

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH



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October 30, 2019

Camille Fontanella
Environmental Analyst
Connecticut Department of Energy
and Environmental Protection
79 Elm Street
Hartford, CT

Dear Ms. Fontanella,

This letter is in response to your request that we evaluate environmental data from 3 indoor air probes from the barbeque restaurant, adjacent to Crystal Cleaners, 'House of Bones,' 1 New Haven Avenue, Derby. The Connecticut Department of Energy and Environmental Protection (CT DEEP) routinely requests our advice regarding evaluating indoor air issues related to vapor intrusion. CT DEEP has some questions about the magnitude of risk to human health because the operators of Crystal Cleaners, who are in CT DEEP's Voluntary Cleanup Program, have turned off a soil vapor extraction system in 2012 that was installed in 2010 to vent out volatile organic compounds that are present in the indoor air. There is, however, an exhaust fan operating in the basement of the restaurant and a fan in the dry cleaning facility that may be helping to decrease the volatile organic compound levels (VOCs).

We have reviewed indoor air data in the barbeque restaurant collected on 9/13/18, 12/16/18, and 2/24/19. As shown in Table 1, tetrachloroethene (PCE) was the only contaminant that exceeded Connecticut's Industrial Target Indoor Air Concentration used to screen indoor air data (CT DEEP 2003). A maximum PCE concentration of 51.2 ug/m³ was measured on 10/21/19 (with the exhaust fan turned off). Lower PCE concentrations (20.1 and 12.5 ug/m³) resulted with the exhaust fan operating.



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Table 1. Indoor air concentrations detected at the barbeque restaurant adjacent to Crystal Cleaners and Comparison Values (CT DEEP Industrial/Commercial Target Indoor Air Concentrations) used to screen indoor air data.

Date	Tetrachlorethylene Concentration (ug/m³)	Target Indoor Air Concentration (ug/m³)[#]
10/21/18 (with exhaust fan turned off)	51.2	5
12/16/18 (with exhaust fan turned on)	20.1	5
2/24/19 (with exhaust fan turned on)	12.5	5

[#]Proposed Revisions, Connecticut's Remediation Standard Volatilization Criteria (CT DEEP 2003).

The Connecticut Department of Public Health (CT DPH) calculated non cancer risk from inhalation exposure to PCE in indoor air at the restaurant associated with 5 years of exposure. Exposure was assumed to be 8 hours per day, 5 days per week, and 50 weeks per year. Maximum concentrations (with the basement exhaust fan turned on and off) were used as a conservative assumption. Using the United States Environmental Protection Agency's (US EPA) reference concentration (EPA 2012) of 40 ug/m³ for PCE, we have determined that non cancer health impacts from exposure to PCE are unlikely.

CT DPH also calculated theoretical cancer risks from exposure to indoor air in the barbeque restaurant associated with 5 and 25 years of exposure using US EPA's Inhalation Unit Risk value of $2.6 \times 10^{-7} \text{ (ug/m}^3\text{)}^{-1}$ for PCE (EPA 2012)¹. Exposure was assumed to be 8 hours per day, 5 days per week, and 50 weeks per year. Maximum concentrations (with the basement exhaust fan turned on and off) were used as a conservative assumption. Theoretical cancer risks from exposure to maximum concentrations ranged from a low of 9×10^{-8} (5 year exposure)² to a high of 1×10^{-6} (25 year exposure). Both of the exposure scenarios resulted in minimal excess cancer risk (less than 1×10^{-5}).

¹ EPA's 2012 Unit Risk value for PCE of $2.6 \times 10^{-7} \text{ (ug/m}^3\text{)}^{-1}$ is an order of magnitude lower than California EPA's Unit Risk value of $5.9 \times 10^{-6} \text{ (ug/m}^3\text{)}^{-1}$ for PCE which serves as the basis for the Target Air Concentration for PCE in Connecticut's Remediation Standard Volatilization Criteria Proposed Revision (CT DEEP 2003). Because the US EPA's Unit Risk value is lower than the Unit Risk value for PCE than California EPA, it leads to a higher allowable concentration in air.

² This means that there might be 9 excess cancers in a population of 100,000,000 exposed to the contaminated indoor air 5 days per week for 5 years.

Conclusions

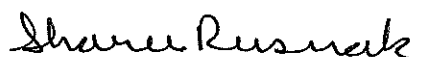
CT DPH has concluded that exposure to indoor air levels of PCE at the barbeque restaurant do not pose a public health risk if the exhaust fan remains off. Exposure to levels of PCE over longer periods of time (25 years) without the exhaust fan operating results in only minimal excess cancer risk.

Recommendations

1. CT DPH recommends regular monitoring of indoor air in the restaurant to ensure that levels remain low enough to not pose a public health risk. However, there is some uncertainty in indoor air concentrations to which current and future workers in the restaurant might be exposed because there are not enough rounds of data to adequately represent the large variability inherent in indoor air VOC concentrations. Because of this, CT DPH recommends that the exhaust fan should remain on and continued regular monitoring of indoor air needs to be performed to adequately characterize the indoor air of the barbeque restaurant, the dry cleaning facility and the restaurant basement. If levels increase above the current maximum indoor air concentration in the barbeque restaurant (51.2 ug/m^3), then the environmental exposure conditions need to be re-evaluated.

If you have any questions or need additional information, please contact me at (860) 509-7583.

Sincerely,



Sharee M. Rusnak
Site Assessment and Chemical Risk Unit
Environmental and Occupational
Health Assessment Program
CT Department of Public Health

References

[CT DEEP 2003] Proposed Revisions, Connecticut's Remediation Standard Volatilization Criteria, March 2003.

[EPA 2012] United States Environmental Protection Agency. February 2012. Integrated Risk Information System. Available at:
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