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Closure Achieved With Cost-Effective Vapor Intrusion Solution

Retro-Coat Applied to Former Jazz Club Ensures Protection From Vapor Intrusion



Highlights

- 33% Savings compared to alternative remedial approaches
- Safe and Effective
- Quick 3-Day Installation
- Closure Achieved within 6 Months

Timeline

December 2016
Prior consulting firm conducts sub-slab soil vapor assessment to assess the potential for volatile organic compounds from neighboring dry cleaning facility

January 2017
New consultant hired to replace prior consultant. Initial indoor air quality assessment conducted to evaluate indoor quality and screen the data against Washington DOE's soil vapor intrusion guidance.

February 2017
Retro-Coat VI Coating Applied

May 2017
Consultant conducts post-application indoor air quality assessment

June 2017
VI Remedial Closure Achieved

Overview

Subsurface contamination caused by chlorinated volatile organic compounds (CVOCs) beneath a former jazz club posed a direct risk to the indoor air quality for a Renton, Washington property. The CVOC's had migrated beneath the property from a neighboring dry cleaning operation resulting in a vapor intrusion (VI) issue. Concentrations of tetrachloroethylene (PCE) and carbon tetrachloride, primary contaminants of concern, exceeded the Washington State Department of Ecology (DOE) risk screening regulatory level of indoor air quality.

An environmental consultant was hired by the owner to develop a solution to improve the indoor air quality of the 7,300 square foot space. When the consultant performed a cost analysis of different vapor mitigation and remediation approaches, it was found that the Retro-Coat® Vapor Intrusion Coating System would provide an excellent solution at about a third of the cost less than other remedial approaches.

Background

Renton, Washington is a bedroom community located just outside of downtown Seattle. As a suburb of downtown Seattle, Renton has seen tremendous growth over the last two decades as technology giants like Microsoft, Amazon, and Nintendo choose the area for their global headquarters. With commercial properties and home values ever increasing, developers are looking for new ways to restore brownfield sites quickly and effectively, to allow them to move forward with future development. In the case of this former popular jazz club in the historic section of downtown Renton, indoor air quality was impacted with volatile organic compounds associated with dry cleaning solvents that had spread from a nearby dry cleaning operation.





Initial Indoor Air Quality Evaluation

Previous environmental consultants had conducted a sub-slab soil vapor assessment at the property in December 2016 to assess the potential for VOC vapor intrusion from the adjoining dry cleaning facility onto the property. Results from the previous environmental consultant's sub-slab soil vapor assessment indicated the presence of VOCs, specifically PCE at a concentration of 28,100 micrograms per cubic meter (µg/m3) and TCE at a concentration of 75 µg/m3. Concentrations were significantly above Washington State Department of Ecology (DOE) Vapor Intrusion Indoor Air Method B cancer cleanup levels (CULs) of 9.6 µg/m3 and 0.37 µg/m3, respectively.

To further evaluate the current indoor air quality and assess the VI risk to the site, a new consultant was contracted to conduct an initial indoor air quality assessment in January 2017. The data was compared to Washington State DOE soil vapor intrusion screening levels. To collect indoor air samples, SUMMA cannisters (6-liter capacity), individually certified by H&P Mobile Geochemistry, Inc., were used. Each cannister was outfitted with an 8-hour air flow controller.

Indoor air quality results indicated that vapor intrusion, likely associated with the adjoining dry cleaning facility, impacted the property. Laboratory analytical results for the four indoor air samples indicated the following results:

- **Elevated PCE Concentrations Above Washington DOE CULs:** PCE concentrations in the dining room area (JRIA-1 indoor air sample – 12 µg/m3) and in the basement (JIRA-4 indoor air sample – 44 µg/m3) were measured above DOE Vapor Intrusion Indoor Air Method B cancer CULs of 9.6 µg/m3.

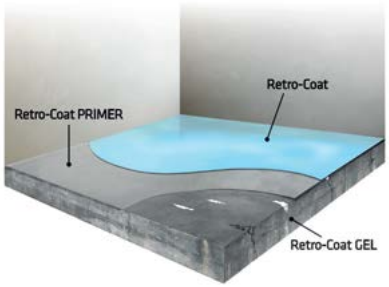
- **Elevated VOCs Above State Regulatory Levels:** Other VOCs associated with dry-cleaning solvents, including carbon tetrachloride, chloroform, and 1,2-dichloropropane, were also detected above their respective DOE Vapor Intrusion Indoor Air Method B cancer CULs at all indoor air sampling locations.

The detections of VOCs associated with dry-cleaning solvents, including PCE, carbon tetrachloride, chloroform, and 1,2-dichloropropane, were measured above their respective DOE Vapor Intrusion Indoor Air Method B cancer CULs.

In accordance with Washington DOE regulations, the presence of these carcinogenic VOCs necessitates a mitigation measure at the property to ensure that the air quality does not pose health risks for indoor receptors at the property.







The Retro-Coat® Vapor Intrusion Coating System is a complete product line consisting of chemically resistant materials to properly protect existing structures from the threat of contaminant vapor intrusion. Retro-Coat finishes to a high gloss, easy-to-clean surface that is impervious to vapor and moisture transmission. Available in a variety of colors, Retro-Coat can be applied on damp as well as dry concrete, concrete masonry units, tile, brick and metal. For enhanced slip resistance, a suitable aggregate can be added.

Application Details

The concrete was first prepped by diamond grinding and shot blasting the surface to create a profile within the existing floor for maximum bonding of the Retro-Coat barrier system.

All cracks, holes, and expansion joints were filled with a Retro-Coat caulk. A 6-mil Retro-Coat Primer was then applied across the entire concrete floor to prepare for the Retro-Coat barrier.

Following the curing of the Retro-Coat Primer, Retro-Coat was applied using squeegees and rollers applying two 10-mil applications, for a cured thickness of 20-mils.

The safe, effective and efficient installation of the Retro-Coat Vapor Mitigation System was completed within three days.



Results

The consultant conducted an indoor air quality assessment in May, 2017 at the property after installation of the Retro-Coat VI Coating System. In order to obtain samples representative of indoor air conditions at the property and ensure that the same indoor air conditions existed during the previous indoor air quality assessment conducted by the consultant in January, 2017, the consultant requested that the client turn on the heater unit in the building prior to sample collection.

Laboratory analytical results for indoor air quality assessment after installation of the Retro-Coat VI Coating System indicated the following:

- The PCE concentration in the dining room area (JRIA-5 indoor air sample—5.1 µg/m3) measured below the DOE Vapor Intrusion Indoor Air Method B cancer CUL of 9.6 µg/m3 (DOE, 2016).
- Other VOCs associated with dry-cleaning solvents, including carbon tetrachloride, 2 butanone, toluene, and xylenes, were also detected below their respective DOE Vapor Intrusion Indoor Air Method B cancer CULs.

Figure 1 Air Quality Monitoring Data

Laboratory analytical results for indoor air quality assessment after installation of the Retro-Coat VI Coating System

CVOCs	Cleanup Levels	Initial Samples	Post-Installation Samples
1,2-Dichloropropane	0.25 µg/m³	1.2 µg/m³	<0.25 µg/m³
Carbon Tetrachloride	0.42 µg/m³	0.7 µg/m³	<0.42 µg/m³
Tetrachloroethene	9.6 µg/m³	44 µg/m³	<9.6 µg/m³

Findings from the indoor air quality assessment after installation of the Retro-Coat VI Coating System include:

- **VOCs Now Below Vapor Intrusion Levels:** Indoor air quality results indicate that installation of the Retro-Coat VI Coating System resulted in mitigation of VOCs migrating into the property—notably at the first floor dining room area where detections of PCE and other VOCs associated with dry-cleaning solvents are below their respective DOE Vapor Intrusion Indoor Air Method B cancer CULs. Before the installation of the Retro-Coat VI Coating System, detections of these VOCs were above their respective DOE Vapor Intrusion Indoor Air Method B cancer CULs.

- **PCE and VOCS Below Washington DOE CULs:** The adjoining property is no longer an active dry cleaning facility. It operates only as a drop-off facility for dry-cleaning services. With respect to vapor intrusion of VOCs associated with dry-cleaning operations, indoor air quality at the property has improved measurably after the installation of the Retro-Coat VI Coating System. Detections of PCE and associated dry cleaning VOCs are now currently below DOE Vapor Intrusion Indoor Air Method B cancer CULs.

Retro-Coat®
Vapor Intrusion Coating

The objective of mitigating vapor intrusion of VOCs into the building structure for future occupants at the property has been met by the installation of the Retro-Coat VI Coating System. Retro-Coat provides a long-term solution to the property indoor air quality issues arising from the adjoining dry cleaners facility.



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