



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1 - NEW ENGLAND
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**Addendum to Second Five-Year Review Report
Pine Street Canal Superfund Site (VTD980523062)
Burlington, Vermont**

On December 22, 2011, the U.S. Environmental Protection Agency (EPA) issued a Second Five-Year Review Report (Report) for the Pine Street Canal Superfund Site (Site), located in Burlington, Chittenden County, Vermont. EPA deferred its final protectiveness determination for the remedy in that Report until it obtained further information. Through this document, EPA provides an update on the progress that has been made at the Site since the Report was issued, and amends the deferred protectiveness determination in the Report for the exposure pathway contained therein.

The Report, signed by James T. Owens, III, Director, Office of Site Remediation and Restoration, EPA, Region 1, included the following protectiveness statement:

This second five-year review concludes that while the remedy is protective for most pathways of exposure to contaminants, a protectiveness determination of the remedy at the Pine Street Canal Superfund Site cannot be made until further information is obtained to evaluate potential vapor intrusion impacts at the existing Burlington Electric Department building. The vapor intrusion study will also examine how to consider the potential for vapor intrusion on the undeveloped parcels near the Site. Once the data are collected, they will be assessed and a determination will be made on whether or not additional measures are necessary to ensure protection of human health. It is expected that these actions will take approximately 12 months to complete at which time a protectiveness determination will be made.

Progress since the Second Five-Year Review Completion Date

In response to EPA's findings during the second five-year review, the Performing Defendants for the Site undertook a soil gas and groundwater study under an EPA-approved workplan at the Burlington Electric Department (BED) building at 585 Pine Street, located just south of the original manufactured gas plant. This effort included:

- a preliminary screening (October 2012), the results of which indicated that some targeted volatile organic compounds were above groundwater screening thresholds;
- two seasonal sampling events (March and October 2013) to collect soil gas and groundwater from four locations immediately adjacent to the BED office space and garage (see figure); and

- a vapor intrusion (VI) screening study (March 2014) to determine if additional testing (e.g., indoor air, sub-slab soil gas) and/or corrective actions are warranted.

Collectively, these data supported EPA's review and completion of a risk evaluation of vapor intrusion at the BED building. On March 25, 2014, EPA completed the vapor intrusion risk evaluation for exposure to soil vapor using the ratio approach: by comparing the maximum detected soil vapor concentrations to the screening levels developed from the vapor intrusion screening level (VISL) calculator (November 2013), using default industrial/commercial exposure values, site-specific groundwater temperature, and maximum detected soil vapor concentrations for benzene and naphthalene (site-related contaminants of potential concern (COPCs)).

Using the above approach, EPA estimated VI cancer risk for a commercial scenario at the BED building due to exposure to benzene and naphthalene concentrations in soil vapor to be 2.6×10^{-5} , which is within EPA's acceptable cancer risk range of 1×10^{-4} to 1×10^{-6} .

Since there is no unacceptable risk to human health due to vapor intrusion at the BED building, EPA has made the determination – and the State of Vermont concurs – that the vapor intrusion pathway is not complete inside the BED building. No further sampling or mitigation is needed to address the potential for vapor intrusion inside the BED building.

Although soil vapor concentrations of ethylbenzene (also a COPC) do not exceed its screening level, the concentrations found in groundwater samples collected just off the northwest corner of the BED garage (BED-1) – which range from 400 $\mu\text{g}/\text{L}$ to 1,700 $\mu\text{g}/\text{L}$ – exceed its 1×10^{-6} VISL of 29 $\mu\text{g}/\text{m}^3$ by many orders of magnitude. For this reason, EPA may require that the Performing Defendants collect additional data and perform another vapor intrusion screening study at and near the BED property for subsequent five-year reviews.

Based on the above findings, EPA amends the protectiveness statement in the Second Five-Year Review Report as follows:

EPA has determined, as part of the second five-year review and this subsequent addendum, that the remedy at the Pine Street Canal Superfund Site is currently protective in the short-term. For the remedy to remain protective in the long term, the collection of additional data (e.g., soil gas, etc.) and a new assessment of the vapor intrusion pathway may be required to demonstrate that conditions have not changed.

EPA also amends the first row in the table in Section 8.0 Issues of the Second Five-Year Review Report to read as follows:

Issue	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Groundwater in excess of EPA generic vapor intrusion screening values for target risk of 1×10^{-6} is present in some portions of the plume at the Site. Should conditions change or the plume migrate, there is the potential for these contaminants to become located in the vicinity of currently-occupied buildings at levels that exceed screening criteria.	No	Yes

EPA also replaces the first row in the table in Section 9.0 Recommendations and Follow-up Actions of the Second Five-Year Review Report with the following:

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness	
					Current	Future
Vapor intrusion to indoor air pathway in new or expanded structures on Site.	Evaluation of need for vapor barrier in planned new construction or expansions of existing structures on parcels on and near the Site.	Property owners with existing deed restrictions (ICs)	EPA	Annually beginning Dec 2014	No	Yes
	VI screening, sampling and characterization, as appropriate, on new or expanded construction on and near the Site.	Performing Defendants	EPA	One year before Five Year Reviews beginning Dec 2015	No	Yes
Vapor intrusion to indoor air pathway at BED building.	VI screening, sampling and characterization, as appropriate, at BED building.	Performing Defendants	EPA	One year before Five Year Reviews beginning Dec 2015	No	Yes

Next Five-Year Review

The next five-year review will be completed in December 2016, five years after the signature of the Second Five-Year Review Report.



James T. Owens, III, Director
Office of Site Remediation and Restoration
U.S. EPA Region 1

Date

8/19/14

EPA also requires the first row in the table in Section 9.0 Recommendations and Follow-up Actions of the Second Five-Year Review Report with the following:

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protection?	
					Current	Future
Vapor intrusion to indoor air pathway in new or expanded structures on site.	Evaluation of need for vapor barrier in planned new construction or expansion of existing structures on parcels on and near the Site.	Property owners with existing deed restrictions (IC)	EPA	Annually beginning Dec 2011	No	Yes
Vapor intrusion to indoor air pathway in existing structures on and near the Site.	VI screening, sampling and characterization as appropriate, on new or expanded construction on and near the Site.	Performing Detachments	EPA	One year before Five Year Review beginning Dec 2012	No	Yes
Vapor intrusion to indoor air pathway at SED building.	VI screening, sampling and characterization at SED building.	Performing Detachments	EPA	One year before Five Year Review beginning Dec 2012	No	Yes

References

- Johnson Company, 2012. Technical Memorandum: *Revised Vapor Intrusion Screening Study, Pine Street Canal Superfund Site in Burlington, Vermont*. October 10, 2012.
- Johnson Company, 2013. *Quality Assurance Project Plan, Soil Vapor Testing (Revision 1), City of Burlington, Burlington Electric Department Property, Pine Street Canal Superfund Site, Burlington, Vermont*. March 2013.
- Johnson Company, 2014. Technical Memorandum: *2013 Vapor Intrusion Summary Report, Pine Street Canal Superfund Site, Burlington, Vermont*. March 24, 2014.
- Vu, Chau, 2014. Technical Memorandum: *Review of the 2013 Vapor Intrusion Summary Report for Pine Street Site*. March 25, 2014.

