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Engineering
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Remedial Alternatives Analysis & Remedial Action Work Plan

Location:

3865 & 3875 West Henrietta Road
Henrietta, New York

Prepared for:

RJ Dorschel Corporation
3817 West Henrietta Road
Rochester, New York 14623

LaBella Project No. 206139.03

March 2008
Revised February 2009

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1.0 Introduction

This Remedial Alternatives Analysis (RAA) and Remedial Action Work Plan (RAWP) provides a summary of remedial alternatives evaluated and selects remedial actions to be implemented for the two (2) contiguous parcels located at 3865 & 3875 West Henrietta Road (State Route 15), located in the Town of Henrietta, Monroe County, New York, New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Site #C828134. Hereinafter, these two parcels collectively will be referred to as "the Site." A Project Locus Map is included as Figure 1.

The remedial alternatives and actions were evaluated based on the data obtained during pre-BCP activities, a recent Remedial Investigation (RI), and Interim Remedial Measures (IRMs) conducted at the Site. This RAA & RAWP summarizes the findings of the Remedial Investigation Report for 3865 & 3875 West Henrietta Road in Henrietta, New York; however, the RI Report should be referenced for greater details on these activities. The alternatives are compared and based on the use of the Site and the surrounding area, appropriate remedial actions are selected.

2.0 Background

The existing building on the 3865 West Henrietta Road parcel ('3865 Parcel') was reportedly constructed in 1970. The 3865 Parcel has been unoccupied from approximately February 2005 until October 2006. The northern portion of the 3865 West Henrietta Road building appears to have historically been used for automobile sales and as an automobile showroom, while the southern portion of the 3865 West Henrietta Road building was used for automobile service and includes two (2) above-ground hydraulic lifts. Prior to the automobile sales and service facility use, the Site was used as a gasoline and service station.

The 3875 West Henrietta Road building was reportedly constructed in 1965 with an addition in the late 1990s. The 3875 Parcel has been unoccupied since approximately February 2005. The eastern portion of the 3875 Parcel building appears to have historically been used for automobile sales and as an automobile showroom, while the western portion of the 3875 West Henrietta Road building was used for automobile service and includes in-ground hydraulic lifts.

In June 2006, the 3865 Parcel was entered into the NYSDEC Brownfield Cleanup Program (BCP) (BCP Site #C828134). In April 2007, the 3875 Parcel was entered into the NYSDEC BCP as an amendment to the Site's BCP activities.

3.0 Areas of Concern

This section summarizes the investigation work and the IRMs completed at the Site. Based on the data obtained from this work, the Areas of Concern (AOCs) remaining at the Site are presented. These AOCs will be subsequently evaluated for remedial alternatives. Figure 2 presents these AOCs on-site.

Pre-BCP Evaluations and RI

All of the pre-BCP and RI fieldwork collectively included advancing seventy three (73) soil borings, excavating nine (9) test pits and installing sixteen (16) groundwater monitoring wells at the Site. To further evaluate the subsurface conditions at the Site, the following soil, groundwater, and soil gas samples were submitted for laboratory testing:

- 13 soil samples for NYSDEC Spill Technology and Remediation Series (STARS) List volatile organic compounds (VOCs) and NYSDEC STARS List semi-volatile organic compounds (SVOCs);
- 21 soil samples for United States Environmental Protection Agency (USEPA) Target Compound List (TCL) VOCs;
- 17 soil samples for USEPA TCL SVOCs;
- 16 soil samples for Target Analyte List (TAL) Metals;
- 12 soil samples for pesticides;
- 11 soil samples for polychlorinated biphenyls (PCBs);
- 7 groundwater samples for NYSDEC STARS List VOCs and NYSDEC STARS List SVOCs;
- 32 groundwater samples for USEPA TCL VOCs;
- 25 groundwater samples for USEPA TCL SVOCs;
- 10 groundwater samples for TAL Metals;
- 6 groundwater samples for pesticides;
- 5 groundwater samples for PCBs;
- 4 sub-slab soil vapor samples for VOCs;
- 5 indoor air samples for VOCs;
- 4 soil gas samples for VOCs; and,
- 2 ambient outside air samples for VOCs.

In addition, the RI included evaluating groundwater flow at the Site over several different sampling rounds. Generally groundwater appears to flow to the south and southwest. However, one sampling round indicated a northeast flow direction which could indicate some seasonal variations to the predominant flow to the south/southwest.

The results of this investigation identified an UST at the 3875 Parcel in addition to impacts in the area of the former pump islands on the 3865 Parcel. These areas were addressed via IRMs. In addition to these areas, sub-slab soil gas for the two buildings and impacts to groundwater and potentially free product identified around the hydraulic lifts and the oil/water separator at the 3875 Parcel also appeared to require further consideration. The analytical data for soil and groundwater impacts are shown on Figures 3 and 4, respectively.

Interim Remedial Measures

The interim remedial measures at the Site have included the removal of underground storage tanks (USTs) and soil at the 3865 Parcel and a UST/soil removal at the 3875 Parcel. The IRMs for each parcel are summarized separately below:

- **3865 Parcel:** The IRM at this Parcel included the excavation of approximately 1,700 cubic yards of petroleum impacted soils from around the pump islands and orphan USTs. The petroleum impacted soils were placed in a biocell constructed at an off-site location (refer to Figure 1). As part of the soil removal work, five (5) USTs were removed from the 3865 Parcel. A total of about 250-gallons of waste oil was removed from a waste oil tank and about 8,000-gallons of predominantly water with some gasoline was removed from the four gasoline tanks. Due to underground utilities, the right-of-way (ROW) and the building, the 3865 Parcel IRM soil removal did not completely remove contamination above the Remedial Action Objectives (RAOs), refer to Section 5.0, as confirmed by five confirmatory soil samples. However, the contamination remaining on-site is limited in extent and is well defined. Figure 5 indicates the location of the IRM work.

- **3875 Parcel:** The IRM at this Parcel included the removal of one orphan UST and approximately 40 cubic yards of petroleum impacted soils. The petroleum impacted soils were placed in the biocell constructed at an off-site location (refer to Figure 1) as part of the 3865 IRM work. A total of about 350-gallons of waste oil was removed from the waste oil tank. The UST/soil removal work at the 3875 Parcel removed contamination above soil RAOs, refer to Section 5.0, which was confirmed by five confirmatory soil samples collected prior to backfilling the excavation.

Areas of Concern

The cumulative findings/work of the pre-BCP investigations, the RIs and the IRMs at the Site have identified five AOCs remaining at the Site that warrant further consideration. The nature and extent of impacts for these areas have been defined and are summarized below:

- ***AOC #1: Petroleum Impacts Left In-Place (3865 Parcel)*:** This AOC consists of gasoline impacted soil and groundwater along the eastern portion of the 3865 Parcel and one (1) location beneath the parking lots. The IRM completed at the 3865 Parcel removed, to the extent practicable, impacts in the soil and groundwater at the 3865 Parcel; however, two (2) limited areas of impacts were left in-place and the on-site extent of these areas have been delineated. The extent of impacted soil and groundwater off-site to the east has not been fully delineated. While it is not anticipated that impacts extend beyond the ROW, defining the extent of impacts is not the responsibility of the Volunteer. Rather this additional work (if warranted) would be the responsibility of the responsible party or the NYSDEC. The area of petroleum impacts left in-place are shown on Figure 2. The impacts are petroleum-related VOCs.

- ***AOC #2: Hydraulic Lifts/Former Oil-Water Separator (3875 Parcel) and Residual Site-Wide Groundwater*:** Groundwater sampling indicated that low level concentrations of VOCs and SVOCs are present in the groundwater in proximity to the hydraulic lifts and oil/water separator. However, two wells in this area identified a limited amount of apparent free product. The extent of these impacts have been defined and appear limited to beneath and in proximity to the service area portion of the 3875 building. The hydraulic lifts, oil/water separator and the wells with free product are shown on Figure 2. In addition, this AOC will include the residual site-wide groundwater impacts (i.e., 3865 and 3875 Parcels). This includes petroleum impacts at both parcels and selenium impacts at the 3875 Parcel.

- ***AOC #3: Sub-Slab Soil Vapor Beneath Buildings*:** Sub-slab vapor samples, soil gas samples, and indoor air samples from within the building footprints for both buildings on-Site detected VOCs at concentrations that suggest the potential for sub-slab soil vapor to impact indoor air in the future. It is intended that sub-slab depressurization systems be installed as a precautionary measure to mitigate the potential future exposure risk associated with VOCs entering the ambient air space of the buildings at the Site. This AOC is indicated on Figure 2.

- ***AOC #4: Biocell Soils*:** The biocell soils are considered an AOC for the purposes of managing the continued maintenance and monitoring of the biocell soils. These soils consist of approximately 1,740 cubic yards of petroleum impacted soils generated from the two soil removals conducted as part of the IRMs.

- ***AOC #5: Elevated Metals in Surface Soil*:** Surface Soil sample SS-2 collected from the eastern portion of the 3865 Parcel detected concentrations of four metals (arsenic, barium, selenium and silver) at concentrations above the RAOs (refer to Section 5.0). It should be noted that 15 other soil samples did not detect elevated concentrations of arsenic, barium, or silver; however, selenium was detected at a concentration above the RAOs in 4 of 8 soil samples from the 3875 Parcel .

4.0 Objective

The objective of this RAA & RAWP is to evaluate remedial alternatives to address the AOCs presented above and select remedial actions to be implemented. As defined in NYSDEC DER-10 (Section 4.0), remedial alternatives will be evaluated based on the following criteria:

1.) *Overall Protection of Public Health and the Environment* - This criterion evaluates exposure and residual risks to human health and the environment during or subsequent to implementation of the alternative.

2.) *Compliance with SCGs* - This criterion evaluates whether the remedial alternative will ultimately result in compliance with SCGs, to the extent practicable.

3.) *Long-Term Effectiveness and Permanence* - This criterion evaluates if the remedy is effective in the long-term after implementation (e.g., potential rebound). In the event that residual impacts will remain as part of the alternative, then the risks and adequacy/reliability of the controls are also evaluated.

4.) *Reduction of Toxicity, Mobility, or Volume with Treatment* - This criterion evaluates the reduction of contaminant toxicity, mobility or volume as a result of the remedial alternative. In addition, the reversibility of the contaminant destruction or treatment is evaluated.

5.) *Short-Term Effectives* - This criterion evaluates if the remedial alternative protects the community, workers and the environment during implementation.

6.) *Implementability* - This criterion evaluates the remedial alternative based on its suitability, implementability at the specific site, and availability of services and materials that will be required.

7.) *Cost* - This criterion evaluates the capital, operation, maintenance, and monitoring costs for the remedial alternative. The estimated costs are presented on a present worth basis.

8.) *Community Acceptance* - A summary of the public participation program completed as part of the project. In addition, any public comments concerns and overall perception are addressed as part of the criteria.

[*Note: The public participation work completed to date has included the initial public notice as part of the BCP Application and RI Work Plan and subsequent notices for the IRMs. These public notices have not resulted in any comments from the public. As such, each alternative will be evaluated as if the alternative would be acceptable to the community. In the event that any public comments are received, these will be addressed.*]

5.0 Remedial Action Objectives

Remedial action objectives (RAOs) are medium-specific objectives for the protection of public health and the environment and are developed based on contaminant-specific standards, criteria, and guidance (SCGs) established by NYSDEC and/or New York State Department of Health (NYSDOH).

Soil RAOs

The RAOs for soil (with the exception of the biocell soils) used in this RAAR & RAWP are:

- NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (RPSCOs) for the Protection of Public Health/Commercial Use; and
- NYCRR Subpart 375-6 RPSCOs for the Protection of Groundwater.

[*Note: Based on the limited impacts, this evaluation assumes a Track 2 remedial approach.*]

Groundwater RAOs

The RAOs for groundwater used in this RAAR & RAWP are:

- NYSDEC Part 703 Groundwater Standards.

Sub-Slab Soil Vapor

The RAOs for sub-slab soil vapor used in this RAAR & RAWP are:

- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006. [*Note: Based on the potential for sub-slab soil vapor to infiltrate into the buildings at the Site, this guidance document will be used for developing sub-slab soil vapor mitigation criteria.*]

Biocell Soils RAOs

The biocell soils will be evaluated under a separate set of soil criteria based on the fact that these soils are being remediated off-site and are intended to be spread out at this off-site location (subsequent to achieving the RAOs below). The RAOs for the biocell soils are:

- NYSDEC Technical and Administrative Guidance Memorandum (TAGM) # 4046 Recommended Soil Cleanup Objectives as amended by Supplemental Tables dated August 22, 2001.

The RAOs selected are presented in tables included in Appendix 1 for each of the contaminants of concern identified for the Site above these RAOs. [*Note: Tables are not provided for the sub-slab soil vapor since these RAOs are based on the guidance document and not 'look up' tables.*]

6.0 Development of Remedial Alternatives

This section develops the remedial alternatives being considered for addressing the AOCs identified for the Site. The remedial alternatives evaluated for each AOC are summarized below:

1.) AOC #1: Petroleum Impacts Left In-Place

- **No Action:** The no action alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur beyond those implemented during the IRM work. No environmental easement would be recorded to run with the land including institutional or engineering controls to further manage residual contamination. This area would remain virtually as it is and change in use would not be limited except by existing land use controls such as zoning.

- **Site Management Plan with Institutional Controls:** Under this restricted use alternative, institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a Site Management Plan (SMP) including a Health and Safety Plan (HASP) would be implemented to protect against exposure and also control Site use. In addition, long-term groundwater monitoring would be included in this alternative as part of the SMP.

- **Additional Soil Removal and Disposal:** Under this alternative, the petroleum impacted soil left in-place that is above the RAOs would be removed to the BCP boundary. This alternative would require temporarily disconnecting public utilities in the area and temporarily closing portions of the ROW. The petroleum impacts would be removed and the area backfilled and restored.

2.) *AOC #2: Hydraulic Lifts/Former Oil-Water Separator (3875 Parcel) and Residual Site-Wide Groundwater*

- **No Action:** The no action alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur beyond those implemented during the IRM work. No environmental easement would be recorded to run with the land including institutional or engineering controls to further manage residual contamination. This area would remain virtually as it is and change in use would not be limited except by existing land use controls such as zoning.

- **Site Management Plan with Institutional Controls:** Under this restricted use alternative, institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of a SMP including a HASP would be implemented to protect against exposure and also control Site use. In addition, long-term groundwater monitoring would be included in this alternative as part of the SMP

- **Hydraulic Lift/Product Removal with SMP/Institutional Controls :** This alternative would include the SMP and institutional controls discussed above (including long-term groundwater monitoring). However, this alternative would also include removing the remaining hydraulic lifts from the 3875 Parcel building . During the lift removal work, any impacted soils would be removed as necessary. In addition, recovery of free product would also be conducted from the lift removal areas and in the area of monitoring well MW-3R (near the oil/water separator). Subsequent to completing this work, one round of groundwater sampling would be conducted in order to confirm that residual concentrations of contaminants decrease. .

3.) *AOC #3: Potential Soil Vapor Intrusion Beneath Buildings*

- **No Action:** The no action alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur beyond those implemented during the IRM work. No environmental easement would be recorded to run with the land including institutional or engineering controls to further manage residual contamination. This area would remain virtually as it is and change in use would not be limited except by existing land use controls such as zoning.

- **Sub-Slab Vapor Mitigation System and SMP:** Under this alternative, a sub-slab vapor mitigation system would be installed in both buildings on Site to minimize potential infiltration of sub-slab soil vapor into the buildings in the future. Additionally, a SMP accompanied by a HASP would be developed in order to provide information on the systems to the current and future property owner/building occupants.

4.) AOC #4: Biocell Soils

- **No Action:** The no action alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur beyond those implemented during the IRM work. No environmental easement would be recorded to run with the land including institutional or engineering controls to further manage residual contamination. This area would remain virtually as it is and change in use would not be limited except by existing land use controls such as zoning.

- **Maintenance and Monitoring:** Under this alternative, the biocell would be maintained and monitored as indicated in the IRM Work Plan. This maintenance includes regular flipping/tilling of the biocell with periodic sampling to gauge the current status of the biocell. Subsequent to meeting the biocell RAOs, this soil will be spread at its current location and allowed to naturally vegetate.

5.) AOC #5: Elevated Metals in Surface Soil

- **No Action:** The no action alternative is included as a procedural requirement and as a baseline to evaluate other alternatives. Under this alternative, no further remedial or monitoring activities would occur in relation to the elevated metals in surface soil. No environmental easement would be recorded to run with the land including institutional or engineering controls to further manage residual contamination. This area would remain virtually as it is and change in use would not be limited except by existing land use controls such as zoning.

- **Soil Removal:** Under this alternative, a soil removal of approximately 5-ft. by 5-ft. and 1-ft. deep would be conducted to remove soils with elevated metals concentrations. The soils would be sent off-site for disposal and confirmatory soil sampling would be conducted to verify the effectiveness of the remedial work.

7.0 Detailed Evaluation of Alternatives

1.) AOC #1: Petroleum Impacts Left In-Place

No Action

Description

Under this alternative the soil in the area along the ROW on the 3865 Parcel would remain as is and future Site use and development would not be limited. In addition, remedial and monitoring activities as well as placement of institutional controls at the Site would not be implemented.

Assessment

This alternative may not be protective of human health or the environment. Soil samples collected from this area were found to exceed NYSDEC Part 375 Soil Cleanup Objectives and in the event that this area is disturbed in the future with no action, there is a potential for human exposure to the impacts and potentially the environment.

With the exception of possible natural attenuation of VOCs, this alternative would not result in the reduction of contaminant toxicity, mobility or volume and therefore would not be in compliance with chemical-specific RAOs.

There would be no increased short-term risks associated with the no action alternative for the area along the ROW since remedial activities are not implemented and there does not appear to be a current exposure pathway with these impacts; however, this alternative may not be effective in the long-term and is not a permanent remedy.

Based on the findings of the studies performed to date it is anticipated that this alternative would not be acceptable to the community.

Of the alternatives being considered, the no action alternative for this AOC is not effective for the long-term and does not reduce toxicity, mobility, or volume of petroleum related impacts to this AOC. The estimated cost for this alternative is summarized below:

Estimated Cost of No Action ..... $ 0

Site Management Plan with Institutional Controls

Description

Under this restricted use alternative, institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of an SMP including a HASP, would be implemented to minimize potential exposures and also control Site use. The SMP would include procedures for properly handling and disposing of impacted media (e.g., soil, etc.) in this area should it be disturbed in the future. In addition, this alternative would include the long-term groundwater monitoring for the 3865 Parcel in order to confirm impacts are not increasing at the Site. The groundwater monitoring would consist of sampling wells MW-1R, MW-4 and MW-7 for NYSDEC STARS List VOCs and SVOCs. In order to obtain representative samples, low-flow sampling techniques will be implemented. The groundwater sampling would be conducted semi-annually for two years, at which time the data will be evaluated and a determination made for terminating or continuing monitoring activities.

Assessment

This alternative would be protective of human health and the environment. Since these impacts do not provide a current exposure route with the exception of contact during any potential ground intrusive work. The SMP would provide the necessary controls to minimize potential future exposures and the institutional controls would provide the necessary mechanism to ensure proper notification to future owners.

Although active remediation is not proposed as part of this alternative, this alternative would provide for long-term management of this area. With the exception of possible decreases in the concentration of VOCs through natural attenuation processes, this alternative would not result in the immediate reduction of contaminant toxicity, mobility or volume; and, therefore would not be in compliance with chemical-specific RAOs. However, over time, it is anticipated that ground intrusive work that occurs in the area would facilitate removal of impacts.

There would be no increased short-term risks associated with the institutional action for this AOC since remedial activities are not implemented. This alternative should be effective in the long-term; however, this alternative may not be a permanent remedy.

Based on the findings of the studies performed to date, it is anticipated that this alternative may be acceptable to the community due to the planned commercial use of the Site.

The institutional action alternative for this AOC is feasible. The cost for this alternative is summarized below:

Estimated Cost of SMP with Institutional Controls ..... $ 9,460

Additional Soil Removal and Disposal

Description

Under this alternative, the soil left in-place would be removed and disposed of off-site in accordance with applicable regulations. In order to facilitate the soil removal work, underground utilities (including, but not limited to, water and gas) would have to be temporarily disconnected/rerouted and the sidewalk (and potentially the western lane of southbound State Route 15) would require temporary closure. Subsequent to removing soil from this area, the underground utilities would be reconnected, the excavation backfilled and the ROW restored. For the purpose of this evaluation, it is assumed that approximately 240 cubic yards of soil would require removal and disposal. The extent of the soil removal would include the area shown on Figure 2. As part of this alternative, three monitoring wells would be installed and sampled quarterly for one year to confirm the effectiveness of the removal work. [*Note: The previous soil removal removed the majority of the impacted soils including the worst-case soils from the immediate source area. Specifically, about 1,700 cubic yards were removed which equates to approximately 88% of the total cubic yards of impacts soils on-site (i.e., based on the estimated additional 240 cubic yards*. In addition, it is anticipated that this volume of soil removal represents more than 95% of the contaminant mass, since the worst-case/source area soils were removed.]

Assessment

This alternative should be protective of human health and the environment. Soil with contaminant concentrations above RAOs on-site would be removed and disposed of off-site. This removal should also reduce groundwater impacts in this area.

This alternative would result in the reduction of the toxicity, mobility, and volume of contaminants in the soil. Therefore, the area of soil removal would be in compliance with chemical-specific SCGs.

This alternative would increase short-term risks for the community and the workers implementing the alternative (i.e., utility damage, partially closing of the road and ROW, potential undermining of road, etc.). However, this alternative would be effective in the long-term. The soil removal and disposal alternative would be a permanent remedy.

Based on the findings of the studies performed to date, it is anticipated that the results of this alternative would be acceptable to the community; however, this alternative would impact the community during implementation (i.e., closing sidewalk, disruption of utility services, etc.).

Of the alternatives being considered, the soil removal and disposal alternative for this AOC is not practicable. Additionally, it is not common practice to excavate and disconnect utilities adjacent to a commercial street in a commercial area. The cost for this alternative is summarized below:

Estimated Cost of Additional Soil Removal and Disposal ..... $ 123,550

2.) ***AOC #2: Hydraulic Lift/Product Removal with SMP/Institutional Controls***

No Action

Description

Under this alternative the Hydraulic lifts and oil water separator area would remain as is and future Site use and development would not be limited. In addition, remedial and monitoring activities as well as placement of institutional controls at the Site would not be implemented.

Assessment

This alternative may not be protective of human health or the environment. Groundwater samples collected from this area were found to exceed RAOs.

With the exception of possible natural attenuation of VOCs and SVOCs, this alternative would not result in the reduction of contaminant toxicity, mobility or volume and therefore would not be in compliance with chemical-specific SCGs.

There would be no increased short-term risks associated with the no action alternative for the area around the hydraulic lifts and oil water separator since remedial activities are not implemented; however, this alternative may not be effective in the long-term and is not a permanent remedy.

Based on the findings of the studies performed to date it is anticipated that this alternative may be acceptable to the community.

Of the alternatives being considered, the no action alternative for this area of concern is not effective for the long-term and it does not reduce toxicity, mobility, or volume of petroleum related impacts to this AOC. The estimated cost for this alternative summarized below:

Estimated Cost of No Action ..... $ 0

Site Management Plan with Institutional Controls

Description

Under this restricted use alternative, institutional controls (e.g., deed restrictions, NYSDEC Environmental Easement, etc.) and development of an SMP including a HASP, would be implemented to minimize potential exposures and also control Site use. The SMP would include procedures for properly handling and disposing of impacted media (e.g., soil, etc.) in this area should it be disturbed in the future. In addition, long-term groundwater monitoring would be conducted in order to confirm impacts are not increasing at the 3875 Parcel. The groundwater monitoring would consist of sampling wells RIMW-3, MW-2 and MW-3R for NYSDEC STARS List VOCs and SVOCs and for the metal selenium. In order to obtain representative samples, low-flow sampling techniques will be implemented. The groundwater sampling would be conducted semi-annually for two years, at which time the data will be evaluated and a determination made for terminating or continuing monitoring activities.

Assessment

This alternative should minimize potential impacts to human health and the environment due to the hydraulic lifts/oil water separator area. Groundwater samples collected from this area exceed RAOs. This alternative would implement controls (institutional actions, SMP, etc.) in the event that ground intrusive work was conducted in this area during future use of the Site.

With the exception of possible decreases in the concentration of VOCs and SVOCs through natural attenuation processes or during future ground intrusive work in this area, this alternative would not result in the reduction of contaminant toxicity, mobility or volume; and, therefore would not be in compliance with chemical-specific SCGs.

There would be no increased short-term risks associated with the institutional action alternative for this AOC since remedial activities are not implemented. This alternative should be effective in the long-term; however, this alternative may not be a permanent remedy.

Based on the findings of the studies performed to date, it is anticipated that this alternative may be acceptable to the community due to the planned future commercial use of the Site.

Of the alternatives being considered, the institutional action alternative for this AOC may be feasible. The costs for this alternative are summarized below:

Estimated Cost of SMP with Institutional Controls ..... $ 9,460

Hydraulic Lift/Product Removal with SMP/Institutional Controls

Description

Under this alternative, the SMP and Institutional Controls discussed above (including long-term groundwater monitoring) would be implemented. In addition, the remaining hydraulic lifts (or portions remaining) in the 3875 Parcel building would be removed and any impacted materials encountered during removal would be removed at that time. This alternative would include collecting confirmatory soil samples in accordance with DER-10. In addition to the lift and soil removal, free product removal would also be conducted from the resulting excavation of two (2) of the lifts closest to MW-2 and MW-3R. The area of removal is shown on Figure 6. The free product removal work would likely include excavating the lift areas into the top of the water table (at least) 2-3 feet and installing a coarse stone and 4-inch recovery wells for free product to collect and as extraction points to remove accumulated product. Based on the limited amount of free product observed and the low-level dissolved phase constituents in this area, it is not anticipated long-term removal of product or groundwater would be necessary. Rather it is anticipated that up to three extraction events (via vacuum truck extraction) would be adequate to remove product. In the event that free product continues to accumulate into the wells, alternative methods could then be evaluated (e.g., a more permanent removal plan/system). For the purposes of the cost estimate, it is assumed that up to 9,000 gallons of liquid will be removed and disposed of as non-hazardous waste and up to 120 cubic yards of petroleum impacted soil can be placed in the biocell (depending on waste characterization testing results).

Assessment

This alternative should be protective of human health and the environment. Soil concentrations that exceed RAOs in the immediate areas of the lifts would be removed and disposed of off-site, or treated in the biocell. Groundwater and residual free product encountered will be removed as well, which should further reduce potential impacts to human health and the environment. In addition long-term monitoring of the residual groundwater impacts through the SMP will provide additional control at the Site.

This alternative would result in the reduction of the toxicity, mobility, and volume of contaminants in the soil and groundwater and as such, would be effective in the long term and result in the permanent removal of contaminants of concern.

There would be an increase in short-term risks associated with the soil removal work for this alternative; however, these risks could be managed through a HASP and a detailed remedial work plan.

It is anticipated that this alternative would be acceptable to the community and for the anticipated planned future use of the Site.

Of the alternatives being considered, the hydraulic lift/product removal action for this AOC is feasible. The cost for this alternative is summarized below:

Estimated Cost of Hydraulic Lift and Product Removal $63,760

3.) *AOC #3 – Potential Soil Vapor Intrusion Beneath Buildings*

No Action

Description

Under this alternative, no actions would be implemented to reduce the potential for sub-slab soil vapors to infiltrate into the indoor air of the building at the Site. The buildings would remain as is and future Site use and development would not be limited. In addition, remedial and monitoring activities as well as placement of institutional controls at the Site would not be implemented.

Assessment

This alternative may not be protective of human health or the environment. Sub-slab vapor samples, soil gas samples, and ambient air samples collected from the building areas indicated that there is a potential for sub-slab soil vapors to infiltrate into the indoor air.

With the exception of possible natural attenuation of VOCs, this alternative would not result in the reduction of contaminant toxicity, mobility or volume and therefore would not be in compliance with chemical-specific SCGs.

There would be no increased short-term risks associated with the no action alternative since remedial activities are not implemented. This alternative may not be effective in the long-term and is not a permanent remedy.

Based on the findings of the studies performed to date it is anticipated that this alternative may not be acceptable to the community.

Of the alternatives being considered, the no action alternative for this AOC is not effective for the long-term and it does not reduce toxicity, mobility, or volume of impacts to this AOC. The estimated cost for this alternative is summarized below:

Estimated Cost of No Action ..... $ 0

Sub-Slab Vapor Mitigation System and SMP

Description

Under this alternative, sub-slab vapor mitigation systems would be required for any occupied buildings on-Site to mitigate the potential for sub-slab soil vapors infiltrating into the indoor air. However, the automotive service areas will be exempt from this requirement (i.e., due to the nature of the work in these areas. For the purpose of this evaluation, it is assumed that the 3865 Parcel building will require one venting fan with two depressurization points while the 3875 Parcel building will require two venting fans. Figure 6 includes the potential vent fan locations. [*Note: Actual system design would be based on NYSDOH Guidance and the building foundation system.*] Subsequent to installation of the systems, a pressure field extension test will be completed in order to confirm that the entire building slab is being influenced by the systems (i.e., negative pressures). An SMP accompanied by a HASP would be utilized to provide information on the system and ensure the current and future

owners/building occupants understand the operation, maintenance and monitoring of the System. In addition, the deed restriction for the Site will indicate the requirement for sub-slab vapor mitigation for new structures at the Site.

Assessment

This alternative should be protective of human health and the environment inside the buildings by mitigating the potential for sub-slab vapor intrusion.

With the exception of possible natural attenuation of VOCs and the marginal removal of contaminants within the vented sub-slab soil vapor, this alternative would not result in the reduction of contaminant toxicity or volume. However, this alternative would remove contaminants in sub-slab vapor and discharge them to above the roofline. This alternative would be in compliance with the RAOs.

There would be minimal short-term risk associated with the sub-slab vapor mitigation system. This alternative would be effective in the long-term and with the SMP for continued maintenance would be a permanent remedy. The implementation of this alternative as well as the monitoring of this alternative is feasible and is quantitative and measurable.

Based on the findings of the studies performed to date it is anticipated that this alternative would be acceptable to the community.

Of the alternatives being considered, the sub-slab mitigation system and SMP alternative for this area of concern is effective for the long-term and is permanent when coupled with the SMP. The estimated cost for this alternative is summarized below:

Estimated Cost of Sub-Slab Vapor Mitigation..... $ 26,820

4.) AOC #4 – Biocell Soils

No Action

Description

Under this alternative no actions would be implemented to continue the maintenance and monitoring of the biocell soils.

Assessment

This alternative may not be protective of human health or the environment. The biocell soils are currently above the RAOs and if not maintained could impact the environment (i.e., cover deterioration and removal exposing soils to the environment).

With the exception of possible natural attenuation of VOCs, this alternative would not result in the timely reduction of contaminant toxicity, mobility or volume and therefore would not be in compliance with chemical-specific SCGs.

There may be increased short-term risks if the biocell is not monitored and maintained in the short-term. This alternative may not be effective in the long-term and is not a permanent remedy.

Based on the findings of the studies performed to date it is anticipated that this alternative would not be acceptable to the community.

Of the alternatives being considered, the no action alternative for this AOC is not effective for the long-term and would not be acceptable to the community. The estimated cost for this alternative summarized below:

Estimated Cost of No Action ..... $ 0

Biocell Maintenance and Monitoring

Description

Under this alternative, the biocell soils would be maintained/monitored as indicated in the IRM Work Plan. The specific activities to be completed would include routine monitoring of the integrity of the biocell cover and sump, periodic 'flipping'/tilling of the biocell soils and periodic sampling of the soils in order to evaluate the condition of the soils and when the soils could be spread. Subsequent to determining that the biocell soils have been adequately remediated, closure sampling would be conducted. At the time that satisfactory closure sample results are received, the biocell soils would be spread out and seeded.

Assessment

This alternative should be protective of human health and the environment. This alternative would significantly reduce the toxicity, mobility and volume of contaminants in the biocell soils.

There would be minimal short-term risk associated with the monitoring, maintenance and sampling activities; however, these risks could be managed by a HASP. This alternative would be effective in the long-term and would be a permanent remedy. The implementation of this alternative as well as the monitoring of this alternative is feasible and is quantitative and measurable.

Based on the findings of the studies performed to date it is anticipated that this alternative would be acceptable to the community.

The estimated cost for this alternative is summarized below:

Estimated Cost of Biocell Maintenance and Monitoring ..... $ 38,760

5.) AOC #5 – Elevated Metals in Surface Soils

No Action

Description

Under this alternative the elevated metals in surface soil on the 3865 Parcel would remain as is and future Site use and development would not be limited. In addition, remedial and monitoring activities as well as placement of institutional controls at the Site would not be implemented.

Assessment

This alternative may not be protective of human health or the environment. The surface soil sample collected from this area detected several heavy metals at concentrations that exceed the NYSDEC Part 375 Soil Cleanup Objectives and this area is a lawn area directly adjacent to the public ROW. Based on this and the possibility that this area could be disturbed in the future (via roadwork and/or underground utility work) there is a potential for human exposure to the impacts.

This alternative would not result in the reduction of contaminant toxicity, mobility or volume and therefore would not be in compliance with chemical-specific RAOs.

There would be no increased short-term risks associated with the no action alternative for the area along the ROW since remedial activities are not implemented; however, since the impacts are in the surface soils, there could be an exposure pathway with these impacts. This alternative may not be effective in the long-term and is not a permanent remedy.

Based on the findings of the studies performed to date it is anticipated that this alternative would not be acceptable to the community.

Of the alternatives being considered, the no action alternative for this AOC is not effective for the long-term and does not reduce toxicity, mobility, or volume of heavy metals in the area of SS-2. The estimated cost for this alternative is summarized below:

Estimated Cost of No Action ..... $ 0

Soil Removal

Description

Under this alternative, a soil removal of approximately 5-ft. by 5-ft. and 1-ft. deep would be conducted to remove soils with elevated metals concentrations. This volume equates to approximately 1 cubic yard of soil that would be transported off-site for disposal. Subsequent to conducting the soil removal, confirmatory soil samples would be collected. Based on the limited size/depth of the excavation, it is anticipated that one 2:1 composite sample and one grab sample would be adequate for evaluating the effectiveness of the soil removal work. The anticipated extent of the soil removal area is shown on Figure 2.

Assessment

This alternative should be protective of human health and the environment. Soil with contaminant concentrations above RAOs on-site would be removed and disposed of off-site.

This alternative would result in the reduction of the toxicity, mobility, and volume of contaminants in the soil. Therefore, the area of soil removal would be in compliance with chemical-specific SCGs.

This alternative would increase short-term risks for the community and the workers during the implementation of the alternative; however, proper work practices in accordance with a health and safety plan could minimize such risk. This alternative would be effective in the long-term. and would be a permanent remedy.

Based on the findings of the studies performed to date, it is anticipated that the results of this alternative would be acceptable to the community.

Of the alternatives being considered, the soil removal and disposal alternative for this AOC is preferred. The cost for this alternative is summarized below:

Estimated Cost of Additional Soil Removal and Disposal	$1,100

8.0 Comparative Evaluation of Alternatives and Recommended Actions

This section of the report compares the remedial alternatives proposed for each AOC and presents the recommended action for each AOC.

1.) AOC #1 – Soil Impact Along ROW:

- The no action alternative may not be protective of human health and the environment. While the no action alternative may be acceptable to the community, there is a potential that future ground intrusive activities in this area will encounter these impacts, which indicates a level of risk in relation to exposure to workers in the area.
- The SMP with institutional controls is anticipated to be acceptable to the community. This alternative would manage the risk realized during future ground intrusive work in this area and over time will likely remediate this area as it is accessed in the future. In addition, the long-term groundwater monitoring would further add control and confirm that groundwater impacts are not increasing.
- The additional soil removal and disposal alternative would be a long-term and permanent remedy; however, the estimated cost and potential impacts to the community do not appear to justify the benefits of soil removal in this area. This is based on the fact that a majority of the impacts (about 88% of the total cubic yards) were removed from this AOC as part of the IRM, there are no current exposure routes identified and this alternative would require significant disturbances to the community. As such, this remedial alternative is not considered practicable.

The recommended remedial action for AOC #1 is the SMP with institutional controls.

2.) AOC #2: Hydraulic Lifts/Former Oil-Water Separator (3875 Parcel) and Residual Site-Wide Groundwater:

- The no action alternative may not be protective of human health or the environment. In addition, the no action alternative may not be acceptable to the community or in-conjunction with redevelopment of the Site.
- The SMP with institutional controls may be acceptable to the community and facilitate proper redevelopment of the Site should this area be disturbed in the future. In addition, the long-term groundwater monitoring would add control and confirm that groundwater impacts are not increasing. However, this remedial alternative does not allow for the reduction of toxicity, mobility or volume of impacted media associated with this AOC.
- The hydraulic lift/product removal with SMP/Institutional Controls alternative is a feasible, long-term solution to free product in this area and should reduce groundwater impacts as well. Furthermore, removal of the lifts, impacted soil, and product will eliminate sources of impacts to groundwater and allow residual impacts to attenuate over time, which would be monitored for up to two years as part of the SMP.

The recommended remedial action for AOC #2 is the hydraulic lift and product removal.

3.) AOC #3 – Potential Soil Vapor Intrusion Beneath Buildings:

- The no action alternative may not be protective of human health (e.g., within the buildings) or the environment. In addition, the no action alternative may not be acceptable to the community and could limit the redevelopment of the Site.
- The sub-slab vapor mitigation system and SMP is a long-term alternative that protects human health and the environment within the buildings. It is anticipated that this alternative would be acceptable to the community and is practicable.

The recommended remedial action for AOC #3 is the sub-slab vapor mitigation systems and SMP.

4.) AOC #4 – Biocell Soils:

- The no action alternative may not be protective of human health or the environment. In addition, the no action alternative may not be acceptable to the community.
- The maintenance, monitoring and sampling of the biocell is an effective alternative in the long-term and is permanent. While there are some short-term risks, these can be managed with the HASP developed previously for this Site. It is anticipated that this alternative would be acceptable to the community and is practicable.

The recommended remedial action for AOC #4 is the maintenance, monitoring and sampling of the biocell.

5.) AOC #5 – Elevated Metals in Surface Soil

- The no action alternative may not be protective of human health and the environment. In addition, the location of the impacted soils (surface and adjacent to sidewalk) allows for potential exposure issues.
- The soil removal and disposal alternative would be a long-term and permanent remedy. While some increased risk is realized during the remedial action, these risks can be minimized through proper work practices and a HASP. It is anticipated that this alternative would be acceptable to the community.

The recommended remedial action for AOC #5 is soil removal and disposal.

9.0 Summary of Recommended Final Remedial Actions

Based on the above recommendations, this section summarizes the overall final remedial strategy for the Site (including the biocell soils).

Subsequent to NYSDEC approval and completing the removal of the hydraulic lifts/product and installation of the sub-slab vapor mitigation fans/confirmation testing, a Final Engineering Report would be submitted with an SMP.

The estimated cost and the next actions to complete the work are shown below.

Area of Concern	Recommended Action	Estimated Cost
AOC #1 (Petroleum Impacts Left In-Place)	SMP/Institutional Controls	$9,460
AOC #2 (Hydraulic Lifts and Product)	Lift and Product Removal with SMP/Institutional Controls	$63,760
AOC #3 (Sub-Slab Soil Vapor)	Mitigation System	$26,820
AOC #4 (Biocell Soils)	Maintenance and Monitoring	$38,760
AOC #5 (Elevated Metals in Surface Soil)	**Soil Removal and Disposal**	**$1,100**
Total	**N/A**	**$134,400***

** The total cost has been reduced to remove repetitive items such as SMP and environmental easements. In addition the above costs do not include implementation of the SMP (e.g., groundwater monitoring).*

10.0 Remedial Action Work Plan

This section presents the Remedial Action Work Plan for the recommended actions for the Site. The development of this RAWP is in accordance with Brownfield Cleanup Program Guide dated May 2004. The following sub-sections present the methods for implementation of the RAWP.

1.) Site Management Plan/Institutional Controls

A Site Management Plan (SMP) coupled with Institutional Controls will be developed for the entire Site, including all areas of concern. The intent of this document will be to manage any impacts remaining at the Site at levels above RAOs. This document will be developed and submitted for regulatory approval subsequent to completing the active remedial work identified for the other AOCs (i.e., hydraulic lift/product removal and sub-slab mitigation system installation). The SMP will include the following:

- Identify specific areas of residual impacted soil and groundwater that remain on-site (based on the RI, IRM and remedial data) and illustrate these areas on mapping.
- A Soils Management Plan that identifies proper handling, characterization, transportation and disposal requirements for the various impacted material should such material be encountered during any site redevelopment or future construction activities (e.g., underground utility work). This portion of the SMP will include (but not limited to) handling of the impacts left in-place along the eastern property boundary of the Site.
- Identify the recommendations for vapor mitigation (i.e., sub-slab depressurization) for occupied portions of buildings at the Site (including current and future occupied buildings at both parcels). This will include general design requirements for the systems based on the recommendations in the NYSDOH Guidance.
- Indicate that groundwater cannot be used as a source of drinking water or extracted for any reason without prior approval from regulatory agencies.
- An Operation Maintenance and Monitoring (OM&M) Plan for the Site that includes the requirements for long-term groundwater monitoring, sub-slab depressurization system monitoring and the biocell. [Note: These requirements are provided below.]
- Indicate that an annual certification be submitted to NYSDEC certifying that the requirements of the SMP were adhered to.
- Indicate that the above Site use and groundwater use restrictions are part of an environmental easement and will include a copy of the easement.
- The long-term groundwater monitoring for the Site (both parcels) will be initiated subsequent to completing the lift/product removal work (see below). The long-term groundwater monitoring will be completed in general accordance with American Society of Testing and Materials (ASTM) Standard D6771-02 (Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations). Low-flow sampling will be used in order to obtain representative samples of groundwater. The following wells will be included in the monitoring program and sampled for the following parameters:
  - 3865 Parcel: MW-1R, MW-4, and MW-7 – analyzed for NYSDEC STARS-List VOCs and SVOCs using USEPA Methods 8260 and 8270, respectively.
  - 3875 Parcel: RIMW-3, MW-2, and MW-3R – analyzed for NYSDEC STARS-List VOCs and SVOCs using USEPA Methods 8260 and 8270, respectively and for selenium using USEPA Method 6010.

The analytical testing will be completed by a NYSDOH ELAP certified laboratory for the parameters tested. The results will be provided in ASP Category B Deliverables and a DUSR will be conducted on the laboratory data to confirm it is valid. Subsequent to each sampling event a letter report will be submitted to NYSDEC which will include the laboratory data and a groundwater contour map. The monitoring will be conducted semi-annually for a period of two years, at which time the cumulative results will be evaluated and discussed with NYSDEC in order to determine if monitoring can be terminated or should be continued. [*Note: It is anticipated that in the event concentrations of constituents in groundwater are stable or decreasing then additional monitoring would not be required.*]

The SMP and environmental easements to be recorded with the Town Clerk will be provided to NYSDEC prior to finalizing/recording these documents.

2.) Hydraulic Lift/Product Recovery

The hydraulic lifts will be removed and any impacted soil in the vicinity of each lift will be removed and disposed of. Additionally, two (2) recovery wells will be installed into two of the lifts located on either side of MW-2 in order to recover free petroleum product from this area and any potential source area groundwater impacts. In addition, a recovery well will be installed in proximity to MW-3 on the exterior of the building in order to recover free petroleum product and potential source area groundwater from this area. The following presents further details on implementation of this remedial action.

- **Removal of Hydraulic Lifts and Soil Excavation:** The four (4) existing lifts and one partially removed lift will be removed as part of this work. In addition, the previously removed two (2) lifts will be excavated in order to evaluate the underlying soils for impacts. This work will be completed by initially removing hydraulic oils and the accessible portions of the existing lifts including the cylinders. Hydraulic oils that are removed will be containerized and transported off-site for recycling and/or disposal. If necessary, the required waste characterization testing for recycling or disposal will be completed.

  Subsequent to removing the oils and accessible mechanical equipment, an approximate 5-ft. by 10-ft. area around each lift will be saw-cut and the concrete removed. The remaining subsurface portions of the lifts will be removed and the exposed soils will be evaluated by an Environmental Geologist for odors, staining and/or photo-ionization detector (PID) readings, collectively referred to as "evidence of impairment". Soils exhibiting odors, staining or PID readings greater than 25 parts per million (ppm) will be removed to the extent practicable. Based on the RI work completed, it is not anticipated that significant impairment will be encountered and that soil removal will be limited in extent. Currently, it is anticipated that approximately 120 cubic yards of soil will be excavated and removed. The excavated soils will be stockpiled on-site and characterized by analysis for USEPA TCL and NYSDEC STARS-List VOCs using USEPA Method 8260B and USEPA TCL SVOCs using USEPA Method 8270C. Depending on the results of this testing, these soils may be transported to the biocell for remediation or transported to a NYSDEC Part 360 permitted facility for disposal. Prior to final disposition of the soil, NYSDEC will be contacted for approval.

Crushed stone will be used to backfill the excavations to grade, with the exception of two of the excavations which will be used for product recovery (see below). Prior to backfilling each excavation, confirmatory soil sampling will be completed for each excavation in accordance with NYSDEC DER-10. Based on the anticipated excavation perimeters (about 30-ft. each), 1 sidewall and one bottom sample are anticipated to be collected from each excavation. In the event that groundwater enters the excavation, the bottom sample will be collected from the worst-case sidewall (based on PID readings) at the groundwater interface. The samples will be will be analyzed for USEPA TCL and NYSDEC STARS-List VOCs using USEPA Method 8260B and USEPA TCL SVOCs using USEPA Method 8270C. The analytical testing will be completed by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for the parameters tested. The results will be provided in Analytical Services Protocol (ASP) Category B Deliverables and a Data Usability Study Report (DUSR) will be conducted on the laboratory data to confirm it is valid.

- **Recovery Well Installation:** Three (3) 4-inch polyvinyl chloride (PVC) recovery wells will be installed. Two (2) of these wells will be installed inside the building into the backfill of two of the hydraulic lift removal locations and one (1) well will be installed outside the building near the oil/water separator (refer to Figure 6 for locations). The wells will be constructed with 5 to 10-ft. of 0.10 slot well screen (depending on excavation depths and observed groundwater table depths).

  The wells installed in the lift removal areas, will be backfilled around the screen area and at least 1-ft. above the well screens with a #2 washed stone. The #2 washed stone will allow for ample void space in order to collect groundwater and potentially free petroleum product. The remaining portions of the excavation above the #2 washed stone will be backfilled with crusher run stone to grade. The well screens will be connected to solid riser piping which will be left approximately 1 to 2 ft. above grade and capped with a "J-Plug". Since this building is not planned to be occupied during the remedial work, the interior wells will not be finished with flush mount well casings. A figure detailing the well construction is shown as Figure 7.

  The exterior recovery well will be installed using a rotary drill rig. Initially, a borehole will be advanced using 6¼-inch hollow stem augers (HSAs) to approximately 10-ft. below the ground surface. A 4-inch PVC 0.10-slot well screen will be placed into the resulting borehole. The well screen will be 5-ft. to 10-ft. in length (depending on the depth of the groundwater table at that time) and connected to solid PVC riser pipe to grade. An appropriate sand pack will be placed in the annulus around the well screen to at least 1-ft. above the well screen and a 2-ft. thick bentonite seal will be placed above the sand pack. The remaining annulus space will be grouted with a cement/bentonite grout to grade and the well will be finished at grade with a flush mount well casing. A figure detailing the well construction is shown as Figure 7.

- **Product Recovery:** Subsequent to installation of the recovery wells, the wells will be evaluated for free product by gauging with an oil/water interface probe. In the event that measurable free product is observed in any of the wells, a vacuum truck will be mobilized to the Site and free product recovery will be initiated. Free product recovery will consist of connecting the vacuum truck extraction hosing to a well head. Free product and groundwater will then be removed until the well is dry or until the vacuum truck is full. The extraction will be conducted on any of the wells exhibiting measurable product. The extracted product/groundwater will be transported off-site for recycling or disposal at a NYSDEC Part 360 permitted facility. Approximately 2 weeks after an extraction event, the wells will be gauged for measurable product in order to evaluate the effectiveness of the removal work. In the event that measurable product continues to accumulate, additional extraction events will be conducted. In the event that measurable product is not observed, the wells will be monitored monthly for a period of up to 1 year. Subsequent to three consecutive monthly events identifying no measurable product, then groundwater samples will be collected from the product recovery wells. The groundwater samples will be analyzed for USEPA TCL and NYSDEC STARS-List VOCs using USEPA Method 8260B and NYSDEC STARS-List SVOCs using USEPA Method 8270C._The groundwater monitoring will be completed in general accordance with American Society of Testing and Materials (ASTM) Standard D6771-02 (Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations). Low-flow sampling will be used in order to obtain representative samples of groundwater.

3.) Sub-Slab Depressurization Systems

Since the use of the 3875 Parcel is unknown and it is possible that the 3875 parcel building may be demolished and a new structure constructed, at this time sub-slab depressurization of this building will not be conducted. However, in the event that this building will be refurbished and occupied or if a new building is constructed, regulatory agencies will be notified and a sub-slab depressurization system will be designed and installed prior to the occupancy of the structure. As indicated in the SMP description above, this requirement will be included in the SMP and the environmental easement, which will ensure that this is conducted. Furthermore, the annual certification would include such language that would verify any newly constructed/occupied building would account for vapor mitigation.

The 3865 Parcel is currently occupied and will be used as an active facility, a sub-slab depressurization system will be installed to mitigate the potential for sub-slab vapor intrusion. [Note: Although a sub-slab depressurization system is recommended, it should be noted that the Remedial Investigation sub-slab soil vapor and indoor air sampling did not identify any compounds in exceedence of the current NYSDOH established guidance values (i.e., decision matrices).] Prior to installation of the system the integrity of the floor throughout the building will be evaluated. Areas where cracks are observed in the floor slab will be sealed with backer rod/urethane caulk. The installation of the system will be conducted as follows:

- Initially, one (1) sub-slab vapor mitigation system will be installed in the northern portion of the building, in a closet area (i.e. in order to be relatively inaccessible and protected). The system will be installed by coring an approximate 5-inch hole through the floor slab and removing the core. Subsequently, the accessible sub-slab material will be removed (i.e., stone sub-base and native soils). The resulting void space will be filled with a screen section that will be used to keep the void space open and keep solids from clogging the piping. An approximate 3-inch PVC pipe will be inserted into the corehole and sealed to the floor. The piping will be run up through the 'drop-ceiling' and through the nearest exterior wall or the roof where it will then be connected to an in-line fan (110-volt fan capable of 4-inches of water column). . The in-line fan will be connected to the piping in order to create a negative pressure beneath the building slab. The fan and exhaust point will be located above the roofline (i.e., exterior of the building) and at least 25-ft. from any air intake points and will be finished with a raincap or 'goose-neck'. In addition, an in-line manometer will be connected to the intake piping beneath the vent fan. The in-line manometer will be used to confirm that the system is operational. A label indicating ("Sub-Slab Depressurization System" will be affixed to the piping in proximity to the manometer. An alarm light will also be installed with the system (on a separate circuit) so that in the event the fan fails, the light will go on to notify the occupants that the system requires maintenance. Figure 8 provides details on the installation of the sub-slab depressurization system and monitoring points.

- Subsequent to installation and startup of the vent fan, monitoring points will be advanced at four locations in the building in order to evaluate the effectiveness of the depressurization system (i.e., communication testing). The monitoring points will be installed by coring an approximate ½-inch hole through the floor slab. The resulting core-hole will be used to insert tubing connected to a manometer and temporarily sealing between the monitoring point and the tubing. The manometer will be capable of measuring pressure differentials of at least 0.01-inches of water column. Currently it is anticipated that a TSI VelociCalc Plus (Model #8386) manometer (or equivalent) will be used. The system will be deemed effective in any areas that a measurable negative pressure is observed (i.e., negative 0.01-inches of water column or greater). This reading will require to be sustained for 30-seconds with no movement of the measuring device (i.e., insert tubing into the monitoring point and seal it then leave the manometer stationary for at least 30-seconds). In the event that a monitoring point does not observe a measurable negative pressure, then additional venting systems will be installed until a negative pressure is observed beneath the entire floor slab. NYSDEC and NYSDOH will be contacted as the data is obtained and included in the decision making process on the requirement for and location of additional systems. This potentially iterative approach appears well suited based on the lack of available information on the construction of the building slabs and footers. Furthermore, unknowns within the subsurface soils and fill beneath the buildings warrants such an iterative approach.

- Subsequent to obtaining an adequate negative pressure beneath the entire floor slab, the system will be monitored after 1-month, 3-months and 6-months by obtaining pressure readings on the sub-slab monitoring points. Subsequent to confirming the system is effective for 6-months, then the system monitoring will be reduced to annually confirming that the fan is operational by observing the in-line manometer has a negative pressure (i.e. no further sub-slab monitoring). Since the Remedial Investigation sub-slab soil vapor and indoor air sampling did not identify any compounds in exceedence of the current NYSDOH established guidance values, post sub-slab depressurization sampling does not appear warranted.

- The sub-slab depressurization system will be designed with oversight from a Professional Engineer and the Final Engineering Report (FER) will include an as-built drawing certified (stamped) by the Professional Engineer. In addition, the SSD system will be installed by a National Environmental Health Association certified radon mitigation contractor. The intent of the sub-slab depressurization system will be to minimize health, safety or environmental hazards to building occupants.

4.) Biocell Maintenance/Monitoring

The maintenance of the biocell soils will consist of routine 'flipping' and/or tilling of the biocell soils. The flipping/tilling of the soils will be conducted at least twice per year. The flipping is anticipated to be conducted in the Spring (around late April) and Summer (around late July) in order to aerate the soils and mix in fertilizer and straw in order to promote biodegradation of the contaminants. These timeframes have been chosen in order to promote the biodegradation and aerate/fertilize the soils during the most effective times of the year (i.e. during the summer and fall).

During flipping/tilling events the biocell soils will be monitored by an Environmental Geologist for evidence of impairment. The field observations (specifically PID readings) will be documented in order to evaluate the progress of the remediation. In addition to the field observations, annually 2 composite and 4 grab samples will be collected and analyzed for NYSDEC STARS-List VOCs using USEPA Method 8260. [*Note: Based on the extensive RI testing, the contaminants of concern are gasoline related VOCs and as such, additional parameters are not warranted.*] These annual samples will be collected from the worst-case locations as identified by the highest PID readings. Subsequent to the biocell soils apparently being adequately remediated (defined as PID readings less than 50 ppm), close-out sampling will be conducted. The closeout sampling will consist of collecting 9 grab samples and 3 composite samples from the biocell soils. [*Note: This amount of sampling equates to one grab sample for approximately every 200 cubic yards and one composite sample for every 600-cubic yards.*] The results of the biocells soil sampling will be compared to NYSDEC TAGM 4046 RSCOs and provided to the NYSDEC. In the event that that the contaminant concentrations are at or below the TAGM 4046 RSCOs, the biocell soils will be spread out at their current location and seeded (subsequent to NYSDEC concurrence).

5.) Elevated Metals in Surface Soils

The shallow soil in the area of SS-2 on the 3865 Parcel will be removed in order to address the apparent limited metals impacts in this area. The soil removal will include excavating a 5-ft. by 5-ft. area to approximately 1-ft. in depth. The removed soil will be containerized, characterized (if necessary) and transported off-site for disposal at an approved NYSDEC Part 360 landfill. Prior to backfilling the area, one composite (2:1) and one grab sample will be collected from the excavation bottom. [*Note: Based on the shallow depth of removal, it does not appear that sidewall samples would be appropriate.*] The confirmatory soil samples will be analyzed for barium and arsenic using USEPA Method 6010.

Health and Safety Plan and Community Air Monitoring Plan

The remedial work will be conducted under the existing Health and Safety Plan (HASP) for the Site, which was implemented as part of the RI work. In addition, the NYSDOH Generic Community Air Monitoring Plan (CAMP) will also be implemented during all remedial work at the Site.

Final Engineering Report

A Final Engineering Report (FER) documenting the active remedial work conducted will be developed and submitted to NYSDEC subsequent to completing the hydraulic lift/product removal work and the sub-slab depressurization system installation/monitoring activities. The FER will include the laboratory data, DUSRs, and other monitoring data. The FER will include as an Appendix the SMP for managing the Site.

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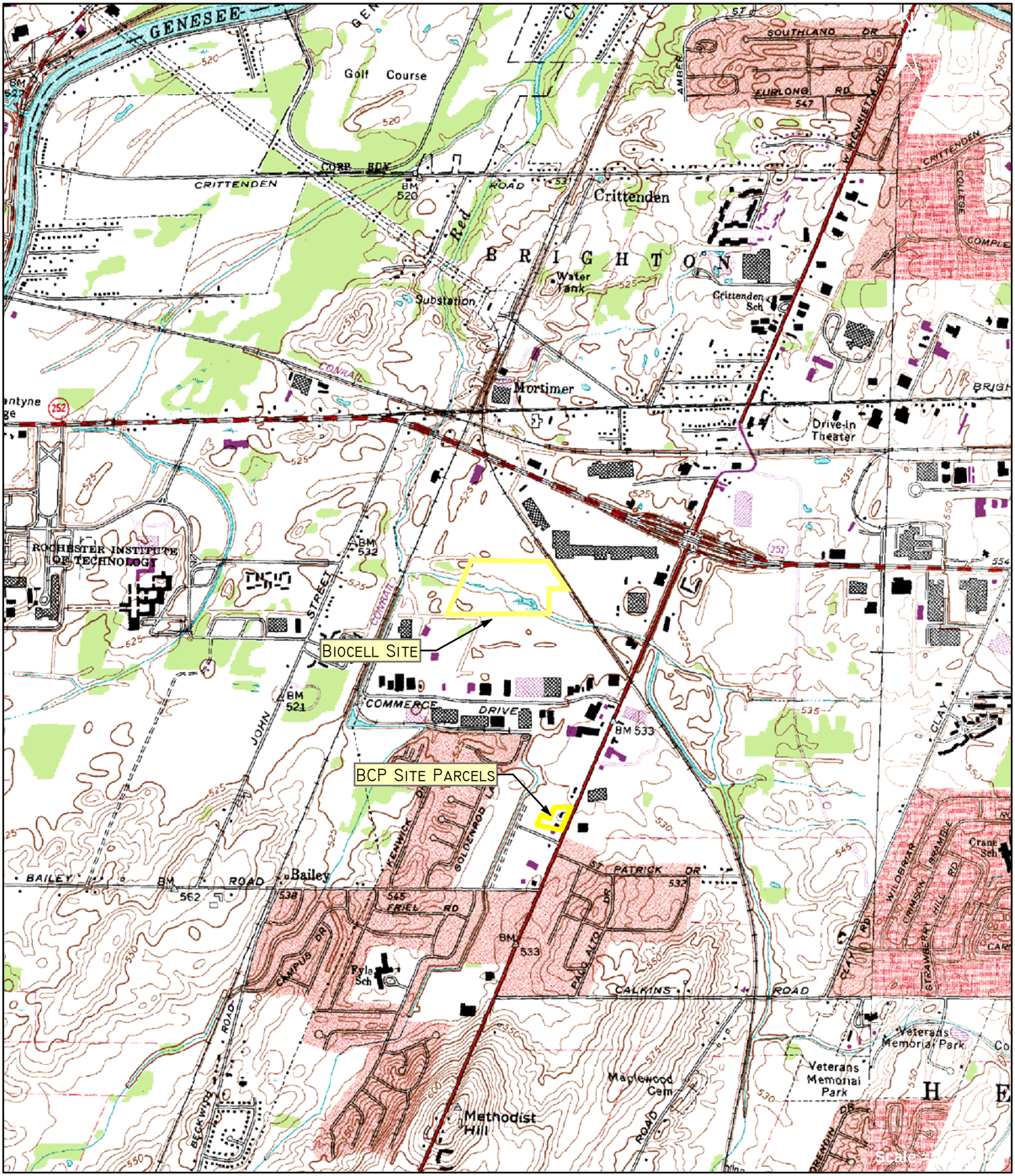
Figures



PROJECT/DRAWING NUMBER

206139.03

FIGURE 1

DRAWING TITLE

SITE LOCATION MAP

ISSUED FOR: REVIEW

DESIGNED BY: RCN

DRAWN BY: RCN

REVIEWED BY: DPN

DATE: NOVEMBER, 2007

S:\GIS\PROJECTS\3865 W Henrietta Rd\RAA\FIG 1.mxd

PROJECT/CLIENT

REMEDIAL ALTERNATIVES ANALYSIS & REMEDIAL ACTION WORK PLAN REPORT

BCP SITE #C8281324
3865 WEST HENRIETTA RD
ROCHESTER, NY 14623

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PROJECT/CLIENT

BROWNFIELD CLEANUP PROGRAM
REMEDIAL ALTERNATIVES ANALYSIS & REMEDIAL ACTION WORK PLAN REPORT
BCP Site # C828134

3865 & 3875 WEST HENRIETTA RD
ROCHESTER, NY 14623

DRAWING TITLE

SITE PLAN WITH AREAS OF CONCERN

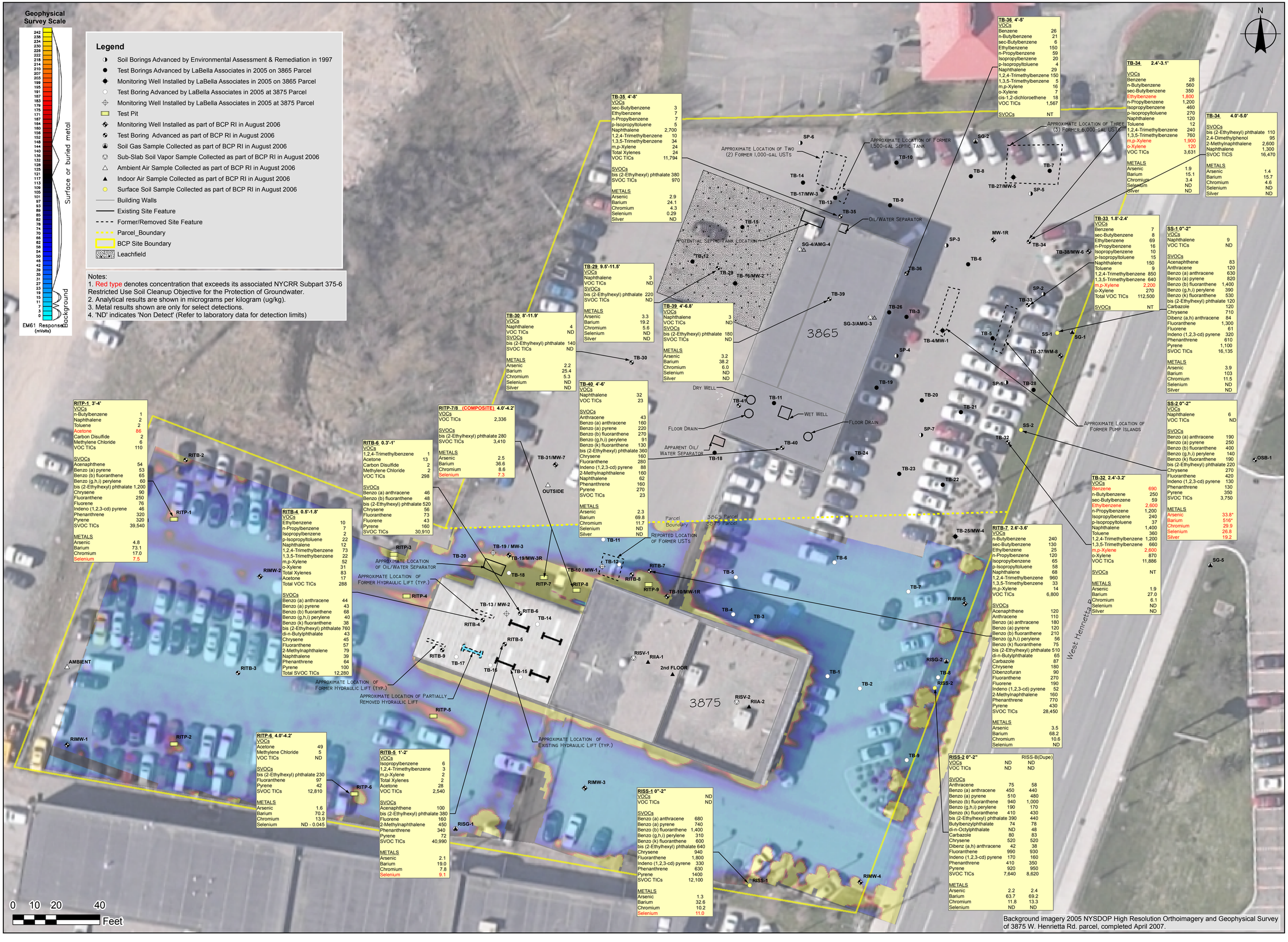
ISSUED FOR: FINAL
DESIGNED BY: RCN
DRAWN BY: RCN
REVIEWED BY: DPN
DATE: 2/26/2009

S:\GIS\PROJECTS\3865 W Henrietta Rd\RAAP\FIG 2.mxd

PROJECT/DRAWING NUMBER

206139.03

FIGURE 2



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REMEDIAL ALTERNATIVES ANALYSIS AND REMEDIAL ACTION WORK PLAN REPORT
BCP Site # C828134
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DRAWING TITLE
REMEDIAL INVESTIGATION SOIL SAMPLING RESULTS

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FILE: \\mrppee1\Share\GIS\PROJECTS\3865 W Henrietta Rd\RAA \FIG 3.mxd
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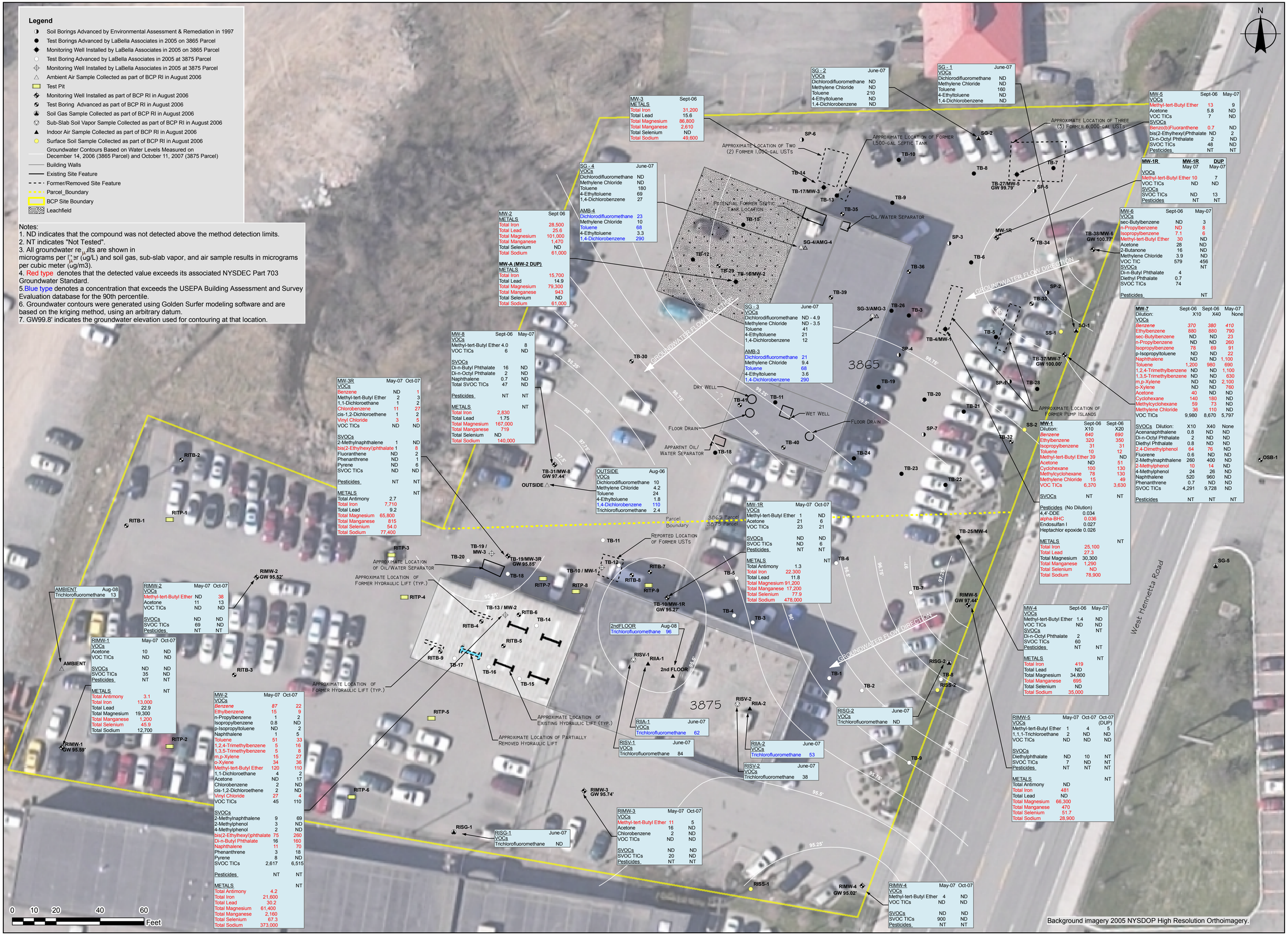
FIGURE 3



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BROWNFIELD CLEANUP PROGRAM
REMEDIAL ALTERNATIVES
ANALYSIS AND REMEDIAL
ACTION WORK PLAN REPORT
BCP Site # C828134
3865 & 3875 WEST HENRIETTA RD
ROCHESTER, NY 14623

DRAWING TITLE
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS, CONTOURS, AND VAPOR INTRUSION TESTING

ISSUED FOR: FINAL
DESIGNED BY: RCN
DRAWN BY: RCN
REVIEWED BY: DPN
DATE: 2/26/2009
FILE: I:\mmpet\Shared\GIS\PROJECTS\3865 W Henrietta Rd\RAA #3\14 02-12-09.mxd
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FIGURE 4

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REMEDIAL ALTERNATIVES ANALYSIS AND REMEDIAL ACTION WORK PLAN REPORT
BCP Site # C828134
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DRAWING TITLE
EXTENT OF PETROLEUM REMEDIAL MEASURES

ISSUED FOR: FINAL
DESIGNED BY: RCN
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REVIEWED BY: DPN
DATE: 2/26/2009
FILE: \\mpepe\1Share\GIS\PROJECTS\3865 W Henrietta Rd\FRAA \FIG 5.mxd
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FIGURE 5

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BROWNFIELD CLEANUP PROGRAM
REMEDIAL ALTERNATIVES ANALYSIS AND REMEDIAL ACTION WORK PLAN REPORT
BCP Site # C828134

3865 & 3875 WEST HENRIETTA RD
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DRAWING TITLE

REMEDIAL ALTERNATIVES LOCATIONS

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FILE: I:\Images1\Share\GIS\PROJECTS\3865 W Henrietta Rd\RAA IFIG 6.mxd
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FIGURE 6

FIGURE 7

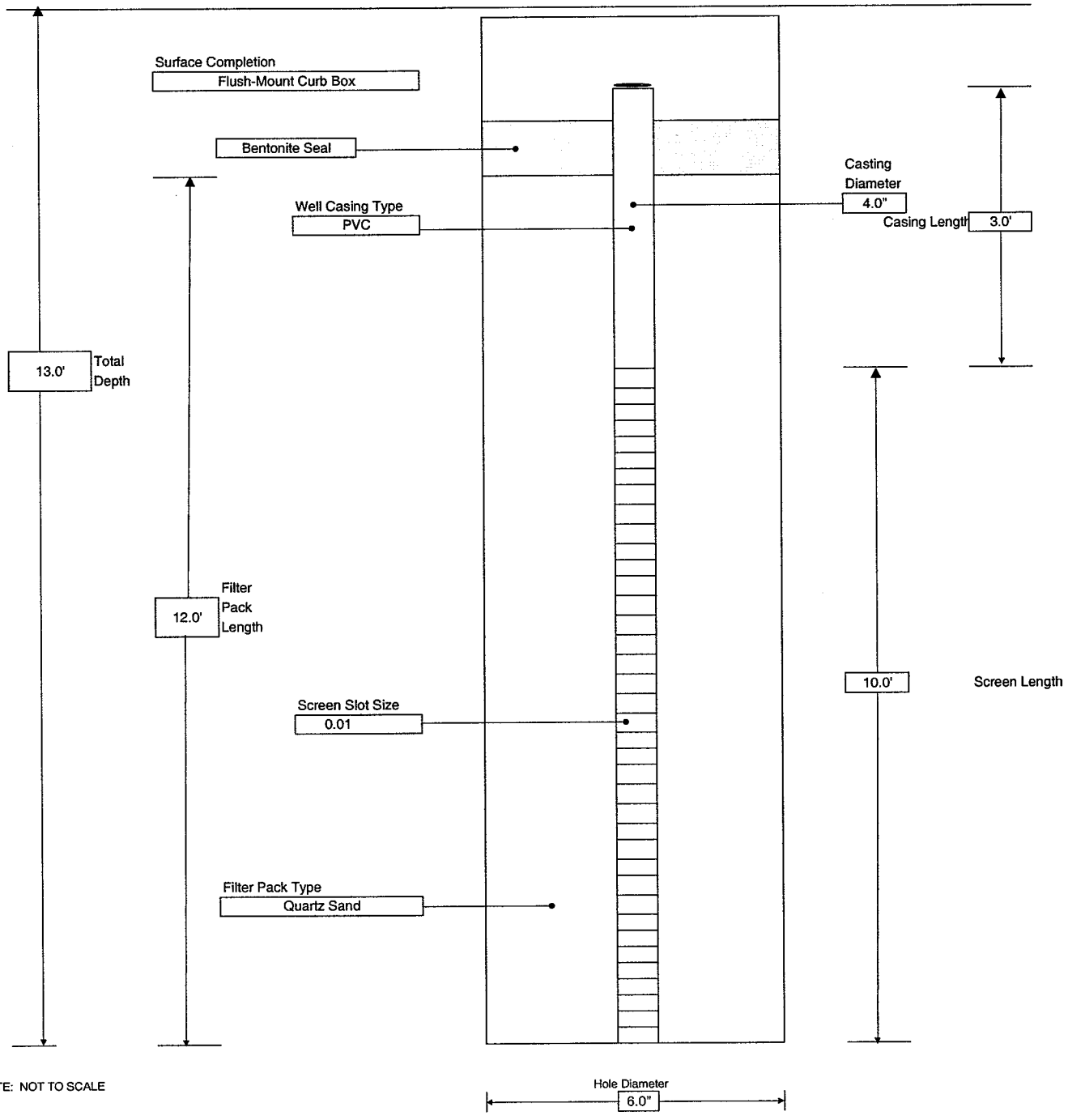
LABELLA Associates, P.C. 300 STATE STREET, ROCHESTER, NEW YORK ENVIRONMENTAL ENGINEERING CONSULTANTS	PROJECT Dorschel 3865 & 3875 West Henrietta Road Rochester, New York	BORING: Recovery Well Diagram SHEET 1 OF 1 JOB # 206139.03 CHKD. BY: E. Dumrese

CONTRACTOR: To Be Determined
DRILLER: To Be Determined
LABELLA REPRESENTATIVE: To Be Determined
BORING LOCATION: Recover Well
GROUND SURFACE ELEVATION: N/A DATUM: N/A
START DATE: N/A END DATE: N/A

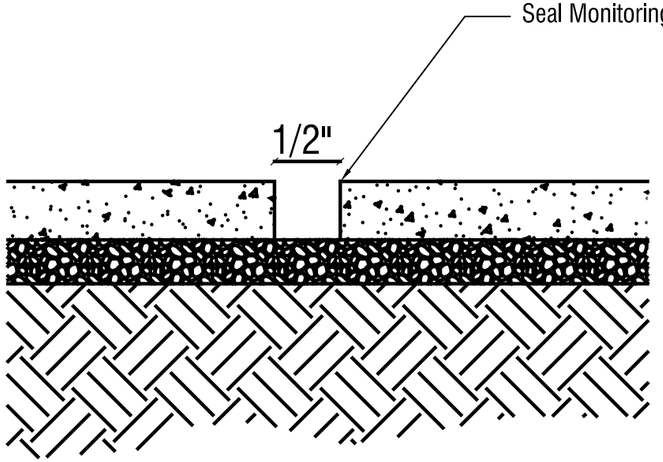
TYPE OF DRILL RIG: To Be Determined
AUGER SIZE AND TYPE: N/A
OVERBURDEN SAMPLING METHOD: To Be Determined
ROCK DRILLING METHOD: N/A

WATER LEVEL DATA

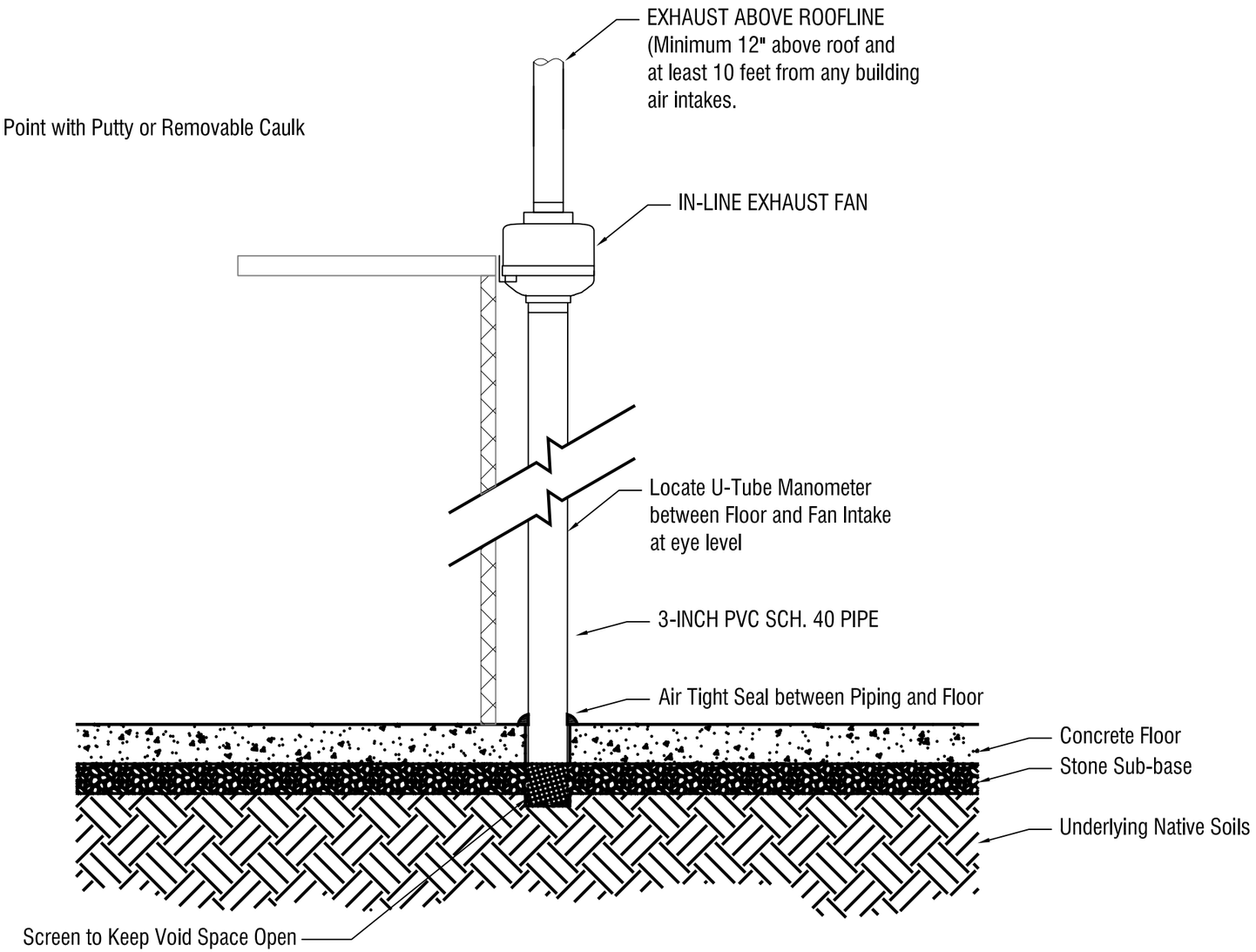
DATE	TIME	WATER	CASING	REMARKS



NOTE: NOT TO SCALE



Typical Sub-Slab Monitoring Point
(Not to Scale)



Typical Sub-Slab Venting System
(Not to Scale)

Notes:
1. In-Line Exhaust Fan to be 110-volts, capable of 4-inches WC.
2. Exhaust Fan to be installed above roofline.
3. Exhaust Fan to be equipped with a Motor Failure Alarm on a separate circuit.

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REMEDIAL ACTION WORK PLAN REPORT
BCP Site # C828134
3865 & 3875 WEST HENRIETTA RD
ROCHESTER, NY 14623

DRAWING TITLE
SUBSLAB DEPRESSURIZATIOIN DETAILS

DESIGNED BY: RCN
DRAWN BY: RCN
REVIEWED BY: DPM
ISSUED FOR: FINAL
DATE: FEB 2009

PROJECT/DRAWING NUMBER
206139.03

FIGURE 8

S:\GIS\PROJECTS\3865 W Henrietta Rd\RAA\FIG 8.dwg

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300 State Street
Rochester, New York 14614

Appendix 1

Tables

TABLE 1

3865 & 3875 West Henrietta Road
Rochester, New York

ESTIMATE OF COST FOR REMEDIAL ALTERNATIVES

Area of Concern One: Soil Impact Along Right-Of-Way						
Alternative	**Subcontractor Cost**	**Laboratory Analytical Cost**	**Professional Services Cost**	**Estimated Regulatory Fees**	**Contingency**	**Estimated Cost**
No Action	$0	$0	$0	$0	$0	$0
EMP with Institutional Controls	$0	$0	$4,500	$3,380	$1,580	$9,460
Additional Soil Removal and Disposal	$52,930	$3,830	$26,400	$19,800	$20,590	$123,550

Area of Concern Two: Hydraulic Lifts and Oil Water Separator Area						
Alternative	**Subcontractor Cost**	**Laboratory Analytical Cost**	**Professional Services Cost**	**Estimated Regulatory Fees**	**Contingency**	**Estimated Cost**
No Action	$0	$0	$0	$0	$0	$0
EMP with Institutional Controls	$0	$0	$4,500	$3,380	$1,580	$9,460
Hydraulic Lift Removal and Trenching	$27,940	$5,500	$11,250	$8,440	$10,630	$63,760

Area of Concern Three: Potential Soil Vapor Intrusion Beneath Buildings						
Alternative	**Subcontractor Cost**	**Laboratory Analytical Cost**	**Professional Services Cost**	**Estimated Regulatory Fees**	**Contingency**	**Estimated Cost**
No Action	$0	$0	$0	$0	$0	$0
Sub-Slab Vapor Mitigation System and EMP	$8,700	$0	$7,800	$5,850	$4,470	$26,820

Area of Concern Four: Biocell Soils						
Alternative	**Subcontractor Cost**	**Laboratory Analytical Cost**	**Professional Services Cost**	**Estimated Regulatory Fees**	**Contingency**	**Estimated Cost**
No Action	$0	$0	$0	$0	$0	$0
Maintenance and Monitoring	$12,000	$2,800	$10,000	$7,500	$6,460	$38,760

Area of Concern Five: Elevated Metals in Surface Soils						
Alternative	**Subcontractor Cost**	**Laboratory Analytical Cost**	**Professional Services Cost**	**Estimated Regulatory Fees**	**Contingency**	**Estimated Cost**
No Action	$0	$0	$0	$0	$0	$0
Soil Removal	$550	$100	$150	$115	$185	$1,100

TABLE 2

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 1: Soil Impact Along Right-Of-Way
Alternative: EMP with Institutional Controls

Professional Costs		
Environmental Easement	$	1,000
Site Management Plan (including Health and Safety Plan)	$	3,500
Total Professional Costs	**$**	**4,500**
Estimated Regulatory Fees (75% of Professional Cost)	$	3,380
20% Contingency	*$*	*1,580*
Total Estimated Costs		**$ 9,460**

TABLE 3

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 1: Soil Impact Along Right-Of-Way
Alternative: Additional Soil Removal and Disposal

Sub-contractor Costs		
Temporary Relocation of Utilities	$	8,500
Removal of Sidewalk (est. 12 yd^3 @ $100/$yd^3$)	$	$1,200
Soil Excavation (est. 240 yds^3 @ $15/ yd^3)	$	3,600
Soil Loading and Transport – Biocell (est. 240 yds^3 @ $17/ yd^3)	$	4,080
Soil Loading and Disposal (per ton)	$	0
Supply/Install Backfill (est. 240 yds^3 @ $35/ yd^3)	$	8,400
Well Installation (3-1" wells @ $550 ea.)	$	1,650
Replace Utilities	$	10,000
Site Restoration (1)	$	15,500
Sub-contractor Costs Subtotal	**$**	**52,930**
Laboratory Costs		
Soil Waste Characterization Sample (2)	$	500
Groundwater Samples (4)	$	1,080
Confirmatory Soil Samples (3)	$	2,250
Laboratory Costs Subtotal	**$**	**3,830**
Professional Costs		
Work Plan	$	4,500
Oversight and Sampling ($75/hr x 80 hours)	$	6,000
Groundwater Monitoring ($75/hr x 8 hrs/event x 4 events)	$	2,400
Soil Removal Report	$	7,500
Groundwater Monitoring Reports (est. $1,500/Rpt. x 4 Rpts.)	$	6,000
Sub-contractor Costs Subtotal	**$**	**26,400**
Estimated Regulatory Fees (75% of Professional Cost)	$	19,800
20% Contingency	*$*	*20,590*
Total Estimated Costs	**$**	**123,550**

Notes:

(1) This cost assumes only a gas and water line require temporary re-routing during the construction work. In addition it is assumed that only the sidewalk will require replacement.
(2) Assumes analysis for United States Environmental Protection Agency (USEPA) Target Compound List (TCL) & New York State Department of Environmental Conservation (NYSDEC) Spill Technology and Remediation Series (STARS)-list VOCs via Method 8260B, STARS-list SVOCs via Method 8270C, PCBs via Method 8082A, and 8 RCRA Metals via Method 6010,7470, and 7471.
(3) Assumes analysis of up to ten (10) soil samples for STARS-list VOCs via Method 8260B and STARS-list SVOCs via Method 8270C.
(4) Assumes one (1) year of quarterly monitoring from three (3) monitoring wells analyzed for NYSDEC STARS-list VOCs.

TABLE 4

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 2: Hydraulic Lifts and Oil Water Separator Area
Alternative: EMP with Institutional Controls

Professional Costs		
Environmental Easement	$	1,000
Site Management Plan (including Health and Safety Plan)	$	3,500
Total Professional Costs	**$**	**4,500**
Estimated Regulatory Fees (75% of Professional Cost)	$	3,380
20% Contingency	*$*	*1,580*
Total Estimated Costs		**$ 9,460**

TABLE 5

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 2: Hydraulic Lifts and Oil Water Separator Area
Alternative: Hydraulic Lift and Product Removal and Trenching

Sub-contractor Costs		
Lift Removal (Lump sum)	$	5,800
Soil Excavation (est. 120 yds^3 @ $15/ yd^3)	$	1,800
Concrete Removal/Disposal (est. 7 yds^3 @ $100/ yd^3)	$	700
Soil Loading and Transport – Biocell (est. 120 yds^3 @ $17/ yd^3)	$	2,040
Soil Loading and Disposal (est. 0 tons @ $48/ton)	$	0
Supply/Install Backfill (est. 120 yds^3 @ $35/ yd^3)	$	4,200
Installation of Recovery Wells (lump sum)	$	200
Vacuum Extraction Events (10 hrs/event x 3 events @ $135/hr)	$	4,050
Groundwater Disposal Fee (3,000-gal./event x 3 events @ $0.75/gal.)	$	6,750
Disposal of Free Product (est. 1 55-gal drums @ $300/drum)	$	300
Removal of Surface Soil [SS-2 Area] (est. 1 drum) @ $250/drum)	$	250
Concrete Replacement (est. 350 sq. ft. @ $6/$ft^2$)	$	2,100
Sub-contractor Costs Subtotal	**$**	**27,940**
Laboratory Costs		
Soil Waste Characterization Sample (1)	$	500
Confirmatory Soil Samples (2)	$	3,000
Post Product Removal Well Sampling	$	1,500
Product Waste Characterization Sample (1)	$	500
Laboratory Costs Subtotal	**$**	**5,500**
Professional Costs		
Work Plan	$	2,000
Oversight and Sampling ($75/hr x 40 hours)	$	3,000
Groundwater Sampling (post remediation – 1 round)	$	750
Final Engineering Report and Site Management Plan	$	5,500
Professional Costs Subtotal	**$**	**11,250**
Estimated Regulatory Fees (75% of Professional Cost)	$	8,440
20% Contingency	*$*	*10,630*
Total Estimated Costs	**$**	**63,760**

Notes:

(1) Assumes analysis for USEPA TCL & NYSDEC STARS-list VOCs via Method 8260B, STARS-list SVOCs via Method 8270C, PCBs via Method 8082A, and 8 RCRA Metals via Method 6010,7470, and 7471.

(2) Assumes two grab samples from the bottom of each lift excavation. Samples analyzed for TCL & NYSDEC STARS-list VOCs via Method 8260B and STARS-list SVOCs via Method 8270C.

TABLE 6

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 3: Potential Soil Vapor Intrusion Beneath Buildings
Alternative: Sub-Slab Vapor Mitigation System and EMP

Sub-contractor Costs		
Installation of Mitigation Systems (3 @ $2,900 ea.)	$	8,700
Sub-contractor Costs Subtotal	**$**	**8,700**
Professional Costs		
Work Plan	$	500
System Installation Oversight ($75/hr x 16 hrs)	$	1,200
Site Management Plan (including Health and Safety Plan)	$	3,500
Remediation Report	$	1,000
Environmental Easement	$	1,000
Start-up (confirmation) Monitoring ($75/hr x 16 hrs)	$	600
Professional Costs Subtotal	**$**	**7,800**
Estimated Regulatory Fees (75% of Professional Cost)	$	5,850
20% Contingency	*$*	*4,470*
Total Estimated Costs	**$**	**26,820**

TABLE 7

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 4: Biocell Soils
Alternative: Maintenance & Monitoring

Subcontractor Costs		
Soil Tilling and Flipping (4 events @ $3,000/event)	$	12,000
Sub-contractor Costs Subtotal	**$**	**12,000**
Laboratory Costs		
Periodic Monitoring [(1)]	$	1,600
Closeout Sampling [(2)]	$	1,200
Laboratory Costs Subtotal	**$**	**2,800**
Professional Costs		
Monitoring/Observation ($75/hour x 20 hrs/event x 4 events)	$	6,000
Periodic Reporting ($500/event x 4 events)	$	2,000
Closeout Reporting	$	2,000
Professional Costs Subtotal	**$**	**10,000**
Estimated Regulatory Fees (75% of Professional Cost)	$	7,500
20% Contingency	*$*	*6,460*
Total Estimated Costs	**$**	**38,760**

Notes:

(1) Assumes conducting four (4) events with four (4) samples analyzed for New York State Department of Environmental Conservation (NYSDEC) Spill Technology and Remediation Series (STARS)-list VOCs via Method 8260B.

(2) Closeout sampling will be conducted in accordance with NYSDEC STARS Memo #1, Section VI, Sub-section B. Soils. Due to the approximate volume (approximately 2,060 yd^3), a soil sampling plan will be required. This estimate assumes twelve grab samples for NYSDEC STARS-list VOCs via Method 8260B.

TABLE 8

3865 & 3875 West Henrietta Road
Rochester, New York

Area of Concern 5: Elevated Metals in Surface Soils
Alternative: Soil Removal

Sub-contractor Costs		
Soil Excavation [(1)]	$	100
Soil Loading and Disposal (est. 1 55-gal drum @ $200/drum)	$	200
Place Topsoil and Seed (est. $250)	$	250
Sub-contractor Costs Subtotal	**$**	**550**
Laboratory Costs		
Soil Waste Characterization Sample [(2)]	$	0
Confirmatory Soil Samples [(3)]	$	100
Laboratory Costs Subtotal	**$**	**100**
Professional Costs		
Work Plan[(1)]	$	0
Oversight and Sampling ($75/hr x 2 hours)	$	150
Final Engineering Report and Site Management Plan[(1)]	$	0
Professional Costs Subtotal	**$**	**150**
Estimated Regulatory Fees (75% of Professional Cost)	$	115
20% Contingency	*$*	*185*
Total Estimated Costs	**$**	**1,100**

Notes:

(1) Cost assumes that this work will be conducted as part of the hydraulic lift removal work (AOC #2).
(2) Assumes that the previous laboratory data from this location will be adequate for the waste characterization requirements of the landfill.
(3) Assumes one 2:1 composite sample and one grab sample analyzed for arsenic and barium using USEPA Method 6010.

Table 9
3865 & 3875 West Henrietta Road
Rochester, New York
Comparison of Remedial Alternatives

AREA OF CONCERN #1 - Soil Impact Along Right-Of-Way							
Alternative	**Compliance with SCGs**	**Protective of Human Health and the Environment**	**Short Term Impacts**	**Long Term Effectiveness and Permanence**	**Reduction of Toxicity Mobility and Volume**	**Implementability**	**Estimated Cost**
No Action	Does Not Comply	No action will most likely not impact human health due to groundwater not being used as source of drinking water. Contact with soil and/or groundwater may be limited to possible future utility work in Right-Of-Way	None	No treatment/disposal of soil and therefore may not be effective in the long term	Does not change waste characteristics in soil	Easy	$0
EMP with Institutional Controls	Does Not Comply	In comparison to the no action alternative, provides protection of human health	None	Restricts/controls activities with soil (thus, reduce exposure risks) and over time is anticipated to remediate area	Does not immediately change waste characteristics in soil, however over time should reduce volume	Easy	$9,460
Additional Soil Removal and Disposal	Complies	In comparison to the no action alternative, provides a high level of protection of human health and the environment	Yes, high risk due to utilities in ROW and highway closures	Permanent removal of soils that exceed SCGs	Removes soil that exceeds SCGs	Difficult	$123,550

AREA OF CONCERN #2 - Hydraulic Lifts and Oil Water Separator Area							
Alternative	**Compliance with SCGs**	**Protective of Human Health and the Environment**	**Short Term Impacts**	**Long Term Effectiveness and Permanence**	**Reduction of Toxicity Mobility and Volume**	**Implementability**	**Estimated Cost**
No Action	Does Not Comply	No action will most likely not impact human health due to groundwater not being used as source of drinking water. Contact with soil and/or groundwater may be limited to possible future utility work in Right-Of-Way	None	No treatment/disposal and therefore may not be effective in the long term	Does not change waste characteristics	Easy	$0
EMP with Institutional Controls	Does Not Comply	In comparison to the no action alternative, provides some protection of human health and the environment	None	Restricts/controls activities with soil (thus, reduce exposure risks)	Does not change waste characteristics	Easy	$9,460
Hydraulic Lift Removal and Trenching	Complies	In comparison to the no action alternative, provides a high level of protection of human health and the environment	Controllable with HASP	Permanent removal of soils and free product that exceed SCGs	Removes soil that exceeds SCGs	Moderate	$86,760

Table 9
3865 & 3875 West Henrietta Road
Rochester, New York
Comparison of Remedial Alternatives

AREA OF CONCERN #3 (Potential Soil Vapor Intrusion Beneath Buildings)							
Alternative	**Compliance with SCGs**	**Protective of Human Health and the Environment**	**Short Term Impacts**	**Long Term Effectiveness and Permanence**	**Reduction of Toxicity Mobility and Volume**	**Implementability**	**Estimated Cost**
No Action	Does Not Comply	No action leaves levels of contamination unchanged	None	No treatment/disposal or mititgation and therefore may not be effective in the long term	Does not change waste characteristics	Easy	$0
Sub-Slab Vapor Mitigation System and EMP	Complies	In comparison to the no action alternative, provides high level of protection of human health and the environment	None	Mitigates sub-slab vapor beneath buildings which is effective and with EMP/Deed Restrictions is permanent	Reduces mobility of soil vapor by preventing soil vapor from entering building ambient air space	Easy	$26,820

AREA OF CONCERN #4 (Biocell Soils)							
Alternative	**Compliance with SCGs**	**Protective of Human Health and the Environment**	**Short Term Impacts**	**Long Term Effectiveness and Permanence**	**Reduction of Toxicity Mobility and Volume**	**Implementability**	**Estimated Cost**
No Action	Does Not Comply	No action leaves levels of contamination unchanged	Some, due to nature of impacted soils presenting exposure risk while in biocell.	No treatment/disposal of soil and therefore may not be effective in the long term	Does not change waste characteristics in soil	Easy	$0
Maintenance and Monitoring	Complies	In comparison to the no action alternative, provides protection of human health and the environment	Some during maintenance activities however, can be controlled with a HASP	Is both effective and a permanent method of soil remediation.	Reduces toxicity, mobility, and volume of soil impacts.	Moderate	$38,760

AREA OF CONCERN #5 (Elevated Metals in Surface Soils)							
Alternative	**Compliance with SCGs**	**Protective of Human Health and the Environment**	**Short Term Impacts**	**Long Term Effectiveness and Permanence**	**Reduction of Toxicity Mobility and Volume**	**Implementability**	**Estimated Cost**
No Action	Does Not Comply	No action leaves levels of contamination unchanged	Some, due to nature of impacted soils presenting exposure risk while in biocell.	No treatment/disposal of soil and therefore may not be effective in the long term	Does not change waste characteristics in soil	Easy	$0
Soil Removal	Complies	In comparison to the no action alternative, provides a high level of protection of human health and the environment	Limited and can be managed with work plan and health and safety plan	Permanent removal of soils that exceed SCGs	Removes soil that exceeds SCGs	Easy	$1,100