Interim Remedial Measures Work Plan
136 Fuller Road Site
Brownfields Cleanup Program
NYSDEC Site No. C401055

City of Albany and Town of Guilderland
Albany County, New York

June 2010

THE Chazen COMPANIES®
Engineers
Environmental Professionals
Land Surveyors
Landscape Architects
Planners

Prepared for:

Fuller Partners, LLC
P.O Box 370
East Chatham, NY 12060

New York State Department of Environmental Conservation – Region 4
1130 North Westcott Road
Schenectady, New York 12306

Prepared by:

Capital District Office:
The Chazen Companies
547 River Street
Troy, New York 12180

Hudson Valley Office
(845) 454-3980

North Country Office
(518) 812-0513

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1.0 PROPOSED INTERIM REMEDIAL MEASURE

To reduce and/or prevent potential contaminant exposures and to protect public health and safety, one interim remedial measure (IRM) is presently planned for the 136 Fuller Road Site (site) during the Remedial Investigation (RI) phase of the project. A soil and groundwater contaminant plume has been identified on the site and is known to extend beneath portions of the main site building. The contaminants of concern at the site primarily consist of volatile organic compounds (VOCs). While indoor air quality testing showed no evidence that VOCs have migrated through the building slab at concentrations that adversely affected air quality in the building, the presence of VOCs beneath the building constitutes a threat of vapor intrusion. A sub-slab depressurization system (SSDS) will be implemented at the site as an IRM to mitigate the potential for contaminant vapors to enter the occupied space within the building and to vent additional volatile compounds that may be created during proposed remedial actions. This IRM Work Plan will be implemented in four stages: the system design pilot study, system design, system installation, and system operation.

An IRM is defined by the New York State Department of Environmental Conservation (NYSDEC) as a discrete set of planned actions for both emergency and non-emergency situations that can be conducted without the extensive investigation and evaluation of a remedial investigation and feasibility study (RI/FS). IRMs are designed to be a permanent part of the final remedy. Additional IRMs may be proposed if field or analytical evidence of defined areas or quantities of contamination are revealed during the course of the remedial investigation.

Because IRMs are performed as a component of remedial investigation activities, they will be conducted in accordance with the HASP and QAPP prepared for the site Remedial Investigation Work Plan.

2.0 SUMMARY OF HISTORICAL DATA - SUB-SLAB AND INDOOR AIR SAMPLING

Soil and groundwater investigations at the site have resulted in the identification of a VOC plume beneath approximately 50 percent of the 266,000± sq. ft. building. The approximate boundaries of the groundwater plume are depicted in Figure 1. The VOC plume in the overburden aquifer is known to be primarily comprised of chlorinated compounds (PCE and degradation products) and some petroleum-related compounds.

Sub-slab soil gas samples were collected from three locations in April 2006. Indoor air samples were collected from 9 locations within the building on December 26, 2006. Air samples were analyzed for VOCs according to EPA method TO-15. These sample locations are depicted on Figure 1.

Sub-slab samples identified concentrations of New York State Department of Health (NYSDOH) Matrix 2 compounds greater than 1,000 ug/m^3 at location SSG-2, which triggered the requirement to mitigate sub-slab vapors. This mitigation is being completed as a precautionary measure to ensure that a vapor migration pathway to the building interior is eliminated and to ensure that vapor migration does not occur as a result of the proposed plume

remediation. No VOCswere present in the indoor air samples collected for the indoor air quality study.

3.0 PURPOSE

This Work Plan addresses the NYSDOH's current requirement for mitigation of vapor-phase chlorinated solvents trapped beneath the concrete slab of the building. The system design pilot study will consist of installing and conducting a pilot test on eight vapor extraction points throughout building areas (Figure 1). Data collected during system design pilot study are needed to design an effective SSDS. It is particularly important to determine the radius of influence (ROI) of each vapor extraction point and operational vacuum pressures to determine the frequency of extraction points and size vacuum pumping equipment needed in the final design to depressurize the entire impacted area.

4.0 BUILDING CONSTRUCTION

Limited information is available regarding the details of foundations beneath the building. However, based on a review of available drawings and information provided from the current building owner, the building was constructed as one contiguous unit in 1955, with no internal foundations or footers other than for structural columns. Additions were built in 1962 and 1964 (First Addition and Second Addition, respectively on Figure 1). Therefore, the main building and each addition area may be considered separate spaces for purposes of vapor mitigation.

5.0 INSTALLATION OF EIGHT TEST VAPOR EXTRACTION POINTS

Eight test SSDS vapor extraction points will be installed throughout the building in locations shown on Figure 1. At each location, an 18-inch square of concrete floor will be removed and a hole will be hand dug to a depth of 1.5 feet. The vapor extraction points will be constructed using a 12- to 18-inch long, 4-inch diameter PVC screen (see typical vapor extraction point detail on Figure 2). The slotted, or screened, portion of the extraction point will extend from the underside of the slab to a maximum depth of approximately 1.5 feet below the finished floor. The space around the PVC screen will be filled with a highly permeable backfill material (i.e. coarse gravel) to create and preserve a high degree of connectivity (i.e., air flow) between the existing soil and the proposed vapor extraction point. The top of the screen will contain a reducing coupling (four inch to two inch) and continue through the slab as two-inch diameter galvanized steel piping. The steel piping will extend above the slab along an existing structural column, extend at least 36 inches above the finished floor elevation and capped pending pilot testing. The concrete slab will be restored around the SSDS piping to pre-existing conditions.

6.0 PROPOSED SUB-SLAB DESIGN PILOT STUDY

The sub-slab design pilot study will consist of individual pilot tests of each of the eight vapor extraction points to estimate the typical capture area for SSDS points in various portions of the building. The proposed pilot study vapor extraction point locations are shown in Figure 1. Data collected during the pilot study will be used to determine the number of SSDS vapor extraction points and selection of appropriately sized blower units needed for a comprehensive SSDS.

A network of temporary, sub-slab, pressure monitoring points will be installed around each vapor extraction point. A vacuum will be created at each vapor extraction point and the radius of influence (ROI) for the vapor extraction point will be determined by measuring the vacuum response at temporary monitoring points. The following pilot test activities will be conducted at each of the eight vapor extractions points.

- A hammer drill will be used to install a ½-inch diameter hole through the concrete slab at each monitoring point. The borehole will be drilled six-inches below the bottom of the slab, and a ¼-inch diameter polyethylene tube will be installed to within one-inch of the borehole bottom. Glass beads will be used to backfill the void around each length of tubing to allow proper connectivity with the air-gap beneath the slab. A temporary clay seal (e.g. bentonite clay or modeling clay) will be used to seal the tubing to each borehole's sidewall, which will ensure that the tubing end is properly isolated from the building interior. Monitoring points will be installed according to guidelines recommended in the *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, February, 2005) and referenced appendices, including *Radon Mitigation Standards* (USEPA 402-R-93-078, revised April 1994).

- Pilot testing will be completed using a combination air-compressor and Vaccon Air-flow ST Series silencer to apply a constant vacuum to the vapor extraction point. The vacuum response will be measured at each monitoring point to determine the ROI of the vapor extraction point.

- In general, the monitoring points will be installed at multiple distances from the vapor extraction point. Test distances will begin close to the vapor extraction point, and will increase in distance in two opposing directions until the ROI is determined.

- The limits of ROI will be determined when a pressure differential equal to or exceeding 0.004 inches water column (IWC) can no longer be measured.

- An initial vacuum rate of approximately 10 IWC will be applied to each vapor extraction point, and the resultant air flow will be measured using a vane anemometer. Higher vacuum rates may be applied to specific vapor extraction points if little to no pressure response is recorded in monitoring points during the 10 IWC test.

- Vacuum measurements collected from the monitoring points will be recorded as either positive pressure, representing higher pressure beneath the slab, or negative pressure, representing lower pressure beneath the slab as a result of the vacuum placed on the SSDS vapor extraction point.

- Sub-slab and indoor air pressure conditions will be recorded at each monitoring point prior to the start of the test to identify any unusual pressure gradients that may exist under normal (i.e. non-vacuum) conditions. Vacuum measurements will be collected immediately after the vacuum source is energized. Typically, vacuum responses in monitoring points are reasonably instantaneous (e.g. within 5 to 10 seconds) if good connectivity exists beneath the slab; however, each vacuum/air-flow combination test will be run for a period of at least one hour to allow time for the ROI to expand to the maximum pneumatic boundary around each vapor extraction point. The vacuum and air flow rates may be increased during the test interval depending on the response time observed in each monitoring point and the observed ROI. The pilot test will end once each vapor extraction point ROI is determined under the starting 10 IWC vacuum level and potentially secondary higher vacuum scenarios.

- After testing, each vapor extraction point will be capped using a rubber Fernco cap (or similar) for later use in the SSDS. TCC will restore all monitoring points after testing is completed. Monitoring points will be backfilled with an appropriate base material, and the concrete slab will be patched to pre-test conditions using hydraulic cement.

7.0 SSDS DESIGN AND INSTALLATION

Results of the sub-slab design pilot study will be utilized to design an SSDS that covers the extent of the groundwater plume area. The proposed SSDS design will be submitted to NYSDEC for comments and approval. Vapor extraction points will be added as necessary to create overlapping coverage. All points will be manifolded to one or more vacuum blowers with exhaust discharged to the building exterior just below the roof line (approximately 20 feet above surrounding ground level).

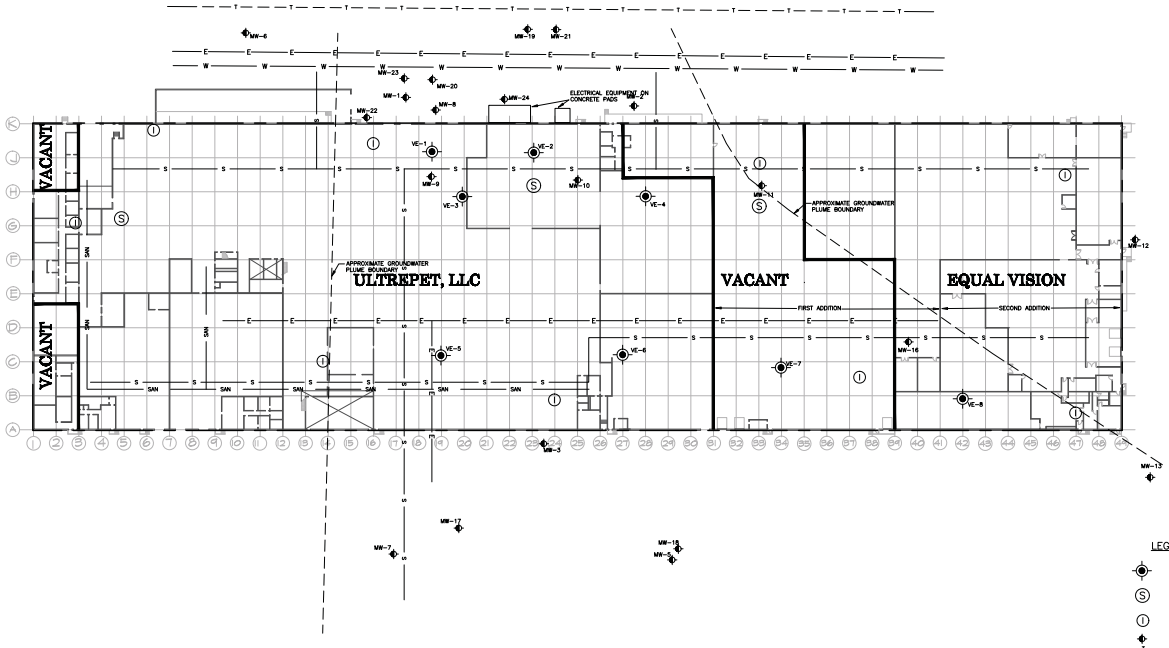
An Operation and Maintenance Manual will be created for the installed SSDS, a copy of which will be kept on site and a copy to be provided to NYSDEC. TCC proposes that monthly operational checks of the system be completed through the first year of operation. Less frequent system checks may be appropriate after the first year.

8.0 SUB-SLAB SAMPLING

Following SSDS installation over the identified groundwater plume footprint, sub-slab soil vapor samples will be collected incrementally outward from the plume area to document horizontal extent and determine if the SSDS needs to be expanded.

9.0 SCHEDULE

The installation of eight pilot vapor extraction wells will begin upon receipt of NYSDEC approval, and may take up to 4 weeks to complete. Pilot testing will take place within 1-2 weeks after vapor extraction point installations are completed. A final pilot test summary and SSDS design can be submitted to NYSDEC approximately 8 to 10 weeks after receipt of agency approval of this plan. The SSDS design pilot study report and SSDS design will include a discussion of vapor extraction point and monitoring point installation, field testing procedures, and field test data supporting design of an SSDS to achieve depressurization beneath the building above the plume area. Upon approval of the SSDS design document, TCC will proceed with installation and operation of the SSDS within the building.



LEGEND

- PROPOSED PILOT STUDY VAPOR EXTRACTION WELL LOCATION
- SUB-SLAB SOIL GAS SAMPLE LOCATION (APRIL 2006)
- INDOOR AIR SAMPLE LOCATION (DECEMBER 2006)
- EXISTING MONITORING WELL
- T — UNDERGROUND TELECOM UTILITIES
- E — UNDERGROUND ELECTRIC UTILITIES
- W — UNDERGROUND WATER UTILITIES
- SAN — SUB-SLAB SANITARY UTILITIES
- S — UNDERGROUND STORM SEWER UTILITIES

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THE Chazen COMPANIES
Engineers/Surveyors
Planners
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Landscape Architects

CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO., P.C.

Office Locations:

Albany County Office
21 Fox Street
Albany, New York 12401
Phone: (518) 464-1060

Capital District Office
Troy, New York 12182
Phone: (518) 273-0055

North Country Office
284 Broad Street
Glens Falls, New York 12801
Phone: (518) 812-0513

Connecticut
(By Invitation Only)
Shelton, Connecticut 06484
Phone:(860) 402-2640

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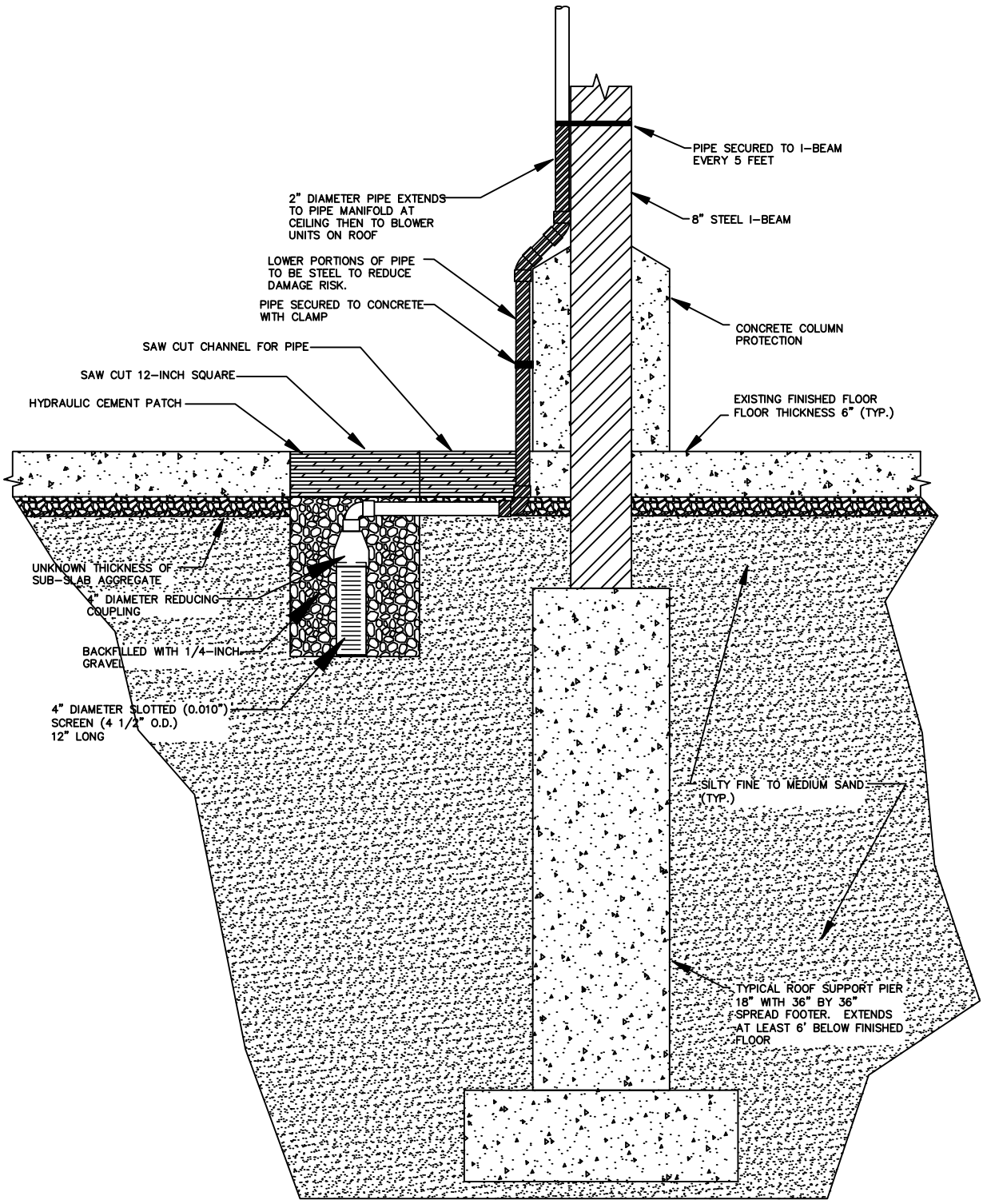
FORMER FULLER BRUSH FACILITY

SITE MAP INDICATING PROPOSED PILOT STUDY AREAS
136 FULLER ROAD

CITY OF ALBANY, ALBANY CO., NEW YORK

drawn	checked
date: 5/28/09	scale: 1" = 40'
project no.: 9061.8.00	
sheet no.: FIG. 1	

Drawing Name: S:\Projects\9061.8\Drawings\Figures\9061.8_Fig1_Site_Map.dwg
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THE Chazen COMPANIES
Engineers/Surveyors
Planners
Environmental Scientists

Dutchess County Office:
21 Fox Street Poughkeepsie, NY 12601
Phone: (845) 454-3980

Capital District Office:
547 River Street Troy, NY 12180
Phone: (518) 273-0055

Orange County Office:
356 Meadow Avenue Newburgh, NY 12550
Phone: (845) 567-1133

North Country Office:
100 Glen Street Glens Falls, NY 12801
Phone: (518) 812-0513

136 FULLER ROAD PROPERTY

PROPOSED VAPOR EXTRACTION POINT CONSTRUCTION DETAIL

CITY OF ALBANY, ALBANY COUNTY, NEW YORK

drawn	checked
ST	KB
date	scale
8/10/09	N.T.S.
project no.	
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FIGURE 2	

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Drawing Name: S:\9\90600-90699\90618_00\ENV\RI Work Plan\Draft RI AAR Work Plan\IRM Plan\FIG02-VAPOR WELL DETAIL.dwg Date Printed: Aug 10, 2009, 10:13am