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SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN PLAN

RIVER PLAZA SHOPPING CENTER

130 WILDEY STREET

SECTION 01, TAX SHEET 2, LOTS P-25 AND P-25B

TARRYTOWN, WESTCHESTER COUNTY, NEW YORK

NYSDEC SITE ID NO.: 360084

Submitted to:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 3

21 South Putt Corners Road

New Paltz, New York 12561-1620

and

NEW YORK STATE DEPARTMENT OF HEALTH

Bureau of Environmental Exposure Investigation

Flanigan Square

547 River Street

Troy, New York 12180

Prepared for:

ACADIA TARRYTOWN, LLC

1311 Mamaroneck Avenue, Suite 260

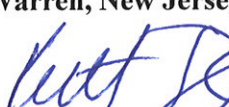
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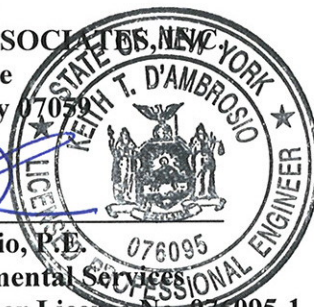
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Christopher Seib
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Whitestone Project No.: EJ0810744.003

April 7, 2010

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April 7, 2010

via email and Federal Express

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Protection, Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1620

Attention: Ms. Janet Brown, Case Manager

and

NEW YORK STATE DEPARTMENT OF HEALTH
Bureau of Environmental Exposure Investigation
Flanigan Square
547 River Street
Troy, New York 12180

Attention: Mr. Nate Walz, Project Manager

**Regarding: SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN PLAN
RIVER PLAZA SHOPPING CENTER
130 WILDEY STREET
SECTION 01, TAX SHEET 2, LOTS P-25 AND P-25B
TARRYTOWN, WESTCHESTER COUNTY, NEW YORK
NYSDEC SITE ID NO.: 360084
WHITESTONE PROJECT NO.: EJ0810744.003**

Dear Ms. Brown and Mr. Walz:

Whitestone Associates, Inc. (Whitestone) is pleased to submit for your review the attached *Sub-Slab Depressurization System Design Plan* (SSDSDP) for the above-referenced site that was prepared on behalf of Acadia Tarrytown, LLC. This SSDSDP has been prepared to address vapor intrusion (VI) concerns identified during supplemental air quality sampling activities conducted at the site in accordance with Whitestone's January 21, 2010 *Supplemental Remedial Investigation Workplan (Rev.1)* (SRIW). The SSDSDP is based on Whitestone's discussion with the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) during the March 3, 2010 conference call.

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NYSDEC/NYSDOH
Sub-Slab Depressurization System Design Plan
River Plaza Shopping Center
130 Wildey Street
Lots P-25 and P-25B
Tarrytown, New York
April 7, 2010
Page 2

Please contact us at (908) 668-7777 with any questions or comments regarding the enclosed report.

Sincerely,

WHITESTONE ASSOCIATES, INC.

A handwritten signature in blue ink, appearing to read 'Keith D'.

Keith T. D'Ambrosio, P.E.
Principal, Environmental Services
Professional Engineer License No. 076095-1

A handwritten signature in blue ink, appearing to read 'Christopher Seib'.

Christopher Seib
Director, Environmental Division

DK/mjb C:\Documents and Settings\AZAMBELL\Local Settings\Temporary Internet Files\OLK4\10744SSDSPlan-Tarrytown.wpd
Enclosures
Copy: Jeremy Hill, Acadia Tarrytown, LLC

SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN PLAN
River Plaza Shopping Center
130 Wildey Street
Tarrytown, Westchester County, New York

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SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN PLAN
River Plaza Shopping Center
130 Wildey Street
Tarrytown, Westchester County, New York

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SECTION 1.0

Executive Summary

Whitestone Associates, Inc. (Whitestone) was retained by Acadia Tarrytown, LLC (Acadia) to prepare this *Sub-Slab Depressurization System Design Plan (SSDSDP)* to address vapor intrusion (VI) concerns identified during the supplemental remedial investigation (RI) activities conducted at the River Plaza Shopping Center site located at 130 Wildey Street in Tarrytown, Westchester County, New York. The RI was conducted in accordance with Whitestone's January 21, 2010 *Supplemental Remedial Investigation Workplan (Rev. 1)* (SRIW). The SRIW was approved by the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) on February 3, 2010. This SSDSDP specifically addresses the VI concerns identified during the RI sampling activities conducted at the subject property. The results of the supplemental soil and groundwater sampling conducted during the RI will be addressed in a subsequent report to NYSDEC.

As outlined in Section 2.0 of this SSDSDP, elevated concentrations of tetrachloroethene (PCE) and trichloroethene (TCE) were detected in the sub-slab and indoor air samples collected from Van Tassel Cleaners warranting further monitoring and/or mitigation. Additional volatile organic compounds (VOCs) including acetone, chloroform, isopropanol, and ethanol were detected in select sub-slab and/or indoor air samples at slightly elevated levels. The most elevated levels of acetone, ethanol, and isopropanol detected in indoor air were documented in Tappen Zee Dental Group. The presence of these compounds is attributable to the disinfectants and sterilizers including rubbing alcohol utilized within the dental facility. Chloroform was detected at a slightly elevated concentration in indoor air in the laundromat. The presence of chloroform may be attributable to clothing dyes present in the laundromat on a daily basis. The remainder of the VOCs detected exceeding laboratory reported detection limits appear to be contributable to background conditions, products stored in the individual units, or off-gasing building materials. With the exception of PCE and TCE, the VOCs detected at the site are not compounds of concern.

As discussed with NYSDEC and NYSDOH during the March 3, 2010 conference call, Whitestone proposes the installation of a sub-slab depressurization system (SSDS) in the drycleaners unit of the northern retail building to mitigate the elevated TCE and PCE concentrations impacting indoor air quality. Details pertaining to the VI investigation and associated communication testing are outlined in Section 2.0 of this report and the design of the SSDS is outlined in Section 3.0 of this report.

The NYSDEC's and NYSDOH's comments pertaining to Whitestone's June 24, 2009 *Remedial Investigation Report and Supplemental Remedial Investigation/Corrective Action Workplan* (RIR and SRI/CAW) and September 30, 2009 *Supplemental Remedial Investigation Workplan* will be addressed in Whitestone's pending comprehensive RIR.

SECTION 2.0

Introduction

2.1 SITE LOCATION/DESCRIPTION

2.1.1 Location

The subject property is located at 130 Wildey Street in Tarrytown, Westchester County, New York. The property is further identified as Section 01, Tax Sheet 2, Lots P-25 and P-25B, and comprises approximately 3.3 acres. The site location and site layout are shown on Figures 1 and 2, respectively.

2.1.2 Existing Structures/Improvements and Current Site Use

The subject property currently consists of an approximately 24,000 square feet (footprint), single-story, retail building occupied by Walgreens, Dunkin' Donuts, and Chase Bank in the southeastern portion of the site and an approximately 9,000 square feet (footprint), retail building occupied (from west to east) by Van Tassel Cleaners, Tappan Zee Dental Group, a laundromat, a video store, and a dollar store in the northern portion of the site. The remaining portions of the site consist of asphalt-paved parking and driveway areas. The off-site parcel located immediately west of the northern retail building currently is occupied by a McDonald's restaurant.

2.1.3 Past Uses of the Property

According to historical sources reviewed by Whitestone, the current site buildings reportedly were constructed in 1976. The current Walgreens building formerly was occupied by a supermarket. The northern retail building reportedly has been occupied by a drycleaning facility since construction. Prior to 1976, the subject property was occupied by a variety of commercial retail uses dating back to the late-1800's. Additional site history will be provided in the site conceptual model to be included in the pending comprehensive RIR.

2.1.4 Uses of Adjoining Properties

The area immediately surrounding the subject property consists of a mix of residential and commercial uses. The site is bound by Stiloski's Automotive Corporation, a playground area, residential properties, and the Salvation Army beyond Wildey Street to the north; Union Street Bank and residential properties beyond Central Avenue to the east; a residential apartment building beyond a landscaped area to the south; and a McDonald's restaurant, Cortland Street, Tarrytown Bakery, Valad Electric and Heating Company, and railroad tracks to the west.

2.2 PHYSICAL SETTING

2.2.1 Topography/Geology

Surface topography at the subject property is relatively flat with an approximate average elevation of 25 feet above mean sea level (msl). The subsurface conditions encountered in the soil borings and monitor wells previously installed at the site by Whitestone in January 2009 and February 2009 consisted of the following generalized strata in order of increasing depth.

Surface Material: Six inches of asphalt/subbase or topsoil were encountered at the surface in the borings and monitor wells drilled at the site.

Fill Materials: Fill materials generally consisting of gray medium to fine sand with variable amounts of silt, gravel, and debris were encountered in the borings drilled during these investigations. The debris encountered in the borings consisted of brick, asphalt, concrete, and wood fragments. The borings penetrated through the fill material at depths ranging from approximately 0.5 feet below ground surface (fbgs) to 6.0 fbgs.

Native Materials: Underlying the fill materials, three strata of soils were encountered in the borings. The first stratum consisted of layers of dark grayish-brown sand and silt between 6.0 fbgs and 14.0 fbgs. The second stratum consisted of a layer of dark brownish-black fibrous peat between 14.0 fbgs and 16.0 fbgs, and the third stratum consisted of intermingled layers of clay, silt, and sand to termination depths of 30.0 fbgs.

Groundwater: Static groundwater conditions recorded during previous investigation and monitoring activities were encountered at depths that ranged from approximately 6.0 fbgs to 8.05 fbgs.

2.2.2 Surface Water/Wetlands

No evidence of surface water or wetland areas were observed on site. The subject property is not described on the United States Fish and Wildlife Service *National Wetlands Inventory Interactive Mapper* as a mapped wetland area. The nearest surface water body or wetland area is located approximately 0.25 mile to the west of the subject property.

2.2.3 Groundwater

Groundwater was encountered beneath the subject property during the most recent investigation activities at depths of approximately 6.0 fbgs to 8.05 fbgs. Groundwater was determined to flow in a southwesterly direction during Whitestone's previous RI activities.

2.3 OBJECTIVE

In response to NYSDEC's and NYSDOH's comments pertaining to Whitestone's June 24, 2009 RIR & SRI/CAW, September 30, 2009 SRIW, and January 21, 2010 SRIW (Rev. 1), supplemental VI, soil, and groundwater investigations were conducted at the site. The supplemental VI investigations conducted at the site are presented in Section 3.0 of this report. The results of the supplemental soil and groundwater sampling conducted during the RI will be addressed in a subsequent report to NYSDEC.

Based on the results of the VI investigation, this SSDSDP is being presented to address elevated concentrations of PCE and TCE detected in sub-slab and indoor air samples collected in Van Tassel Cleaners. The SSDSDP proposes the installation of a SSDS in the drycleaners unit to promptly mitigate the VI concerns. The proposed interim remedial measures will be conducted as required by the May 12, 2005 *Order on Consent* and subsequent December 18, 2008 modification in accordance with NYSDEC *DER-10 Technical Guidance for Site Investigations and Remediation* and NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006).

SECTION 3.0

Remedial Investigations

This SSDSDP has been prepared to document the VI investigation completed in accordance with Whitestone's January 21, 2010 SRIW and to address the VI conditions/concerns identified at the site during the VI investigation.

3.1 PRODUCT INVENTORY INSPECTION

Prior to the sub-slab and indoor air sampling activities, a product inventory inspection was conducted to identify any potential sources of PCE, TCE, and/or other contaminants within Van Tassel Cleaners as well as the four adjoining tenants located in the northern retail building. During the product inventory inspection, NYSDOH *Indoor Air Quality Questionnaire and Building Inventory* forms were completed for each of the tenants of the building. Copies of the forms for each of the tenants are included in Appendix 1 of this report.

As listed on the forms, various cleaners and stain removers were identified in the drycleaners unit. A review of the *Material Safety Data Sheets* (MSDSs) for these products revealed that the stain remover Picrin is composed entirely of TCE. The MSDSs for the cleaners/stain removers Pyratex and Streetex identified in the drycleaners unit did not report their specific chemical compositions as they are trade secrets. These products are used on a daily basis in the drycleaning operation, and could not be removed prior to the sub-slab or indoor air sampling activities.

Product inventory inspections for the remaining tenants did not identify any potential sources of PCE or TCE. Disinfectants and sterilizers rubbing alcohol were noted in Tappen Zee Dental Group. A complete inventory of the products used in the laundromat could not be conducted as patrons of this unit continuously bring various detergents/cleaners to the facility for use in the washing machines.

3.2 SUB-SLAB, SOIL GAS, AND INDOOR AIR QUALITY SAMPLING

One sub-slab soil gas sample was collected within Van Tassel Cleaners as well as in each of the four units located within the northern retail structure (Tappen Zee Dental Group, the laundromat, the video store, and the dollar store) in order to investigate the potential for VI. Concurrently, one indoor air sample was collected from within each of the five units which occupy the structure.

Soil gas vapor samples were also collected to assess the potential for VI into the adjacent McDonald's restaurant. Specifically, one soil gas vapor sample was collected immediately northwest and one soil gas vapor sample was collected immediately southwest of the drycleaners unit to assess the potential for VI into the McDonald's restaurant. Whitestone attempted to collect one additional soil gas vapor sample in the parking lot area to the southeast of the drycleaners unit to assess the potential for VI into the Walgreens

building, however, due to the presence of trapped water beneath the asphalt pavement in this area, this sample could not be properly collected. One ambient air quality sample was also collected from outside the northern retail building to establish background conditions.

The sub-slab, soil gas, indoor air, and ambient air samples were collected over the same 8-hour duration utilizing Summa canisters and submitted to Alpha Analytical Laboratories, a NYSDOH-certified laboratory, for VOC analyses by USEPA Method TO-15. The samples were collected utilizing the methodologies outlined in NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006). The negative inches of mercury contained within the Summa canisters were recorded prior to and following sample collection and are displayed on the laboratory chain of custody. The sample locations are identified on Figure 2. The analytical results from this sampling event are provided in Appendix 3 and Table 1 and were compared with the criteria outlined in NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006).

The VI sampling activities were conducted on February 18, 2010 during the heating season which runs from November 15th through March 31st. As listed in Table 1, the analytical results identified select VOC exceedances of NYSDOH's Soil Vapor/Indoor Air Matrices. PCE was detected at concentrations in the sub-slab and indoor air samples from the drycleaners unit warranting mitigation per NYSDOH's Soil Vapor/Indoor Air Matrix 2. PCE was not identified at concentrations warranting further monitoring or mitigation per NYSDOH's Soil Vapor/Indoor Air Matrix 2 in the sub-slab or indoor air samples from the four adjoining units. Based on NYSDOH guidance and the detection of PCE in sub-slab and indoor air samples in the drycleaning unit and at lower levels in the adjacent Tappen Zee Dental Group and Laundromat units, reasonable and practical actions to identify the sources of the PCE and reduce exposure is necessary. Accordingly, a SSDS is proposed to be installed as outlined in Section 3.0 of this report to mitigate indoor air impacts to these units.

TCE was detected at concentrations in the sub-slab and indoor air samples from the drycleaners unit warranting additional monitoring per to NYSDOH's Soil Vapor/Indoor Air Matrix 1. TCE was not identified at concentrations warranting further monitoring or mitigation per NYSDOH's Soil Vapor/Indoor Air Matrix 1 in the sub-slab or indoor air samples from the four adjoining units. PCE and TCE as well as methylene chloride were not detected at concentrations exceeding NYSDOH Air Guidance Values in the indoor air samples. Precautionary recommendations to mitigate the elevated TCE concentrations are outlined in Section 3.0 of this report.

Additional VOCs including acetone, chloroform, isopropanol, and ethanol were detected in select sub-slab and/or indoor air samples at slightly elevated levels. The most elevated levels of acetone, ethanol, and isopropanol detected in indoor air were documented in Tappen Zee Dental Group. The presence of these compounds is attributable to the disinfectants and sterilizers including rubbing alcohol utilized within the dental facility. Products containing isopropanol also were identified in the video store and products containing ethanol were identified in the drycleaners and dentist. Chloroform was detected at a slightly

elevated concentration in indoor air in the laundromat. The presence of chloroform may be attributable to clothing dyes present in the laundromat on a daily basis. The remainder of the VOCs detected exceeding laboratory reported detection limits appear to be contributable to background conditions, products stored in the individual units, or off-gasing building materials. With the exception of PCE and TCE, the VOCs detected at the site are not compounds of concern. The results of the VI investigation also will be included in Whitestone's pending comprehensive RIR.

3.3 COMMUNICATION TESTING

Following Whitestone's review of the results of the sub-slab and indoor air sampling activities, communication testing was performed to confirm that vapors will be drawn from underneath the entire floor slab of the drycleaners unit as this unit documented PCE and TCE concentrations requiring mitigation and monitoring. Communication testing in the two adjoining units (Tappen Zee Dental Group and the laundromat) also was conducted to ensure the protection of air quality in these units. The communication testing consisted of drilling three holes through the dry cleaner's flooring and concrete slab. These borings were terminated in the sub-base material immediately beneath the floor slab. One boring location was installed in the location of the future SSDS unit and the two other borings were installed in the two locations within the unit that were furthest from the SSDS location to ensure that a vacuum can be created across the entire floor slab of the unit. The former locations utilized to collect the sub-slab air samples in the two adjoining units were re-established in an effort to confirm that vapors would also be drawn from underneath these units. Hand-held, digital micromanometers with the ability to measure inches of water column (wc) of pressure to the ten thousandth of an inch of a wc (with an accuracy of one percent) were placed in the holes away from the proposed SSDS unit location to evaluate/measure pressure differentials while a vacuum was applied at the proposed SSDS location test hole.

The micromanometers were utilized to confirm that a preferred pressure differential of 0.0025 inches wc to 0.0035 inches wc can be achieved across the floor slab in the drycleaners unit as well as the two adjoining units (Tappen Zee Dental Group and the laundromat). A portable device capable of establishing comparable vacuum pressure to a SSDS was utilized to complete the communication testing. The device utilized for the testing was capable of extracting approximately 90 cubic feet per minute (CFM) of air. A meter was utilized to confirm the CFM of air being removed to create the required vacuum pressure across the floor slabs. Based on the results of the communication testing, a pressure differential of 0.0026 inches wc was detected at the furthest sampling point (Tappen Zee Dental Group). Pressure differentials in the drycleaners unit ranged for 0.0029 to 0.0041 inch wc. Communication test results are included in Table 2. The holes in the floor slab were sealed following the communication test.

SECTION 4.0

Sub-Slab Depressurization System Design Plan

4.1 SUB-SLAB DEPRESSURIZATION SYSTEM

To address the VI concerns outlined in Section 3.0, a SSDS will be installed in the Van Tassel Cleaners unit at the location utilized for the communication test as shown on Figure 2.

The SSDS will be constructed by placing a four-inch diameter PVC pipe in the sub-base immediately below the building's floor slab. The pipe will extend vertically (upward) through the unit and vent to the exterior atmosphere above the roof. A fan (Radonaway Model RP145) capable of mechanically venting a minimum of 90 CFM of air from beneath the slab will be placed in line with the vent pipe above the roof. A sealable sampling port will be installed at the base of the unit for future sampling purposes. Additionally, an in-line magnahelic dial vacuum gauge and alarm system (Radonaway Checkpoint II) will be installed on the SSDS unit. The fan and gauge/alarm will each have their own dedicated electrical circuits. A plan depicting the proposed SSDS system design is attached as Figure 3. Specifications for the gauge/alarm system and fan to be used on the SSDS are attached in Appendix 2.

Upon installation of the SSDS, the communication test outlined in Section 3.3 of this report will be repeated to ensure the SSDS is functioning properly. In addition, an indoor air sample will be collected from the adjacent Tappen Zee Dental Group unit during the next heating season. The air sampling will be conducted in accordance with the procedures outlined in Whitestone's January 21, 2010 SRIW.

4.2 REPORTING

In addition to this SSDSDP, a comprehensive *Remedial Investigation Report and Supplemental Remedial Investigation/Corrective Action Workplan* (as necessary) will be submitted to NYSDEC and NYSDOH for review. The comprehensive RIR will include the results of the VI investigations outlined herein as well as the results of the supplemental soil and groundwater sampling and analyses conducted at the site in accordance with Whitestone's January 21, 2010 SRIW. The workplan will include recommendations for supplemental remedial investigations and/or corrective actions (if any) that may be necessary to address site conditions. Furthermore, the comprehensive RIR will address NYSDEC's and NYSDOH's comments as outlined in the December 11, 2009 letter and will develop a site conceptual model in accordance with NYSDEC's *DER-10 Technical Guidance for Site Investigation and Remediation*.

4.3 OPERATION AND MAINTENANCE

A *Site Management Plan* (SMP) will be submitted for the site upon evaluating the results of the supplemental soil and groundwater investigations conducted at the site. The SMP will include the corrective actions (if any) required to address VI, soil, and groundwater contamination at the site.

4.4 HEALTH AND SAFETY

The proposed tasks will be completed under the supervision of a Professional Engineer pursuant to the project's *Site Health and Safety Plan* (SHASP) as previously provided in J.R. Holzmacher, P.E., LLC's September 2007 *Supplemental Investigation Workplan*. The SHASP also outlines the Community Air Monitoring that will be conducted during the short term invasive activities (penetrating the floor slab) associated with the SSDS installation.

4.5 SCHEDULE

Task	Estimated Schedule*
Installation of SSDS	Two Weeks
SSDS Inspection	Monthly
* Startup and schedule are from NYSDEC's and NYSDOH's approval of this SSDSDP.	