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New York State Electric & Gas Corporation

Vapor Intrusion Interim Remedial Measure Draft Work Plan

Geneva (Wadsworth Street) Former MGP Site
Geneva, New York

October 2008

ARCADIS

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Geneva (Wadsworth Street)
Former MGP Site
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1. Introduction

1.1 Overview

This Work Plan presents objectives for the installation of a vapor intrusion mitigation system and development of a vapor intrusion management program for the City of Geneva Public Safety Building (PSB) located at 255 Exchange Street in Geneva, New York. The work activities consist of both installation of a sub-slab depressurization (SSD) system at the northwest quadrant of the PSB and air balancing of the heating ventilation and air conditioning (HVAC) system and exhaust fans. During previous investigations conducted at this facility, sub-slab, indoor, and outdoor air was sampled to evaluate possible impacts to indoor air due to vapor intrusion related to historical operations. As described in the May, 2007 (Revised August 2007) Vapor Intrusion Evaluation Report issued by ARCADIS BBL (now ARCADIS), BTEX compounds and naphthalene were detected in sub-slab vapor of the PSB which have the potential to migrate into occupied areas of the building. Pressure field extension testing was performed throughout representative areas of the PSB facility. Subsequent air balance testing (triggered by the results of the pressure field extension testing) was performed throughout the PSB.

Based on the information obtained during the pressure field extension testing and air balance testing, the installation of a SSD system by itself, to address vapor intrusion concerns at the PSB is not feasible due to the inability to induce an effective sub-slab negative pressure gradient throughout a majority of the building. This is likely due to the low permeability of soils below the floor slab. Additionally, due to the observed operational characteristics of the building's HVAC system, the sub-slab pressure gradient is positive relative to the occupied portions of the facility which would promote the migration of vapors from below the slab to the building's interior space.

This approach will address sub-slab vapor in the northwest quadrant by installation of the SSD system and will address the remaining portion of the building through the elimination of the existing negative pressure condition within occupied portions of the building relative to the sub-slab pressure gradient using the building's HVAC and exhaust fan system. It is likely that a combination of air balancing for the entire building and installation of a vapor mitigation system in the northwest quadrant of the PSB will eliminate the presence of vapors within the occupied portion of the PSB above targeted concentrations.

2. Vapor Intrusion Interim Remedial Measure Activities

Installation of a sub-slab depressurization (SSD) system in the northwest quadrant of the Public Safety Building (PSB) will be performed by ARCADIS's subcontractor, Enviro Testing Inc. (Binghamton, NY) and will include the following:

- Accessible foundation cracks or gaps encountered during SSD system installation will be sealed
- Containerized chemicals and cleaning products that may affect the results of post-mitigation air sampling will be removed from building
- System operational issues and inquiries will be addressed

2.1 Building Preparation Activities

The following action items will be conducted to minimize the potential for vapor intrusion and interference with and/or compromise of post-mitigation indoor air analytical results:

2.1.1 Building Preparation Objectives

Caulking/sealing will be conducted for accessible floor and wall penetrations throughout the PSB foundation areas. Caulking of floor and wall penetrations will minimize the potential for sub-slab air infiltration into the PSB.

Containerized chemicals will be removed to decrease the potential for background interferences during post mitigation indoor air sampling.

2.1.2 Caulking/Sealing

Observed and accessible floor and wall cracks and gaps, and joint areas between the wall and floor will be filled and sealed using an elastomeric caulk and/or expandable foam. Prior to application of caulk/foam, surfaces must be vacuumed (using a typical shop-vac) to clear loose debris. Floor and wall cracks and penetrations will be sealed with caulking material and smoothed with a putty knife. Joints between walls and floor are to be filled using expandable foam. Gaps associated with utility piping will be sealed with expandable foam.

2.1.3 Containerized Chemical Removal

Cleaning products, paints, and other containerized chemicals from the custodian/maintenance closet that may contain volatile organic compounds (VOCs) that contribute to detectable concentrations of chemicals included in the NYSDEC TO-15 list of analytical constituents will be removed from the building to minimize the possibility of background interferences during post-mitigation air sampling.

2.2 Sub-Slab Depressurization (SSD) System Installation

2.2.1 Sub-Slab Depressurization (SSD) System Background and Objectives

The primary objective of the SSD system is to reduce/eliminate the potential for vapor intrusion into the occupied portions of the building from below the floor slab. The SSD system creates a vacuum beneath the floor slab, resulting in lower air pressure beneath the slab relative to indoor air pressure. The SSD system will be designed consistent with Section 4 of the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October, 2006. Each SSD device is comprised of a fan-powered vent connected to piping to be installed through the slab of the PSB. Based on pressure field extension testing data for the entire PSB, the northwest portion of the facility is the only suitable portion of the facility for SSD. The proposed locations of the two SSD suction points are presented on Figure 1.

2.2.2 Sub-Slab Depressurization (SSD) System Installation

System extraction points will be located based on the results of previously performed pressure field extension testing. To the extent possible, pipe risers will be located to minimize the possibility of damage due to building operations. Based on results of pressure field extension testing and the size of the area being mitigated, it is anticipated that two extraction points and two extraction fans will be installed.

Extraction points will be constructed by cutting holes through the building slab, making sure that any vapor barriers are breached and the sub-slab materials are encountered. A pit will be excavated at each extraction point, to a depth of approximately 10 inches. Crushed stone will then be backfilled around the extraction pipe, and the extraction hole patched around the piping using mortar or non-shrink grout, to insure a good seal.

Depressurization will be accomplished using an in-line centrifugal fan unit connected to 4-inch diameter PVC piping. These units are capable of inducing 0 to 4 inches of

water vacuum, while moving 50 to 300 cubic feet per minute (cfm) of air. A liquid gage u-tube manometer will be installed on the suction riser to indicate proper operation of the mitigation system. The manometer will be installed at a location where it is highly visible and building maintenance staff will be made aware of the warning device and what actions to perform in the event of a system malfunction.

Fan units will be mounted on an exterior wall with a weather tight enclosure. A "fan guard" device will be provided on the discharge side of the fan to drain condensate water to the suction pit. The specific location of the vent pipe exhausts will be field determined subject to the following constraints:

i. Above the highest eve of the roof a minimum of 12 inches above the surface of the roof
ii. A minimum of 10 feet above ground level
iii. A minimum of 10 feet away from any opening that is less than 2 feet below the exhaust point
iv. A minimum of 10 feet from any adjoining or adjacent buildings or HVAC intakes or supply diffusers

2.3 Air Balancing

2.3.1 Air Balancing Background and Objectives

On April 3, 2008, ARCADIS performed air balance testing to confirm negative indoor air pressure relative to sub-slab pressure conditions at the PSB.

The building is currently heated and cooled using five roof-top mounted forced air HVAC units. The PSB contains a series of roof discharge exhaust fans for the removal and circulation of indoor air. The existing air handling units will be operated such that the occupied building space is maintained at a neutral to slightly positive pressure relative to the sub-slab pressure. This pressure differential would function in reverse of a SSD system and effectively prevent sub-slab vapors from entering the building through positive pressurization of the occupied space.

2.3.2 Air Balancing Activities

Air balancing activities will consist of measuring air flow rates in supply air, return air, and building exhaust duct work and evaluating the operational set points of the five roof top air handlers and each exhaust fan. Adjustments will be made to air handling

equipment (i.e., fan speed, damper position, sheave positions, etc.) such that an overall air balance between supply and exhaust air flow rates are neutral to slightly positive (i.e., more air is being drawn into the building than is being exhausted). Measurements of air flow rates prior to and after adjustments will be recorded along with final operational set points.

3. Operation Maintenance and Monitoring (OM&M) Plan for the SSD System

Routine operation maintenance and monitoring (OM&M) is required following installation and subsequent operation of the SSD system. Maintenance and monitoring activities should occur every 18 months.

3.1 Operations, Maintenance and Monitoring (OM&M)

An Operations, Maintenance and Monitoring (OM&M) Plan will be submitted to the NYSDEC following installation of the SSD system. The OM&M Plan will include details on system installation and performance requirements. This OM&M Plan will be provided to the site owner to facilitate an understanding of the system's operation, maintenance and monitoring requirements.

The OM&M Plan will include the following:

- A description of the installed sub-slab depressurization (SSD) system including basic operating principles
- A description of the air balance HVAC operational set points and exhaust fan settings
- A description of operating procedures, including manufacturer's instructions and warrantees
- Information on how the owner can determine that the SSD system is working properly
- A description of how and when the SSD, HVAC, and exhaust fan settings will be verified and maintained, including instructions for evaluating system supply air, return air, and exhaust vent set points (i.e. flow rates and static pressure) following air balancing
- A list of appropriate actions for the owner to take if a SSD warning device indicates failure
- Contact information in the case of questions or concerns

OM&M activities should begin within 18 months after the SSD system becomes operational and should be performed every 18 months thereafter, in accordance with Section 4.4.1 of the NYSDOH Guidance Document entitled Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

Routine monitoring activities will include the following:

- Visual inspection of the equipment and piping
- Identification of any leaks and subsequent repair
- Audible check for fan operation

Visual inspection of pressure gauge to verify that SSD fan operational condition is consistent with conditions following initial system commissioning.

4. Sampling Plan

The effectiveness of the SSD system and air balancing will be demonstrated by the collection of indoor and outdoor air samples for TO-15 laboratory analysis no sooner than 30 days following system installation and commissioning. Post mitigation sampling will be conducted during the heating season and may be repeated (as required) based on analytical results. Details regarding the sampling will be contained in a Post-Mitigation Vapor Intrusion Sampling Plan (Sampling Plan) that will be developed and submitted to NYSDEC/NYSDOH for approval prior to sampling. The Sampling Plan will be prepared in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

5. Sampling Plan Submission Schedule

This plan will be developed and submitted for NYSDEC/NYSDOH approval within 30 days of system installation and commissioning.

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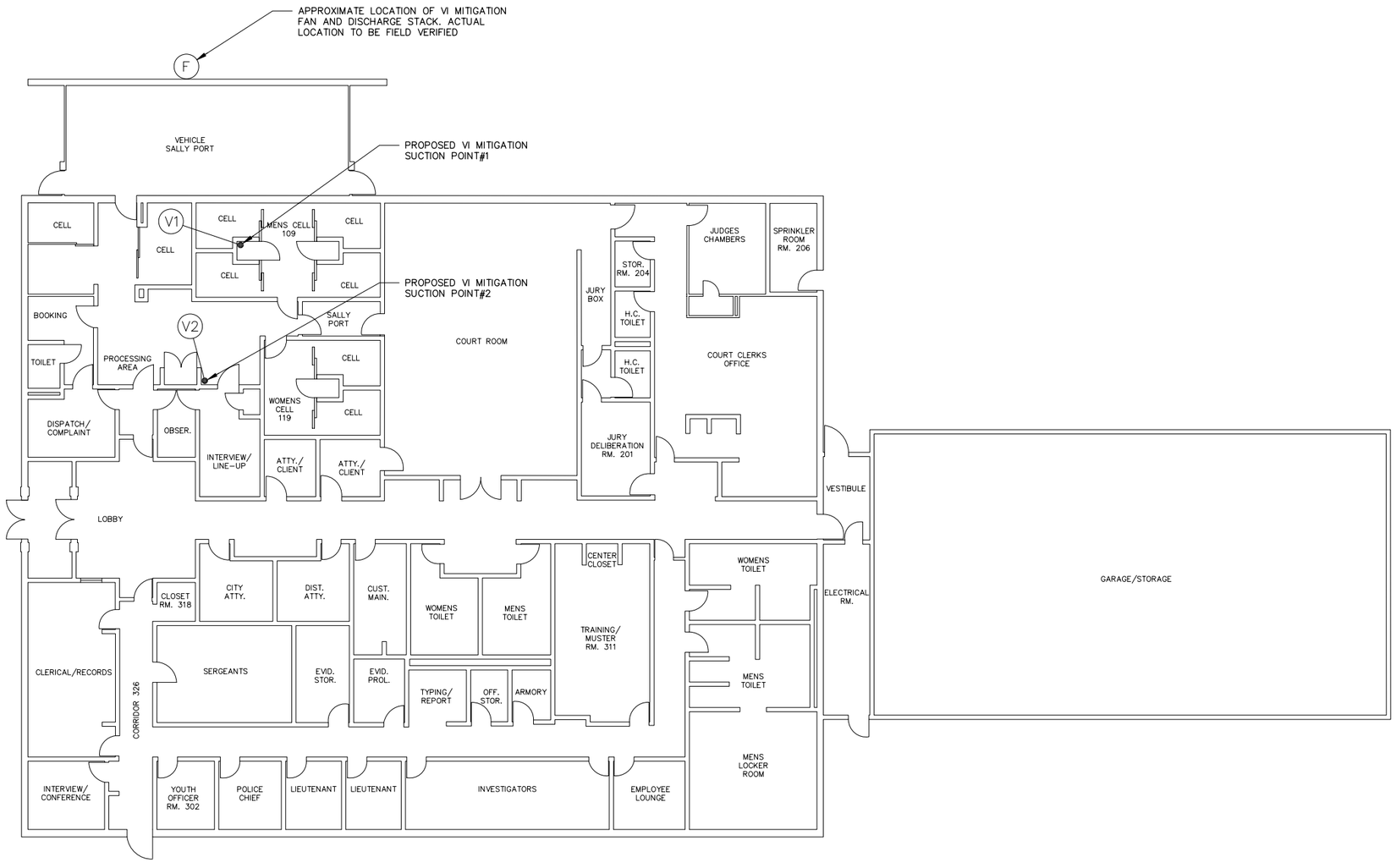
Figure 1

Proposed Public Safety Building
Vapor Extraction Locations



FLOOR PLAN

LEGEND:

- (V1) VI MITIGATION SUCTION POINT
- (F) VI MITIGATION FAN LOCATION

NOTES:

1. INTERIOR FLOOR PLAN WAS DIGITIZED FROM BELL & SPINA PUBLIC SAFETY BUILDING FIGURE TITLED FLOOR PLAN, SHEET 2 OF 28, DATED FEBRUARY 10, 1997, SCALE 3/16 = 1'–0" .
2. EXTERIOR BUILDING WALLS BASED ON SURVEYS COMPLETED BY NYSEG ON DECEMBER 14, 2005 AND OCTOBER 2006.
3. LOCATION OF PROPOSED VI MITIGATION SUCTION POINTS TO BE ADJUSTED IN THE FIELD AS NECESSARY.
4. PROVIDES EXTRACTION PIT AT EACH VI MITIGATION SUCTION POINT CONSISTING OF A 10 INCH DIAMETER REMOVAL OF EXISTING SUB–SLAB SOIL WITH CRUSHED STONE BACKFILL AROUND PVC EXTRACTION PIPING.

0 10' 20'
GRAPHIC SCALE

NEW YORK STATE ELECTRIC AND GAS
GENEVA (WADSWORTH ST.)
FORMER MGP SITE
VAPOR INTRUSION INTERIM REMEDIAL MEASURE WORK PLAN

PROPOSED VI MITIGATION SYSTEM SUCTION POINTS AND FAN/DISCHARGE STACK LOCATION

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FIGURE
1

CITY: SYRACUSE DIV/GROUP: 141 DB: AMS GMS LD: PD: LYRON=*-OFF=REF
G:\CADACTIB\00130570\0001\000011\DWG\130570B12.DWG LAYOUT: 1 SAVED: 7/28/2008 10:45 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: C-LD2B-PDF-TABLOID PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 7/28/2008 10:45 AM BY: STOWELL, GARY
XREFS: IMAGES: PROJECTNAME: ---