
Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion Executive Summary

Background

Toxic vapors can move from contaminated groundwater and soil to indoor air. This process is called vapor intrusion. Vapors inside buildings can threaten human health. The science behind vapor intrusion has been evolving quickly. To protect the health of Californians, the Department of Toxic Substances Control (DTSC) and the California Water Boards, drafted a supplement to existing vapor intrusion guidance. This document is called the “*Draft Supplemental Guidance: Screening and Evaluating Vapor Intrusion*” (Draft Guidance). This Draft Guidance contains recommended improvements for vapor intrusion investigations and promotes consistency throughout the state. It also offers suggestions on the following topics:

- Which buildings to sample first
- How to screen buildings for vapor intrusion
- Where to sample
- When additional steps are necessary
- When sewers may contribute to vapor intrusion
- What information we use to refine our approach

The Draft Guidance is intended to be used with existing State guidance (DTSC 2011 Vapor Intrusion Guidance and San Francisco Bay Regional Water Board 2014 Interim Framework¹) when there is a spill or disposal of vapor-forming chemicals. This guidance does not apply to leaking petroleum underground storage tanks (USTs) since they are governed under State Water Resources Control Board’s Low-Threat UST Case Closure Policy.²

Four Steps to Evaluate Vapor Intrusion

The Draft Guidance describes four recommended steps to decide if there is vapor intrusion that could pose a risk to the health of people inside buildings. These actions are meant to protect public health and should be carried out under oversight of the lead regulatory agency.

Step 1 – Decide which buildings should be tested first and how.

When there are several buildings, start with those that are occupied and closest to the contamination. If a building is directly above or very close to the spill, or if it is likely that the sewer could bring toxic vapors inside, skip Step 2 and go directly to Step 3.

¹ [DTSC 2011 Vapor Intrusion Guidance](https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/01/Final_VIG_Oct_2011.pdf) https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/01/Final_VIG_Oct_2011.pdf
[San Francisco Bay Regional Water Quality Control Board 2014 Interim Framework](http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/sitecleanup/TCE_Interim_VI_Framework.pdf)
www.waterboards.ca.gov/rwqcb2/water_issues/programs/sitecleanup/TCE_Interim_VI_Framework.pdf

² [State Water Board 2012 Low-Threat Underground Storage Tank Case Closure Policy](https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf)
https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf

Step 2 – Screen buildings from outside.

Measure vapor-forming chemicals underground at these locations:

- Between the spill and the building
- Just outside the building
- From at least two depths at the same location(s)
- Sample in at least two different seasons and use the data to assess whether people are likely to be affected

Step 3 – Test indoor air.

Measure vapor-forming chemicals in indoor air, beneath the building's foundation, and outdoor air at the same time:

- Test the air in at least three rooms
- Test below the foundation near where the indoor air was tested to check if vapor-forming chemicals are coming from under the building
- Test the outdoor air to check if the vapor-forming chemicals are coming from outside
- Repeat the sampling in different seasons, and
- Test with the heater or air conditioner (on and off) to see if that changes the results

Use these test results to estimate if people are likely to be affected.

Step 4 – Act to protect public health.

- To protect current occupants, take action based on the amount of vapor-forming chemicals in the indoor air
- To protect future occupants, take action based on the amount of vapor-forming chemicals underground because the building characteristics can change over time
- The best response is to clean up the contamination at the spill (remediation)
- Use protective technologies when remediation is not feasible or until the spill is cleaned up
- In extreme cases, occupants may need to be temporarily relocated

The overall cleanup should be designed when the contamination is fully understood and should consider the characteristics of each site.

Toxic Vapors Can Travel Through Sewer Pipes

Vapor-forming chemicals can enter sewer pipes that run through contaminated soil or groundwater. Once inside a sewer, vapors can move through the pipes and escape through cracks or openings, under or inside a building. Some of the traditional ways to test for vapor intrusion could potentially miss vapor-forming chemicals moving through sewer pipes. This Draft Guidance recommends evaluating whether the sewer could bring toxic vapors inside.

Vapor Intrusion Attenuation Factors

Attenuation factors are used to estimate how much of the vapors underground or in groundwater end up in the indoor air. This Draft Guidance uses attenuation factors recommended by the U.S. Environmental Protection Agency.³ These were calculated from a large study of buildings at contaminated sites around the nation, including California.

California Vapor Intrusion Database

Data from sites evaluated using the process described in the Draft Guidance will be entered in a database that will be publicly available. The State will analyze the information in the database and learn how to better protect the people of California from vapor intrusion.

Where to Find the Draft Guidance

Department of Toxic Substances Control (DTSC):

<https://dtsc.ca.gov/vapor-intrusion/>

State Water Resources Control Board:

https://www.waterboards.ca.gov/water_issues/programs/site_cleanup_program/vapor_intrusion/

³ [OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air](http://www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf), www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf