Former ALCO Site
Brownfield Cleanup Project

City of Schenectady
Schenectady County, New York

Parcel B
Remedial Design Work Plan
(RDWP)

New York State
Brownfield Cleanup Program
Site No. C447043

January 2015

Barton & Loguidice

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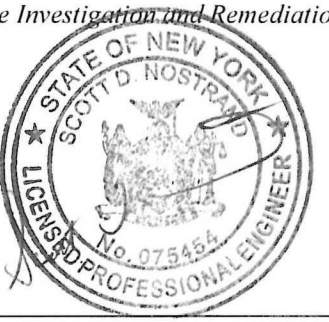
Prepared For:

Maxon ALCO Holdings, LLC
540 Broadway
Albany, New York 12207

Prepared By:

Barton & Loguidice, Inc.
Engineers • Environmental Scientists • Planners • Landscape Architects
10 Airline Drive, Suite 200
Albany, New York 12205

I, the undersigned engineer, certify that I am currently a NYS registered professional engineer and that this Remedial Design Work Plan was prepared in accordance with all applicable statutes and regulations, and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).



Scott D. Nostrand, P.E.

Table of Contents

1.0 Introduction

Maxon ALCO Holdings, LLC (MAH) entered into Brownfield Cleanup Agreements (BCA) through the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP) for the property located at 301 Nott Street in Schenectady, New York, identified as the ALCO Site (Property or Site) and historically known as the Nott Street Industrial Park (Park). In 2010, after purchasing the property, the Volunteer (Maxon-ALCO Holdings) divided the Property into three parcels: Parcel A, Parcel B and Parcel C (Site Nos. C447042, C447043, and C447044, see Figure 1) and each Parcel was deemed eligible for the BCP and subject to separate BCAs. In November of 2013, MAH proposed the reconfiguration of Parcels B and C to NYSDEC to more efficiently proceed with potential Interim Remedial Measures and redevelopment planning; the proposed reconfiguration is provided as an appendix to the Alternatives Analysis Report (AAR).

The purpose of the BCP is to encourage voluntary remediation of brownfield sites for reuse and development. This includes conducting a complete characterization of the Site by performing a Remedial Investigation (RI). The primary objective of the RI is to identify environmental concerns and to provide the basis for evaluating remedial alternatives, if necessary. The RI was completed in the first half of 2012, and the RI Report (prepared by CHA) was submitted to NYSDEC in August 2012. Though a separate Work Plan was prepared for each Parcel, the Remedial Investigation (RI) Report covered the entire Site since remedial decision making will include activities that involve multiple parcels on the ALCO Site.

Specifically, the objectives of the RI were to:

- Supplement the historic investigations that have been conducted on the Site,
- Further identify source(s) of contamination,
- Define the nature and extent of that contamination,
- Assess the impact of contamination on public health or the environment, and
- Provide information for the development and selection of a remedial work plan across all parcels (A, B, and C) that make up the Alco property.

The RI Report also provided a qualitative human health exposure assessment. An exposure pathway is complete when all five elements of an exposure pathway are documented; a potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway is not documented.

The results of the exposure assessment indicated that there is currently one complete exposure pathway.

- Exposure of current tenants of Building 306 to VOCs in indoor air through inhalation.

The following potential exposure pathways were identified:

- Exposure of future on-Site workers, residents, site occupants to soil, groundwater, soil vapor or LNAPL that may be contaminated with VOCs, SVOCs, and/or metals during future intrusive activities at the Site. Routes of exposure to future on-Site workers could include inhalation, ingestion, dermal contact, eye contact, and puncture/injection.
- Exposure to groundwater that may be contaminated with VOCs, SVOCs, and/or metals if groundwater wells are installed and used for drinking water, etc.

By letter dated December 14, 2012, NYSDEC provided comments on the RI Report; general comments were provided for site-wide issues, and comments specific to each parcel were also provided. The comment letter indicated that no further investigation was required for a majority of the areas/issues that were addressed by the RI. Finally, the comment letter requested additional data collection activities to follow-up on and/or reserve some specified issues to finalize the RI.

In January 2013 Barton & Loguidice prepared a Supplemental Remedial Investigation Work Plan (SRI-WP) to provide the procedures for conducting the requested follow-up work. In follow-up discussions with the NYSDEC, there was concurrence that the design investigation tasks proposed in the Remedial Work Plan (RWP) should be combined with the requested follow-up RI work, as the tasks were: 1) similar in nature, and 2) needed to be performed prior to the Remedial Design (RD). The tasks performed during the Supplemental Remedial Investigation are summarized below:

<u>Tasks Requested in the NYSDEC 12/14/12 Letter and Follow-up Discussion:</u>

- Follow-up investigation on the geophysical investigation in identified areas
- Soil Vapor Intrusion investigation in the identified buildings
- Installation of three monitoring wells between Buildings 306-320
- Inspection of Buildings 308 Trench
- Borings in the MW-36 Area (AOC 1A)

<u>Tasks Proposed in the Remedial Work Plan (RWP):</u>

- Chlorinated Solvent Plume Source Investigation (AOC 2)
- Chlorinated Solvent Plume Delineation (monitoring wells) (AOC 2)
- Monitoring well in the MW-45 Area (AOC 1B)

The SRI activities included the installation of soil borings, monitoring wells, soil vapor monitoring points, and test pits along with the collection of subsurface soil, soil vapor, and groundwater to further characterize the site. The planned scope of SRI activities consisted of the following:

- Installation of three monitoring wells between Buildings 306-320 screening the water table and the collection of groundwater samples for VOCs analysis.
- Installation of three monitoring wells screening the water table near MW-45 to determine the approximate extent of previously documented LNAPL at this location.
- Installation of 12-15 Geoprobe borings around MW-36 to assess the extent of previously documented LNAPL at this location.
- Advancement of approximately 30 membrane interface probe (MIP) borings near SV-C9 and MW-19 to determine the source of the previously documented chlorinated solvent plume.
- Collect subsurface soil samples from the MIP borings for VOCs analysis.
- Installation of four monitoring wells to delineate the chlorinated solvent plume and determine an effective means for mitigation.
- Collection of groundwater samples from the four newly installed chlorinated solvent plume delineation wells along with seven existing plume delineation wells to be analyzed for VOCs.
- Installation of test pits around Ground Penetrating Radar (GPR) area 2, 6, and 8 as a follow-up to the geophysical survey performed during the 2012 Remedial Investigation by CHA.
- Installation of six subsurface soil vapor points in Buildings 306 and 330.
- Inspection and confirmation of filling of the former Building 308 trench system.

The Supplemental RI activities were completed during the period from May through August 2013. Field activities were conducted in general accordance with NYSDEC protocols (including DER-10), the Remedial Action Work Plan (Kleinfelder, Inc., 2010), and the Supplemental Remedial Investigation Work Plan (Barton & Loguidice, P.C., 2013). Deviations from these plans are summarized below.

- Due to the presence of a thick concrete slab in the area surrounding SV-C9 and MW-19 the MIP could not be advanced. Instead, a Geoprobe was utilized to advance the MacroCore and a photoionization detector (PID) and field Gas Chromatograph (GC) were used to screen select samples in the field before submitting to the lab for analysis.
- Monitoring well MW-50 was sampled during the RI and was scheduled for re-sampling, but could not be located and was not sampled.
- The NYSDEC and NYSDOH indicated in a phone call on 5/31/13 that soil vapor samples were not required in Building 300 due to extensive mold in the basement and the building's current unoccupied status. SVI sampling will be required if the building is to be occupied.

Under contemplated future land use, the objective of the selected remedial alternative would be to prevent exposure to contaminated soil, groundwater, and soil vapor.

The Alternatives Analysis Report (AAR) is the next step in the BCP process; the AAR was prepared by Barton & Loguidice, Inc. As part of the AAR, three areas of concern (AOCs) were identified based on the findings of the RI and the Exposure Assessment:

1. Historic aged free-phase petroleum on the water table around monitoring well MW-36 and MW-45 (AOCs 1A and 1B) and existing underground storage tanks (USTs) that were not properly closed (AOC 1C) ;
2. A chlorinated solvent plume in a narrow area of the eastern portion of the Site that extends from the vicinity of MW-19 toward the Mohawk River (AOC 2); and
3. Soil impacts from polynuclear aromatic hydrocarbons (PAHs) (AOC 3).

The AAR presented an evaluation of remedial alternatives to eliminate or mitigate potential threats to public health and the environment at the former ALCO site, to support the selection of the preferred remedy.

1.1 Purpose of Report

This Remedial Design Work Plan (RWP) presents the procedures for designing the remedy identified in the AAR. The alternatives are based upon the findings presented in the August 2012 RI Report. This RDWP has been prepared in accordance with DER-10, 6 NYCRR Part 375, and the Brownfield Cleanup Program Guidelines.

1.1.1 Report Organization

This report is organized into four major sections (including this introduction section), with appropriate subsections within each division. Figures are located following the text, in the back of the document.

1.2 Site Background

1.2.1 Site Description

The Schenectady Locomotive Engine Manufactory initially developed a portion of the existing Park in 1849. In 1851, the company changed its name to Schenectady Locomotive Works (Works) and continued to develop the Site. In 1901, the Works merged with several other companies to form the American Locomotive Company (ALCO). ALCO operated the Site until 1969. Schenectady Industrial Corporation (SIC) purchased the Park in 1971, with General Electric Company (GE) occupying the Park from 1971 to 1985. Small industrial, manufacturing and fabrication companies have occupied various buildings within the Park since 1985, when occupancy of buildings was returned to SIC.

During April 1992, Coyne Textile Services (CTS), with operations on Front Street, adjacent to the ALCO Site, had a fuel oil release that partially leaked into the municipal storm drain sewer system which flows under the Site, discharging to the Mohawk River at the College Creek Outfall. During inspection of this release, the NYSDEC reportedly observed petroleum seeping from riprap along the bank of the Mohawk River adjacent to Buildings 320 and 324. The NYSDEC requested that a subsurface investigation be performed onshore adjacent to the

petroleum seep areas. Following this release, Schenectady Industrial Corporation (SIC) entered into an Order on Consent (OC) [Index No. R4-1338-92-05] with the NYSDEC.

In 1992, SIC performed a subsurface investigation that included advancing a series of five hand-excavated test pits, (TP-A1 through TP-E1), along the riverbank. Soil analytical results indicated total petroleum hydrocarbon (TPH) concentrations up to 12,000 parts per million (ppm). Following these results, two deep soil borings and five shallow soil borings were advanced adjacent to the test pits. The five shallow soil borings were completed at groundwater monitoring wells. Free-phase petroleum was found in two wells and the free-phase petroleum in one well was found to contain trace levels of polychlorinated biphenyls (PCBs). Groundwater analytical results indicated TPH concentrations ranging from 4.6 ppm to 32,200 ppm. Volatile organic compound (VOC) concentrations were detected.

Historically there have been many environmental investigations completed at the former ALCO Site since the initial investigation in 1992. These investigations, some of which were conducted in conjunction with NYSDEC oversight, have taken place across the ALCO-Maxon Site, which has been separated into Parcels A, B, and C. In addition to the environmental investigations conducted throughout the former ALCO Industrial property, underground storage tank (UST) removals and remedial activities have been completed on the ALCO-Maxon Site parcels. Summaries of the investigations, UST removals, and remedial activities are provided in Section 4.0.

Due to the historic industrial impacts identified on the ALCO Site and subsequent to the execution of a BCA, three Remedial Investigation Work Plans (one for each parcel) were prepared by Kleinfelder, Inc. (KLF) and submitted to NYSDEC on May 24, 2010. The Work Plan outlined the procedures and protocols that were to be utilized to conduct a full-scale remedial investigation that would provide the necessary field data to further delineate the nature and extent of contamination at the subject Site. The Work Plan was prepared to conform to the Draft DER-10 *Technical Guidance for Site Investigation and Remediation* issued by the Division of Environmental Remediation (December 2002). The RI Work Plans for Parcels B and C were subsequently approved by the NYSDEC on June 23, 2011. One of the comments received by the NYSDEC was a request for sampling of both the riverbank and Mohawk River sediments adjacent to the Site. Following the submission of a Work Plan Addendum on January 10, 2012, the RI Work Plan for Parcel A was approved by the NYSDEC on January 23, 2012.

1.2.2 Remedial Investigation Findings

1.2.2.1 Geology/Hydrogeology

The Site is underlain by a unit of fill that is present across much of the Site, varying from a minimum depth of 2 feet to a maximum depth observed during the RI of 12.4 feet. In general, the fill material consists of reworked soil (e.g., silt, sand, gravel, and clay) with lesser amounts of brick, concrete, ash/cinders, slag, metal, wood/organics, and glass. In locations where the fill unit is generally thinner, a fine to coarse grained sand unit of limited thickness is present beneath the fill. Based on the groundwater contours, it is apparent that groundwater flow across the majority of the subject Site is to the North towards the Mohawk River. The horizontal hydraulic

gradient from south to north across the Site (i.e., from MW-19 to MW-25D) is approximately 0.006 ft/ft.

1.2.2.2 Surface Soil

The analytical results from this RI indicate that there are no VOC or PCB impacts to surface soil at the Site. These results are generally consistent with results from previous investigations. There are relatively widespread SVOC detections in surface soils at concentrations below Part 375 SCOs, and only limited areas that exceed Part 375 SCOs. The presence of certain VOC and SVOC Tentatively Identified Compounds (TICs) suggest that degradation/breakdown of historic aged petroleum has and/or is occurring across the Site. Lastly, there are limited, isolated areas of arsenic, lead, and/or mercury that slightly exceed Part 375 SCOs; these locations (sample location RB-6 on Parcel A and sample locations SS-A3 and SS-B3 on Parcel B) were identified in the NYSDEC letter of 12/14/12 and will be subject to individual removal actions described in the IRM work plan.

1.2.2.3 Subsurface Soil

Analytical results for samples collected from the upper fill/sand unit suggest that there are no significant VOC impacts and only limited SVOC impacts to unsaturated soils. Within the unsaturated zone, the area of highest SVOC concentrations is present in the area just west of Building 308, the area located just south of Building 320, beneath the slab of Building 320, and the area between Buildings 316 and 332.

Based on the analytical results for soil samples that were collected from test pits as part of the current RI and from previous investigations, there is no evidence of any PCB or metal impacts to subsurface soils across the Site.

1.2.2.4 Groundwater

The results obtained during this RI confirm the detection of a historic chlorinated solvent plume, which appears to originate upgradient from or in the vicinity of MW-19 and extends over 1,200 feet in length towards the Mohawk River. The plume appears to be relatively narrow and is well-delineated to the east, south, and west. The depth of the plume is relatively shallow (~20 feet bgs) in the vicinity of monitoring well MW-19 and temporary monitoring well TMW-19C and deepens to approximately 50 to 70 feet bgs along the length of the plume. The data confirms that natural degradation is occurring based on the presence of PCE and TCE breakdown products.

The only other areas with impacts to groundwater are those with relatively localized SVOC (PAH) detections that are generally associated with former UST areas or free product recovery areas. However, a comparison of analytical results from this and from previous investigations suggests that contaminant concentrations have generally decreased, with few exceptions. The presence of TICs in most wells across the Site, consisting primarily of petroleum-related compounds, suggest that degradation/breakdown of historic, aged petroleum has occurred in groundwater across the Site.

1.2.2.5 Soil Vapor Summary

The most apparent impacts to subsurface vapor are present at the southern edge of the Site located just north of Erie Boulevard. The subsurface in this area is primarily impacted by chlorinated VOCs that appear to be related to the underlying chlorinated solvent groundwater plume. Chlorinated VOC impacts extend to the north/northeast and generally follow the direction of the groundwater plume. There are also chlorinated VOC impacts to subsurface soil vapor in a limited area between Buildings 346 and 324 and in the southwestern-most portion of the Site between Buildings 306 and 308. There are various but minor impacts to subsurface soil vapor from petroleum-related compounds; however, the detections do not appear to indicate the presence of any significant petroleum source for soil vapor contamination.

1.2.2.6 Riverbank Soil Summary

The analytical results from this RI indicate that there are no VOC or PCB impacts to soils on the bank of the Mohawk River that runs parallel to the Site, generally consistent with results from previous investigations. Impacts from SVOCs to the riverbank of the Mohawk River associated with the Site are generally limited to areas where historic operations took place, in the immediate vicinity of Buildings 326, 324 and 322.

Based on the results obtained during this RI and the previous remedial measures undertaken, minor detections of inorganics (mainly iron, arsenic, mercury and lead) in riverbank soils appear to also be limited to the western portion of the riverbank that runs parallel to the Site (west of College Creek Outfall). The eastern portion of the riverbank has only limited detections of metals (arsenic and lead) slightly above Part 375 SCOs in the area north of Building 346.

1.2.2.7 River Sediment Summary

Collectively, the RI noted detectable concentrations of contaminants present in Mohawk River sediments both adjacent to the Site and upstream from the Site. The data indicate that an up-gradient source of chlorinated VOCs impacted up-gradient river sediments, but the impacts are relatively localized. There do not appear to be any VOC impacts to sediment immediately adjacent to the site. SVOC impacts are most evident upstream and adjacent to the western-most portion of the site (i.e., in the Building 320 area to the east) and suggest that, in addition to limited contribution from the Site itself, an up-gradient SVOC source is, or was, also present. There are no PCB impacts to the river sediments. The results also indicate that sediments both adjacent to the Site and upstream from the Site have detectable concentrations of metals. It does not appear that the Site is causing significant adverse inorganic impacts to river sediments.

1.2.3 Supplemental Remedial Investigation Findings

The additional activities implemented as part of the SRI provided further delineation and identification of historic industrial conditions at the former industrial property. The data gathered was consistent with prior site investigation information.

1.2.3.1 Parcel B

- Follow-up on the geophysical study Area 2 identified an underground vault.
- Follow-up on the geophysical study Area 6 identified a former concrete building wall with re-bar.
- Concentrations of petroleum-related VOCs were detected in one of the three wells installed between Building 306 and former Building 320; concentrations did not exceed 22 ug/L.
- Concentrations of chlorinated VOCs in Parcel B monitoring wells sampled ranged from ND to 178 ug/L.

1.2.3.2 Site-Wide Groundwater Quality

- Monitoring wells installed on Parcels A, B and C provided further delineation of the chlorinated solvent plume, which migrates across the three parcels along the established groundwater flow gradient.
- The source area for the chlorinated solvent plume was identified and delineated in an area of Parcel C around soil vapor point SV-C9.

1.2.4 Current and Intended Use

The City of Schenectady adopted its new Zoning Ordinance (Chapter 264) on March 24, 2008. The ALCO Site is zoned C-3 Waterfront Development District. The purpose of the C-3 district is to provide unique opportunities for the development and maintenance of water-oriented uses within certain areas of the City adjacent to the Mohawk River. The C-3 District permits certain recreational, open space, business, and residential uses which will generally benefit from and enhance the unique aesthetic, recreational, and environmental qualities of the waterfront areas.

The former industrial site is serviced by municipal water and sewer and currently has commercial tenants on a limited portion of the property along Front Street and is otherwise unoccupied with the vacant structures being demolished in 2011. The intended future use of Parcel B is restricted residential.

2.0 Description of Selected Remedy

2.1 Remedy Selection

The remedial goal is to evaluate options and select a remedial program to provide for appropriate redevelopment of the Site and to eliminate or mitigate threats to public health and the environment that, upon implementation, will allow the NYSDEC to issue a Certificate of Completion for the three BCP parcels and to lead to the redevelopment and reuse of the parcels.

This AAR indentified three areas of concern (AOC) on Parcel B based on the findings of the RI Report:

1. Historic Free-phase petroleum product on the water table around monitoring well MW-36 (AOC 1A) and existing underground storage tanks (USTs) that were not properly closed (AOC 1C);
2. The chlorinated solvent plume that extends from the vicinity of MW-19 to the Mohawk River (AOC 2); and
3. Soil impacts from polynuclear aromatic hydrocarbons (PAHs) (AOC 3).

As outlined in the Exposure Assessment, the following are complete or potential exposure pathways associated with the recognized AOC:

The results of the exposure assessment indicate that there is currently one complete potential exposure pathway and two future potential exposure pathways:

- Exposure of current tenants of Building 306 to VOCs in indoor air through inhalation and potential exposure to tenants in Building 330 to VOCs in indoor air through inhalation (AOC 1 and 2).
- Potential exposure of future on-Site workers to soil, groundwater, soil vapor or LNAPL that may be contaminated with VOCs, SVOCs, and/or metals during future intrusive activities at the Site. Routes of exposure to future on-Site workers could include inhalation, ingestion, dermal contact, eye contact, and puncture/injection (AOC 1, 2 and 3).
- Potential exposure to groundwater that may be contaminated with VOCs, SVOCs, and/or metals if groundwater wells are installed and used for drinking water, etc. (AOC 1, 2 and 3).

The final remedial measures for the site must satisfy Remedial Action Objectives (RAOs), which are site-specific statements that convey the goals for minimizing or eliminating substantial risks to public health and the environment.

The following RAOs for the site were identified as a result of the Exposure Assessment in the RI Report:

1. Prevent volatilization of organic constituents from subsurface soils and groundwater (vapor intrusion) in future and current on-site buildings (AOCs 1 and 2).
2. Prevent ingestion of contaminated groundwater (AOCs 1 and 2).
3. Prevent contact, inhalation, and incidental ingestion with impacted surficial soils (AOC 3).
4. Develop site management practices to address potential exposure pathways associated with future site work (AOCs 1, 2 and 3).

The AAR recommended Alternative 3 for the final site remedy, which would use a site-wide soil cover to mitigate AOC 3. Alternative 3 also includes measures to remediate groundwater exposure pathways associated with AOCs 1 and 2.

2.2 Description of Selected Remedy

2.2.1 General Description of Selected Remedy

Alternative 3 will use a two-foot thick soil cover (with a geotextile demarcation layer) to address AOC 3; the use of a soil cover is specifically discussed in DER-10 Section 4.1 (f) to mitigate impacted surficial soils and has been used on other parts of the former ALCO site. Clean soils have been stockpiled on the property and can serve as appropriate cover material with the permission of the NYSDEC. Two feet of clean soil cover, due to the restricted residential use of the property, will be applied. Alternative 3 will also employ Institutional Controls to address the remaining potential exposure pathways.

It should be noted that as part of site preparation the implementation of necessary flood hazard mitigation will require alteration of the current river bank, soil removal and the creation of lands under water with hydraulic connection to the Mohawk River. That is, areas of the site adjacent to the Mohawk River will need to be excavated to below the water level of the Mohawk River, allowing the Mohawk River water to extend onto and cover certain areas of the site for flood control. Design for the alteration and facilities will be presented in the Remedial Design (RD – Section 3), and will be dovetailed with the site-wide remedial program and subject to review and approval by NYSDEC. The establishment of such lands under water is a necessary element of site preparation; review and approval by the NYS Canal Corporation and U.S. Army Corps of Engineers will likely be necessary for these designs. The lands under water will not be subject to the protective soil cover or geotextile. Any lands under water created by site preparation within the existing legal description of the site will remain as part of the site and subject to certain provisions of the site management plan.

In addition to the soil cover and targeted soil removal as part of the IRMs, Alternative 3 would also include measures to remediate groundwater exposure pathways associated with AOCs 1 and 2. LNAPL areas around monitoring wells MW-36 and MW-45 (AOCs 1A and 1B) will be addressed by excavation as IRMs, and the USTs that comprise AOC 1C will be removed; isolated areas of impacted soils identified by NYSDEC in their letter of 12/14/12 will also be addressed by excavation. Mitigation of the chlorinated solvent plume and its source area will be accomplished using in-situ remediation (chemical oxidation) and natural attenuation. Institutional controls restricting the use of groundwater would likely be required.

2.2.2 Parcel –Specific Remedial Actions

2.2.2.1 Parcel B

Remedial actions specific to Parcel B are listed below:

- Two-foot soil cover
- In-situ treatment and natural attenuation of the chlorinated solvent plume
- Removal of an isolated area of surficial soil impacts at sample locations SS-B3 (see IRM work plan)
- IRM for AOC 1A and 1C
- Backfilling of underground vault identified at location GPR-2
- Mitigation measures for suspected soil vapor intrusion at Building 306
- Institutional controls
- Final Engineering Report
- Site Management Plan

3.0 Remedial Design – Parcel B

The remedial design program will provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

3.1 Site-Wide Soil Cover

As discussed earlier, a soil cover (with a geotextile demarcation layer) will be designed to address AOC 3; the use of a soil cover is specifically discussed in DER-10 Section 4.1 (f) to mitigate impacted surficial soils, particularly where soil impacts are low level and widespread. A soil cover has been used on other parts of the former ALCO site (former Big N Plaza and former Ramada Inn sites). Clean soils have been stockpiled on the property and can serve as appropriate cover material with the permission of the NYSDEC. Two feet of clean soil cover, due to the restricted residential use of the property, will be applied. The design for the soil cover will incorporate appropriate features for management and control of storm water; the design may also incorporate grading and areas of thicker soil cover to accommodate future site development. A Remedial Design package will be prepared for NYSDEC review; the design package will include a design report and plans, stamped by a Professional Engineer licensed in the State of New York.

3.2.2 Chlorinated Solvent Plume

A source area for the chlorinated solvent plume was identified in the SRI Report. Because of the location and dimensions of the source area (particularly with respect to the City of Schenectady sewers), in-situ remediation (chemical oxidation) will be employed the source area located on Parcel C (discussed in the next section).

In-situ chemical oxidation will be used to destroy the higher concentration contaminant areas of the plume itself existing on Parcel B (an area of roughly 300 ft by 300 ft). This process entails the injection of a chemical oxidant solution into the contaminated zone, where the chemical oxidant breaks the contaminant down into its constituent components. For a chlorinated compound, the end products are water, carbon dioxide, and chloride ion. The chemical is injected at different depths and locations to ensure that the contaminated zone is fully saturated with the oxidant. The oxidant solution is a mixture of the oxidant, an activator complex, and water. The residual compounds left over after the reactions are conventional groundwater constituents: iron, carbonate, carbon dioxide, chloride, etc. The remedial design will identify the location of the injection area, and will provide the oxidant loading per boring.

Monitored natural attenuation (MNA) will be used to address the lower concentration portions of the plume that exist on Parcel B. MNA has been recognized by USEPA as an effective means of addressing residual groundwater contamination, particularly after application of remedial measures addressing contaminant source areas (USEPA, 1999). From the standpoint of remediating overall contaminant mass, there are often areas in a contaminant plume where active remedial measures provide minimal or no incremental benefit relative to natural processes, such as biodegradation, sorption, dispersion, volatilization and dilution.

4.0 Permit Requirements

Any permits required by federal, state, or local statute or regulation not exempted by the Brownfield Cleanup Agreement will be obtained prior to the commencement of the remedial action.

5.0 Project Timeline

The Remedial Design of Parcel b will be submitted with 45 days of the approval of the Remedial Design Work Plan.

6.0 Site Management Plan

As previously stated, Alternative 3 will also employ Institutional Controls to address the remaining potential exposure pathways. The contemplated ICs would include:

- An Environmental Easement prohibiting all groundwater use at the site without the NYSDEC and NYSDOH approval;
- Development of a Soil Management Plan to guide possible future site developments that may require excavation into the residually-contaminated soils;
- Development of Soil-Vapor Mitigation Plan to guide future building construction;
- Development of a Groundwater Monitoring Plan to document improving groundwater quality in response to remediation activities;
- Development of a Flood Hazard Mitigation Plan to comply with Chapter 157 –Flood Hazard Control of the City of Schenectady Code, as the ALCO site lies within FEMA mapped Zones A-16 and B.
- Other environmental easements and/or deed restrictions necessary to meet regulatory requirements and enable the restricted future use of the property.

A Site Management Plan (SMP) will be prepared which will identify the necessary procedures to be utilized if future site work were conducted within each AOC, including soil vapor mitigation measures. The property owner will be required to submit a periodic certification of the institutional and engineering controls.

Mitigation of the chlorinated solvent plume and its source area will be accomplished using in-situ remediation (chemical oxidation) and natural attenuation. Institutional controls restricting the use of groundwater would likely be required

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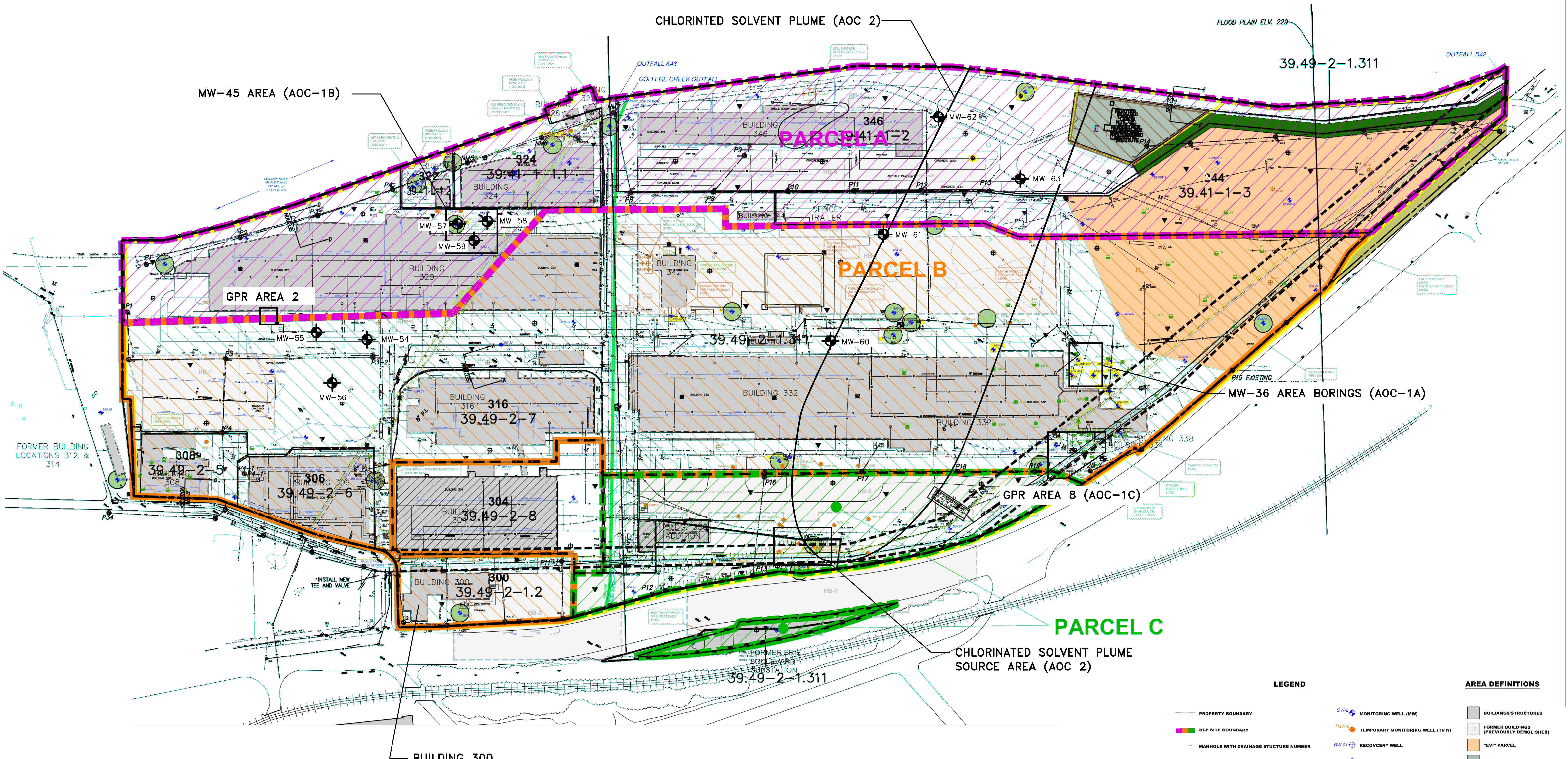
Figure 1

Site Location Map Showing Areas of Concern



LEGEND

PROPERTY BOUNDARY	OW-2 MONITORING WELL (MW)
BCP SITE BOUNDARY	TMW-6 TEMPORARY MONITORING WELL (TMW)
MANHOLE WITH DRAINAGE STUCTURE NUMBER	RW-01 RECOVCERY WELL
CATCH BASIN WITH DRAINAGE STRUCTURE NUMBER	P-2 PIEZOMETER
LIFT STATION WITH DRAINAGE STRUCTURE NUMBER	DB-18 GEOPROBE BORING
MANHOLE (M.H.)	SS-5 SURFACE SOIL SAMPLE LOCATION (SS)
CATCH BASIN (C.B.)	SB-2 SOIL BORING LOCATION

AREA DEFINITIONS

- BUILDINGS/STRUCTURES
- HB FORMER BUILDINGS (PREVIOUSLY DEMOLISHED)
- "EVI" PARCEL
- "RPI" PARCEL
- OTHER PROPERTIES NO PART OF S
- REMEDIATION AREA
- FORMER UST/AST LOCATIONS

MW-63 MONITORING WELL (SRI INVESTIGATION 2013)

MAP REFERENCE:

1) "SURVEY OF LANDS, ALCO LOCOMOTIVE, INC., CITY OF SCHENECTADY, COUNTY OF SCHENECTADY", DATED MARCH 1970, AS PREPARED BY C.T. MALE ASSOCIATES.

2) "A SUBDIVISION OF A PORTION OF LANDS OF SCHENECTADY INDUSTRIAL CORPORATION", DATED JUNE 30, 1988, AS PREPARED BY THE ENVIRONMENTAL DESIGN PARTNERSHIP.

3) "SITE PLAN, PROPOSED C & D RECYCLING FACILITY, NOTT STREET INDUSTRIAL PARK", DATED FEBRUARY 1995, AS PREPARED BY INGALLS SMART ASSOCIATES.

SOURCE:

1) ABD ENGINEERS AND SURVEYORS FEBRUARY 1988, REVISED NOVEMBER 1999.

2) HISTORIC BUILDING (HB) LOCATIONS BASED ON A "FUEL OIL PIPING" PLAN, PREPARED FOR AMERICAN LOCOMOTIVE CO., REVISED AUGUST 22,195.

Barton & Loguidice, D.P.C.

MAXON ALCO HOLDINGS, LLC
REMEDIAL DESIGN WORK PLAN

SITE PLAN

CITY OF SCHENECTADY, NEW YORK

Figure 1
Project No. 1368.001.001
Date 1/23/2015