



# Indoor Air and Sub-Slab Vapor Intrusion Sampling at the Drop Hammer Building

October 2020

Lockheed Martin's Environment, Safety and Health team has evaluated the Drop Hammer Building to assess the potential for vapor intrusion (VI). Sampling of both indoor air and sub-slab vapors occurred in May and August 2020. While this sampling showed indoor air is considered safe for employees, contaminant levels found beneath the building are high enough to consider adding mitigation measures to prevent vapor intrusion into the building. More steps are planned to address this newly identified circumstance. This fact sheet provides more information about the sampling program and why it's necessary.

## What is the process to sample for vapor intrusion (VI)?

Vapor intrusion sampling is a process in which indoor air is screened for chemicals that may have moved into a building from soil or groundwater beneath the building. Assessments are typically performed in stages:



Summa® Cannister

the design of each investigation phase derives from the results of the prior phase(s). First, groundwater or underlying soil is assessed from the results of a sampling and monitoring program. If volatile contaminants are discovered in groundwater or soil beneath or near buildings (underground, or "sub-slab"), then the

vapors beneath the building are sampled to see if those chemicals may have volatilized from the groundwater or soil, into air amidst soil or bedding material immediately under the building. If they have, the contaminated vapors may move into the building if the lowest floor and below-grade walls are not sealed. That potential intrusion into the building may be identified initially by various means, including hand-held equipment that screens for airborne chemicals in the air, vents, or at cracks, joints, and other potential breaches in the lowest floor and subgrade walls. If this screening indicates volatile chemicals are present, sampling using vacuum-sealed (Summa®) canisters can help to better assess their presence in indoor air. If above certain concentrations, the volatile chemicals may become the subject of corrective measures, such as sealing cracks in the floor, to prevent worker exposure to them.

At the Drop Hammer Building, initial hand-held indoor air and soil vapor sub-slab screening occurred in May 2020, and the results were assessed. Sampling by means of Summa® canisters subsequently was conducted to further evaluate indoor air. Based on the results of this sampling, a more comprehensive follow-on sampling of indoor air and sub-slab vapors using Summa® canisters occurred in August 2020.

## Why is the Drop Hammer Building being sampled now?

Over the past several years, Lockheed Martin has assessed soil, groundwater, and indoor air in buildings at the Middle River Complex. A "plume" of groundwater contaminated primarily with trichloroethene, or TCE, has been identified west of A Building. Prior to the sampling event, the groundwater plume was thought to be far enough away and deep enough that concentrations of any contaminants in soil vapor beneath the Drop Hammer Building would likely be low. The remediation project

## For More Information

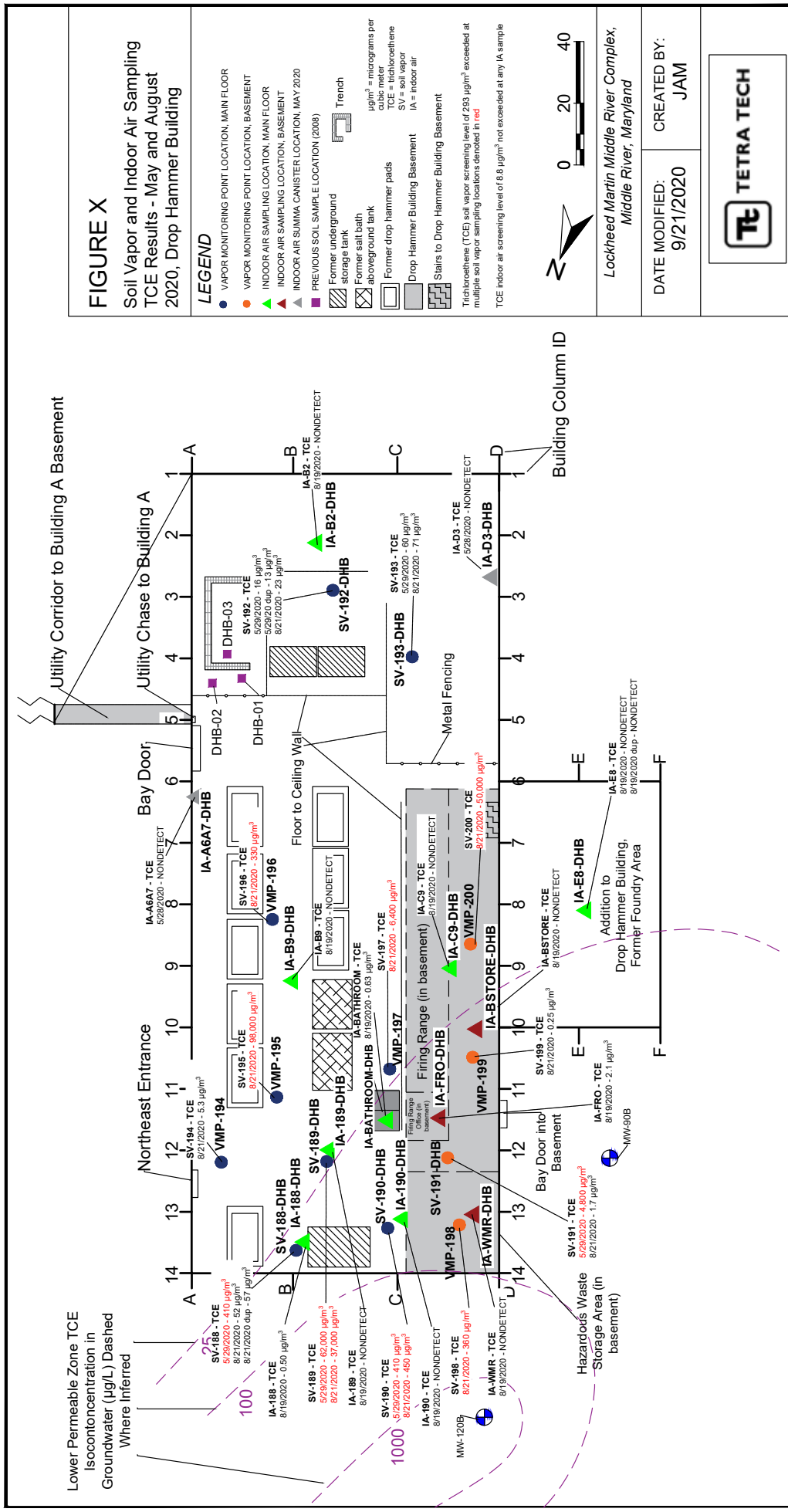
Tom Blackman, Project Lead, (301) 548-2209, Cell (240) 460-7508, Tom.D.Blackman@lmco.com

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2017 aerial photograph provided by the State of Maryland.



Graphic shows the Drop Hammer Building location at the Middle River Complex.



Layout depicts the Drop Hammer Building and conceptual groundwater contaminant plume locations, and provides results from May and August 2020 sampling events. Locations beginning "IA-" represent indoor air sampling locations and results; locations beginning "SV-" indicate sub-slab vapor sampling locations and results. Red lettered results indicate those sub-slab vapor locations exceeding the screening level of 293 micrograms per cubic meter established by the Maryland Department of the Environment, indicating additional actions may be needed.



team nevertheless recommended assessing the potential for vapor intrusion into the building. There is also limited information about whether TCE has been used historically in the Drop Hammer Building, or whether any spills may have occurred there, but conversations with longtime employees have suggested historical TCE use is possible. Visual inspection of the Drop Hammer Building, which was constructed in the 1930's, indicates the overall structural condition of the building appears sound, which limits the potential for vapors to enter the building.

## What has sampling shown?

The vapor intrusion sampling performed to date consists of two phases: 1) an initial screening of indoor air from multiple locations throughout the building, sampling of soil vapors from beneath the floor slab of the building, and limited sampling of indoor air in May 2020; and 2) more comprehensive follow-on sampling of indoor air and sub-slab vapors in August 2020.

In May, during phase 1, handheld screening equipment was used prior to Summa<sup>®</sup> canister sampling to help choose indoor sampling locations. Nineteen locations were screened, including air ducts; breathing zones in the first floor and basement levels; the utility corridor leading to the A Building basement; and floor drains/storm sewer manholes. Two screening locations, from the southern portion of the building, produced results indicating the presence of low concentration TCE, at air duct vents previously used for heating the building. More rigorous indoor air sampling using Summa<sup>®</sup> canisters did not detect TCE. In contrast, TCE concentrations were elevated in vapors under the floor of the northwest corner of the building (the area closest to the known groundwater plume). Those TCE concentrations exceeded the Maryland Department of the Environment (MDE) sub-slab screening level of 293 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), with the highest level identified being 62,000  $\mu\text{g}/\text{m}^3$ . Soil vapor samples are typically performed to assess the potential for underground vapors to affect indoor air, so these sub-slab vapor levels indicate additional investigation and further assessment of indoor air is warranted.

In August, during phase 2, Summa<sup>®</sup> canisters were used to sample 8 main floor and 3 basement indoor air locations, plus 13 sub-slab vapor locations. Results showed TCE was undetectable in 9 of 11 indoor air samples; the two detections found were low at 0.63  $\mu\text{g}/\text{m}^3$  and 2.1  $\mu\text{g}/\text{m}^3$ , below the MDE-established industrial screening level for indoor air of 8.8  $\mu\text{g}/\text{m}^3$ ,

indicating potential risk is low. However, sub-slab vapor sampling results found TCE detections at 7 of the 13 locations exceeded the MDE screening level of 293  $\mu\text{g}/\text{m}^3$ ; sub-slab vapor concentrations ranged from 0.25 to 98,000  $\mu\text{g}/\text{m}^3$ .

## Do employees need to be concerned?

No. Air and soil testing results indicate that employees do not need to be concerned about indoor air quality resulting from vapor intrusion. Employees are encouraged to ask questions and raise concerns to Lockheed Martin, and they will be addressed promptly.

## What follow-on steps or indoor air sampling will occur?

Lockheed Martin will discuss next steps for monitoring indoor air with the Maryland Department of the Environment and establish follow-on sampling plans and discuss what mitigation measures may be warranted to help prevent the potential for vapors beneath the building to enter the building.

## What do employees need to do?

Employees do not need to take any action during sampling or mitigation activities. Please note, however, that Summa<sup>®</sup> canisters are very sensitive, so once a sampling event is underway, we ask that the canisters not be moved or otherwise exposed unnecessarily to chemicals. Similarly, when sub-slab vapor monitoring points are installed in the floor, please take care not to damage them with heavy equipment.

## How can I learn more?

As more sample results are known and once mitigation plans are developed, additional information will be made available to management and employees.

More information about local environmental activities, including the ongoing indoor air investigation program, can be found at: [www.lockheedmartin.com/middleriver](http://www.lockheedmartin.com/middleriver)

For additional questions, contact Tom Blackman at [tom.d.blackman@lmco.com](mailto:tom.d.blackman@lmco.com) or 301.548.2209.