mitigation tech *vapor intrusion specialists*

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Mr. Jeff Konsella
Environmental Engineer II
NYS Department of Environmental Conservation
27 Michigan Ave.
Buffalo, NY 14203-2915
*Via email: jakonsel@gw.dec.state.ny.us*
*Via email: fghogan@lockportlaw.com*
*Via email: christopher.boron@gza.com*

Re: Peters Dry Cleaning
BCP Site (#C932128),
316 & 310 Willow St.
Lockport, NY
**Work Plan for Soil Vapor Intrusion Mitigation**

Dear Mr. Kinsella,

For you review and comment, we submit the following work plan:

## 1.0 Introduction

This document presents a Work Plan for an Interim Remedial Measure (IRM) that will be implemented at the subject site. Soil vapor containing chlorinated volatile organic compounds has been detected at this site. The specific buildings of concern are a private residence at 310 Willow St. and a dry cleaning facility at 316 Willow St. The IRM will consist of the installation and operation of sub-slab depressurization systems (SSDS) that are designed to mitigate the migration or potential migration of sub surface vapors into the building interiors. The SSDS are intended to protect the occupants of the buildings and are not intended to remove or diminish the source of the contamination. After start-up, demonstration of SSDS effectiveness will be confirmed and thereafter, periodic maintenance and monitoring will be performed.

## 2.0 Objectives

This work plan was developed in general accordance with the documents: "EPA Radon mitigation standard 402-R93-078" and with the NYS DOH document, "Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006".

The objective of each SSDS is to achieve and maintain a minimum negative pressure differential of .002 inches of water column (wci) below all concrete slabs which function as boundaries between sub-slab space and occupied interior space. In cases where crawlspace ventilation is utilized as a mitigation technique, performance may be inferred by volume of air removed. Once the SSDS have been installed, testing will be performed to determine the extent of the pressure field and results will be presented to the

Department for review. Post installation air sampling will be conducted by others in a manner and frequency to be determined.

The results of all testing and sampling will be evaluated and additional actions will be undertaken, as necessary, in accordance with the NYSDOH Guidance. Actions may include additional mitigation measures and additional monitoring. This process will be repeated, as necessary, until all areas have been satisfactorily addressed.

## 3.0 Work Plan Design and Specifications

### 3.1 Overview

Work descriptions are based on certain assumptions identified herein and are subject to modification based on further field observations and measurements before and during construction. In the interest of achieving efficiency of design and optimized cost, this Work Plan is presented on a Design/Build basis which allows for adjustment to quantity and type of system components. This provides optimal cost and design efficiency, informed by predictive analysis of data continuously obtained and easily modifiable in the field, so that the owner's value is maximized as objectives are being met. Of the several factors that dictate this approach, notable is the heavily cluttered main premises built over disparate floor sections of unknown and presumably various sub-slab composition.

### 3.2 Scope of Work– 316 Willow St.

The Scope of Work is to furnish and install (3) independent multiple point active sub-slab depressurization systems. This allows for a symmetrical distribution of negative pressure via strategically located suction cavities. Radius of static pressure influence is not exactly specified under this plan; however, work on comparable structures has demonstrated the efficacy of this paradigm. The influence radius of each system will depend on the permeability of the sub-slab material in the vicinity of each suction point, the performance curve of the fan, and the construction of the suction cavity. So as to provide an opportunity for field modification of any component or technique, influence will be measured continuously during the construction process. In the event the specified design does not furnish sufficient influence at a particular location, the provision to substitute an alternate performance fan may be exercised or the provision to add a suction cavity may be exercised.

<u>Furnish and Install:</u>

- Professional design and supervision
- Sub-slab air communication testing
- (1) RADONAWAY GP-501 series (max 4.2 wci) in-line fan (80-150w continuous duty), front area including storage retail and north portion of center section, sidewall mount with exhaust extension to roof, to provide sub-slab depressurization via 3" schedule 40 PVC pipe, with connection to suction points
- (3-5) Front area suction points as follows: connection via 3" Schedule 40 PVC pipe, surface mount at designated columns, to cavity in sub-slab, with urethane and/or masonry seal, access hole to suction cavity by 5"core drill; suction cavity to consist of approximately 1 cubic foot excavated material in sub-slab
- (1) RADONAWAY GP-501 series (max 4.2 wci) in-line fan (80-150w continuous duty), rear area including linen, pressing and south portion of center section, sidewall mount with exhaust extension to roof, to provide sub-slab depressurization via 3" schedule 40 PVC pipe, with connection to suction points
- (2-3) Rear area suction points as follows: connection via 3" Schedule 40 PVC pipe, surface mount at designated columns, to cavity in sub-slab as described above*2*

- (1) RADONAWAY RP-145 (max 2.0 wci) in-line fan (40-70w continuous duty) for independent connection to inaccessible crawlspaces where SSD is impracticable and ventilation is indicated
- Electrical weatherproof conduit from fan housing to building interior with connection to customer designated circuit
- (3) U-tube vacuum indicator on vertical pipe run
- Urethane sealant over backer rod at perimeter gap of storage area
- Urethane sealant at slab joints, cracks and penetrations to prevent "short circuiting" of pressure field, and where practicable
- At completion, measure pressure differentials and document; label components and provide system description and operational instructions
- Develop operation, maintenance and periodic inspection plan
- Two year warranty, labor and installed components

**3.3 Scope of Work– 310 Willow St.**

The Scope of Work is comparable to that specified in 3.2 except that (1) independent active sub-slab depressurization system will be constructed.

Furnish and Install:

- Pre-install diagnostics to verify system design
- RADONAWAY GP-501 centrifugal fan to provide sub-slab ventilation via 3" schedule 40 PVC pipe to roof exhaust, via exterior fan and pipe on west side
- Exterior electrical connection and switch
- Suction points as follows: (2) suction cavities – near fan pipe entry point and on interior partition following center beam and toward east end
- Vacuum indicator on pipe
- Sealing of floor cracks and other openings to sub-slab as practicable
- At completion, measure pressure differentials and document; label components and provide system description and operational instructions
- Two year transferable warranty, labor and workmanship

**3.4 Post Installation Pressure Field Extension Testing**

We will drill small diameter test holes at useful vacuum monitoring points. We drill enough holes to gain a working understanding of the pressure field extension of each particular section. A digital micromanometer will be used to measure pressure differentials and values will be recorded on a floor plan. All test holes will be repaired with urethane caulk (MSDS available) applied over a closed cell backer rod. Smoke tubes will be used to identify floor cracks and other openings to the sub-slab that could "short circuit" the pressure field. Backdrafting testing will be performed.

**3.5 System Operation Following Power Loss**

The systems will restart automatically after power restoration.

**3.6 Post Installation Sampling**

Details are TBD by appropriate regulatory agencies. One expected consequence of SSDS installation is to eliminate or reduce the frequency and extent of air sampling.

**3.7 IRM Construction Completion Report**

Communication test results, SSDS installation, and post-installation sampling results will be documented in an *IRM* Construction Completion Report (IRM CCR). This report will include detailed descriptions and as-built drawings of the SSDS locations and components.

An Operations, Maintenance, and Monitoring (OM&M) Plan will be submitted with the IRM CCR. The OM&M Plan will be provided to the owner and occupants to facilitate their understanding of the system's operation, maintenance and monitoring. The OM&M Plan will include the following:

- a description of the SSDS Installed and its basic operating principles;
- how the owner or tenant can check that the SSDS is operating properly;
- how the SSDS will be maintained and monitored and by whom;
- a description of long-term reporting and annual SSDS certification requirements;
- a list of appropriate actions for the owner or tenant to take if a SSDS warning device (manometer) indicates system degradation or failure;
- a description of the proper operating procedures for the SSDS, including manufacturer's operation and maintenance instructions and warrantees; and
- contact information if the owner or tenant has questions, comments, or concerns.

**3.8 Maintenance and Monitoring**

Future monitoring will be performed to monitor system communication via differential pressure measurements. The monitoring will be performed annually until a less-frequent monitoring frequency is approved by the Department. This routine monitoring will include:

- visual inspection of the equipment and piping;
- inspection of exhaust points to verify that no air intakes have been located nearby;
- identification and subsequent repair of any leaks;
- audible operational status check of vent fans;
- damper adjustments as required to balance parallel branches of system;
- measurement of differential pressure between the indoor air and the sub-slab to ensure a lower pressure is being maintained in the sub-slab relative to indoor ambient, as indicated by the pressure gauge on the fan suction pipe.

This monitoring may also include indoor air, sub-slab soil vapor, and outdoor air samples upon the Department's request. In addition, non-routine maintenance may be conducted should it appear that the SSDS has reduced its effectiveness due to malfunction, renovation, or other unplanned circumstance. Examples of such circumstances include the following:

- the building's owner or tenants report that a warning device indicates that the SSDS is not operating properly;
- the system is accidentally damaged;

- the building has undergone renovations that may reduce the effectiveness of the system.

The SSDS will be operated until such time as permission in writing is received from NYSDEC to terminate operation of the system and remove the equipment.

**3.9 Schedule**

It is anticipated that installation can be completed within approximately thirty days of receipt of NYSDEC's written approval of this work plan.

**3.10 Discharge Permitting**

It is understood that an air discharge permit from the Department to discharge treated vapors will not be required. It is further understood that all discharges will be direct to the atmosphere and that a Community Air Monitoring Plan is not required.

**3.11 Health and Safety Plan**

Mitigation Tech has prepared a Health and Safety Plan (HASP) for personnel who will be involved with the IRM implementation at this Site.

**End of Work Plan**

MITIGATION TECH, INC.

Nicholas E. Mouganis

**Qualifications**
NEHA NRPP ID certification #100722 RMT (mitigation)
NEHA NRPP ID certification #104867 RT (measurement)
NYS Listed for Radon Mitigation
AARST Membership
Installers are HAZWOPER and OSHA trained
18 years direct experience in Soil Vapor Intrusion Mitigation
Over 8,000,000 square feet accumulated depressurized sub-slabs
Over 3,000 completed work sites since 1991
In house design capability
Extensive experience with high suction fans (to 50 wci) and manifolded SSD systems
Expertise in ASTM E-2121-03 and NYS DOH VI Guidance
Comprehensive Insurance

- $5,000,000 General Liability
- $2,000,000 Pollution Liability
- $2,000,000 Professional Liability
- $1,000,000 Automobile Liability
- Statutory Worker's Comp