Interim Remedial Measures Work Plan

High Vacuum Extraction/Soil Vapor Extraction

136 Fuller Road Site

Brownfield Cleanup Program

NYSDEC BCP Site No. C401055

City of Albany and Town of Guilderland

Albany County, New York

December 2010

THE Chazen COMPANIES®

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Environmental Professionals
Land Surveyors
Landscape Architects
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Troy, New York 12180

I certify that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER10).

Mr. Dan Stone, NYSPE

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1.0 INTRODUCTION

1.1 Proposed Interim Remedial Measure

Remedial investigation testing and analysis of soil and groundwater (2007 – 2010) at the 136 Fuller Road Site (site) has revealed the presence of volatile organic compounds (VOCs) including chlorinated solvents and petroleum constituents (Figure 1). The source of soil and groundwater contamination at the site has been determined to be dense non-aqueous phase liquid (DNAPL) solvents and dissolved-phase petroleum organics adsorbed to soils and present in the shallow groundwater aquifer. The source area is located along the north side of the site building where an historic tank farm was located. Aboveground storage tanks (ASTs) historically located in this area stored chemicals for use in the Fuller Brush Manufacturing Plant, which operated at the site during the 1950s through the early 1970s. The site contaminants are partially "trapped" in a shallow geologic formation in this area of the site (the source area, which is primarily an unpaved grassy area) where a shallow layer of dense lacustrine clay was identified during the 2010 Remedial Investigation (RI). From the source area, chemicals dissolved in the shallow groundwater have been slowly mobilized, via groundwater transport, to down gradient areas of the site, both beneath and south of the manufacturing building (Figure 2).

The Interim Remedial Measures (IRMs) described in this plan are proposed to extract the DNAPL and also begin to reduce high concentrations of dissolved VOCs in the source area. A vacuum extraction system will be the primary mechanism for reduction of DNAPL in the source area. Once DNAPL is extracted and dissolved VOC concentrations are substantially reduced in the source area, VOCs dissolved within the remainder of the impacted plume area will subsequently be remediated in-situ through either direct chemical oxidation or a "bio-remediation" approach that involves the use of existing bacterial populations to reduce VOCs through anaerobic respiration processes.

These proposed IRMs will be conducted in accordance with the Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site Remedial Investigation Work Plan. These plans are included as Appendix C and E of the NYSDEC/NYSDOH-approved Remedial Investigation & Alternatives Analysis Work Plan dated June 2010.

1.2 Nature and Extent of Contamination

Figure 2 depicts both the source area and the groundwater plume. A NAPL layer was only found above the shallow clay formation in the source area and exists at depths from 5 to 15 feet deep, where the top of the clay surface varies from 8 to 15 feet below grade. In the source area and in close proximity to the source area, dissolved chlorinated and petroleum compounds are present in a sand formation from the groundwater surface (as shallow as three feet below grade in some areas), to depths ranging between 15 and 25 feet below grade. Down gradient of the source area, dissolved-phase contaminants in the groundwater are present principally within the top 10 to 12 feet of the sandy groundwater aquifer. VOCs were identified near the southern (most down gradient) boundary of the site at very low concentrations, only slightly above regulatory cleanup standards.

1.3 Soil and Groundwater Cleanup Goals

Groundwater cleanup goals will be established once the source has been removed and the plume has reached a "steady state condition" beyond which treatment is no longer practical.

2.0 IRM DESIGN SCOPE

Due to the presence of DNAPL at the site, an aggressive IRM was selected to remove the chemical source (to the extent practicable), before the dissolved impacts in the plume area can be treated. The IRM chosen for the source area is groundwater/DNAPL extraction and treatment via high vacuum extraction (HVE) coupled with soil vapor extraction (SVE). These source reduction activities will be suspended once DNAPL is reduced and high total VOC concentrations are substantially reduced. VOCs remaining in the source area and groundwater plume area will likely need further in-situ treatment as a second phase of the IRM via in-situ chemical or biological treatment.

2.1 HVE/SVE System for Source Area Removal

A series of nine wells were installed in the source area and these wells will be connected to a vacuum system used to extract groundwater and DNAPL (via a HVE) and soil vapor (via a SVE) (Figure 3). A high vacuum will be applied to the HVE wells to depress the water table to the clay surface. The system will extract grossly contaminated groundwater and DNAPL to the depth of the clay interface and expose impacted soils (currently saturated) allowing the SVE system to volatilize and extract VOCs currently trapped in the saturated soil. The HVE system will establish and maintain a depression of the water table in the source area and help contain impacted groundwater within the treatment area boundaries.

Liquid removed from the subsurface through HVE wells will enter a remediation trailer equipped with a phase separator and then filtered to substantially remove DNAPL and high concentrations of dissolved VOCs. If further reduction of VOCs is necessary, based on effluent system testing, the filtered water will be passed through liquid phase granular activated carbon (GAC) vessels. Treated water will then be discharged to the sanitary sewer through the existing wastewater treatment system operated by UltrePET in accordance with conditions listed on their sewer discharge permit. The extracted vapor phase (soil gas/air) will initially be treated with the use of an on-site catalytic oxidizer and then discharged to the atmosphere. If the monitored levels of VOCs in the vapor stream are low enough that this CatOx treatment is no longer necessary, the CatOx system will be removed. Under this scenario, the discharge would occur untreated through a standard emissions stack extending above the building roof line.

Routine monitoring of the liquid and vapor influent and effluent streams within these proposed extraction systems will be used to determine when the system has effectively removed the source contaminants.

Following installation of the nine HVE/SVE wells, an impermeable layer was installed outside the building foundation before the surface soil layer was replaced. A horizontal perforated pipe was installed around the perimeter of the unpaved area, on top of the

impermeable layer, to convey clean stormwater to the site's storm sewer system. The impermeable layer and perforated pipe will prevent active infiltration of stormwater into the source area where the HVE system will be actively depressing the groundwater level.

2.2 Secondary Remedial Treatment: In-situ Reduction of Dissolved-Phase VOCs

Based on observations of the site's underlying geology and concentrations of VOCs dissolved in the on-site groundwater plume area, the use of In-situ Chemical Oxidation (ISCO) or biological reductive dechlorination methods are proposed to further reduce the residual dissolved-phase VOCs. Once the DNAPL and highly impacted dissolved VOC concentrations have been removed from the source area, pilot testing will occur to determine the most effective technology to remediate the dissolved VOC plume to meet or exceed NYSDEC's standards, criteria and guidelines (SCGs) for groundwater quality, applicable to this site under the BCP.

3.0 PERMITS OR OTHER AUTHORIZATIONS

3.1 Required Permits

Discharge of groundwater from the treated HVE effluent will be directed to the industrial sanitary sewer discharge maintained in the site building by UltrePET, as a portion of their daily sewer discharge, and in accordance with conditions listed on the discharge permit they maintain with the City of Albany. The discharge will be no greater than 10 gallons per minute at the onset and then some reduced portion of that as necessary to maintain dewatering in the treatment area.

3.2 Permit Exemptions

The air discharge from the HVE/SVE system will initially be treated with the use of an on-site catalytic oxidizer (CatOx) and then discharged to the atmosphere as a treated (non-VOC) discharge. If the concentrations of VOCs in the vapor stream become low enough that this CatOx treatment is no longer necessary, the CatOx system will be removed and replaced with a standard emissions stack which will discharge the low VOC concentration vapor phase effluent through an alternate stack above the building's roof elevation. As such, no air discharge permits will be required for this temporary discharge because no regulatory air permit thresholds will be exceeded.

4.0 IRM DELIVERABLES

Prior to operation of the HVE/SVE system, a detailed IRM Design Report will be submitted for Department review.

Prior to any in-situ treatment of dissolved phase groundwater contaminants, appropriate pilot studies will be performed to select and design an appropriate technology and a groundwater treatment design report will be submitted for agency review and approval.

Following completion of IRM activities, IRM Construction Completion Reports (CCRs) will be submitted to the Department.

4.0 SCHEDULE

Schedule for the completion of the IRMs is as follows.

1. IRM Work Plan Fact Sheet will be mailed to the Site Contact List, consistent with the NYSDEC approved Citizen Participation Plan initiating a 45-day public comment period. Copies of this IRM Work Plan will be provided at each of the project repositories for review during the public comment period.
2. Preliminary HVE/SVE IRM Design. The preliminary HVE/SVE IRM design will be completed in February/March of 2011 following receipt of NYSDEC and public comments on this Work Plan.
3. Final submission of the design. The final design for the HVE/SVE system is planned for March of 2011 following receipt of final NYSDEC comments on the draft plan.
4. Following receipt of HVE/SVE IRM Design approval by NYSDEC, the system will be brought online for continuous operation. The system is expected to operate for six months to one year.
5. The design of the in-situ groundwater treatment IRM will follow after the completion of the source area HVE/SVE IRM phase.

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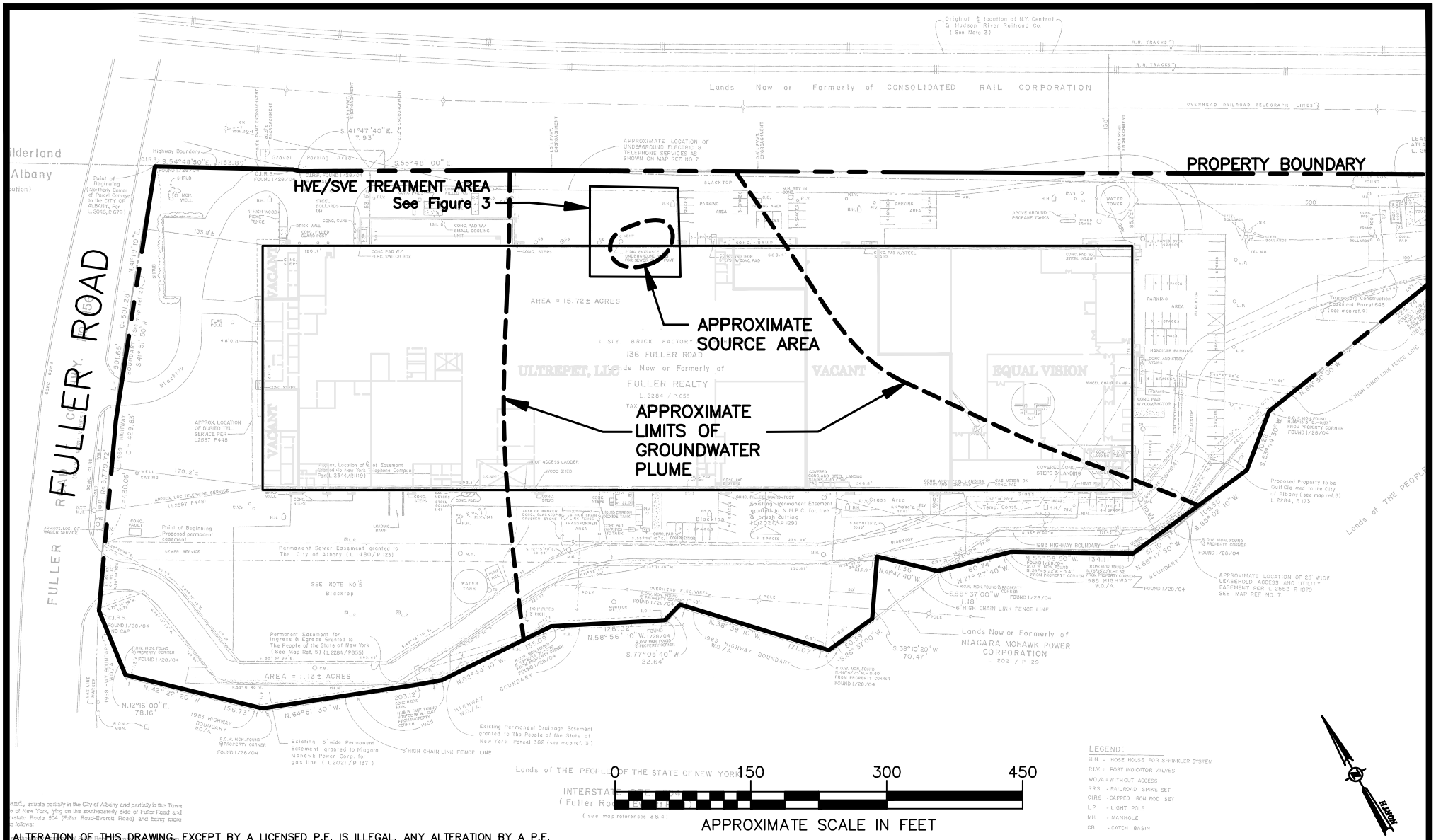
FIGURE 1 - SITE LOCATION MAP

Fuller Partners, LLC Site

136 Fuller Road
City of Albany, Albany County, New York

Base orthoimagery from Google Earth, 2010.

Date:	2010
Scale:	N.T.S
Project #:	90618.00



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FULLER PARTNERS, LLC SITE

SOURCE AREA AND GROUNDWATER PLUME

136 FULLER ROAD
CITY OF ALBANY, ALBANY CO., NEW YORK

drawn	checked
CSD	DS
date 12/9/10	scale 1"=150'
project no. 90618.00	
sheet no. 2	

Drawing Name: S:\9\90600-90699\90618_00\ENG\DWG\FIGURES_90618-00.DWG Date Printed: Dec 23, 2010, 3:28pm

PROPERTY BOUNDARY

PAVED SITE LOOP ROAD

E E E E E E E E E E E

W W W W W W W W

R–8

PERIMETER OF UNPAVED AREA

EXTERIOR SOURCE AREA

REMEDIATION TRAILER

R–7

MW–25

R–9

MW–27

MW–29

R–5

CATOX AIR DISCHARGE

Treated water effluent to UltrePET sanitary sewer

R–6

SANITARY SEWER SUMP

Electrical Equipment

R–4

Cooling Tower

MANIFOLD

BUILDING EXTERIOR WALL

ULTREPET COMPRESSED AIR AND COOLING EQUIPMENT AREA

INTERIOR HVE/SVE WELLS

R–1

R–10 (Unused)

R–2

MW–30

R–3

S S S S S

0 10 20 30

ORIGINAL SCALE IN FEET

LEGEND

R–1	HVE/SVE System Well and Piping
	HVE/SVE System Inflow and Outflow Lines
MW–25	Shallow Groundwater Monitoring Well
MW–1	Deep Groundwater Monitoring Well
	Underground Storm Sewer Pipe
	Underground Electrical Lines
	Underground Water Pipe

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FULLER PARTNERS, LLC SITE

PROPOSED HVE/SVE SYSTEM COMPONENT MAP

136 FULLER ROAD
ALBANY, ALBANY CO., NEW YORK

drawn CSD	checked ASM
date 11/23/10	scale 1"=10'
project no. 90618.00	
sheet no. 3	

Drawing Name: S:\9\90600–90699\90618_00\ENG\DWG\IRM FIGURES_90618–00(SD).dwg Date Printed: Dec 23, 2010, 3:11pm