

# East Palestine Train Derailment Air Monitoring

## Frequently Asked Questions

2/9/23

### What's the difference between air sampling and air monitoring?

Air sampling and air monitoring are two different methods of looking at air quality. (Note: chemicals of concern are listed at the end of this document.)

**Air sampling** involves collecting an air sample over a period of time that is then sent to a laboratory for analysis to identify and quantify specific compounds.

**Air monitoring** uses electronic devices to provide real-time readings of airborne contaminants.

### Which contaminants is EPA monitoring for in the air?

EPA conducted stationary and roaming air monitoring surrounding the derailment.

#### **Stationary air monitoring**

AreaRAE Pro units which were configured to monitor for the following chemical compounds:

- volatile organic compounds (VOCs), which includes vinyl chloride and butyl acrylate
- hydrogen cyanide (HCN)
- carbon monoxide (CO)
- hydrogen sulfide (H<sub>2</sub>S)
- lower explosive limit (LEL)
- oxygen (O<sub>2</sub>)

Honeywell SPM flex units which were configured to monitor for the following chemical compounds:

- phosgene
- mineral acids (which include hydrogen chloride)

#### **Roaming air monitoring teams**

MultiRAE Pro units which were configured to monitor for the following chemical compounds:

- volatile organic compounds (VOCs), which includes vinyl chloride and butyl acrylate
- hydrogen cyanide (HCN)
- carbon monoxide (CO)
- hydrogen sulfide (H<sub>2</sub>S)
- lower explosive limit (LEL)
- oxygen (O<sub>2</sub>)

Honeywell SPM flex units which were configured to monitor for the following chemical compounds:

- phosgene
- mineral acids (which include hydrogen chloride)

UltraRAE which was configured to monitor for benzene

TSI Dustrax which measured PM2.5 and PM 10 Particulate Levels

Air monitoring data table summaries on the website provide maps showing the location of the air monitor stations during that period of air monitoring. EPA determined air monitoring station locations based on IMAAC plume models, wind patterns, and other factors such as anticipated work for a time period.

**What do any detections of contaminants mean?**

EPA began conducting around-the-clock air monitoring within hours of the incident. Low levels of contaminants have been detected through air sampling and monitoring. Detections of contaminants means that the chemical of concern was detected by the instrument but does not always mean there is a health concern. When there are detections above screening levels, personnel verify those readings to determine if additional actions are necessary.

**Can you provide more information about vinyl chloride and its byproduct, phosgene?**

ATSDR ToxFAQs is a series of summaries about hazardous substances. Information for this series is excerpted from the ATSDR Toxicological Profiles. Each fact sheet serves as a quick and easy to understand guide. Answers are provided to the most frequently asked questions about exposure to hazardous substances found around hazardous waste sites and the effects of exposure on human health. Following are the links for Vinyl Chloride and its two byproducts of combustion Phosgene and Hydrogen Chloride.

Vinyl Chloride: <https://wwwn.cdc.gov/TSP/substances/ToxSubstance.aspx?toxid=51>

Phosgene: <https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=1479&toxid=182>

Hydrogen Chloride:

<https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=759&toxid=147>

**Which agency or organization is conducting air monitoring?**

EPA is conducting real-time air monitoring around the community at fixed locations and random locations around the response area using instruments as described above. EPA has also collected air samples in the surrounding community using instruments called Summa canisters. Data collected will be posted to the agency's website.

Ohio's 52nd Civil Support Team, a specialized unit of the Ohio National Guard, provided air monitoring support at the site using similar instrumentation.

Norfolk Southern had their own contractor on site performing air monitoring with similar instrumentation.

EPA also has a mobile laboratory on site to analyze air samples.

**How long with EPA continue air monitoring?**

EPA will continue community air monitoring until the emergency response is over.

**Is EPA also collecting water samples?**

Ohio EPA is leading efforts to investigate and address impacts to Sulphur Run and Leslie Run.

EPA collected water samples from Sulphur Run and Leslie Run on February 4, 2023, and those results will be posted online. EPA did detect elevated levels of volatile organic compounds and semivolatile organic compounds. EPA provided the data to Ohio EPA.

EPA will continue to coordinate and assist Ohio EPA as needed with monitoring water quality.

**What are the chemical exposures of concern?**

**Vinyl chloride** is a flammable gas and if involved in a fire, it could break down into **hydrogen chloride, phosgene**, carbon dioxide, and carbon monoxide vapors when burned. The primary short-term risk of exposure for this incident is inhalation of these vapors. Continuous and roaming air monitoring for these chemicals, as well as particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>,) and volatile organic chemicals (VOCs), was conducted throughout the derailment incident. The monitors were positioned near the incident and several miles away to monitor chemicals of concern. Many of the air monitors were repositioned as necessary to ensure proper placement in reference to current and forecasted meteorological data.

**Vinyl chloride**

Vinyl chloride is a colorless gas with a mild or sweet odor. It is flammable and burns easily. Vinyl chloride is also known as chloroethane, chloroethylene, and ethylene monochloride. Vinyl chloride decomposes on burning and produces toxic and corrosive vapors of hydrogen chloride and phosgene.

**Hydrogen chloride**

Hydrogen chloride at room temperature is a colorless to slightly yellow corrosive, non-flammable gas that is heavier than air. It has a strong irritating odor. On exposure to air, hydrogen chloride forms dense white corrosive vapors.

**Phosgene**

Phosgene is a colorless, nonflammable gas at room temperature that smells like freshly cut hay. When released into air, phosgene exists solely as gas that degrades slowly in the atmosphere. This slower degradation in air can result in long-range transport until it degrades in the air or is deposited in soil or water where it can degrade more rapidly.

**n-Butyl Acrylate**

Clear, colorless liquid with a strong, fruity odor.

**Ethylene Glycol Monobutyl Ether Acetate**

A colorless liquid with a fruity odor.

**2-Ethylhexyl Acrylate**

Appears as a clear colorless liquid with a pleasant odor. Less dense than water and insoluble in water. Vapors heavier than air.

Additional information about EPA's response to the East Palestine, Ohio, train derailment can be found at: [response.epa.gov/EastPalestineTrainDerailment](https://response.epa.gov/EastPalestineTrainDerailment).