ALTERNATIVES ANALYSIS REPORT

Mechanicville Light Industrial Park
Industrial Park Road
Mechanicville, New York

NYSDEC Site Code # E546050

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HRP Associates, Inc.

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TABLE OF CONTENTS

SECTION **PAGE**

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Mechanicville Light Industrial Park
Industrial Park Road
Mechanicville, New York

1.0 INTRODUCTION

This report presents an alternative analysis for remediation prepared by HRP Associates, Inc. (HRP) in connection with the Mechanicville Light Industrial Park at Industrial Park Road in the City of Mechanicville, Saratoga County, New York (Site # E546050, referred to herein as the site).

A Remedial Investigation (RI) was completed for the City of Mechanicville (the City) pursuant to the State Assistance Contract between the City and the New York State Department of Environmental Conservation (NYSDEC). The RI was carried out during the period of July 2007 through November 2008 and tasks included a GPR survey, the installation of Test pits, soil borings, groundwater monitoring wells, soil vapor points and the completion of Interim Remedial Measures (IRMs).

This report summarizes the findings of the RI report, discusses the probable future use of the site by the City of Mechanicville, and compares potential remedial alternatives for remediation of the site. After preparation of the Proposed Remedial Action Plan (PRAP) by the Department, and holding a public hearing on the findings, the remedial action will be documented in a Record of Decision (ROD).

1.1 Goals and Planned Future Use

The purpose of the RI was to identify and define the extent of hazardous substances located on the property. The goal of the City is to obtain a “Release of Liability” from NYSDEC due to the presumed potential for on-site contamination. The “Release of Liability” will allow the City to assure any potential buyers of the site that the NYSDEC has reviewed the site and will not require any further actions with regards to the site.

The subject site is comprised of three areas of proposed future, one (1) area of industrial use and two (2) separate areas of restricted residential use. The intended future use of the majority of the site is redevelopment for light industrial purposes in the central area. Based on recent conversations with the City, the central area of the site is proposed to be used as a bus depot and parking lot. The use of the eastern portion of the site, which is currently developed with DPW buildings, will not change and is included within the proposed industrial use area. The use of the southwestern portion of the site, which is currently developed with a baseball field used by the Mechanicville/Stillwater Little League, will not change and constitutes one of the restricted residential use areas. Although currently vacant, the most western portion of the site, between the cul-de-sac and Elizabeth Street Extension, is proposed to be used as a softball field in the future, according to the City. This portion of the site constitutes the second proposed restricted residential area.

1.2 Findings of Remedial Investigation and Subsequent Surface Soil Sampling

In order to identify the nature and extent of contamination at the subject site, during the RI, HRP collected 22 subsurface soil samples, 23 onsite and 5 offsite surface soil samples, 14 groundwater samples, 5 soil vapor samples and 1 ambient air sample from the subject site. HRP also collected 3 additional surface soil samples in March 2009 in the proposed softball field area of the site, as directed by the NYSDEC and NYSDOH in order to further evaluate the findings of surface soil sample SS-15. The RI evaluated a broad range of parameters including Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), Pesticides, Total Organic Carbon (TOC), and Target Analyte List (TAL) Metals, STARS VOCs and STARS SVOCs. The subsequent sampling event evaluated SVOCs only.

Compounds detected in the various media tested during this RI were compared to the following New York State guidance documents and standards:

- Groundwater and Surface Water: NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1); Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations dated October 1993; Revised June 1998; ERRATA Sheet dated January 1999; and Addendum dated April 2000 (NYSDEC Class GA).

- Subpart 375-6: Remedial Program Soil Cleanup Objectives, Technical Support Document (TSD). "Technical Support Document" is also known as the "New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document" dated September 2006. This document presents the assumptions, rationale, algorithms and calculations utilized by the Department and the New York State Department of Health to develop the soil cleanup objectives in ECL 27-1415(6).

At the time of the ERP RI Application, the City's intent of future use for the site was light industrial for the property. It was then realized that one existing baseball field and batting cages were part of the subject property covered under the EPR program. Based on recent conversations with the City, there is interest in potentially reusing a small portion of the most western area of the site, adjacent and contiguous to the baseball field area, as future softball fields (see Figure 2). This potential proposed use would be consistent with restricted residential use, same as the existing baseball field area. To be consistent with the proposed future uses of the site, soil analytical results for this investigation were compared against Commercial and Industrial Soil Cleanup Objectives (SCOs) for the majority of the site (17 acres or 68% of site), with the exception of samples collected in the existing baseball field area and proposed softball field area (8 acres or 32% of site), which were compared to Unrestricted and Restricted Residential SCOs.

The nature and extent of contamination onsite and RI activities can be summarized by

the following:

- Based on our findings to date, soils and groundwater have been impacted within a contiguous 4 to 5-acre area located on the Central and Southwest Portions of the subject site. It appears that concentrations of individual petroleum compounds are not present above Commercial and Industrial land use values listed for Part 375-6 Soil Cleanup Objectives (SCOs) therefore meeting the proposed SCGs for the area. However, free product was observed in MW-5 and significant staining, odor, and elevated PID readings were observed in soil samples between a depth of 3 to 10 feet in that area. It appears that contamination is concentrated in one area, surrounding TP-6, TP-36, TP-40, TP-41, SB-09, MW-04 and MW-05. Based on discussions with the laboratory, it appears that the source is likely diesel fuel or #2 fuel oil;
- It appears that the Northeast Portion of the site and the majority of the Southwest Portion have not been significantly impacted by historical operations. Trace to low level detections of contaminants were noted in these areas, but do not appear to be a significant concern. No nuisance characteristics were exhibited by soils or groundwater in these areas;
- The most western portion of the site, between the cul-de-sac and Elizabeth Street Extension, is proposed to be used as a softball field in the future. Soil samples collected in the proposed softball field area were compared to Unrestricted and Restricted Residential SCOs due to the proposed land use as a park in that area. The majority of the proposed SCGs for the soil samples were met in the proposed softball field area, with the exception of surface soil sample SS-15, in which high levels of SVOCs exceeded the Restricted Residential SCGs. Subsequent samples were collected in the immediate area of SS-15 and the SVOC compounds detected in the additional samples were below Unrestricted and Restricted Residential SCOs with the exception of exceedances including Benzo(a)anthracene, Benzo(b)flouranthene, Chrysene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, and Dibenz(a,h)anthracene.

- All levels of SVOCs detected in soil samples from borings or surficial samples were below Commercial and Industrial SCOs with the exception of Benzo(a)pyrene, Benzo(a)Anthracene, Chrysene, Benzo(b)fluoranthene, Indeno(1,2,3-cd) pyrene, and Dibenz(a,h)anthracene.

- Levels of Arsenic slightly exceeding the Industrial SCOs were detected in the surface soil samples in areas of where the historic railroad spurs were located on site.

- Trace to low levels of volatile organics including ethanol, chloromethane, benzene, freon, toluene, hexane, and methyl ethyl ketone were noted in soil vapor samples analyzed across the site. Other compounds detected in some, but not all, of the soil gas samples collected include carbon tetrachloride, ethyl benzene, m/p xylenes, o-xylenes, cyclohexane, 4-methyl-2-pentanone, 1,2,4-trimethylbenzene, 2,2,4-trimethylpentane, and tert-butyl alcohol. In addition, methylene chloride and tetrachloroethene were detected only in SV-05;

- Trace levels of one VOC (Bromomethane) and one SVOC (Bis (2-ethylhexyl)phthalate) were detected at levels that marginally exceed the TOGS value for these parameters. Sixteen metals were detected at levels marginally exceeding TOGS values in samples submitted from various locations onsite. There were no other exceedances above the TOGS values in submitted groundwater samples; and
- The extent of the subsurface and surface soil contamination and groundwater contamination appears to be limited to the central portion of the site, north of Clement Street, east of the cul-de-sac, and southwest of Industrial Park Drive and The DPW Building. This central area is currently undeveloped and will most likely be the area for future development onsite.

1.3 Summary of Potential Human Exposure Pathways

An exposure assessment including potential migration routes by which chemicals in the environment may be able to reach human receptors was conducted during the RI. Potential points of human contact with contaminated media and exposure pathways were identified for the Site and Study Area.

- Overburden Groundwater

  Exposure to overburden groundwater, if used as a drinking water supply, includes ingestion, dermal contact and inhalation of vapors. As part of the RI, HRP conducted a private water supply survey and did not identify any private wells within a ½ mile of the subject site. At the time of investigation, the site vicinity utilized municipal water for drinking water only. Therefore, a possible potential threat would occur during future development or utility repair within the site, which may require excavation and dewatering, and workers may be exposed to groundwater. A second possible threat could occur while visitors or trespassers were to come onsite during future development and were exposed to the groundwater. The likelihood for these exposure scenarios to occur is considered low. HRP completed IRM activities onsite which included the removal and treatment of 105,200 gallon of contaminated water, therefore permanently reducing the threat of exposure to contaminated overburden groundwater in the future.

- Surface Water

  No surface water is present on the subject site.

- Potential Exposure to Volatile Vapors

  When volatile organics are detected within soil gas, soils and/or groundwater it creates a potential exposure to building occupants should vapors accumulate beneath structures or have impacted indoor air quality within a structure.

The central portion of the site is currently undeveloped. As such, the present exposure to volatile vapors is minimal to low. However, based on the low levels of volatile organics detected in the soil vapor analysis, there is a potential inhalation exposure from chlorinated and non-chlorinated compound volatilization from the subsurface under the future development scenarios if structures are constructed on-site in the central area. It is expected that the utilization of engineering controls (i.e., vapor barriers or sub slab depression systems) would significantly reduce potential future exposure. However, HRP completed IRM activities which included excavating 2,292 tons of grossly contaminated soils and removal and treatment of 105,200 gallons of contaminated groundwater in the central area of the site thereby removing a significant portion of the source of the potential vapors. HRP suggests continued evaluation of the potential for vapor intrusion during building development on site including provision of mitigations if impacts are identified.

The eastern portion of the site is currently developed with the DPW buildings. The potential for exposure to volatile vapors in the existing onsite DPW buildings is minimal because the soils and groundwater data for that area do not indicate any elevated levels of volatile organic compounds that would be expected to contribute to vapor accumulation. The existing buildings are also approximately 500 feet from the source area located in the central portion of the site and therefore, a disconnect from the source area exists.

- Subsurface and Surface Soils

Potential routes of exposure to subsurface and surface soils include dermal contact, ingestion and inhalation of soil particulates. Exposure to surface soils is possible for site visitors, trespassers or future site workers. Potential exposure through dermal contact and ingestion is low to moderate due to the presence of vegetative covering, roadways and buildings. Exposure through inhalation is also considered low since no intrusive activities occur on-site that disturbs soils and/or generates inhalable dust. At present, the exposure to subsurface soils is presently non existent since the majority of the site is undeveloped. HRP completed IRM activities which included excavating 2,292 tons of grossly contaminated soils, therefore reducing the threat of exposure to contaminated subsurface soils in the central area of the site in the future.

If the central area of the site should be developed for future industrial use and/or the softball fields are developed as proposed, exposure to the soils will increase for on-site workers, utility workers, trespassers and visitors during construction. During development periods, existing fence would remain or construction fencing would be installed for safety reasons. This scenario would keep trespassers out and exposure to soils would be minimal to low.

1.4 Remedial Goals

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous

substances disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to elevated SVOCs detected in the surface soils in the proposed softball field area and contamination detected in the subsurface soils in the central portion of the site;
- exposures of persons at or around the site to arsenic levels detected in the surface soils in the central portion of the site;
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- the release of contaminants from subsurface or surface soils into potential indoor air and/or ambient air through soil vapor.

2.0 IDENTIFICATION AND SCREENING OF ALTERNATIVES

This section of the report provides an overview of potential remedial alternatives, which are screened for possible detailed consideration below, including:

- **Alternative No.1**: No Action
- **Alternative No. 2**: Institutional and Engineering Controls Only
- **Alternative No. 3**: Barrier to Contact in Softball field Area and Institutional and Engineering Controls
- **Alternative No. 4**: Soil Excavation and Disposal Off-site, Groundwater Removal and Treatment, and Return Site to Pre-Disposal Conditions

2.1 Alternative No. 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment. The No Action alternative would not involve any surface soil, subsurface soil, groundwater, or soil vapor remedial activity. In addition, the No Action alternative would not place any institutional or engineering controls on the site property, such as future land use restrictions, groundwater use limitations, and/or application of protective soil cover/barrier.

Present Worth: $0
Capital Cost:.....$0
Annual Costs:
(Years 1-5): $0
(Years 5-30): $0

2.2 Alternative No. 2: Institutional and Engineering Controls Only

The institutional and engineering controls alternative would only involve the implementation of future land use and/or groundwater use restrictions, as well as, the application of proper protective soil/vegetative covers or barriers. This alternative would not involve any surface soil, subsurface soil, or groundwater remedial activity. The institutional controls would consist of restricting the future use of the site to light industrial purposes in the central and eastern areas of the site and restrict future use to restricted residential in the existing baseball field and proposed softball field areas. The use of groundwater for any industrial activity or for drinking water supply would also be restricted. Based on the proposed redevelopment plans for the central, industrial use portion of the site, it is anticipated that the majority of the area will be covered by asphalt and/or buildings. The engineering controls would include the application of a twelve inch minimum protective soil cover and/or vegetative cover in the central portion of the site that is not covered by asphalt and/or buildings. A minimum of six inches of material (asphalt and sub-base) would be required in the central portion of the site in areas that will become roads, sidewalks, and parking lots.

An Environmental Easement would be needed to provide an enforceable legal instrument to ensure compliance with all engineering controls (ECs) and institutional controls (ICs) placed on the site. A Site Management Plan (SMP) would be required and it would specify the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This SMP would provide a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations. Specifically, the SMP would include a provision for a soil management plan for any future site excavation, as well as, the possible installation of a vapor barrier or sub-slab depressurization system in future onsite buildings. The purpose of a mitigation system would be to minimize and possibly eliminate the infiltration of subsurface organic vapors into proposed site buildings.

Present Worth: $22,687
Capital Cost:.....$2,500
Annual Costs:
(Years 1-5): $2,665
(Years 5-30): $17,522

2.3 Alternative No. 3: Barrier to Contact in Proposed Softball field Area and Institutional and Engineering Controls

This alternative would include the same ICs and ECs as Alternative 2, however, in addition a barrier to contact soil cover system would be required in the proposed softball field area. Exposure to remaining contamination in surface soils in the proposed softball field area would be prevented by installing a soil cover system in that area of the site. A demarcation layer between the existing surface soils and soil cover would be required. A demarcation layer will consist of a material or materials, which upon observation or excavation, readily demarcate the acceptable surface cover from under lying existing soils. This cover system would be comprised of a minimum of twelve inches of vegetative soil. The soil must be below the site SCGs of Eastern USA Background on a total basis. Maintenance and long term monitoring of the soil cover would be required. The institutional controls would consist of restricting the future use of the site to light industrial purposes in the central and eastern areas of the site and restrict future use to restricted residential in the existing baseball field and proposed softball field areas. The use of groundwater for any industrial activity or for drinking water supply would also be restricted for all three areas of the site. Based on the proposed redevelopment plans for the central, industrial use portion of the site, it is anticipated that the majority of the area will be covered by asphalt and/or buildings. The engineering controls would include the application of a twelve inch minimum protective soil cover and/or vegetative cover in the central portion of the site that is not covered by asphalt and/or buildings. A minimum of six inches of material (asphalt and sub-base) would be required in areas that will become roads, sidewalks, and parking lots.

An Environmental Easement would be needed to provide an enforceable legal instrument to ensure compliance with all engineering controls (ECs) and institutional controls (ICs) placed on the site. A Site Management Plan (SMP) would be required and it would specify the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This SMP would provide a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations. A site management plan would be required that would include a provision for a soil management plan for any future site excavation, as well as, the possible installation of a vapor barrier or sub-slab depressurization system in future onsite buildings in the central area of the site. The purpose of a mitigation system would be minimize and possibly eliminate the infiltration of subsurface organic vapors into proposed site buildings.

Present Worth: $80,617
Capital Cost:.....$60,430
Annual Costs:
(Years 1-5): $2,665
(Years 5-30): $17,522

2.4 Alternative No. 4: Soil Excavation and Disposal Off-site, Groundwater Removal and Treatment, and Return Site to Pre-Disposal Conditions

The soil excavation and groundwater removal/treatment alternative would involve the excavation and disposal of all remaining contaminated soils above unrestricted soil clean up values or with unacceptable nuisance characteristics (i.e. soil staining, odor, etc.) and any contaminated groundwater encountered at the Site. This remedial alternative would generally consist of excavation to various depths below grade across the site dependent upon contamination location or observed nuisance characteristics locations, and the subsequent disposal of contaminated soil. If contaminated groundwater was encountered during excavation, the groundwater would need to be pumped from the excavation and treated (i.e. carbon filtration). The groundwater would need to be disposed of appropriately. The contaminated soil would be properly disposed of offsite by incineration to destroy any combustible compounds or transported to an approved offsite disposal facility. Clean offsite back fill would be used to restore the excavation. The purpose of this alternative would be to return site to predisposal conditions. Long term monitoring would be needed to confirm post excavation conditions. Please see Figure 2 for proposed unrestricted excavation areas on site.

Present Worth: $4,789,550
Capital Cost:.....$4,769,363
Annual Costs:
(Years 1-5): $2,665
(Years 5-30): $17,522

3.0 DETAILED ANALYSIS AND COMPARISON OF ALTERNATIVES TO PROTECTION CRITERIA

Alternative selected for detailed analysis include:

Alternative No. 1 - No Action

Alternative No. 2 –Institutional and Engineering Controls Only

Alternative No. 3 –Barrier to Contact in Proposed Softball Field Area and Institutional and Engineer Controls

Alternative No. 4 –Soil Excavation and Disposal Offsite, Groundwater Removal and Treatment, and Return Site to Pre-Disposal Conditions

These alternatives are developed in sufficient detail to allow an analysis of their effectiveness and implement ability under applicable criteria for the ERP program, DER - 10 Technical Guidance for Site Investigation and Remediation, and TAGM 4058, Environmental Restoration of Brownfields Projects, which require consideration of the following criteria:

- Overall Protection of Public Health and Environment
- Compliance with Standards, Criteria, and Guidance (SCGs)
- Long Term Effectiveness and Permanence
- Reduction in Toxicity and Mobility
- Short Term Effectiveness
- Implementability
- Cost
- Community Acceptance

3.1 Alternative No. 1 - No Action

- **Overall Protection of Public Health and Environment** – Does not provide sufficient protection to human health and the environment. Residual public health risks would be high in consideration of: 1) the future use of the on-site, contaminated groundwater for industrial or drinking water purposes, and 2) exposure to surface soils that exhibit levels of contamination slightly over SCGs and 3) the potential for soil gas to migrate vertically into buildings constructed on-site in the future.

- **Compliance with SGCs** – Will not comply with SGCs, because known contaminants exists in surface and subsurface soil and the use of the site groundwater for any purpose would be allowable, without the implementation of institutional and engineering controls.

- **Long Term Effectiveness and Permanence** – Will not constitute an effective long

term solution, because the lack of any remedial action or set controls may result in significant public health risks.

- **Reduction in Toxicity and Mobility** – Will not reduce the toxicity or mobility of the known contaminants on-site, since no remedial action is proposed.

- **Short Term Effectiveness** – Will not provide any benefits in the short term, except for zero cost associated with no action and the time to implement the remedy.

- **Implementability** – Will result in the inability to develop the site safely in the future.

- **Cost** – The initial cost to implement the no action alternative would be zero. Future costs, however, may arise if the site is developed and public health suffers as a result.

- **Community Acceptance** – Community acceptance will be evaluated during the public comment period.

The No Action alternative would be the cheapest financially, however, would represent the greatest risk to public health and to any future development of the site property. As a result of the known residual contamination of the site soil, groundwater, and soil vapor the No Action alternative is an impractical remedial action. Even though the site soil and groundwater contamination was identified in the central portion of the site and only a minority of samples exceeded standards only marginally, this alternative poses the greatest public health risk and represents the greatest risk to the sites viability for any future development or inhabitation. In addition, the No Action alternative may result in an unknown amount of future costs related to public health and/or future remedial action costs.

3.2 Alternative No. 2 - Institutional and Engineering Controls Only

- **Overall Protection of Public Health and Environment** – Does provide sufficient protection to both public health and the environment. The residual public health risks would be low due to the institutional and engineering controls that would be in place.

- **Compliance with SGCs** – Will comply with the SGCs regarding surface and subsurface soils due to natural attenuation and the future use of the on-site groundwater due to the institutional and engineering controls.

- **Long Term Effectiveness and Permanence** – Will constitute an effective long term solution, due to restricting land use to light industrial purposes in the central and eastern area and residential purposes in the existing baseball field and future softball field areas and by restricting the use of the on-site groundwater, as well as, addressing potential soil vapor issues that could exist.

- **Reduction in Toxicity and Mobility** – Will reduce the toxicity and mobility of contaminants in the soils, groundwater and soil vapor with the engineering controls by applying a protective soil cover/ barrier.

- **Short Term Effectiveness** – Will provide significant benefits in the short term because it will allow for quick site redevelopment with restrictions on land and groundwater use.

- **Implementability** – Will result in the ability of the City of Mechanicville to redevelop the site as intended quickly.

- **Cost** – The cost to implement the no action and institutional controls alternative would be minimal, due to the lack of any soil excavation and groundwater removal activities. Costs would include the preparation of a site management plan and the periodic certification required by an easement. See Table 3 for cost estimates

- **Community Acceptance** – Community acceptance will be evaluated during the public comment period.

The institutional and engineering controls only alternative would the cheapest alternative to implement after the No Action Alternative. Due to the soil and groundwater contamination identified in the central portion of the site and only a minority of samples slightly or marginally exceeding SCGs, this alternative is acceptable, coupled with institutional and engineering controls. The institutional and engineering controls only alternative would yield a low risk to public health. However, this alternative would not protect the public against dermal exposure of the SVOCs detected in the surface soil samples located in the proposed softball field area. Furthermore, the institutional controls only alternative matches the proposed future use of the property in the central area of the site, however it would not allow for restricted residential use in the proposed softball field area of the site.

3.3 Alternative No. 3 – Barrier to Contact in Proposed Softball Field Area and Institutional and Engineer Controls

- **Overall Protection of Public Health and Environment** – Does provide sufficient protection to both public health and the environment by removing contaminated soil and groundwater in areas exceeding commercial use public health criteria.

- **Compliance with SGCs** – Will comply with the SGCs regarding surface and subsurface soil and the future use of the on-site groundwater.

- **Long Term Effectiveness and Permanence** – Will constitute an effective long term solution, due to the implementation of groundwater and land use restrictions, as well as, protection from any residual contaminated soils using a protective barrier/soil cover and demarcation layer.

- **Reduction in Toxicity and Mobility** – Will likely reduce the toxicity and mobility of contaminants in the site surface, subsurface soils, and groundwater.

- **Short Term Effectiveness** – Will provide significant benefits in the short term, notably the capping of contaminated surface soils in the proposed softball field area, and will allow for site redevelopment with restrictions on land and groundwater use, as well as, protection from any residual contaminated soils using a protective barrier/soil cover int eh central portion of the area.

- **Implementability** – Will result in the ability of the City of Mechanicville to redevelop the site as intended. The cost associated with limited soil excavation and groundwater removal and treatment, if necessary, would be moderate. The time to coordinate the work, excavate and dispose of the soil, and restore the site would prolong the period of time before redevelopment could occur.

- **Cost** – The cost to implement the limited excavation and institutional and engineering controls alternative would be moderate, due to the cost of soil excavation and groundwater removal and treatment, if necessary, and would certainly be excessive due to the low to trace levels of contaminants on site. Costs would include the preparation of a site management plan and the periodic certification required by an easement. See Table 2 for cost estimates.

- **Community Acceptance** – Community acceptance will be evaluated during the public comment period.

The barrier to contact in the proposed softball field area and institutional and engineering controls alternative would be of minimal cost to implement. As a result of the future land and groundwater use restrictions, as well as, the application of proper protective covers or barriers, this alternative would be more protective than Alternatives 1 and 2. This alternative would provide more protection to public health and to future on-site development by reducing overall exposure to surface and subsurface soils. This alternative would have the most long term effectiveness and would be more permanent solution than Alternatives 1 and 2. The costs associated with the soil cover and demarcation layer in the softball field area would be minimal.

3.4 Alternative No. 4 - Soil Excavation and Disposal Offsite, Groundwater Removal and Treatment and Restore Site to Pre-Disposal Conditions

- **Overall Protection of Public Health and Environment** – Upon completion, this alternative does provide a sufficient level of protection to both public health and the environment by removing all contaminated soil and groundwater. Because all contamination will be removed from the site, there will be no residual public health or environmental risks remaining after remediation. Because the site would be restored to pre disposal conditions, this alternative would be the most protective to public health.

- **Compliance with SGCs** – Will comply with the SGCs regarding surface and subsurface soil, however, will not comply with SGCs regarding the future use of the on-site groundwater.

- **Long Term Effectiveness and Permanence** – Will constitute an effective long term

solution, due to the removal of the contaminated soil and groundwater on the site. There would be no residual risks since the source of the contamination would be removed.

- **Reduction in Toxicity and Mobility** – Will reduce the toxicity and mobility of the known contaminants on-site by fully removing them.

- **Short Term Effectiveness** – Will provide significant benefits in the short term, notably the complete removal of contaminated surface and subsurface soil.

- **Implementability** – Will result in the ability of the City of Mechanicville to redevelop the site as intended. However, the cost associated with unrestricted soil excavation/disposal and groundwater removal and treatment would be extremely high and the time to coordinate the work, excavate and dispose of the soil, remove and treat the groundwater, and restore the site would prolong the period of time before redevelopment could occur.

- **Cost** – The cost to implement the unrestricted soil excavation and groundwater removal alternative would be extremely high, and would certainly be excessive due to the low to trace levels of contaminants on site. See Table 1 for cost estimates.

- **Community Acceptance** – Community acceptance will be evaluated during the public comment period.

The soil excavation and groundwater removal/treatment alternative would be the most costly remedial alternative, although it would restore the site to pre-disposal conditions which would be the most protective alternative to public health. Also, this alternative would not consist of any future land use or groundwater use restrictions and would likely yield the lowest risk to public health and to any future on-site development. IRM activities including the removal of 2,292 tons of contaminated soil that exhibited nuisance characteristics and were above industrial SCGs and the removal and treatment of 105,200 gallons of contaminated water were conducted during the RI. Because the IRM activities completed achieved the project goals by removing the most contaminated soils and groundwater from the site, this alternative would be unnecessary and unrealistic due to high costs of removing the large amount of soil remaining on site that exceeds the unrestricted standards and groundwater.

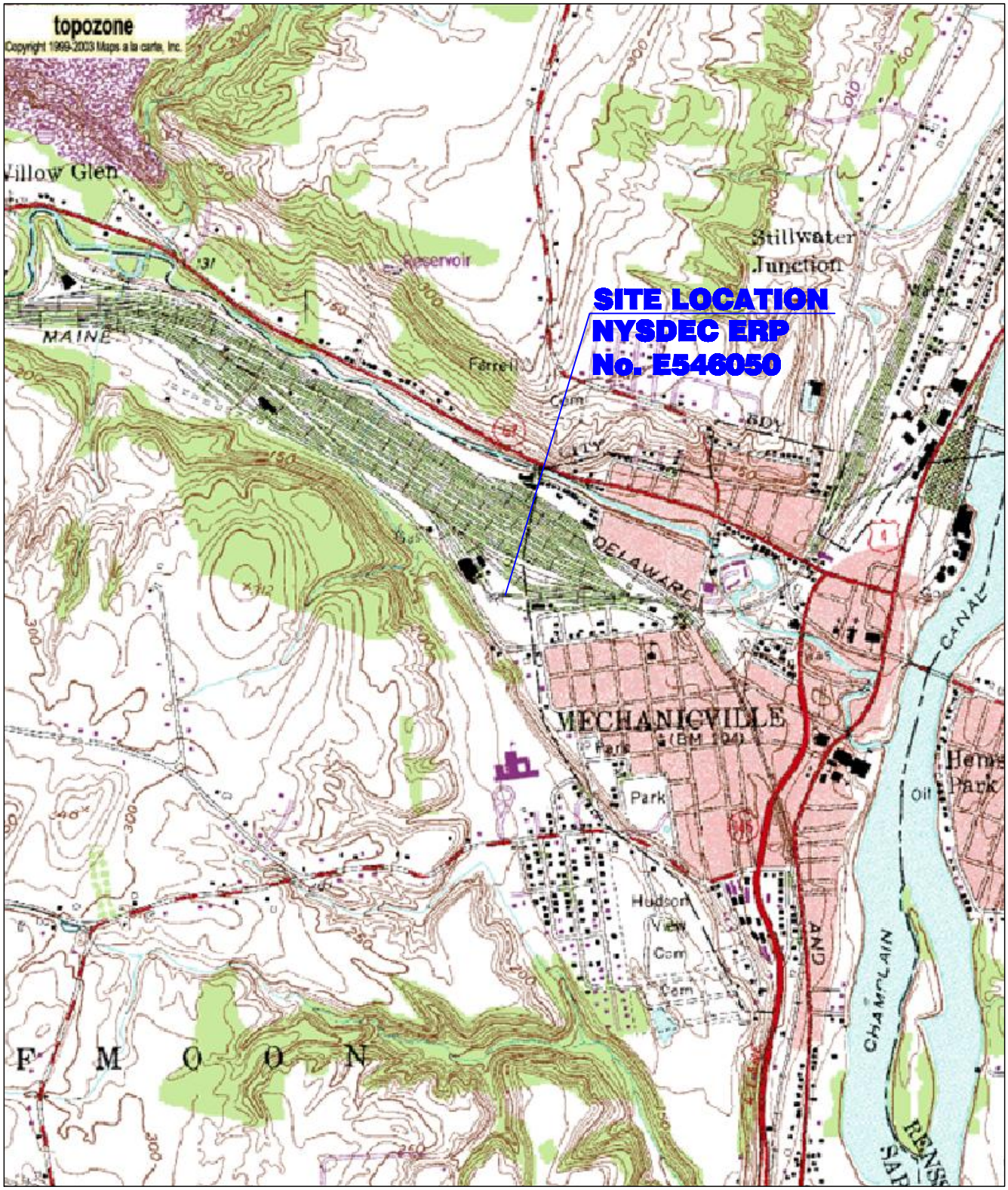
4.0 SUMMARY OF PROPOSED REMEDY

After considering the proposed future use of the site, as well as, reviewing and comparing the four alternatives for the site, it appears that Alternative 3 would be the best choice for the subject site. The Barrier to Contact in Softball Field Area and the Institutional and Engineering Controls Alternative would allow the City of Mechanicville to redevelop the site as light industrial and residential in the proposed softball field area as intended at a minimal cost to the tax payer and City. The long term benefit with this alternative is that marginal contaminants onsite will be addressed by natural attenuation and sufficient protection would be provided to both public health and the environment by limiting land and ground water uses, implementing a demarcation layer and protective soil cover/barrier, as well as, having a site management plan in place. The short term benefit is that the City of Mechanicville would be able to redevelop the site quickly, without the time consuming task and costs of soil excavation/disposal or groundwater removal/treatment. This alternative would yield low risk to public health and to any future on-site development and the costs associated with the soil cover and demarcation layer in the softball field area would be minimal. For these reasons, Alternative 3 seems to be the most appropriate remedial option for the Mechanicville Light Industrial Park site.

TABLE 1 Alternative No.2 Institutional and Engineering Controls Only		
Description	Quantity	Cost (worst case)
Prepare Site Management Plan	1 plan	$2,500
Average annual Cost to prepare periodic certification required by easement	30 years	$500
TOTAL		**$3,000**

TABLE 2 Alternative No.3 Barrier to Contact in Softball Field Area and Institutional and Engineering Controls		
Description	Quantity	Cost (worst case)
Weekly rental for Backhoe($2,950/week) plus $590 mob/de-mob	1 week	$3,540
Backhoe Operator ($2600/week)	1 week	$2,600
HRP oversight of installation of soil cover system ($5000/week)	1 week	$5,000
Soil Cover ($8-11/ton)	4,000 tons	$44,000
Vibratory Roller ($350/day) plus $590 mob/demob	2 days	$1,290
Demarcation Layer	1 unit	$1,000
Prepare Site Management Plan	1 plan	$2,500
Average annual Cost to prepare periodic certification required by easement	30 years	$500
TOTAL		**$60,430**

TABLE 3 Alternative No.4 Soil Excavation and Disposal Off-Site, Groundwater Removal and Treatment, and Return Site to Pre-Disposal COnditions		
Description	Quantity	Cost (worst case)
Weekly rental for Excavator ($2,950/week) plus $590 mob/de-mob	30 weeks	$89,090
Excavator Operator ($2600/week)	30 weeks	$78,000
Transport and Disposal to incineration facility, i.e. ESMI ($67/ton)	54,271 tons	$3,636,157
HRP oversight of excavation and disposal ($5000/week)	30 weeks	$150,000
PID ($500/week)	30 weeks	$15,000
Backfill ($8-11/ton)	54,271 tons	$596,981
Vibratory Roller ($1750/week) plus $590 mob/demob	6 weeks	$11,090
Confirmatory samples: STARS VOCs, SVOCs, ($250/sample)	339 sidewall samples 264 bottom samples 603 total samples	$150,750
Frac Tank Rental ($ 294 weekly rental) plus $385 mob/demob	15 weeks	$4,795
Carbon Filtration System and pumping equipment ($900/week)	15 weeks	$13,500
Carbon Useage Fee ($2.35/lb)	TBD with field activities	TBD with field activities
CAMP Air monitoring Equipment ($3200/mo)	7.5 months	$24,000
TOTAL		**$4,769,363**



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

UTM 18 606100E 4751170N (NAD27)

USGS Mechanicville (NY) Quadrangle

Projection is UTM Zone 18 NAD83 Datum

M * G

M=-14.368

G=0.885

FIGURE 1
SITE LOCATION
MECHANICVILLE
INDUSTRIAL PARK
MECHANICVILLE, NY
HRP # MEC2000.P2
NYSDEC ERP # E546050

S:\Data\M\MECHC - CITY OF MECHANICVILLE\FORMER RAILROAD YARD - D,HB,M, MECHANICVILLE, NY\MEC2000P2\CAD\SITE LOCATION.dwg, Layout1, 1/8/2009 1:14:54 PM

1" = 150'

150 0 75 150 300

APPROXIMATE SCALE IN FEET

PROPERTY BOUNDARY (TYP.)

PAVED PARKING LOT

PUBLIC WORKS FACILITY

1,000 GAL. GAS AST

550 GAL. DIESEL AST

TRANSFER STATION

SALT SHED

DAVENPORT ST.

NORTH 4TH ST.

NORTH 5TH ST.

NORTH 6TH ST.

NORTH 7TH ST.

NORTH 8TH ST.

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

RESIDENTIAL

FORMER FUELING AREA (APPROX.)

COAL HOPPER

ASH PIT

FORMER SAND HOUSE

FORMER OIL HOUSE AND PIPING

GENERAL AREA OF EXCAVATION AND 2K GAS UST REMOVED 4/2000

FORMER ENGINE HOUSE

FORMER POWER HOUSE

FORMER TURNTABLE (FILLED-IN)

APPROX. AREA FORMER POWER LINES

FORMER ROUNDHOUSE STRUCTURE

PROPOSED SOFTBALL FIELD AREA

EXISTING CONCRETE SLABS

ELIZABETH ST. EXT.

WATER TANK

COAL TRESTLE

BRICK BLDG.

SAND PILE

PROPOSED FUTURE INDUSTRIAL USE

PROPOSED FUTURE RESTRICTED RESIDENTIAL USE

SB1 SB2 SB3 SB4 SB5 SB6 SB7 SB8 SB9 SB10 SB11 SB12 SB13 SB14 SB15 SB16 SB17 SB18 SB19 SB20 SB21 SB22 SB23

SS01 SS02 SS03 SS04 SS05 SS06 SS07 SS08 SS09 SS10 SS11 SS12 SS13 SS14 SS15 SS16 SS17 SS18 SS19 SS20 SS21 SS22 SS23 SS24 SS25 SS26

MW1 MW2 MW3 MW4 MW5 MW6 MW7 MW8 MW9 MW10 MW11 MW12 MW13 MW14

TP32 TP33 TP34 TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42

SV-01 SV-02 SV-03 SV-04 SV-05

SW-01 SW-02 SW-03 SW-04 SW-05 SW-06 SW-07 SW-08 SW-09 SW-10 SW-11 SW-12 SW-13 SW-14 SW-15 SW-16 SW-17 SW-18 SW-19

KEY

- ✕ – SURFACE SOIL SAMPLE
- ⊙ – SOIL BORING
- ◐ – TEST PIT
- ◎ – MONITORING WELL
- Ⓥ – SOIL VAPOR POINT
- ⊗ – SIDEWALL OF EXCAVATION SAMPLE
- – EXCAVATION AREA (2,291.53 TONS GROSSLY CONTAMINATED SOIL REMOVED)

FIGURE 2
SITE PLAN
MECHANICVILLE INDUSTRIAL PARK
INDUSTRIAL PARK ROAD
MECHANICVILLE, NEW YORK
HRP # MEC2000.P2
ERP# E546050
SCALE 1" = 150'±

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