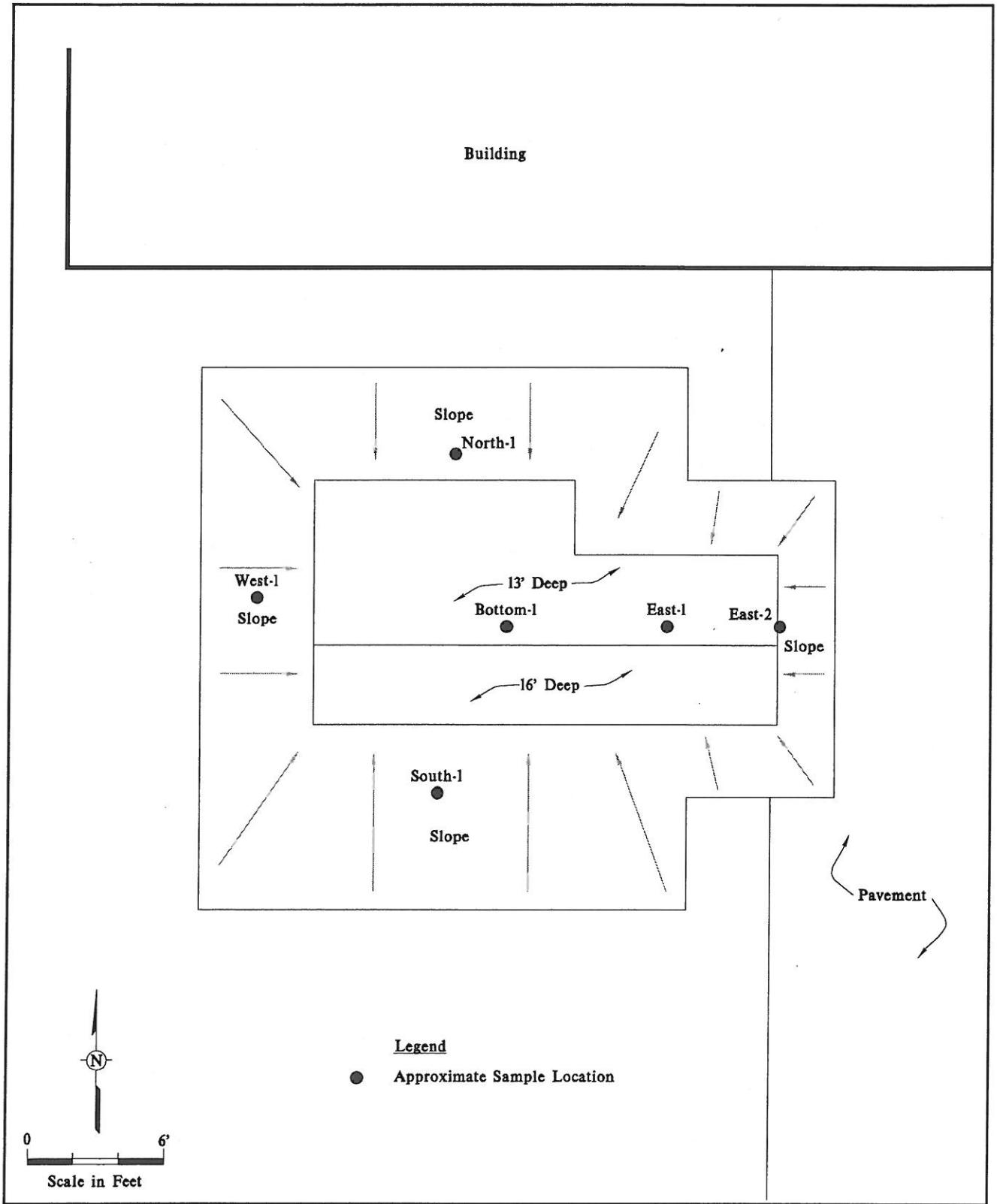
Figures



ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive Suite 900
Reston, Virginia 22090
703-709-6500

Figure 1
Site Layout
Rollway Bearing Facility
Liverpool, New York

13392810.DWG



ENVIRONMENTAL STRATEGIES CORPORATION
ESC
11911 Freedom Drive Suite 900
Reston, Virginia 20190
703-709-6500

Figure 2
Excavation Limits
Rollway Bearing Facility
Liverpool, New York

13392809.DWG

Enclosure 1 – Verification and Backfill Samples Analytical Report

Adirondack Environmental Services, Inc.
Experience is the solution
314 North Pearl Street • Albany, New York 12207 • 800-848-4983 • (518) 434-4546 • Fax (518) 434-0891

LABORATORY REPORT

for

Environmental Strategies Corp.
9 Albany Street
Cazenovia, NY 13035

Attention: Brian Silfer

PJ:133928.05

Report date: 11/14/01
Number of samples analyzed: 10
AES Project ID: 011114 C
Invoice #: 234960

ELAP ID#: 10709

AIHA ID#: 100307

Adirondack Environmental Services, Inc.
Experience is the solution
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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: Bottom-1
AES sample #: 011114 C01
Samples taken by: B.S./T.M.
MATRIX: Soil
Date Sampled: 11/13/01
Date sample received: 11/14/01
Location: Lipe Rollwan
grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<500	ug/kg	SO-A	11/14/01
Ethylbenzene	EPA-8021	1100	ug/kg	SO-A	11/14/01
Toluene	EPA-8021	<1000	ug/kg	SO-A	11/14/01
o-Xylene	EPA-8021	<1000	ug/kg	SO-A	11/14/01
m,p-Xylene	EPA-8021	2300	ug/kg	SO-A	11/14/01
Isopropyl Benzene	EPA-8021	<1000	ug/kg	SO-A	11/14/01
n-Propylbenzene	EPA-8021	1500	ug/kg	SO-A	11/14/01
p-Cymene	EPA-8021	<1000	ug/kg	SO-A	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	12,000	ug/kg	SO-A	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	3900	ug/kg	SO-A	11/14/01
n-Butylbenzene	EPA-8021	5400	ug/kg	SO-A	11/14/01
Naphthalene	EPA-8021	<5000	ug/kg	SO-A	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<2000	ug/kg	SO-A	11/14/01
t-Butylbenzene	EPA-8021	<1000	ug/kg	SO-A	11/14/01

Adirondack Environmental Services, Inc.
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CLIENT: Environmental Strategies Corp. Date Sampled: 11/13/01
CLIENT'S SAMPLE ID: West-1 Date sample received: 11/14/01
AES sample #: 011114 C02 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Soil grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<10	ug/kg	SO-A	11/14/01
Ethylbenzene	EPA-8021	<20	ug/kg	SO-A	11/14/01
Toluene	EPA-8021	<20	ug/kg	SO-A	11/14/01
o-Xylene	EPA-8021	<20	ug/kg	SO-A	11/14/01
m,p-Xylene	EPA-8021	24	ug/kg	SO-A	11/14/01
Isopropyl Benzene	EPA-8021	<20	ug/kg	SO-A	11/14/01
n-Propylbenzene	EPA-8021	<20	ug/kg	SO-A	11/14/01
p-Cymene	EPA-8021	<20	ug/kg	SO-A	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<20	ug/kg	SO-A	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<20	ug/kg	SO-A	11/14/01
n-Butylbenzene	EPA-8021	<20	ug/kg	SO-A	11/14/01
Naphthalene	EPA-8021	<100	ug/kg	SO-A	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<40	ug/kg	SO-A	11/14/01
t-Butylbenzene	EPA-8021	<20	ug/kg	SO-A	11/14/01

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CLIENT: Environmental Strategies Corp. Date Sampled: 11/13/01
CLIENT'S SAMPLE ID: North-1 Date sample received: 11/14/01
AES sample #: 011114 C03 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Soil grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<1000	ug/kg	SO-A	11/14/01
Ethylbenzene	EPA-8021	<2000	ug/kg	SO-A	11/14/01
Toluene	EPA-8021	<2000	ug/kg	SO-A	11/14/01
o-Xylene	EPA-8021	3400	ug/kg	SO-A	11/14/01
m,p-Xylene	EPA-8021	11,000	ug/kg	SO-A	11/14/01
Isopropyl Benzene	EPA-8021	<2000	ug/kg	SO-A	11/14/01
n-Propylbenzene	EPA-8021	3400	ug/kg	SO-A	11/14/01
p-Cymene	EPA-8021	<2000	ug/kg	SO-A	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	26,000	ug/kg	SO-A	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	8400	ug/kg	SO-A	11/14/01
n-Butylbenzene	EPA-8021	11,000	ug/kg	SO-A	11/14/01
Naphthalene	EPA-8021	<10000	ug/kg	SO-A	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<4000	ug/kg	SO-A	11/14/01
t-Butylbenzene	EPA-8021	<2000	ug/kg	SO-A	11/14/01

Adirondack Environmental Services, Inc.
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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: East-1
AES sample #: 011114 C04
Samples taken by: B.S./T.M.
MATRIX: Soil
Date Sampled: 11/13/01
Date sample received: 11/14/01
Location: Lipe Rollwan
grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<2000	ug/kg	SO-C	11/14/01
Ethylbenzene	EPA-8021	24,000	ug/kg	SO-C	11/14/01
Toluene	EPA-8021	77,000	ug/kg	SO-C	11/14/01
o-Xylene	EPA-8021	71,000	ug/kg	SO-C	11/14/01
m,p-Xylene	EPA-8021	180,000	ug/kg	SO-C	11/14/01
Isopropyl Benzene	EPA-8021	6900	ug/kg	SO-C	11/14/01
n-Propylbenzene	EPA-8021	18,000	ug/kg	SO-C	11/14/01
p-Cymene	EPA-8021	<4000	ug/kg	SO-C	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	140,000	ug/kg	SO-C	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	53,000	ug/kg	SO-C	11/14/01
n-Butylbenzene	EPA-8021	38,000	ug/kg	SO-C	11/14/01
Naphthalene	EPA-8021	<20000	ug/kg	SO-C	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<8000	ug/kg	SO-C	11/14/01
t-Butylbenzene	EPA-8021	<4000	ug/kg	SO-C	11/14/01

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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: South-1
AES sample #: 011114 C05 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Soil grab

Date Sampled: 11/13/01
Date sample received: 11/14/01

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<10	ug/kg	SO-C	11/14/01
Ethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Toluene	EPA-8021	<20	ug/kg	SO-C	11/14/01
o-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
m,p-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Isopropyl Benzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Propylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
p-Cymene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Naphthalene	EPA-8021	<100	ug/kg	SO-C	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<40	ug/kg	SO-C	11/14/01
t-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01

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CLIENT: Environmental Strategies Corp. Date Sampled: 11/13/01
CLIENT'S SAMPLE ID: EB111301 Date sample received: 11/14/01
AES sample #: 011114 C06 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Water grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<0.5	ug/l	SO-A	11/14/01
Ethylbenzene	EPA-8021	<1	ug/l	SO-A	11/14/01
Toluene	EPA-8021	<1	ug/l	SO-A	11/14/01
o-Xylene	EPA-8021	<1	ug/l	SO-A	11/14/01
m,p-Xylene	EPA-8021	<1	ug/l	SO-A	11/14/01
Isopropyl Benzene	EPA-8021	<1	ug/l	SO-A	11/14/01
n-Propylbenzene	EPA-8021	<1	ug/l	SO-A	11/14/01
p-Cymene	EPA-8021	<1	ug/l	SO-A	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<1	ug/l	SO-A	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<1	ug/l	SO-A	11/14/01
n-Butylbenzene	EPA-8021	<1	ug/l	SO-A	11/14/01
Naphthalene	EPA-8021	<5	ug/l	SO-A	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<2	ug/l	SO-A	11/14/01
t-Butylbenzene	EPA-8021	<1	ug/l	SO-A	11/14/01

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CLIENT: Environmental Strategies Corp. Date Sampled: 11/13/01
CLIENT'S SAMPLE ID: South-1A Date sample received: 11/14/01
AES sample #: 011114 C07 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Soil grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<10	ug/kg	SO-C	11/14/01
Ethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Toluene	EPA-8021	<20	ug/kg	SO-C	11/14/01
o-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
m,p-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Isopropyl Benzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Propylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
p-Cymene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Naphthalene	EPA-8021	<100	ug/kg	SO-C	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<40	ug/kg	SO-C	11/14/01
t-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01

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CLIENT: Environmental Strategies Corp. Date Sampled: 11/13/01
CLIENT'S SAMPLE ID: BF-1 Date sample received: 11/14/01
AES sample #: 011114 C08 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Soil grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<10	ug/kg	SO-C	11/14/01
Ethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Toluene	EPA-8021	<20	ug/kg	SO-C	11/14/01
o-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
m,p-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Isopropyl Benzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Propylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
p-Cymene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Naphthalene	EPA-8021	<100	ug/kg	SO-C	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<40	ug/kg	SO-C	11/14/01
t-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01

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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: BF-2
AES sample #: 011114 C09 Samples taken by: B.S./T.M. Location: Lipe Rollwan
MATRIX: Soil grab

Date Sampled: 11/13/01
Date sample received: 11/14/01

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<10	ug/kg	SO-C	11/14/01
Ethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Toluene	EPA-8021	<20	ug/kg	SO-C	11/14/01
o-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
m,p-Xylene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Isopropyl Benzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Propylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
p-Cymene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<20	ug/kg	SO-C	11/14/01
n-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01
Naphthalene	EPA-8021	<100	ug/kg	SO-C	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<40	ug/kg	SO-C	11/14/01
t-Butylbenzene	EPA-8021	<20	ug/kg	SO-C	11/14/01

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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: TB111301
AES sample #: 011114 C10 Samples taken by: B.S./T.M.
MATRIX: Water

Date Sampled: 11/13/01
Date sample received: 11/14/01
Location: Lipe Rollwan
grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<0.5	ug/l	SO-C	11/14/01
Ethylbenzene	EPA-8021	<1	ug/l	SO-C	11/14/01
Toluene	EPA-8021	<1	ug/l	SO-C	11/14/01
o-Xylene	EPA-8021	<1	ug/l	SO-C	11/14/01
m,p-Xylene	EPA-8021	<1	ug/l	SO-C	11/14/01
Isopropyl Benzene	EPA-8021	<1	ug/l	SO-C	11/14/01
n-Propylbenzene	EPA-8021	<1	ug/l	SO-C	11/14/01
p-Cymene	EPA-8021	<1	ug/l	SO-C	11/14/01
1,2,4-Trimethylbenzene	EPA-8021	<1	ug/l	SO-C	11/14/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<1	ug/l	SO-C	11/14/01
n-Butylbenzene	EPA-8021	<1	ug/l	SO-C	11/14/01
Naphthalene	EPA-8021	<5	ug/l	SO-C	11/14/01
Methyl-t-Butyl Ether	EPA-8021	<2	ug/l	SO-C	11/14/01
t-Butylbenzene	EPA-8021	<1	ug/l	SO-C	11/14/01

APPROVED BY:
Report date: 11/14/01

No. 027802

CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT NO.	PROJECT NAME AND LOCATION:
133928.05	Lipe Rollwtn, Liverpool, NY

SAMPLERS: (Signature)	PRINT NAME:
Brian E. Silver Todd M. Musterait	Brian G. Silver Todd M. Musterait

SAMPLE I.D.	SAMPLE LOCATION	DATE	TIME	MATRIX	NO. OF CONTAINERS	VOLS (8021) STARS						REMARKS
BOTTOM-1	011114 C01	11/13/01	1330	Soil	1	X						24-hr
WEST-1	C02	11/13/01	1340	Soil	1	X						24-hr
NORTH-1	C03	11/13/01	1346	Soil	1	X						24-hr
EAST-1	C04	11/13/01	1600	Soil	1	X						24-hr
SOUTH-1	C05	11/13/01	1605	Soil	1	X						24-hr
EB111301	C06	11/13/01	1620	AQ	3	X						STD
SOUTH-1A	C07	11/13/01	1625	Soil	1	X						STD
BF-1	C08	11/13/01	1640	Soil	1	X						24-hr
BF-2	C09	11/13/01	1645	Soil	1	X						24-hr
TB111301	C10	11/13/01	—	AQ	1	X						STD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	LAB NAME:
Brian E. Silver	11/13/01 1650		ADIRONDACK
			CITY: ALBANY, NY
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	COURIER: FED EX
			AIRBILL NO. 832641708357
Received for Laboratory by: (Signature)	PRINT NAME:	Date/Time	CUSTODY SEAL NOS: 1316 1, 1316 2
M. Kaskez	M. KASKEZ	11/14/01	COOLER NO: 1029

ATTENTION LAB: SEND ANALYTICAL RESULTS TO THE FOLLOWING ESC STAFF MEMBER:

ENVIRONMENTAL STRATEGIES CORPORATION
11911 Freedom Drive
Reston, Virginia 20190
(703) 709-6500 • Fax (703) 318-3995
Fax (412) 787-8065

ESC

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LABORATORY REPORT

for

Environmental Strategies Corp.
9 Albany Street
Cazenovia, NY 13035

Attention: Brian Silfer

PJ:133928.05

Reissued Report 12/5

Report date: 12/05/01
Number of samples analyzed: 3
AES Project ID: 011116 G
Invoice #: 235116

ELAP ID#: 10709

AIHA ID#: 100307

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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: East-2
AES sample #: 011116 G01
Samples taken by: Brian Silfer
MATRIX: Soil
Date Sampled: 11/15/01
Date sample received: 11/16/01
Location: Lipe Rollway
grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	11	ug/kg	SO-A	11/16/01
Ethylbenzene	EPA-8021	27	ug/kg	SO-A	11/16/01
Toluene	EPA-8021	<20	ug/kg	SO-A	11/16/01
o-Xylene	EPA-8021	39	ug/kg	SO-A	11/16/01
m,p-Xylene	EPA-8021	220	ug/kg	SO-A	11/16/01
Isopropyl Benzene	EPA-8021	<20	ug/kg	SO-A	11/16/01
n-Propylbenzene	EPA-8021	70	ug/kg	SO-A	11/16/01
p-Cymene	EPA-8021	<20	ug/kg	SO-A	11/16/01
1,2,4-Trimethylbenzene	EPA-8021	790	ug/kg	SO-A	11/16/01
1,3,5-TMB & Sec-BB Total	EPA-8021	310	ug/kg	SO-A	11/16/01
n-Butylbenzene	EPA-8021	380	ug/kg	SO-A	11/16/01
Naphthalene	EPA-8021	<100	ug/kg	SO-A	11/16/01
Methyl-t-Butyl Ether	EPA-8021	<40	ug/kg	SO-A	11/16/01
t-Butylbenzene	EPA-8021	<20	ug/kg	SO-A	11/16/01

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CLIENT: Environmental Strategies Corp. Date Sampled: 11/15/01
CLIENT'S SAMPLE ID: EB111501 Date sample received: 11/16/01
AES sample #: 011116 G02 Samples taken by: Brian Silfer Location: Lipe Rollway
MATRIX: Water grab

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<0.5	ug/l	SO-A	11/16/01
Ethylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
Toluene	EPA-8021	<1	ug/l	SO-A	11/16/01
o-Xylene	EPA-8021	<1	ug/l	SO-A	11/16/01
m,p-Xylene	EPA-8021	<1	ug/l	SO-A	11/16/01
Isopropyl Benzene	EPA-8021	<1	ug/l	SO-A	11/16/01
n-Propylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
p-Cymene	EPA-8021	<1	ug/l	SO-A	11/16/01
1,2,4-Trimethylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<1	ug/l	SO-A	11/16/01
n-Butylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
Naphthalene	EPA-8021	<5	ug/l	SO-A	11/16/01
Methyl-t-Butyl Ether	EPA-8021	<2	ug/l	SO-A	11/16/01
t-Butylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01

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CLIENT: Environmental Strategies Corp.
CLIENT'S SAMPLE ID: TB111501
AES sample #: 011116 G03 Samples taken by: Brian Silfer Location: Lipe Rollway
MATRIX: Water grab

Date Sampled: 11/15/01
Date sample received: 11/16/01

PARAMETER PERFORMED	METHOD	RESULT	UNITS	NOTEBK REF	TEST DATE
Benzene	EPA-8021	<0.5	ug/l	SO-A	11/16/01
Ethylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
Toluene	EPA-8021	<1	ug/l	SO-A	11/16/01
o-Xylene	EPA-8021	<1	ug/l	SO-A	11/16/01
m,p-Xylene	EPA-8021	<1	ug/l	SO-A	11/16/01
Isopropyl Benzene	EPA-8021	<1	ug/l	SO-A	11/16/01
n-Propylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
p-Cymene	EPA-8021	<1	ug/l	SO-A	11/16/01
1,2,4-Trimethylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
1,3,5-TMB & Sec-BB Total	EPA-8021	<1	ug/l	SO-A	11/16/01
n-Butylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01
Naphthalene	EPA-8021	<5	ug/l	SO-A	11/16/01
Methyl-t-Butyl Ether	EPA-8021	<2	ug/l	SO-A	11/16/01
t-Butylbenzene	EPA-8021	<1	ug/l	SO-A	11/16/01

APPROVED BY: Christopher Hess
Report date: 12/05/01

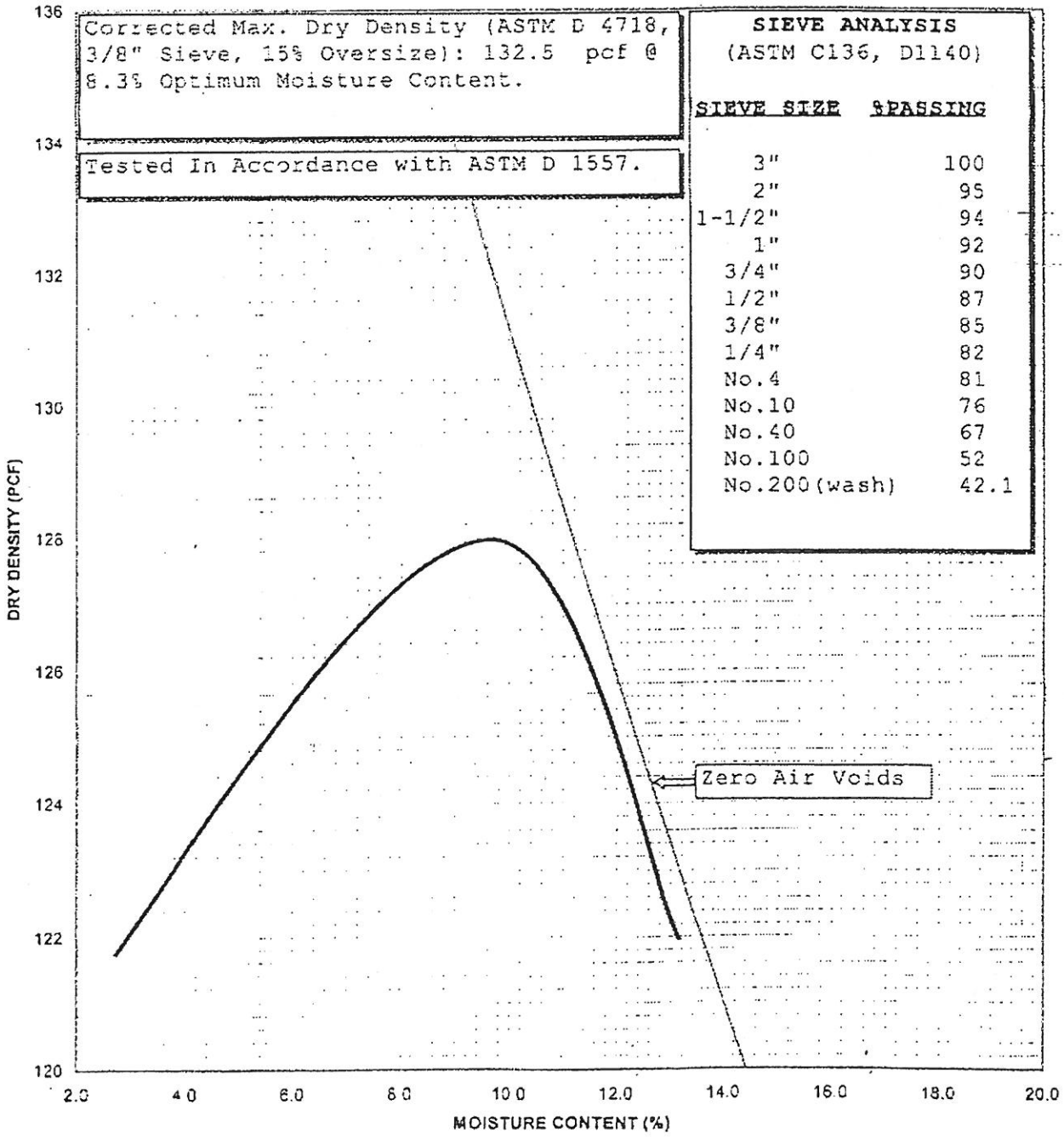
Enclosure 2 – Proctor and In-Place Density Test Results

CME Associates, Inc.

Construction Materials Evaluation

CLIENT:	Mar-Cor Remediation, Inc.	REPORT No.:	10251S-02-1101
PROJECT:	Lipe Rollway, Liverpool, New York	SAMPLE No.:	LN-4598
SAMPLE LOCATION:	Material excavated from on-site	DATE PICKED UP:	11/15/01
		PAGE:	1 of 1
SOIL CLASSIFICATION:	Brown cmf SAND, some SILT, little cmf GRAVEL, trace CLAY		

MOISTURE-DENSITY RELATIONSHIP CURVE



P.O. Box 554 Central Square, NY 13036 (315) 668-3868 FAX (315) 676-3150

CME Associates, Inc.

Construction Materials Evaluation

LABORATORY TEST REPORT

Lipe Rollway, Liverpool, New York
Mar-Cor Remediation, Inc.
CME Report No.: 10251S-02-1101
11/20/01

Our representative was on-site 11/15 to sample soil material proposed for use as backfill and returned the sample to our laboratory for a Particle Size Analysis and a Moisture-Density Relationship Determination. The results are as follows:

1) Material Identification:

Sample #	Date Sampled:	Classification/Source
LN-4598	11/15/01	Brown cmf SAND, some SILT, little cmf GRAVEL, trace CLAY/ Material excavated from on-site

2) Mechanical Analysis (ASTM C136, D1140):

Sieve Size	% Passing by Weight Sample # LN-4598
3"	100
2"	95
1-1/2"	94
1"	92
3/4"	90
1/2"	87
3/8"	85
1/4"	82
No. 4	81
No. 10	76
No. 40	67
No. 100	52
No. 200(wash)	42.1

3) Moisture-Density Relationship (ASTM D1557):

		Sample # LN-4598
Corrected Maximum Dry Density (pcf)	=	132.5
Corrected Optimum Moisture Content (%)	=	8.3

The Moisture-Density Relationship Curve is attached.

The sieve size used to separate the oversized particles was the 3/8" sieve. 15% of Sample # LN-4598 was determined to be oversized for the purposes of this test.

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LABORATORY TEST REPORT

Lipe Rollway, Liverpool, New York
Mar-Cor Remediation, Inc.
CME Report No.: 10251S-02-1101
11/20/01

4) Specific Gravity (ASTM C127):

Sample #	Specific Gravity
LN-4598	2.66

Please feel free to contact our office if you have any questions.

Christopher Peterson, Laboratory Supervisor

CME Associates, Inc.

Construction Materials Evaluation

IN-PLACE FIELD DENSITY TEST REPORT

PROJECT: Lipe Rollway, Liverpool, New York
DATE: 11/16/01
CLIENT: MAR-COR Remediation, Inc.
REPORT NO.: 10251S-01-1101
TEST METHOD: ASTM (D2922) Nuclear Density Gauge
REPRESENTATIVE: J. Clark
MATERIAL TYPE & SOURCE: Brown cmf SAND, some SILT, little cmf GRAVEL, trace CLAY: Material excavated from on-site.
WEATHER: Cloudy
TEMPERATURE: 46 °F
PAGE: 1 of 1

REMARKS:

This Representative was on-site to conduct In-Place Field Density Tests on backfill placed in a trench along the building at the above referenced location. The test results indicate that the required percent compaction was achieved at the locations and elevations listed below. Eric of MAR-COR Remediation was orally informed of today's results. It should be noted that the test results given to Eric on 11/16/01 were estimated since the proctor value had not yet been completed. The test results below are the final results.

Note: BFG = Below Final Grade

RESULTS:

Test #	Test Location	Test Elevation	Moisture Content (%)	OMC (%)	Field Dry Density (pcf)	100% Dry Density (pcf)	Compaction Achieved (%)	Compaction Required (%)
1	10' East of building	3' BFG	8.8	12.0	121.5	132.5	91.7	90.0
2	15' East of building	2' BFG	11.1	12.0	121.8	132.5	91.9	90.0
3	25' East of building	Final Grade	9.4	12.0	122.5	132.5	92.5	90.0

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Enclosure 3 – Waste Characterization Analytical Report

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

MARCOR Remediation, Inc.
52 Marway Circle
Rochester, NY 14624
Attention: Dick Oliver

Report Date: 12/10/2001
Re: Client Project ID: ESC Lipe Rollway
York Project No.: 01120086

CT License No. PH-0723 New York License No. 10854 Mass License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

ONE RESEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Report Date: 12/10/2001
Client Project ID: ESC Lipe Rollway
York Project No.: 01120086

MARCOR Remediation, Inc.
52 Marway Circle
Rochester, NY 14624
Attention: Dick Oliver

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 12/05/01. The project was identifed as your project "ESC Lipe Rollway ".

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

All samples were received in proper condition meeting the NELAC acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All the analyses met the method and laboratory standard operating procedure requirements except as indicated under the Notes section of this report, or as indicated by any data flags, the meaning of which is explained in the attachment to this report, if applicable.

The results of the analyses, which are all reported on an as-received basis unless otherwise noted, are summarized in the following table(s).

Analysis Results

Client Sample ID			Staged Soil Pile	
York Sample ID			01120086-01	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
TCLP Volatiles-8021 STARS	SW846-8260	ug/L	---	---
1,2,4-Trimethylbenzene			Not detected	1
1,3,5-Trimethylbenzene			Not detected	1
Benzene			Not detected	1
Ethylbenzene			Not detected	1
Isopropylbenzene			Not detected	1
Methyl-tert-butyl ether			Not detected	1
Naphthalene			Not detected	1
n-Butylbenzene			Not detected	1
n-Propylbenzene			Not detected	1
o-Xylene			Not detected	2
p- & m- Xylenes			Not detected	2
p-Isopropyltoluene			Not detected	1
sec-Butylbenzene			Not detected	1
tert-Butylbenzene			Not detected	1
Toluene			Not detected	1
Total Xylenes			Not detected	2

YORK

Client Sample ID			Staged Soil Pile	
York Sample ID			01120086-01	
Matrix			SOIL	
Parameter	Method	Units	Results	MDL
Flash Point	EPA 1010M	Degrees F	>200	---
Paint Filter Test	SW846	---	No free liquid	---
TCLP Lead	SW846-1311/6010	mg/L	0.019	0.005

Units Key: For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes for York Project No. 01120086

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation.
6. All analyses conducted met method or Laboratory SOP requirements.
7. It is noted that no analyses reported herein were subcontracted to another laboratory.

Approved By: Robert Q. Bradley
Managing Director

Date: 12/10/2001

YORK

YORK
ANALYTICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

Company Name	Report To:	Invoice To:	Project ID/No.	Samples Collected By (Signature) / Name (Printed)
Marcon Remediation 13 Dwight Park Drive Syracuse, NY 13209	Dick Oliver Fax 315-451-3741	Marcon-Rom 52 Manway Cir Rochester NY 14624	ESC Lipe Rollway Liverpool, NY	Richard Oliver Richard Oliver

Sample No.	Location/ID	Date Sampled	Sample Matrix: Water	Soil	Air	OTHER	ANALYSES REQUESTED	Container Description(s)
#1	Staged Soil Pile	12/3/0001		X			Flash, Paint Fitter TCLP Lead, TCLP Semi-8021	Glass Please Comp Sample
#2				X				

Chain-of-Custody Record

Bottles Relinquished from Lab by	Date/Time	Sample Relinquished by	Date/Time	Sample Received by	Date/Time
		Richard Oliver	12/8/0001		
Bottles Received in Field by	**Date/Time**	**Sample Relinquished by**	**Date/Time**	**Sample Received in LAB by**	**Date/Time**
				J. Lee	12-5-01 1130

Comments/Special Instructions
Please Call with any Questions! 315 457-6046 - Dick Oliver 5.8-C

Turn-Around Time
X Standard ___ RUSH(define)_____

Enclosure 4 – Disposal Documentation

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. N/A
Manifest Document No. 00007
2. Page 1 of 1

GENERATOR

3. Generator's Name and Mailing Address: Emerson Power Roflow Inc. 7600 Morgan Road Liverpool, NY 13088
4. Generator's Phone (315) 453 1933

5. Transporter 1 Company Name: Silvernale Trucking Co
6. US EPA ID Number: N/A
A. Transporter's Phone: 1-716-272 0741

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address: High Acres Landfill Receiving Center 425 Lehigh Station Rd Fairport, NY 14450
10. US EPA ID Number: N/A
C. Facility's Phone: (716) 223 1132

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Waste Non RCRA Solids N.O.S. (Petroleum Contaminated Dirt Soils & Debris)	001	DT	10	TONS
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
a. High Acres Landfill Approval # CV 1991
Manifest PO # 13620

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name: MICHAEL YAPLE
Signature: Michael Yaple
Month 12 Day 15 Year 01

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month 12 Day 15 Year 01

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 18.
High Acres Landfill
Printed/Typed Name: Frank Winegar
Signature
Month 12 Day 15 Year 01

COPY

WM HIGH ACRES LANDFILL
ALL LOADS MUST BE TARPED OR TIED DOWN
LOADS WILL BE REFUSED
HARD HATS REQUIED ON WORKING FACE

TICKET: 242582
DATE: 12/15/2001
TIME: 12:37 - 13:01

CUSTOMER: 2780 / MARCOR-EMERSON LIPE ROLLWAY

P.O.: 13620

GENERATOR: 2563 / EMERSON LUPE ROLL
ORIGIN: ON / ONONDAGA
TRUCK: S64 LICENSE:
MANIFEST: 00004

GROSS: 88860 LBS
TARE: 36020 LBS
NET: 52840 LBS

ROUTE: NA / Non App COUNTY: NY / NEW YORK
PROFILE #: CV1991 / EMERSON LIPE ROLLWAY-SOIL(C)
COMMENT:

GRID: CELL 8

WASTE	NET/TONS	UNIT
08 / Soils - Cover	26.42	T
FUELSUR / Fuel Surcharge		T

Driver: _____ Weighmaster: _____

IN: Paula Schweizer B: ETPC204 OUT: Paula Schweizer B: ETPC206

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. N/A
Manifest Document No. 00.80.1
2. Page 1 of 4

3. Generator's Name and Mailing Address: Emerson Life Rollway, 7600 Morgan Road, Liverpool NY 13088
4. Generator's Phone (314) 553 1983

5. Transporter 1 Company Name: Silvestre Trucking Co
6. US EPA ID Number: N/A
A. Transporter's Phone: (716) 282-0941

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address: High Acres Landfill & Recycling Center, 425 Perinton Parkway, Fairport NY 14450
10. US EPA ID Number: N/A
C. Facility's Phone: (716) 223-6232

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Waste Workers Soiled with Petroleum Contaminated Dirt Solids Debris (NA 9189)	001	DT		TONS
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
High Acres Approval # CV1991
Manson PO# 13620

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
MICHAEL YAPLE	Michael Yaple	12	15	01

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
		12	15	01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR

TRANSPORTER

FACILITY

COPY

WM HIGH ACRES LANDFILL
ALL LOADS MUST BE TARPED OR TIED DOWN
LOADS WILL BE REFUSED
HARD HATS REQUIED ON WORKING FACE

TICKET: 242581
DATE: 12/15/2001
TIME: 12:26 - 12:56

CUSTOMER: 2780 / MARCOR-EMERSON LIPE ROLLWAY

P.O.: 13620

GENERATOR: 2563 / EMERSON LUPE ROLL
ORIGIN: ON / ONONDAGA
TRUCK: S32 LICENSE:
MANIFEST: 00001
ROUTE: NA / Non App COUNTY: NY / NEW YORK
PROFILE #: CV1991 / EMERSON LIPE ROLLWAY-SOIL(C)
COMMENT:

GROSS: 77300 LBS
TARE: 36520 LBS
NET: 40780 LBS

GRID: CELL 8

WASTE	NET/TONS	UNIT
08 / Soils - Cover	20.39	T
FUELSUR / Fuel Surcharge		T

Driver: _____ Weighmaster: _____

IN: Paula Schweizer B: ETPC204 OUT: Paula Schweizer B: ETPC206

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. N/A
Manifest Document No. 00002
2. Page 1 of 3

GENERATOR

3. Generator's Name and Mailing Address: Emunson Tire Rolling, 7600 Morgan Rd, Liverpool NY 13088
4. Generator's Phone (315) 553 4553

5. Transporter 1 Company Name: Silvanoke Trading Co
6. US EPA ID Number: N/A
A. Transporter's Phone: 1916-202-0944

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address: High Acres Landfill Recycling Center, 425 Perinton Parkway, Fairport, NY 14450
10. US EPA ID Number: N/A
C. Facility's Phone: 1-716-223-1682

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Waste Non Regen Solids NOS (Rubber) Petroleum Contaminated Dirt Solids Debris	00	HT		Tons
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
* High Acres Approval # CV1911
Manifest # 13620

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
MICHAEL YAPLE	Michael Yaple	12	15	01

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
		12	15	01

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 18.

Printed/Typed Name	Signature	Month	Day	Year
Frank White		1	15	01

COPY

OM HIGH ACRES LANDFILL
ALL LOADS MUST BE TARPED OR TIED DOWN
LOADS WILL BE REFUSED
HARD HATS REQUIED ON WORKING FACE

TICKET: 242580
DATE: 12/15/2001
TIME: 12:31 - 12:50

CUSTOMER: 2780 / MARCOR-EMERSON LIPE ROLLWAY P.O.: 13620

GENERATOR: 2563 / EMERSON LUPE ROLL
ORIGIN: ON / ONONDAGA
TRUCK: S62 LICENSE:
MANIFEST: 00002
ROUTE: NA / Non App COUNTY: NY / NEW YORK GRID: CELL 8
PROFILE #: CV1991 / EMERSON LIPE ROLLWAY-SOIL(C)
COMMENT:

GROSS: 92880 LBS
TARE: 38060 LBS
NET: 54820 LBS

WASTE	NET/TONS	UNIT
08 / Soils - Cover	27.41	T
FUELSUR / Fuel Surcharge		T

Driver: _____ Weighmaster: _____

IN: Paula Schweizer B: ETPC204 OUT: Paula Schweizer B: ETPC206

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. . . . . NA . . .
Manifest Document No. 00700 3
2. Page 1 of 2

3. Generator's Name and Mailing Address: Emerson Liquidating Way, 7600 Morton Road, Liverpool NY 13088
4. Generator's Phone (314) 553 1953

5. Transporter 1 Company Name: Silvaste Trucking Co
6. US EPA ID Number: N/A
A. Transporter's Phone 1-716-772-0741

7. Transporter 2 Company Name
8. US EPA ID Number
B. Transporter's Phone

9. Designated Facility Name and Site Address: High Acres Landfill Recycling Center, 425 Perinton Parkway, Fairport NY 14450
10. US EPA ID Number: N/A
C. Facility's Phone 1 716 223 6032

	11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a.	Waste Non RCRA Solid NOS, Petroleum Contaminated Dirt Solids Debris (NA)	001	DT		TNS
b.					
c.					
d.					

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
* High Acres Approval # CV 199
Manson PO# 13620

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.
Printed/Typed Name: MICHAEL YAPLE
Signature: Michael Yaple
Month 12 Day 14 Year 18

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month 12 Day 15 Year 18

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Month . Day . Year .

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Month 12 Day 15 Year 18

GENERATOR
TRANSPORTER
FACILITY

COPY

WM HIGH ACRES LANDFILL
ALL LOADS MUST BE TARPED OR TIED DOWN
LOADS WILL BE REFUSED
HARD HATS REQUIED ON WORKING FACE

TICKET: 242577
DATE: 12/15/2001
TIME: 11:35 - 12:11

CUSTOMER: 2780 / MARCOR-EMERSON LIPE ROLLWAY P.O.: RO13620

GENERATOR: 2563 / EMERSON LUPE ROLL GROSS: 96740 LBS
ORIGIN: ON / ONONDAGA TARE: 35920 LBS
TRUCK: S35 LICENSE: NET: 60820 LBS
MANIFEST: 00003
ROUTE: NA / Non App COUNTY: NY / NEW YORK GRID: CELL 8
PROFILE #: CV1991 / EMERSON LIPE ROLLWAY-SOIL(C)
COMMENT:

WASTE	NET/TONS	UNIT
08 / Soils - Cover	30.41	T
FUELSUR / Fuel Surcharge		T

Driver: John Wilson Weighmaster: _____

IN: Paula Schweizer B: ETPC204 OUT: Paula Schweizer B: ETPC206

APPENDIX

E SUMMARY OF VOLUNTARY CLEANUP PROGRAM ACTIVITIES

ENVIRONMENTAL STRATEGIES CONSULTING LLC
5 Sullivan Street Cazenovia, New York 13035 • (315) 655-3900 • Fax (315) 655-3907

SUMMARY OF VOLUNTARY CLEANUP PROGRAM ACTIVITIES FOR THE ROLLWAY BEARING CORPORATION FACILITY LIVERPOOL, NEW YORK

Agreement Index Number: V7-1007-96-10

PREPARED

BY

ENVIRONMENTAL STRATEGIES CONSULTING LLC

AUGUST 5, 2005

A QUANTA TECHNICAL SERVICES COMPANY

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Acronym List

cy	cubic yards
DCE	dichloroethene
DOT	Department of Transportation
EPA	U.S. Environmental Protection Agency
NYSDEC	New York State Department of Environmental Conservation
OCWA	Onondaga County Water Authority
O&M	operation and amintenance
PAH	ploycyclic aromatic hydrocarbons
PCB	polychoorinated biphenyls
PID	photoionization detector
PVC	polyvinyl chloride
SOP	Standard Operating Procedure
SVOC	semivolatile organic compounds
TCE	trichloroethene
TPH	total petroleum hydrocarbons
ug/l	micrograms per liter
VOCs	volatile organic compounds

1.0 Introduction

Environmental Strategies Consulting LLC is submitting this document on behalf of Emerson and Rollway Bearing Corporation, to summarize the remediation activities completed at the Rollway Bearing facility in Liverpool, New York, under the Voluntary Cleanup Agreement between the New York State Department of Environmental Conservation (NYSDEC), Emerson, and Rollway Bearing Corporation (Agreement Index No. V7-10007-96-10). In addition, this document identifies a proposed final remedy for free product under the former heat treat area and an alternative cleanup objective for free product. The final design for the proposed remedy, including an implementation schedule and operation and maintenance (O&M) plan, will be submitted to the NYSDEC once the proposed remedy and alternative cleanup objective is approved. All work was performed in accordance with the approved remedial action work plan for the site, dated May 9, 2000.

2.0 Scope of Work

In accordance with the approved work plan, Environmental Strategies has performed the following activities at the Rollway Bearing facility:

- Excavation and offsite disposal of petroleum-affected soil from the former gasoline underground storage tank area
- Eight quarters of groundwater monitoring
- Free product recovery pilot test activities

A description of these activities is presented below.

2.1 Soil Excavation

The excavation and offsite disposal of petroleum-affected soil from the former gasoline underground storage tank area was previously summarized in a report to the NYSDEC, dated April 5, 2002. A summary of the pertinent information from this report is presented below. A complete copy of the report is presented in Appendix A.

2.1.1 Excavation and Verification Sampling

From November 13 through December 15, 2001, Environmental Strategies provided oversight for the excavation and offsite disposal of petroleum-affected soil in the former gasoline underground storage tank area east of the main building (Figure 1). During the excavation activities, overburden material that was deemed clean was stockpiled on polyethylene sheeting in a separate staging area or adjacent to the excavation for subsequent testing and reuse as backfill. These soils were identified for segregation based on previous soil sampling data from the area, field observations, and organic vapor screening with a photoionization detector (PID). In accordance with the approved work plan, the excavation did not extend under the building or include load-bearing soil near the building foundation.

On removal of the overburden material, petroleum-affected soil was removed, stockpiled in a designated staging area, and covered with polyethylene sheeting. Soil samples were collected frequently from the excavation for organic vapor screening and the organic vapor levels were used to guide the excavation. After the organic vapor levels indicated that the affected soil was removed, one set of verification samples were collected from the bottom and sides of the excavation in accordance with the procedures outlined in the approved work plan.

The bottom sample was designated Bottom-1 and the sidewall samples were designated East-1, West-1, North-1, and South-1 (Table 1). The depth of the sidewall samples coincided with the depth of maximum volatile organic compound (VOC) concentrations, as indicated by pre-remedial sampling data or organic vapor screening during excavation. Environmental Strategies collected samples directly from the excavator bucket using decontaminated stainless steel spoons. The samples were placed in laboratory-supplied containers and shipped under chain of custody procedures to Adirondack Environmental Services, Inc., of Albany, New York, for laboratory analysis of VOCs by Environmental Protection Agency (EPA) Method 8021. The laboratory analytical results are presented in Table 1. A copy of the laboratory analytical reports is provided in Appendix A.

Based on the analytical results, the concentrations of several VOCs exceeded the cleanup criteria in the sample collected from the eastern sidewall of the excavation (sample identification East-1; Table 1). No VOCs were detected in the remaining soil samples at concentrations above the site-specific impact to groundwater cleanup criteria. Based on these results, additional soil was excavated to the east from the surface to the bottom of the excavation and another sample was collected from the eastern sidewall (sample identification East-2). The analytical results from sample East-2 indicated that the VOC concentrations were below the cleanup criteria. The final excavation limits are shown on Figure 2. A total of approximately 230 cubic yards (cy) of material were removed from the excavation.

2.1.2 Backfilling and Site Restoration

Before reusing the stockpiled overburden soil as backfill, samples were collected to verify that the VOC concentrations were below the cleanup criteria. For each 50-cubic yard volume of soil, four samples were collected from representative locations at least 6 inches below the pile surface. Each of the four samples was screened for organic vapors with a PID. Soil from the portion of the pile with the highest organic vapor level was collected for VOC analysis by EPA Method 8021. Two samples of the overburden stockpiled soil were collected for VOC analysis (sample identification BF-1 and BF-2). No VOCs were detected in the overburden soil and, thus, the soils were reused onsite as backfill. The laboratory analytical results are presented in Table 1 and a copy of the analytical results are presented in Appendix A.

In addition to using excavated soils for backfill, additional clean fill material (crusher-run) from an offsite source was used to complete the backfilling activities. The backfill was placed in the excavation in 1-foot-thick loose lifts and compacted with the bucket of the excavator. The lower portion of the excavation was backfilled with imported clean fill material and the upper portion was backfilled with native overburden material, with the exception of the area excavated under the pavement. The majority of this area was backfilled with crusher-run material as a sub-base for the new pavement. The remaining petroleum-affected soil (105 tons) was characterized and disposed of offsite at High Acres Landfill Recycling Center, located in Fairport, New York, as a non-hazardous waste. In the Spring of 2002, the excavation area was covered with topsoil and reseeded and the asphalt pavement was repaired.

2.2 Groundwater Monitoring

2.2.1 Background Information

During the Phase II investigation in November 1995, Environmental Strategies installed monitoring wells MW-2, MW-4, MW-5, and MW-6 and collected groundwater samples for analysis of VOCs by EPA Method 8260, total petroleum hydrocarbons (TPH) by EPA Method 418.1, and polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270 (Figure 3). The analytical results indicated non-detectable concentrations of PAHs in each well (Table 2). In addition, no VOCs were detected in MW-2 or MW-6 above the ambient water quality standards. Five VOCs were detected in MW-5 at concentrations above their respective ambient water quality criteria: 2-butanone (310 micrograms per liter [ug/l]), cis-1,2-dichloroethene (cis-1,2-DCE;1,500 ug/l), trans-1,2-dichloroethene (trans-1,2-DCE; 480 ug/l), trichloroethene (TCE; 72 ug/l), and vinyl chloride (540 ug/l). The ambient water quality criteria for these compounds are 50 ug/l for 2-butanone, 2 ug/l for vinyl chloride, and 5 ug/l for the remaining compounds. One VOC, TCE, was detected in MW-4 at a concentration of 5.9 ug/l, which is slightly above the ambient water quality standard of 5 ug/l. TPH was detected in MW-2, MW-4, and MW-5 at concentrations from 2.0 to 2.9 milligrams per liter; however, there is no groundwater quality standard or guidance value for TPH.

In April 1997, the NYSDEC conducted a site visit to determine if current and past facility operations were potentially contributing to the environmental impairment of Onondaga Lake, a National Priority List site located approximately 1 mile southeast of the property. As a result of

the site visit, Environmental Strategies conducted a limited *in-situ* groundwater investigation around the waste storage shed and subsequently installed two double-cased groundwater monitoring wells at the locations designated MW-7 and MW-8 on Figure 3. Groundwater samples were collected from MW-7 and MW-8 in October 1998 for analysis of VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and total and dissolved target analyte list metals. The analytical results indicated non-detectable concentrations of VOCs, SVOCs, pesticides, and PCBs (Table 3). The total metals analysis indicated the presence of iron (1,970 to 2,150 ug/l), manganese (875 ug/l in MW-7), and sodium (52,100 ug/l in MW-8) at concentrations above the NYSDEC's groundwater quality standards. However, these inorganic compounds were determined to be common constituents of the native soils in the vicinity of the site and were not related to facility operations. The dissolved concentrations of iron and sodium in MW-7 were below the groundwater quality standards.

As discussed in the approved work plan, Environmental Strategies evaluated the VOC data from MW-5 to assess the potential effectiveness of monitored natural attenuation as a remedial alternative for VOCs in groundwater. This evaluation provided direct evidence that natural attenuation was occurring at the site. Specifically, the VOC results from MW-5 indicated low concentrations of TCE (72 ug/l) relative to the concentrations of its biodegradation products cis-1,2-DCE (1,500 ug/l), trans-1,2-DCE (480 ug/l), and vinyl chloride (540 ug/l). In addition, the predominant dichloroethene (DCE) isomer detected was cis-1,2-DCE. This was significant because commercially available DCE usually contains both cis-1,2-DCE and trans-1,2-DCE in roughly equal proportions. However, DCE derived during the biodegradation of TCE is predominantly cis-1,2-DCE. Of the DCE detected in MW-5 during the November 1995 sampling event, approximately 75 percent was cis-1,2-DCE. Furthermore, given the historic nature of the release, and the absence of detectable VOCs in MW-7 and MW-8, the plume appeared to have reached a steady state condition and was no longer expanding.

2.2.2 Quarterly Groundwater Monitoring

Environmental Strategies collected eight quarters of groundwater samples from October 2001 through August 2003. The monitoring wells included in the sampling program were MW-2, MW-5, MW-6, MW-7, and MW-8 (Figure 3). As stated in the approved work plan, the purpose of the quarterly monitoring activities was to verify that the area of groundwater containing VOCs in the vicinity of the hazardous waste storage shed (i.e., MW-5) was not

expanding and that VOC concentrations in groundwater were not increasing. In addition, Environmental Strategies collected geochemical data from select wells during the first quarterly groundwater sampling event to further document that site conditions were suitable for natural attenuation. Groundwater samples were not collected from MW-4 during the two-year monitoring period, due to the presence of a thin layer of free product (i.e., approximately 0.1 foot). MW-4 will be redeveloped and sampled following the completion of the free product recovery activities at the site.

2.2.2.1 Monitoring Well Redevelopment

On September 14, 2001, Environmental Strategies redeveloped groundwater monitoring wells MW-2, MW-5, and MW-6, in preparation for the first quarterly groundwater sampling event. The wells were redeveloped with a submersible pump until the development water was relatively free of suspended sediment and the pH, temperature, and conductivity had stabilized. Field measurements were considered stable when two successive readings varied by less than 10 percent. The pump and tubing were decontaminated before each use in accordance with Environmental Strategies' SOP 16 (Appendix B). All information regarding the well development activities were recorded in the bound field notebook. Approximately 25 gallons of water was generated during the development activities and the water was placed in a 55-gallon DOT-approved steel drum for characterization and offsite disposal.

2.2.2.2 Groundwater Sampling

Before sampling, each well was gauged using an electronic water level indicator to determine the depth to water and the total well depth. The water level information was used to calculate the volume of water in each well. To obtain representative groundwater samples, each well was purged by removing a minimum of three well volumes using a bailer. The pH, specific conductance, and temperature were monitored during the purging process to ensure that the groundwater samples were representative of formation water. After the field measurements stabilized (i.e., varied less than 10%), the groundwater samples were collected from each well using a single-use disposable Teflon bailer. The wells were sampled within 2 hours of purging provided the well had sufficiently recharged. Purge water from the sampling activities was contained in DOT-approved 55-gallon steel drums and transported offsite for disposal as non-hazardous waste.

Groundwater samples were placed in the appropriate laboratory-supplied, pre-cleaned glassware, labeled, and packed on ice. The samples were submitted to Adirondack Environmental Services in Albany, New York, for analysis of VOCs by EPA Method 8260. The samples were stored and shipped to Adirondack for chemical analysis in accordance with Environmental Strategies' SOP 20 (Appendix B).

2.2.2.3 Geochemical Data Collection

Environmental Strategies collected geochemical data from monitoring wells MW-5, MW-7, and MW-8, during the first quarterly sampling event to further document that site conditions are suitable for monitored natural attenuation. In accordance with EPA guidance (Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water, September 1998 [EPA/600/R-98/128]), Environmental Strategies collected groundwater measurements for temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction potential, ferrous iron, and total organic carbon. Measurements for temperature, pH, specific conductance, dissolved oxygen, and oxidation-reduction potential were collected at the well head using a flow-through cell. Ferrous iron was measured in the field with a colorimetric meter. Total organic carbon was analyzed at an offsite laboratory using EPA Method 9060.

2.2.3 Discussion of Groundwater Results

Environmental Strategies completed eight quarters of groundwater sampling from October 2001 through August 2003. As shown in Tables 4 through 8, the total VOC concentrations in MW-5 decreased from a high of 820 micrograms per liter (ug/l) in January 2002 to 261 ug/l in August 2003. In addition, no VOCs were detected in groundwater at concentrations above the NYSDEC's ambient water quality standards and guidance values in downgradient (i.e., MW-7 or MW-8), sidegradient (i.e., MW-6), or upgradient (i.e., MW-2) monitoring wells during the 2-year monitoring period. MW-7 is located approximately 175 feet from the downgradient property line. Therefore, the extent of VOCs in groundwater in the vicinity of MW-5 is not expanding. The groundwater results from MW-5 indicate the presence of TCE and its sequential reductive breakdown products DCE and vinyl chloride. The data show that most of the chlorinated VOC mass is now present in the form of DCE and vinyl chloride and very little of the initial contaminant, TCE, is present. These data indicate that natural attenuation is occurring at the site.

Environmental Strategies performed the Mann-Kendall Test on each of the nine VOCs detected in MW-5 to further document a decrease in the concentrations of these compounds during the 2-year monitoring period. The test was performed in accordance with the U.S. Environmental Protection Agency's (EPA's) Guidance for Data Quality Assessment (EPA QA/G-9, 2000). The Mann-Kendall Test involves computing a statistic S, which is the difference between the number of pairwise slopes that are positive, minus the number that are negative. If S is a large positive value, then there is evidence of an increasing trend in the data. If S is a negative value, then there is evidence of a decreasing trend in the data. The null hypothesis, or baseline condition, for this test is that there is no temporal trend in the data values. The results of the Mann-Kendall Test indicated downward trends for TCE, 1,2-DCE (total), and vinyl chloride. The remaining compounds were only detected on one occasion and, therefore, the test results indicated no trend. The Mann-Kendall Test results for each VOC are presented in Appendix C.

Geochemical data collected in 2001 indicate that the electron donor concentration (17 mg/l) in the waste storage shed area is sufficient to provide the attenuation microbes with energy to drive the reduction of the more chlorinated VOCs remaining in the groundwater (Table 9). The lesser chlorinated VOCs, such as vinyl chloride, may be degraded either by further reduction to ethene or by oxidation to carbon dioxide. The 2001 geochemical data showed contradictory results regarding the most likely pathway; dissolved oxygen concentrations (7.6 mg/l) and ferrous iron data (non-detectable levels) indicate oxidative conditions while the low redox potential (19 mV) indicates reductive conditions. Nevertheless, the VOC data show that less chlorinated VOCs are not accumulating as the more chlorinated VOCs are degraded, indicating that contaminants are being mineralized by one of these pathways.

The Rollway Bearing facility obtains its water from the Onondaga County Water Authority (OCWA). According to Fred Harkey, Water Supervisor with the Clay Uniform Water District, properties in the vicinity of the Rollway Bearing property also receive water from OCWA for drinking and sanitary purposes. No known drinking water wells or process water wells are in use in the area. Furthermore, a groundwater use restriction will be placed on the Rollway Bearing property to limit groundwater use for any purpose. Therefore, there is no known exposure pathway for the groundwater onsite.

2.3 Free Product Recovery

In July 2003, Environmental Strategies submitted a Pilot Test Summary Report to the NYSDEC that provided a detailed summary of the free product recovery pilot test activities performed at the site from September 2001 through February 2003 (Appendix D). In addition, the report contained a description of the subsurface geology below the heat treat department, including geologic cross sections, and a summary of free product delineation activities conducted before the facility was entered into the voluntary cleanup program. The pilot test activities summarized in the July 2003 report included baildown tests to assess product recovery rates within the free product plume area, installing recovery wells RW-1 and RW-2, installing observation wells OW-1 through OW-3, conducting tests to evaluate the performance of product recovery systems manufactured by Xitech Instruments, Inc., and QED, evaluating vacuum radius of influence in the RW-1 area, and collecting product thickness measurements on numerous occasions. Based on the results of the initial pilot test activities, Environmental Strategies developed the following conclusions:

- The subsurface geology below the heat treat area is complex. Approximately 8 to 12 feet of unconsolidated sediments overlie approximately 4 to 7 feet of weathered shale. The weathered shale transitions to more competent shale bedrock at depths from 8 to 15 feet bgs.
- Perched groundwater and free product occur along fractures and partings within the weathered shale interval at depths from approximately 12 to 14 feet bgs. Because the free product occurs in fractures and partings, rather than as a "pool" of product on the water table, free product is likely present in only a small fraction of the total "plume" area.
- Based on the vacuum test results and the observed difference in groundwater elevations and product thicknesses over short horizontal distances, fractures within the weathered shale are not laterally continuous. As a result, product may occur as isolated pockets with limited volumes.
- The vacuum test results indicate that no appreciable radius of influence (i.e., greater than approximately 1.5 feet) can be established in the RW-1 and RW-2 areas. Therefore, it may not be practical create overlapping areas of influence throughout the entire area containing measurable free product.

- No appreciable vacuum (i.e., less than 2 inches of water) could be applied to OW-2 and OW-3 using a blower with a maximum vacuum of 28.3 feet of water. Therefore, these wells appear to penetrate highly permeable materials that may be short-circuiting to the atmosphere.
- An applied vacuum enhanced the flow of product into well RW-1, OW-2, OW-3, and SB-4.
- Only trace product entered recovery well RW-2 under gravity conditions and no increase in product thickness was noted as a result of an applied vacuum. Therefore, no further remediation is warranted in the RW-2 area.
- The Xitech pump was not an appropriate recovery technology for the site because the float mechanism could not be accurately adjusted to remove a thin layer of product.
- The QED Ferret Pump showed initial promise in recovering free product under gravity conditions and under an applied vacuum. However, as discussed below, subsequent pilot tests indicated that the QED system would not reliably recover free product due to fluctuations in the groundwater table and difficulties in positioning the pump intake.
- Given the tight spacing of the pilot test wells and the fact that no appreciable vacuum radius of influence could be established in the pilot test area, it is not feasible to recover all measurable free product from the heat treat area.

Based on the initial pilot test results, Environmental Strategies recommended conducting additional investigation and pilot test activities at the Rollway site. These activities included pumping and bailing product from select wells and monitoring product recovery in the wells to verify that sufficient product was present in the vicinity of these wells to warrant incorporating them into the full-scale system. In addition, four additional observation wells were installed to further define the horizontal extent of free product in the vicinity of RW-1. As discussed above, trace free product entered RW-2 under vacuum conditions or under an applied vacuum. In addition, only a very thin layer of product (i.e., 0.03 foot) is present in nearby SB-7. Therefore, no further remediation is warranted at RW-2. The recommended additional investigation and pilot test activities were conducted from August 2003 through October 2004. A description of

the activities and a discussion of the results are presented below.

2.3.1 Additional Pilot Test Activities

On August 26 and 27, 2003, Environmental Strategies installed four 2-inch inside diameter (ID) polyvinyl chloride (PVC) observation wells in the heat treat area at the locations designated OW-4 through OW-7 on Figure 4. The monitoring wells were installed to further delineate the horizontal extent of free product in the vicinity of recovery well RW-1. The monitoring wells were installed to depths of 16.5 to 18 feet below grade with 5 feet of 0.040-inch continuous wrap PVC screen and a no. 2 sand filter pack. The screened intervals of the observation wells were consistent with RW-1 and SB-1. Each well was constructed with a 2.5 to 3-foot-long section of blank casing below the screen to serve as a sump so that the pump intake could be positioned at the water table when the water level was near the bottom of the screened interval. The annular space between the PVC sump and surrounding bedrock was sealed with bentonite pellets hydrated with potable water. Each well was completed with a flush-mounted protective manhole cover. Boring logs and as-built diagrams for OW-4, OW-5, OW-6, and OW-7 are included in Appendix E.

On September 4, 2003, Environmental Strategies measured the depth-to-product and depth-to-water in SB-1, SB-3, SB-4, SB-5, SB-7, SB-8, SB-9, SB-10, MW-4, RW-1, RW-2, and OW-1 through OW-7 to determine the distribution and thickness of free product under the heat treat area (Table 10). The free product measurements indicated that no measurable product was present in SB-3, RW-2, OW-1, OW-2, OW-4, OW-5, OW-6, and OW-7. The apparent product thickness in the remaining wells ranged from 0.01 foot in SB-7 and SB-9 to 0.92 foot in OW-3. As discussed in the pilot test summary report, free product occurs primarily in the vicinity of SB-4 and RW-1.

On September 11 and September 15, 2003, Environmental Strategies attempted to apply a vacuum to RW-1, SB-4, OW-2, and OW-3 and initiate manual product removal from these wells. The purpose of the product removal activities was to verify that sufficient free product was present in the vicinity of these wells to warrant incorporating them into the full-scale system. These wells were identified during the first phase of testing as the wells containing the greatest volume of recoverable free product. However, the product removal activities were suspended in September 2003 because the regional groundwater table had dropped to a level below the screened intervals of the wells. On January 9, 2004, Environmental Strategies resumed the pilot

test activities by applying a vacuum to RW-1 (5 inches of water), SB-4 (1.5 inches of water), OW-2 (2 inches of water), and OW-3 (3 inches of water) using a vacuum blower. Environmental Strategies then periodically measured the product thickness in each well with an electronic oil/water interface probe and measured the vacuum influence in nearby wells OW-1, OW-4 through OW-7, and SB-1. Environmental Strategies visited the site on January 15 and 22, February 4, 12, 15, and 25, 2004, to measure the product thickness and vacuum influence. After measuring the product thickness during each visit, a bailer or peristaltic pump was used to remove as much oil as possible from the well and then the vacuum was re-connected to the well. The product thickness measurements from each well are presented in Table 10.

As reported in the First Quarter 2004 Progress Report, dated May 17, 2004, Environmental Strategies initiated free product recovery at the site on April 19, 2004, by re-installing the QED product-skimming pump in RW-1 (Figure 4). All vacuum and product tubing and product containment drums were placed above grade in the heat treat department. Environmental Strategies periodically visited the site during April, May, and June 2004 to monitor the performance of the product recovery system. Initially, the pump performed as expected and removed only free product. However, the pump began to recover primarily water and the position of the pump intake could not be accurately adjusted to reliably recover free product. After several discussions with the manufacturer, and the cleaning and replacement of select parts, the pump was shipped back to the manufacturer in late July 2004 for further troubleshooting. The pump was reinstalled in RW-1 in late August 2004 and continued to operate until October 2004 when additional equipment problems occurred and the pilot test activities were terminated. Based on the results of the additional pilot tests, Environmental Strategies concluded that the QED pump is not applicable to the Rollway site. Furthermore, Environmental Strategies conducted a detailed literature review and determined that no other product-only pumping systems are commercially available that will reliably recover free product at the site.

2.3.2 Discussion of Results

No free product was detected in the most recently installed observation wells OW-4 through OW-7. In addition, no free product has been detected to date in existing observation well OW-1. Based on the locations of observation wells OW-1 and OW-4 through OW-7, the horizontal extent of free product in the RW-1 area (i.e., RW-1, OW-2, OW-3, and SB-1) has

been defined (Figure 4). Observation wells OW-6 and OW-7 were dry at the time of installation and during the majority of the pilot test program. The water detected in these wells on September 4, 2003, is from the hydration of the bentonite seals with potable water during well construction (Table 10). The 0.07 to 0.1 foot of water detected in these wells on January 9, 2004, likely represents water that could not be bailed from the wells by hand bailing during the September 4, 2003, site visit.

The results of the additional pilot test activities are consistent with the previous pilot test results. Product continued to enter RW-1 under an applied vacuum. In addition, smaller amounts of product entered OW-2, OW-3, and SB-4 during the pilot test period (Table 10). Applying a vacuum to each of these wells enhanced the flow of product into the wells. However, when applying a vacuum to the wells, no vacuum response was observed in the adjacent observation wells [i.e., OW-1, OW-4, OW-5, OW-6, OW-7, SB-1]. Therefore, no appreciable radius of influence could be established in the vicinity of wells RW-1, OW-2, OW-3, and SB-4.

Based on the results of the additional pilot test activities, existing wells RW-1, OW-2, OW-3, and SB-4 penetrate fractures containing sufficient product to warrant including these wells in the full-scale system (Figure 4). Environmental Strategies proposes to install a 2-inch ID PVC observation well (i.e., OW-8) to replace SB-4, which is a 1-inch diameter well and is not adequate for product recovery. The details regarding the installation of OW-8 will be included in the design document for the proposed alternative remedy discussed below.

2.3.4 Proposed Alternative Remedy For Free Product

As discussed above, the QED Ferret pump performed satisfactorily during the initial phase of pilot testing. However, during subsequent testing, the system did not reliably recover free product; even with frequent site visits. Based on research conducted by Environmental Strategies, the QED and Xitech pumps were the most appropriate product-only pumping systems for achieving the cleanup objective, given the need to operate the system under an applied vacuum and the need to install the system below grade. Because these systems were ineffective, Environmental Strategies evaluated alternative remedies to address free product at the site. Based on the results of this evaluation, Environmental Strategies is proposing to implement vacuum-enhanced physical removal to address the free product remaining in the vicinity of wells RW-1, OW-2, OW-3, and future replacement well OW-8. This alternative employs two separate

vacuum systems. A wellhead vacuum system, driven by a centralized blower, to draw product to the extraction wells. The collected oil and groundwater will be periodically removed from the well casing using a vacuum truck fitted with a small-diameter probe. Following liquid removal, the vacuum source will be reconnected to the wellhead. The total liquid stream will be transported offsite in the vacuum truck and disposed of at an approved facility. This approach offers the advantage of an applied vacuum without the inherent difficulties associated with operating a product-only recovery system. If necessary to facilitate use of the building, the vacuum lines and wellhead fixtures will be installed below grade. Environmental Strategies proposes to submit a final design document for this technology once the NYSDEC has approved the proposed remedy and alternative cleanup objective. The final design will include an operation and maintenance plan and an implementation schedule.

2.3.5 Proposed Alternative Remedial Endpoint For Free Product

The results of the extensive pilot testing conducted at the site indicate that it is not technically feasible to remove all measurable free product in the heat treat area due to the following site conditions:

- no appreciable radius of influence (i.e., greater than approximately 1.5 feet) could be established in the pilot test area despite repeated pilot testing
- product-containing fractures within the weathered shale are not laterally extensive and, thus, product apparently occurs as isolated "pockets"
- the product is limited to an area under a building and is 15 feet below grade and, thus, is not readily accessible by excavation.

As a result, Environmental Strategies is proposing to focus the remedial effort on four wells [i.e., RW-1, OW-2, OW-3, and replacement well OW-8] that exhibit the presence of recoverable free product and operate the recovery well(s) until asymptotic product recovery rates are achieved. Environmental Strategies is currently involved in another site where the NYSDEC has accepted asymptotic concentrations in groundwater as the remedial endpoint for groundwater treatment. A performance-based remedial endpoint for free product is appropriate for the Rollway Bearing facility because a deed restriction limits future land use to industrial purposes and a groundwater use restriction limits the use of site groundwater for any purpose. In addition, soils that contained chemical constituents above the site-specific impact to groundwater cleanup

criteria have been excavated and disposed of offsite and VOCs in groundwater are limited to a single well near the middle of the facility and the levels in this well have decreased significantly since 1995. Emerson considered the possibility that it may be technically impracticable to meet a cleanup objective of no measurable free product when the remedial action work plan for the site was submitted to the NYSDEC in May 2000. The work plan, which was approved by the NYSDEC, stated that Emerson reserved the right to petition the NYSDEC for site closure if the application of available technologies is unable to remove all measurable free product.

3.0 Conclusions and Recommendations

Based on the remediation activities completed to date at the Rollway facility, Environmental Strategies has developed the following conclusions and recommendations:

3.1 Soil Excavation

Soils containing VOC concentrations above the site-specific impact to groundwater cleanup criteria have been excavated and disposed of offsite at a licensed disposal facility. No further investigation or remediation is warranted with respect to soil at the site.

3.2 Groundwater Monitoring

- The Rollway Bearing facility and surrounding properties receive water from OCWA for drinking and sanitary purposes and no known drinking water wells or process water wells are in use in the area. A groundwater use restriction will be placed on the Rollway Bearing property to limit groundwater use for any purpose. Therefore, there is no known potential for exposure to affected groundwater at the site.
- With the exception of a trace level of TCE (5.9 ug/l) in MW-4, the presence of VOCs above the ambient water quality criteria is restricted to MW-5 and the VOC concentrations in this well have decreased significantly since 1995.
- The horizontal extent of VOCs in groundwater has been defined and it is contained well within the property boundaries. Downgradient monitoring well MW-7, which did not contain any VOCs above the ambient water quality criteria, is approximately 175 feet from the downgradient property line. Based on the groundwater monitoring results, the VOC plume is not expanding.
- The VOC data from MW-5 indicate that the TCE concentration is low relative to the concentrations of its sequential breakdown products. Furthermore, the VOC results from MW-5 indicate that the less chlorinated VOCs are not accumulating in groundwater as the more chlorinated VOCs are degraded. This indicates that the less chlorinated VOCs are undergoing further reduction to ethene or are being

oxidized to carbon dioxide. Furthermore, the results of the Mann-Kendall Tests provide statistical evidence that the concentration of VOCs in MW-5 decreased during the 2-year monitoring period. Therefore, the chlorinated VOCs in groundwater are attenuating naturally.

- No further investigation or remediation of site groundwater is warranted.

3.3 Free Product Recovery

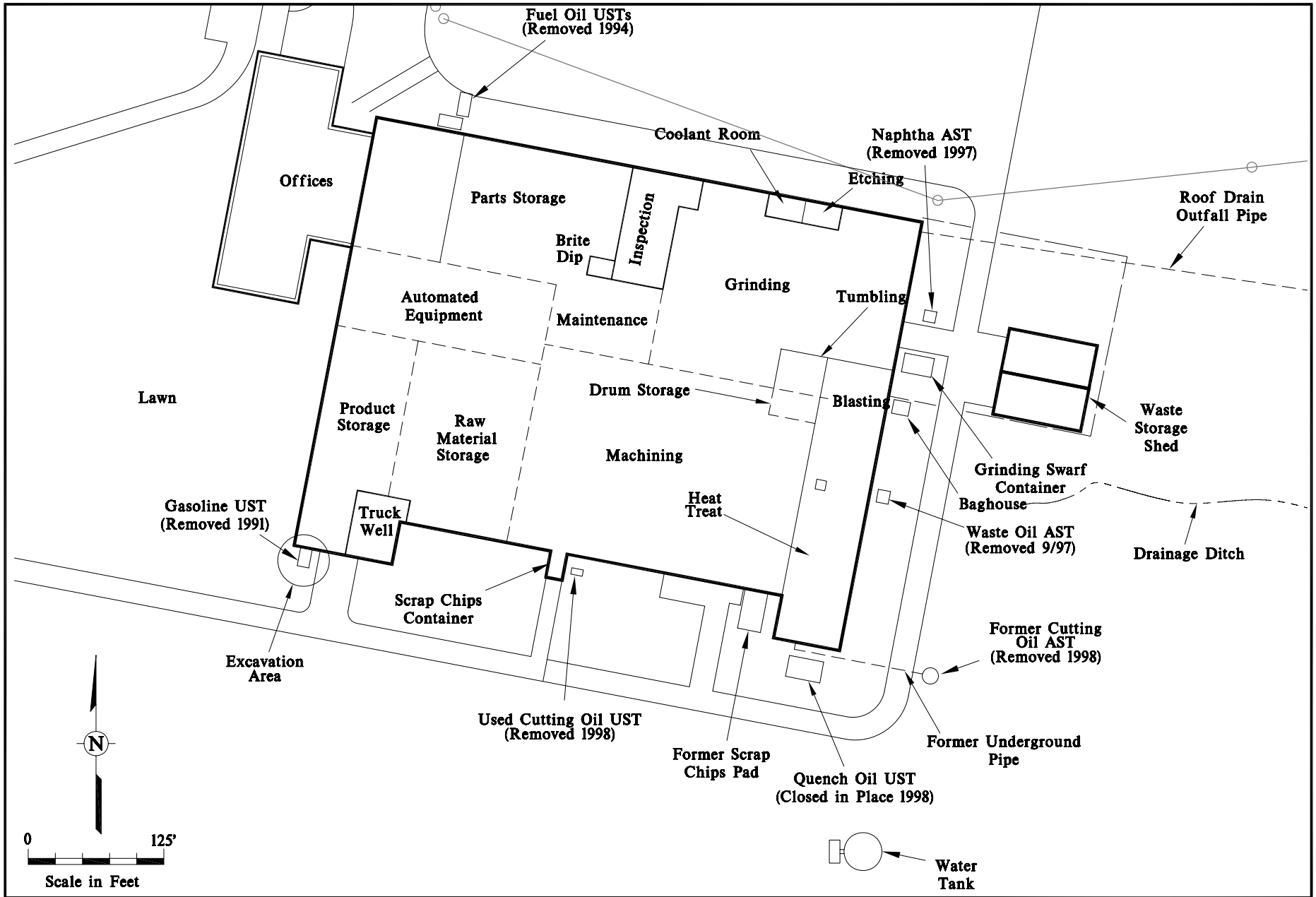
- The horizontal extent of free product in the vicinity of RW-1 has been defined.
- Sufficient product is present in the vicinity of wells SB-4, OW-2, OW-3, and RW-1 to warrant including these wells in the final design.
- Only trace product (less than 0.03 inches) entered nearby well RW-2 under either gravity or vacuum conditions. Therefore, no further investigation or remediation is warranted in the RW-2 area.
- Extensive pilot testing demonstrates that when vacuum is applied to the wells it does not result in a uniform pattern of vacuum extending out from the point of vacuum application; however, it does appear to enhance the flow of product to the wells.
- Free product occurs along fractures within the weathered shale and the fractures are not laterally continuous. In addition, the vacuum test results indicate that no appreciable radius of influence (i.e., greater than approximately 1.5 feet) can be established in the pilot test area. Therefore, recovery wells would be required on an approximately 1-foot by 1-foot grid spacing to create overlapping areas of influence throughout the area of measurable free product. As a result, it is not practicable to remove all measurable product from below the heat treat department**.**
- Environmental Strategies proposes to apply future free product remediation activities to four wells (i.e., RW-1, OW-2, OW-3, and SB-4) that have been shown to penetrate fractures with “recoverable” volumes of free product.
- Due to the poor performance of the product-only recovery pumps pilot tested for this site, and the absence of other commercially available pumping systems that can achieve the cleanup objective given site conditions, Environmental Strategies

proposes to implement vacuum-enhanced physical removal to address the free product. As discussed above, this alternative will be implemented until asymptotic recovery rates are achieved.

4.0 Project Schedule

Environmental Strategies will prepare and submit a design document for the proposed final remedy within 6 weeks receiving written approval from the NYSDEC.

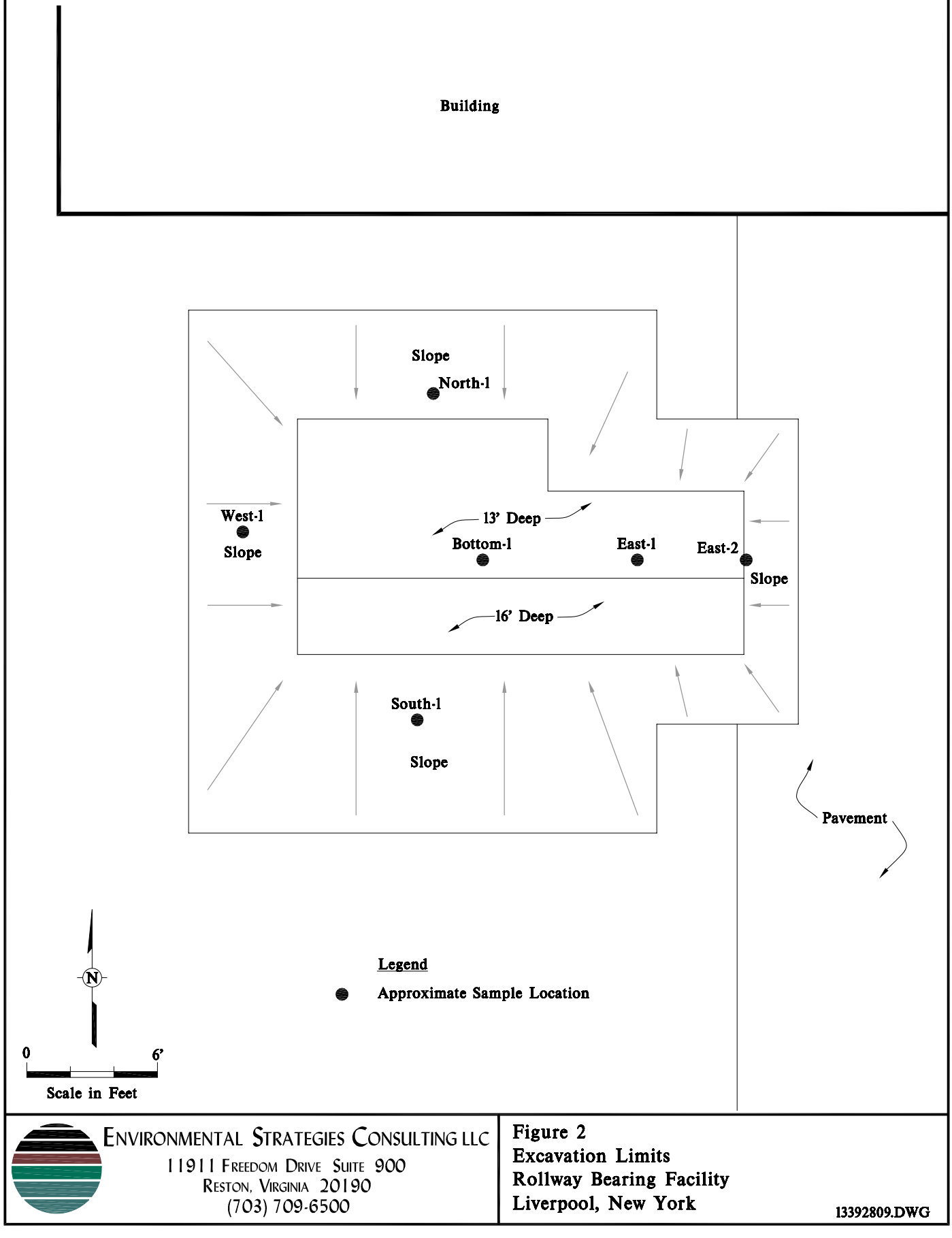
Figures



ENVIRONMENTAL STRATEGIES CONSULTING LLC
11911 FREEDOM DRIVE SUITE 900
RESTON, VIRGINIA 20190
(703) 709-6500

Figure 1
Site Layout
Rollway Bearing Facility
Liverpool, New York

13392810.DWG



ENVIRONMENTAL STRATEGIES CONSULTING LLC
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RESTON, VIRGINIA 20190
(703) 709-6500

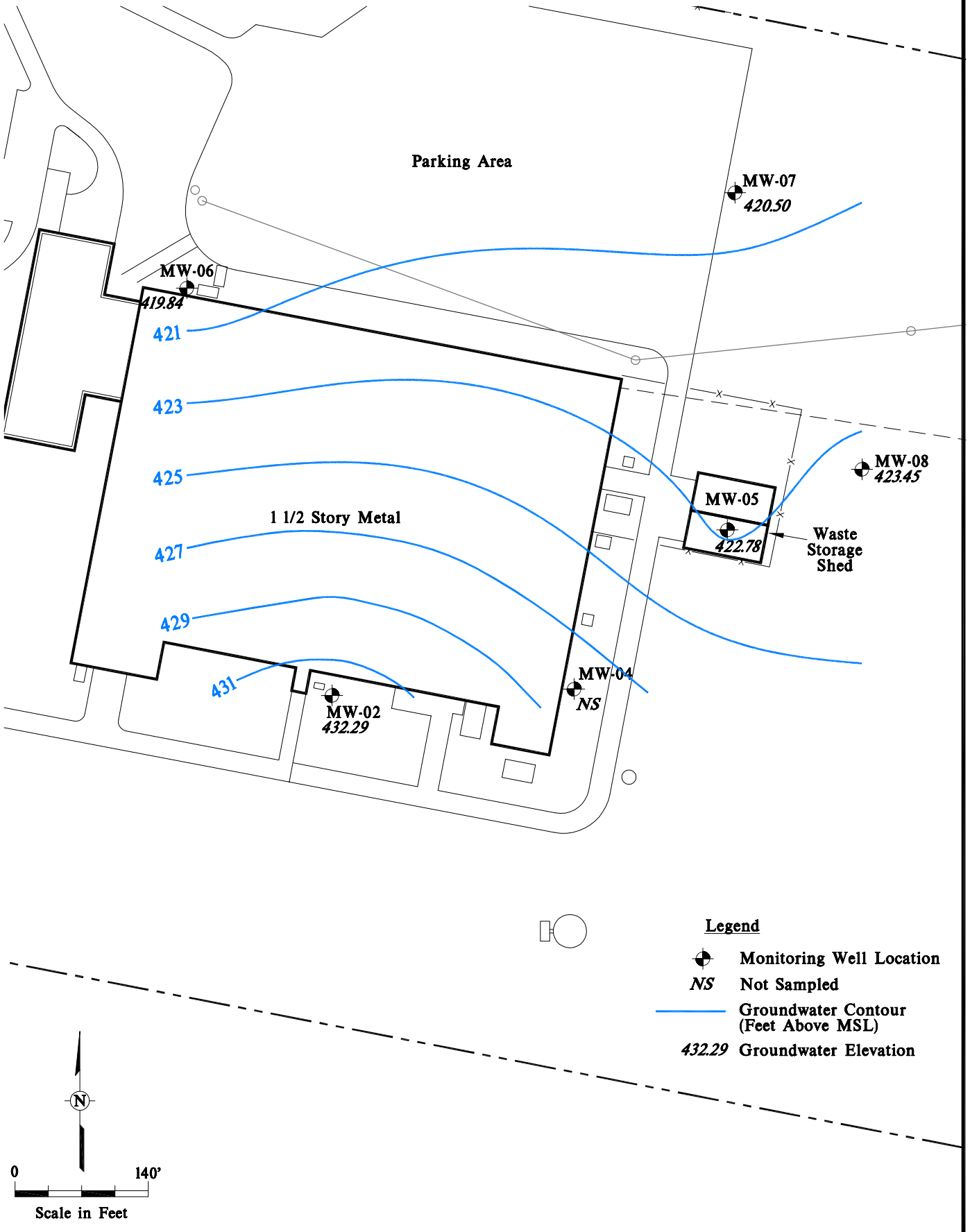
Figure 2
Excavation Limits
Rollway Bearing Facility
Liverpool, New York

13392809.DWG

DWG Name: 13392830.DWG

Checked: Approved:

Drawn By: EGC



ESC Engineering of New York, P.C.

Figure 3

GROUNDWATER CONTOUR ELEVATIONS
(August 26, 2003)

ROLLWAY BEARING CORPORATION
LIVERPOOL, NEW YORK
PREPARED FOR
ROLLWAY BEARING CORPORATION

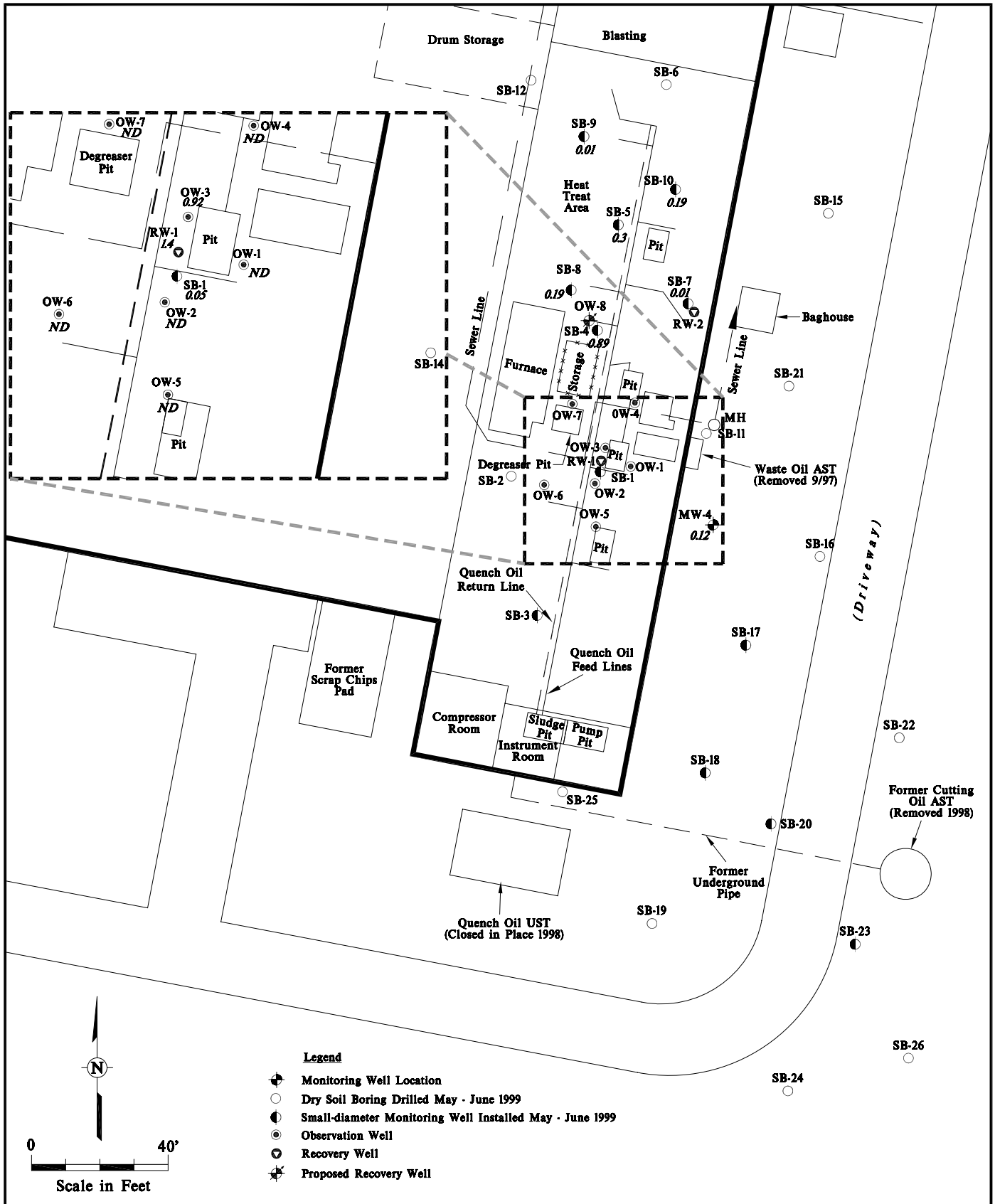


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Figure 4
Free Product Thickness Measurements - September 4, 2003
Rollway Bearing Corporation
Liverpool, New York

13392841.DWG

Tables

Table 1

Verification and Backfill Soil Sample Results
Rollway Bearing Corporation Facility
Liverpool, New York
November 13 and 15, 2001(a)

Compound	Bottom-1	West-1	North-1	East-1	South-1	East-2	BF-1	BF-2	Cleanup Criteria
Depth (feet bgs)	13	12	11	11	11	11			
Sample Date	11/13/2001	11/13/2001	11/13/2001	11/13/2001	11/13/2001	11/15/2001	11/13/2002	11/13/2002	
VOCs									
Benzene	500 U	10 U	1,000 U	2,000 U	10 U	11	10 U	10 U	4,600
Ethylbenzene	1,100	20 U	2,000 U	24,000	20 U	27	20 U	20 U	9,300
Toluene	1,000 U	20 U	2,000 U	77,000	20 U	20 U	20 U	20 U	12,300
o-Xylene	1,000 U	20 U	3,400	71,000	20 U	39	20 U	20 U	20,600
m,p-Xylene	2,300	24	11,000	180,000	20 U	220	20 U	20 U	20,600
Isopropyl Benzene	1,000 U	20 U	2,000 U	6,900	20 U	20 U	20 U	20 U	2,900
n-Propylbenzene	1,500	20 U	3,400	18,000	20 U	70	20 U	20 U	198,000
p-Cymene	1,000 U	20 U	2,000 U	4,000 U	20 U	20 U	20 U	20 U	NS
1,2,4-Trimethylbenzene	12,000	20 U	26,000	140,000	20 U	790	20 U	20 U	220,000
1,3,5-TMB & Sec-BB Total	3,900	20 U	8,400	53,000	20 U	310	20 U	20 U	53,200
n-Butylbenzene	5,400	20 U	11,000	38,000	20 U	380	20 U	20 U	198,000
Napthalene	5,000 U	100 U	10,000 U	20,000 U	100 U	100 U	100 U	100 U	22,300
Methyl-t-Butyl Ether	2,000 U	40 U	4,000 U	8,000 U	40 U	40 U	40 U	40 U	NS
t-Butylbenzene	1,000 U	20 U	2,000 U	4,000 U	20 U	20 U	20 U	20 U	5,681,000

a/ All concentrations in micrograms per kilogram; bgs = below ground surface; VOCs = Volatile organic compounds; NS = no standard.
volatile organic compounds; J = Estimated concentration below reporting limit; E = Concentration exceeds the calibration limit.
b/ Cleanup criteria are from Appendix A (Table 7) of the revised Remedial Action Work Plan, dated May 9, 2000.

Table 2
Groundwater Analytical Results
Rollway Bearing Corporation Facility, Liverpool, New York
November 10-14, 1995

	MW-2	MW-4	MW-5	MW-6	MW-10 (b)	NYSDEC Groundwater Quality Criteria(c)
TPH (mg/l)	2.1	2.4	2.9	ND	2.0	-
PAHs (ug/l)	ND	ND	ND	ND	ND	-
VOCs (µg/l)						
Acetone	ND	14 J	ND	ND	ND	50
2-Butanone	ND	16 J	310 J	13	300	50
Carbon Disulfide	ND	ND	ND	ND	ND	50
1,1-Dichloroethene	ND	ND	ND	ND	230	5
cis-1,2-Dichloroethene	ND	2.6 J	1,500	2.0	1,200	5
trans-1,2-Dichloroethene	ND	3.0 J	480	2.3	290	5
Trichloroethene	ND	5.9	72 J	1.4	48	5
Vinyl Chloride	ND	ND	540	ND	240	2

a/ ND = not detected; J=estimated concentration below the detection limit.
b/ duplicate sample of MW-5.
c/ NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, dated June 1998.

Table 3

Groundwater Analytical Results
Rollway Bearing Corporation Facility, New York
October 1998 (a)

Analyte	MW-7	MW-8	MW-18(b)	Evaluation Criteria (c)
VOCs (µg/l)				
Methylene Chloride	ND	ND	ND	5
Xylenes (Total)	ND	ND	2 J	5
Total Metals (µg/l)				
Aluminum	1,140	ND	ND	NL
Arsenic	ND	5.4	7.9	25
Barium	64.2	11.7	12.2	1,000
Calcium	186,000	456,000	430,000	NL
Copper	ND	ND	ND	200
Iron	1,970	2,150	2,030	300
Lead	2.2	ND	ND	25
Magnesium	69,700	97,500	92,400	NL
Manganese	875	227	222	300
Potassium	6,850	62,500	58,500	NL
Silver	3.8 B	ND	4.3	50
Sodium	5,260	52,100	48,800	20,000
Zinc	ND	ND	ND	NL
Dissolved Metals (µg/l)				
Aluminum	ND	ND	ND	NL
Arsenic	ND	4.4	3.6	25
Barium	ND	ND	ND	1,000
Beryllium	ND	ND	1.1	NL
Calcium	127,000	443,000	411,000	NL
Copper	ND	ND	ND	200
Iron	ND	1,600	1,360	300
Lead	ND	2.6	ND	25
Magnesium	40,900	92,300	81,800	NL
Manganese	ND	157	145	300
Potassium	7,500	61,200	54,400	NL
Silver	4.1	ND	ND	50
Sodium	6,020	51,300	45,000	20,000
Zinc	ND	ND	ND	NL

a\ µg/l = micrograms per liter; VOCs = volatile organic compounds; ND = analyte not detected above method detction limit; J = estimated value; BJ = probable blank contamination; NA = not analyzed; B = result is between the instrument detection limit and the practical quantitation limit.
Shaded concentrations are those that exceed the evaluation criteria.
b\ MW-18 is a duplicate of MW-8.
c\ Evaluation criteria are the water quality standards for groundwater in Title 6 NYCRR Part 703.5.

Table 4

Summary of VOC Concentrations in Groundwater in MW-2
Rollway Bearing Corporation Facility
Liverpool, New York (a)

Sample ID	**MW-2**	**MW-2**	**MW-2**	**MW-2**	**MW-2**	**MW-2**	**MW-2**	**MW-2**
Sample Date	**Oct-01**	**Jan-02**	**May-02**	**Aug-02**	**Nov-02**	**Feb-03**	**May-03**	**Aug-03**
VOCs (ug/l)								
Acetone	NA	NA	10 U	10 U	10 U	10 U	12	7 BJ
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3 J
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3 BJ

a/ ug/l = micrograms per liter; VOCs = volatile organic compounds; J = estimated concentration below detection limit;
B = analyte was detected in an associated blank; U = compound was analyzed for but not detected.

Table 5

Summary of VOC Concentrations in Groundwater in MW-5
Rollway Bearing Corporation Facility
Liverpool, New York (a)

Sample ID	MW-5	MW-15 (b)	MW-5	MW-5	MW-5	MW-5	MW-5	MW-5	MW-50 (c)	MW-5	MW-50 (c)
Sample Date	**Oct-01**	**Oct-01**	**Jan-02**	**May-02**	**Aug-02**	**Nov-02**	**Feb-03**	**May-03**	**May-03**	**Aug-03**	**Aug-03**
VOCs (ug/l)											
Acetone	NA	NA	NA	10 U	10 U	50 U	10 U	30	20 U	5 BJ	9 BJ
1,2-Dichloroethene (Total)	290	330	640	250	310	280	190	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	130	130
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	10 U	10 U	41	43
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	25 U	5 U	16	15	5 U	ND
Methylene chloride	5 U	5 U	5 U	5 U	5 U	25 U	5 U	10 U	10 U	6 B	7 B
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	25 U	5 U	14	12	5 U	ND
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	25 U	5 U	10 U	12	5 U	ND
Trichloroethene	11	13	5 U	10	11	25 U	6	10 U	10 U	7	8
Vinyl Chloride	88	80	180	46	230	50 U	67	130	170	54	64

a/ ug/l = micrograms per liter; VOCs = volatile organic compounds; ND = not detected; NA = not analyzed;
J = estimated concentration below detection limit; B = analyte was detected in an associated blank.
b/ MW-15 is a duplicate of MW-5.
c/ MW-50 is a duplicate of MW-5.

Table 6

Summary of VOC Concentrations in Groundwater in MW-6
Rollway Bearing Corporation Facility
Liverpool, New York (a)

Sample ID	**MW-6**	**MW-6**	**MW-6**	**MW-6**	**MW-6**	**MW-6**	**MW-6**	**MW-6**
Sample Date	**Oct-01**	**Jan-02**	**May-02**	**Aug-02**	**Nov-02**	**Feb-03**	**May-03**	**Aug-03**
VOCs (ug/l)								
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	5 U	2 J
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 BJ
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 J

a/ ug/l = micrograms per liter; VOCs = volatile organic compounds; J = estimated concentration below detection limit;
B = analyte was detected in an associated blank; U = compound was analyzed for but not detected.

Table 7

Summary of VOC Concentrations in Groundwater in MW-7
Rollway Bearing Corporation Facility
Liverpool, New York (a)

Sample ID	**MW-7**	**MW-7**	**MW-7**	**MW-7**	**MW-7**	**MW-70(b)**	**MW-7**	**MW-70(b)**	**MW-7**	**MW-7**
Sample Date	**Oct-01**	**Jan-02**	**May-02**	**Aug-02**	**Nov-02**	**Nov-02**	**Feb-03**	**Feb-03**	**May-03**	**Jul-03**
VOCs (ug/l)										
1,2-Dichloropropane	5 U	5 U	(c)	5 U	5 U	5 U	5 U	5 U	8	5 U
Methylene chloride	5 U	5 U	(c)	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	(c)	5 U	5 U	5 U	5 U	5 U	6	5 U

Sample ID	**MW-7**
Sample Date	**Aug-03**
VOCs (ug/l)	
1,2-Dichloropropane	5 U
Methylene chloride	5 BJ
1,1,2,2-Tetrachloroethane	5 U

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a/ ug/l = micrograms per liter; VOCs = volatile organic compounds; J = estimated concentration below detection limit;
B = analyte was detected in an associated blank; U = compound was analyzed for but not detected.

b/ MW-70 is a duplicate of MW-7.

c/ MW-7 was dry during the May 2002 sampling event.

Table 8

Summary of VOC Concentrations in Groundwater in MW-8
Rollway Bearing Corporation Facility
Liverpool, New York (a)

Sample ID	MW-8	MW-8	MW-80(b)	MW-8	MW-80(b)	MW-8	MW-80(b)	MW-8	MW-8
Sample Date	**Oct-01**	**Jan-02**	**Jan-02**	**May-02**	**May-02**	**Aug-02**	**Aug-02**	**Nov-02**	**Feb-03**
VOCs (ug/l)									
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

	MW-8	MW-8
Sample Date	**May-03**	**Aug-03**
VOCs (ug/l)		
Methylene chloride	5 U	7 B

_____

a/ ug/l = micrograms per liter; VOCs = volatile organic compounds; J = estimated concentration below detection limit;
B = analyte was detected in an associated blank; U = compound was analyzed for but not detected.
b/ MW-80 is a duplicate of MW-8.

Table 9

Groundwater Geochemical Measurements
Rollway Bearing Corporation Facility
Liverpool, New York
October 9, 2001(a)

Well Identification	pH (s.u.)	Temperature (°C)	Specific Conductance (mS/m)	Dissolved Oxygen (mg/l)	Reduction-Oxidation Potential (mV)	Iron (Fe2+; mg/l)	Total Organic Carbon (mg/l)
MW-5	6.69	11.26	0.807	7.26	19	0	17
MW-15(b)	-	-	-	-	-	-	5.7
MW-7	6.95	11.12	0.720	8.95	202	0.01	1.1
MW-8	6.97	11.82	2.55	9.48	-65	0.08	1 U

a/ mg/l = milligrams per liter; mV = millivolts; mS/m = millisiemens per meter; °C = degrees Celcius; s.u. = standard units;
U = compound was analyzed for but not detected.
b/ MW-15 is a duplicate of MW-5.

Table 10

Free Product Thickness Measurements
Rollway Bearing Corporation Facility
Liverpool, New York (a)

	September 4, 2003			January 9, 2004			January 15, 2004	
Well	**Depth to Product (ft)**	**Depth to Groundwater (ft)**	**Product Thickness (ft)**	**Depth to Product (ft)**	**Depth to Groundwater (ft)**	**Product Thickness (ft)**	**Depth to Product (ft)**	**Depth to Groundwater (ft)**
SB-1	13.64	13.69	0.05	NA	NA	NA	12.79	12.86
SB-3	ND	10.55	NA	NA	NA	NA	NA	NA
SB-4	12.26	13.15	0.89	12.26	13.50	1.24	12.2	13.42
SB-5	13.13	13.43	0.30	NA	NA	NA	NA	NA
SB-7	12.95	12.96	0.01	NA	NA	NA	NA	NA
SB-8	12.05	12.24	0.19	NA	NA	NA	NA	NA
SB-9	12.95	12.96	0.01	NA	NA	NA	NA	NA
SB-10	17.29	17.48	0.19	NA	NA	NA	NA	NA
SB-17	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	19.13	19.25	0.12	NA	NA	NA	NA	NA
RW-1	15.64	15.69	0.05	12.8	13.45	0.65	12.85	13.45
RW-2	ND	14.07	NA	NA	NA	NA	NA	NA
OW-1	ND	18.62	NA	NA	NA	NA	ND	18.63
OW-2	ND	16.29	NA	15.71	15.8	0.09	15.71	15.83
OW-3	15.61	16.53	0.92	12.58	13.5	0.92	12.68	12.96
OW-4	ND	14.57	NA	ND	14.31	NA	ND	16.42
OW-5	ND	13.21	NA	ND	13.15	NA	ND	13.28
OW-6	ND	13.76	NA	ND	16.91	NA	ND	DRY
OW-7	ND	14.6	NA	ND	17.69	NA	ND	DRY

Table 10

Free Product Thickness Measurements
Rollway Bearing Corporation Facility
Liverpool, New York (a)

	January 22, 2004			February 4, 2004				
Well	**Product Thickness (ft)**	**Depth to Product (ft)**	**Depth to Groundwater (ft)**	**Product Thickness (ft)**	**Depth to Product (ft)**	**Depth to Groundwater (ft)**	**Product Thickness (ft)**	**Depth to Product (ft)**
SB-1	0.07	12.29	13.14	0.85	13	13.18	0.18	12.61
SB-3	NA	NA	NA	NA	NA	NA	NA	NA
SB-4	1.22	12.15	13.7	1.55	12.21	13.67	1.46	12.22
SB-5	NA	NA	NA	NA	NA	NA	NA	NA
SB-7	NA	NA	NA	NA	NA	NA	NA	NA
SB-8	NA	NA	NA	NA	NA	NA	NA	NA
SB-9	NA	NA	NA	NA	NA	NA	NA	NA
SB-10	NA	NA	NA	NA	NA	NA	NA	NA
SB-17	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	NA	NA	NA	NA	NA	NA	NA	NA
RW-1	0.60	13	13.64	0.64	13.07	13.68	0.61	12.9
RW-2	NA	NA	NA	NA	NA	NA	NA	NA
OW-1	NA	ND	18.64	NA	ND	18.65	NA	ND
OW-2	0.12	15.72	15.93	0.21	15.7	15.95	0.25	15.84
OW-3	0.28	12.81	13.42	0.61	12.88	13.32	0.44	12.69
OW-4	NA	ND	16.34	NA	ND	16.46	NA	ND
OW-5	NA	ND	13.27	NA	ND	13.36	NA	ND
OW-6	NA	ND	DRY	NA	ND	DRY	NA	ND
OW-7	NA	ND	DRY	NA	ND	DRY	NA	ND

Table 10

Free Product Thickness Measurements
Rollway Bearing Corporation Facility
Liverpool, New York (a)

Well	February 12, 2004 Depth to Groundwater (ft)	Product Thickness (ft)	Depth to Product (ft)	February 25, 2004 Depth to Groundwater (ft)	Product Thickness (ft)
SB-1	12.91	0.30	12.43	12.86	0.43
SB-3	NA	NA	NA	NA	NA
SB-4	13.7	1.48	12.31	13.7	1.39
SB-5	NA	NA	NA	NA	NA
SB-7	NA	NA	NA	NA	NA
SB-8	NA	NA	NA	NA	NA
SB-9	NA	NA	NA	NA	NA
SB-10	NA	NA	NA	NA	NA
SB-17	NA	NA	NA	NA	NA
MW-4	NA	NA	NA	NA	NA
RW-1	13.41	0.51	12.82	13.3	0.48
RW-2	NA	NA	NA	NA	NA
OW-1	18.62	NA	ND	18.66	NA
OW-2	16	0.16	13.83	14.5	0.67
OW-3	13.31	0.62	12.61	12.98	0.37
OW-4	16.53	NA	ND	16.57	NA
OW-5	13.35	NA	ND	13.28	NA
OW-6	DRY	NA	ND	DRY	NA
OW-7	DRY	NA	ND	DRY	NA

a/ ND = no measurable product detected in the well; NA = not applicable.

Appendix A – Soil Excavation Summary Report

Appendix B – Environmental Strategies Standard Operating Procedures

Appendix C - Mann-Kendall Test Results

Appendix D – Pilot Test Summary Report

Appendix E - Monitoring Well Logs and As-built Diagrams

Boring Log: OW-3

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 19.0

Completion Date: Nov. 21, 2002 **Borehole Diameter (inches):** 8.25/4.0

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
						Concrete	
						Not Sampled	
8	1	0.0	NA	25			
10						***Silt (ML)*** Dark yellowish-brown silt, little to some clay, trace gravel; dense to very dense; dry.	
	2	1.9	NA	75		***Weathered Bedrock*** Olive (5Y5/3) weathered shale, friable, some partings visible; medium dense to dense; dry becoming moist between 11.5 and 12.0 and 12.5 and 12.6 feet bgs; moderate oil odor.	
12	3	0.0	NA	100		**Convert from 4.25-inch ID HSA to 4.0-inch OD Downhole Air Hammer.**	
14						***Not Sampled***	
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Ian Grassy

** AMSL = Above mean sea level*

Boring Log: OW-1

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 19.8

Completion Date: Nov. 22, 2002 **Borehole Diameter (inches):** 8.25/4.0

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
						Concrete	
						Not Sampled	
8	1	52.5	NA	50		***Silt (ML)*** Brown (7.5YR4/3) silt, little to some clay, trace gravel; dense; dry.	
10	2	71.8	NA	25		***Weathered Bedrock*** Olive (5Y5/3) weathered shale, little clay, friable, some partings visible; dense to very dense; dry becoming moist between 13.1 and 13.2 feet bgs and wet between 14.0 and 14.8 feet bgs; faint oil odor.	
12	3	NR	NA	75		**Convert from 4.25-inch ID HSA to 4.0-inch OD Downhole Air Hammer.**	
14	4	54.2	NA	100			
						Not Sampled	
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Ian Grassy

** AMSL = Above mean sea level*

Boring Log: OW-2

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 19.5

Completion Date: Nov. 22, 2002 **Borehole Diameter (inches):** 8.25/4.0

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
						Concrete	
						Not Sampled	
8							
	1	425	NA	75		***Sand (SP)*** Strong brown (7.5YR4/6) fine-grained sand, little gravel; loose to medium dense; dry.	
10						***Silt (ML)*** Pale yellow(2.5Y7/3) silt, little to some clay, trace gravel; dense; dry.	
	2	8.1	NA	75		***Weathered Bedrock*** Olive (5Y5/3) shale, little clay, friable, some partings visible; medium denseto very dense; dry; faint oil and solvent-type odor.	
12							
	3	1.6	NA	75		**Convert from 4.25-inch ID HSA to 4.0-inch OD Downhole Air Hammer.**	
14							
	4	527	NA	100			
16						***Not Sampled***	
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Ian Grassy

** AMSL = Above mean sea level*

Boring Log: OW-4

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 18

Completion Date: Aug. 27, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
	1	0.5	NA	100		***Concrete***	
2	2	0.1	NA	100		***Silt with Gravel (ML)*** Red (10YR 4/6) silt, some clay, trace to little gravel; very dense; dry.	
4	3	0.2	NA	50		***Silt (ML)*** Olive yellow (2.5Y 6/6) silt, some clay; dense; dry.	
6	4	0.1	NA	50		***Silt with Gravel (ML)*** Red (10R 4/6) silt, some clay; trace to little gravel; very dense; dry.	
8	5	0.2	NA	50		***Silt (ML)*** Pale yellow (5Y 7/3) silt, some clay, some residual shale partings; dense; dry.	
10	6	0.9	NA	50		***Weathered Bedrock and Silt (ML)*** Greenish-gray (10Y 6/1) weathered shale; dense, friable; dry, moist between 11.0 and 11.2 feet and also between 13.0 and 13.4 feet; faint oil odor between 11.0 and 11.2 feet and also between 13.0 and 13.4 feet; interbedded with thin (0.25 to 0.5-inch thick) layers of silt, some clay; very dense; dry.	
12	7	0.8	NA	50			
14	8	0.3	NA	25		***Weathered bedrock*** Gray (10YR 6/1) weathered shale; very dense, friable; dry. **Spoon refusal at 14.5 feet.**	
16	9	NA	NA	50		***Silt (ML)*** Greenish-gray (10BG 5/1) silt, some clay, laminated/mottled appearance; very dense; dry.	
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☐

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-5

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 16.5

Completion Date: Aug. 26, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
						Ground Surface	
0						***Concrete***	
	1	0.0	NA	100		***Sand (SP)*** Brown (10YR 4/3) to dark brown (10YR 3/3) fine to medium-grained sand, little silt, trace to little gravel; loose; dry; faint oil odor between 6.5 feet and 7.4 feet.	
2	2	0.1	NA	25			
4	3	0.6	NA	25			
6	4	1.6	NA	75			
8	5	14.2	NA	100		***Silt (ML)*** Olive (5Y 5/4) silt, some clay, trace remnant shale partings; medium dense to dense, no cohesiveness, non-plastic when wetted; dry, moist to wet between 8.0 and 9.1 feet; faint to moderate oil odor.	
10	6	12.2	NA	100		***Weathered Bedrock*** Greenish-gray (5GY 5/1) weathered shale; dense, friable; dry; moderate oil odor. Alternates with thin (0.5 to 0.75-inch thick) bands of greenish-gray clay with residual shale partings; moist.	
12						***Not Sampled*** **Convert from 4.25-inch ID HSA to 3.75-inch OD Downhole Air Hammer.** **Advanced 4.25 inch ID HSA to 16.5 feet to clear bridged bentonite at interface between Downhole Air Hammer and HSA.**	
14							
16							
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☑

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-6

Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 18

Completion Date: Aug. 26, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
						Ground Surface	
0	1	NA	NA	NA		***Concrete***	
2	2	1.5	NA	25		***Silty Sand (SM)*** Brown (10YR 4/3) fine to medium-grained sand, trace to little silt and gravel; loose; dry.	
4	3	1.4	NA	50			
6	4	1.5	NA	50		***Silt (ML)*** Very dark grayish-brown (10YR 3/2) silt, little clay, trace organic material; medium dense; dry.	
8	5	-	NA	35		***Silt (ML)*** Olive (5Y 5/3) silt, some clay, some shale fragments and distinct partings; medium dense to very dense; dry. **Spoon refusal at 7.0 feet.**	
10	6	1.2	NA	100		***Weathered Bedrock*** Greenish-gray (5GY 6/1) weathered shale; very hard, friable; dry; faint oil odor. **Spoon refusal at 8.7 feet.**	
12	7	1.0	NA	25		***Silt (ML)*** Olive (5Y 4/3) silt, some clay; moist; medium dense.	
14	8	-	NA	100		***Weathered Bedrock*** Greenish-gray (5GY 6/1) weathered shale with distinct partings, some weak red (10 R 4/4) 0.5 to 1.0-inch diameter clay nodules (sapprolites?) between 11.5 and 12.0 feet; dense to very dense, friable; dry; faint oil odor.	
16	9	-	NA	100			
18							
20							

Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☐

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

Boring Log: OW-7

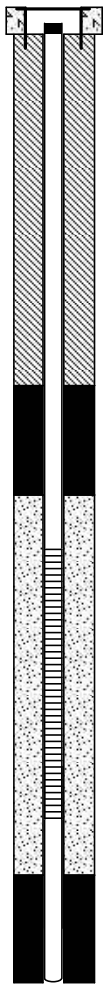
Project: Rollway Bearing Corp. **Surface Elevation (feet AMSL*):** Not determined

Project No.: 133928 **TOC Elevation (feet AMSL*):** Not determined

Location: Liverpool, NY **Total Depth (feet):** 18

Completion Date: Aug. 27, 2003 **Borehole Diameter (inches):** 8.25

Sample Data					Subsurface Profile		
Depth	Sample Interval	PID/OVM (ppm)	Blow Count	% Recovery	Lithology	Description	Well Construction
0						Ground Surface	
	1	0.2	NA	100		***Concrete***	
2	2	0.4	NA	100		***Silt (ML)*** Light olive brown (2.5Y 5/3) silt, some clay, trace to little shale fragments between 6.5 and 7.0 feet, massive to laminated; dense to very dense, friable between 6.5 and 7.0 feet; dry.	
4	3	0.4	NA	50			
6	4	0.3	NA	50			
8	5	0.7	NA	75		***Weathed Bedrock*** Gray (5Y 6/1) weathered shale; dense, friable; dry; occasional 0.25 to 0.5-inch thick clay layers; dense to very hard, friable; dry, moist between 11.2 and 11.4 feet; faint to moderate oil odor, trace free product (?) visible in some partings between 11.2 and 11.4 feet.	
10	6	3.2	NA	50			
12	7	3.6	NA	75			
14	8	2.0	NA	100			
16	9	NA	NA	50			
18						***Weathered Bedrock*** Reddish-gray (5YR 5/2) to light yellowish-brown (2.5 Y 6/4) weathered shale; dense, friable; dry.	
20							



Geologist(s): David P. Bouchard **Method:** **HSA** ☑ **ID(inches):** 4.25

Subcontractor: Parratt Wolff, Inc. **Downhole Air Hammer** ☐

Driller/ Operator: Doug Toma

** AMSL = Above mean sea level*

APPENDIX

F SITE MANAGEMENT PLAN

The Site Managemet Plan (SMP) for the Former Rollway Bearing Corporation Facility, dated March 6, 2018, was submitted electronically to the New York State Department of Environmental Conservation (NYSDOH) and the New York State Department of Health. A paper copy of the SMP was also submitted to the NYSDEC on March 7, 2018.