

EAST PALESTINE TRAIN DERAILMENT

East Palestine, Ohio

Frequently Asked Questions

Updated: November 6, 2023

WHAT'S NEW

- Updated information regarding the release of the EPA Accuracy and Precision of Photoionization Detectors information (page 2)

BACKGROUND

On February 3, 2023, at approximately 9:30 PM, a Norfolk Southern train had 53 cars derail in East Palestine, Ohio. The site of the derailment is a few hundred yards from the Pennsylvania (PA) border. Five of the train cars contained the hazardous material vinyl chloride. Additional cars contained other chemicals of concern.

PENNSYLVANIA COMMUNITY-BASED HEALTH RESOURCE NETWORK

Governor Josh Shapiro announced in late March the formation of a health resource network to directly connect Pennsylvania residents with local providers in response to the East Palestine train derailment.

The Pennsylvania Department of Health (DOH) is working with local health care providers in Beaver and Lawrence counties to meet any long-term needs of residents who may be impacted by the Norfolk Southern train derailment.

Residents with derailment-related health concerns can call the Pennsylvania Department of Health hotline (877-PA-HEALTH) to request a check-up to help identify the root of their health concerns. They will be linked to the appropriate local health care services, including physical and behavioral health care providers from Allegheny Health Network, Heritage Valley Health System, UPMC and Primary Health Network.

This network replaces the previous Health Resource Center, which assisted 583 individuals in person at the Darlington Township building. DOH greatly appreciates the hospitality of the Darlington Township staff and the community for allowing the department to share information with residents at that location.

The Pennsylvania Emergency Management Agency (PEMA) continues to coordinate the Commonwealth's response to this incident, and has launched a **Train Derailment Dashboard** at www.pema.pa.gov.

UPDATES ON KEY EFFORTS

HOLDING NORFOLK SOUTHERN RESPONSIBLE: On February 14, [Governor Shapiro issued a letter to Norfolk Southern](#) raising questions about the emergency response that was undertaken in the immediate aftermath of the derailment and vowing to hold the company accountable. The Shapiro Administration has also highlighted further information about air and water quality, which [can be found here](#).

On March 6, Governor Shapiro announced that Norfolk Southern will pay millions for the impacts of the train derailment on Pennsylvania residents. In a direct meeting, Gov. Shapiro secured a commitment from Norfolk Southern to cover the entirety of the costs incurred by Commonwealth agencies and local fire departments that responded to the derailment, as well as set up a \$1 million community relief fund for businesses and residents in Beaver and Lawrence counties who lost revenue as a result of the incident. Read more [here](#).

On March 30, Governor Shapiro announced that Norfolk Southern completed their [first \\$1 million in reimbursement to Pennsylvania](#) fire departments, first responders, and Beaver County Hazmat.

ASSESSMENT OF CHEMICAL EXPOSURES (ACE) SURVEY PRELIMINARY RESULTS

The ACE surveys for residents and first responders ended on March 31. Additional survey efforts are being considered. Preliminary information from the ACE survey included symptoms such as headaches, cough, and eye irritation. These symptoms are consistent with what might be expected from possible short-term exposure to chemicals of potential concern released during and immediately following the derailment.

In addition, preliminary information indicates a number of people are dealing with stress and anxiety related to the incident. It is natural to feel post-traumatic stress, anxiety, grief, and worry during and after an emergency. There are resources available to help those who are struggling following the incident:

- For immediate assistance, CALL or TEXT the Substance Abuse and Mental Health Services Administration (SAMHSA) [Disaster Distress Helpline](#) at 1-800-985-5990 (press 2 for Spanish).
- [Pennsylvania's Support & Referral Helpline](#) connects Pennsylvanians with mental and emotional support and to local resources. Call 855-284-2494 (TTY: 724-631-5600).
- Beaver County Behavioral Health Services at 724-371-8060 or 1-800-400-6180.
- For more information on managing stress, visit: [Community Stress Fact Sheet | ATSDR \(cdc.gov\)](#)

PHOTOIONIZATION DETECTORS (PID) REPORT ON ACCURACY/PRECISION

On November 6, 2023, U.S. EPA released information regarding the study on the PIDs that occurred during the first week of May 2023.

A multi-organizational task force consisting of members of Unified Command was established to conduct the study, along with expert third-party reviewers.

The task force evaluated three different PIDs that were used on location of the East Palestine Train Derailment incident.

Information regarding the study, a summary of its findings, and the study can be found on the [EPA About Air Monitoring webpage](#).

DEP SOIL AND WATER TESTING INTERACTIVE MAP

On April 24, the PA Department of Environmental Protection (DEP) released a [new interactive mapping tool](#) that shows final sample results from soil and water testing conducted by DEP in the wake of the East Palestine train derailment. Pennsylvanians can use this tool to review sampling results in the vicinity of the derailment.

The map shows key details from the derailment including the derailment location and the 2-mile evacuation radius. The final sample results from soil, surface water, private drinking water wells, and public water system wells are available.

Samples were tested for chemicals of concern identified by the U.S. Environmental Protection Agency and Unified Command. The map includes a time-lapse feature to show where and when samples were collected. Additional sample locations and dates will be added to the map as they are available.

AIR AND WATER TESTING

WHAT DOES THE AIR MONITORING INDICATE NOW?

Over the course of the derailment, environmental, health and safety officials from Pennsylvania, Ohio, and multiple federal agencies have implemented a phased multilayered approach to measure air quality in Ohio and Pennsylvania, including sorbent tubes, summa canisters, the U.S. EPA Trace Atmospheric Gas Analyzer bus, passive badges, and handheld devices, which provide separate and redundant sources of data on air quality in affected communities.

As excavation of contaminated soil below the railroad tracks at the derailment site started in early March, it is possible nuisance odors will be present in air near the site. These odors should not be at levels where symptoms occur. Monitoring of air contaminants of concern will continue throughout the excavation process.

Response officials recently suspected that select handheld devices may not be sensitive enough to detect butyl acrylate at low levels in the air. U.S. EPA is working with the meter manufacturers to obtain more information about the handheld devices in relation to butyl acrylate measurements and conducting additional testing and evaluations of the devices.

Butyl acrylate reacts in the environment and degrades in the presence of sunlight, making it unlikely to persist in the air. In addition, butyl acrylate can generally be smelled at levels far below levels of health concern.

No long-term effects are expected from potential short-term exposure to butyl acrylate. Individuals with pre-existing respiratory conditions, such as asthma, emphysema, and chronic obstructive pulmonary disease may be more likely to experience symptoms to this class of chemicals, or this type of exposure may exacerbate pre-existing conditions. Butyl acrylate is a known dermal sensitizer, which means that future exposures may result in an increased reaction, such as a rash or skin irritation. For more information about how environmental odors can affect you, please review this fact sheet from the Centers for Disease Control and Prevention here: [Are Environmental Odors Toxic \(cdc.gov\)](#).

To date, preliminary information from residents who already completed the Assessment of Chemical Exposure (ACE) survey included symptoms such as headaches, cough, and eye irritation. These symptoms are consistent with what might be expected from possible exposures to chemicals of potential concern released during and immediately following the derailment.

Pennsylvania continues to review the data being provided by the agencies involved in this response, including EPA, Norfolk Southern and their contractors, etc. to ensure the protection of the health and safety of residents. The phased multilayered approach to measure air quality in Ohio and Pennsylvania, including sorbent tubes, summa canisters, the U.S. EPA Trace Atmospheric Gas Analyzer bus, passive badges, and handheld devices. Together they provide separate and redundant sources of data on air quality in affected communities.

The farther away a person or household is from the derailment site, the lower the concentration of any air contaminant. While there are limited measured air quality values outside of the 2-mile radius, none have shown any elevated readings. It is extremely unlikely that people further than 2 miles from the train derailment were exposed to chemicals or particles of concern.

Reassuringly, **Allegheny County Health Department's (ACHD) air quality monitors** (25 miles away from the derailment) **have not measured a change in air quality since the train derailment.** ACHD monitors are capable of measuring many air pollutants, such as benzene and vinyl chloride. The ACHD Air Quality Program will continue to monitor air quality, collaborate with state and federal partners, and provide updates for Allegheny County residents as appropriate.

DOES MY WATER NEED TO BE TESTED?

While contamination in Pennsylvania from the train derailment is unlikely, Governor Josh Shapiro previously announced that DEP will be conducting independent water sampling to closely monitor water contamination risks. Individuals living within the 2-mile radius can contact PA DEP to discuss water testing at the **PA DEP Southwest Regional Office at 412-442-4000.**

DEP has begun and will continue to provide letters with water sampling results to residents with details if any levels exceeded established drinking water standards.

ARE THERE SPECIFIC MEDICAL TESTS FOR THE CHEMICALS RELATED TO THE TRAIN DERAILMENT?

There are some tests available for some of the chemicals of concern but may not be clinically helpful. The levels detected might be coming from sources other than the train derailment.

Vinyl Chloride

Medical tests to determine if you have been exposed to vinyl chloride include measuring vinyl chloride in your breath but must be collected shortly after exposure. The test is not useful for very low levels of exposure. Thiodiglycolic acid, which is a breakdown product of vinyl chloride detected in urine, can also provide information on exposure but also must be done shortly after exposure and does not reliably determine the level of exposure.

Hydrogen chloride

Medical tests for hydrogen chloride exposure are not very useful. However, in the event of a very high-level exposure, blood, urine and other tests to determine if you had tissue damage to the lungs or gastrointestinal tract are useful. Some tests can be conducted in a doctor's office, but others may require visiting a hospital.

Phosgene

Medical tests for phosgene exposure do not exist. However, if phosgene exposure is suspected, a chest x-ray is a rapid way to determine if you have lung damage. A chest x-ray can be conducted in many settings that have an x-ray machine, such as urgent care offices and emergency departments.

Carbon monoxide

There are blood tests available for carbon monoxide exposure or poisoning, specifically carbon monoxide levels in blood and carboxyhemoglobin.

Carbon dioxide

There are blood tests to determine CO₂ exposure. You can also monitor oxygen levels in real-time.

WHAT ARE DIOXINS?

The [EPA has announced](#) that it will require Norfolk Southern to conduct dioxin testing at the derailment site. It is important to understand that "dioxins" is an umbrella term used for a large class of 100+ chemicals that are already known to exist widely in the environment with varying degrees of toxicity. People are already exposed to dioxins through routine activities — If you ever sat around a campfire, smoked, or spread pesticides or herbicides around a garden, you were exposed to dioxins. In fact, many of the foods we eat (meat, dairy products, and fish) account for roughly 90% of the average person's dioxin intake.

Because dioxins are all around us, especially in rust-belt regions, it is extremely likely that residents have already experienced low level exposure to dioxins before the train derailment. Due to the duration of the fires being approximately 4 days at the derailment site, scientists do not expect to observe appreciable levels of chlorinated dioxins that are of toxicologic concern to humans. Any medical dioxin testing for individuals will likely be inconclusive because we do not have baseline (pre-derailment) dioxin levels for the population in the region. Also, individual testing cannot tell when, or how, a person was exposed.

WHAT IS ACROLEIN?

Acrolein is an irritant that primarily affects the lungs. The effects of acrolein on the body include watery eyes, and burning nose and throat at low level inhalation exposure. These effects will disappear once an individual is no longer exposed to acrolein. Small amounts of acrolein can be formed and can enter the air when trees, tobacco, other plants, gasoline, and oil are burned. Acrolein breaks down easily in air and rapidly evaporates from soil and water.

WHAT IS N-BUTYL ACRYLATE?

A railcar containing n-butyl acrylate spilled at the derailment site. N-butyl acrylate is a clear, flammable liquid with a strong, fruity odor. It has a low odor threshold, which means it can be smelled at very low concentrations. For example, n-butyl acrylate has reported odor thresholds (when you can start to smell it) of 0.1 – 35 parts per billion (ppb). Mild irritation of the eyes, nose, throat, and respiratory tract can occur around 50 ppb. Therefore, people may smell n-butyl acrylate but not have any health effects associated with the presence of this odor. It is also considered a sensitizer, which means it can cause a person to become sensitive or allergic to a chemical after repeated exposure. Since March 5, there has been extensive air monitoring for n-butyl acrylate at and around the derailment site and during soil excavation.

WHAT IS 2-ETHYLHEXYL ACRYLATE?

A railcar containing 2-ethylhexyl acrylate (2-EHA) spilled at the derailment site. 2-EHA is a clear and colorless liquid with a characteristic pleasant odor. It is commonly used for making plastics and paint. 2-EHA is an irritant and sensitizer, similar to n-butyl acrylate. 2-EHA can cause eye, nose, throat, and respiratory irritation. It is also considered a sensitizer, which means it can cause a person to become sensitive or allergic to a chemical after repeated exposure. Currently there is extensive air monitoring around the site and during excavation activities for 2-EHA.

WHAT IS DEHP?

Due to the comprehensive analysis of well water conducted by DEP, contaminants may be detected that are unrelated to the derailment. Bis(2-ethylhexyl)phthalate, also known as di(2-ethylhexyl)phthalate (DEHP), is a chemical commonly added to plastics to increase flexibility. DEHP can be present in many common items such as wall coverings, floor tiles, upholstery, rainwear, packaging film, medical tubing, and blood storage bags. Due to its widespread use in plastics, DEHP can be found at low levels throughout the environment. DEHP can move out of plastic materials into the environment over long periods of time. DEHP can leach from PVC, rubber, cellulose, and styrene materials. Most of the DEHP and its breakdown products leave the human body within 24 hours of exposure in urine and feces.

DEHP attaches strongly to soil and sediment, so it will not move rapidly into groundwater. Since DEHP is an *additive* to plastics, it was not present or produced in the controlled vent and burn of vinyl chloride. Additionally, scientific studies have shown that DEHP is not emitted when PVC plastics are burned. Therefore, detections of DEHP in private well water is likely due to conditions within a well system prior to the train derailment incident.

WHERE CAN I GET MORE INFORMATION ABOUT THE TRAIN DERAILMENT INCIDENT?

General information, details of the incident, and environmental data for the public regarding the East Palestine Train Derailment is updated regularly on the [US EPA website](#).

WHAT ABOUT FOR LIVESTOCK AND WILDLIFE?

Our understanding of the effects of animals or livestock breathing in the chemicals released during the derailment including vinyl chloride, hydrogen chloride, and phosgene is limited. However, it is expected

that the risk to animals would be similar to the risk to humans. When vinyl chloride is burned, as was done, hydrogen chloride and phosgene are formed. Hydrogen chloride rapidly breaks down in water or moisture, so it is unlikely that grazing on grass in the affected area will result in health effects to livestock or wildlife. Phosgene does not stick to soil. Instead, phosgene may evaporate into the air or pass through the soil surface and break down in water. Because hydrogen chloride and phosgene do not accumulate in the food chain, you cannot be sickened by eating an animal that may have come into contact with these gases.

Anyone with concerns regarding their livestock and pets should contact their veterinarian.

WHAT IF I HAVE ADDITIONAL HEALTH CONCERNS ABOUT EXPOSURE TO THESE CHEMICALS?

In the event of an emergency, please call 911. If you have health concerns, please contact your primary care physician. If you have specific questions about these potential exposures call:

- Poison Control Center (made up of Pittsburgh and Ohio poison centers) incident hotline at **1-877-603-0170, press 2 for PA residents.**
- **1-877-PA-HEALTH (1-877-724-3258)**
- PA DOH environmental health concern email address env.health.concern@pa.gov.

Due to the relatively short duration exposure from this incident, health effects consistent with long-term exposure are not expected to occur.

If you experience any of these symptoms and believe you were exposed, you should contact your primary care physician or health care provider. If you are experiencing a medical emergency, call 911.

People with certain health conditions, such as heart disease, respiratory problems, anemia, or vulnerable populations such as those who are pregnant, children, and elderly individuals are generally more susceptible to the effects of these chemicals.

ADDITIONAL RESOURCES

IF YOU ARE IN NEED OF MENTAL AND EMOTIONAL ASSISTANCE

The PA Support & Referral Helpline is at **1-855-284-2494** (TTY: 724-631-5600) or you can call the national suicide prevention and crisis support line at **988**.

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION SOUTHWEST REGIONAL OFFICE

The Pennsylvania Department of Environmental Protection (DEP) is conducting independent water quality monitoring. If you are concerned about your water quality, you can call DEP's Southwest Regional Office for assistance and advice at **412-442-4000**.

PENNSYLVANIA DEPARTMENT OF AGRICULTURE

Pennsylvania farmers and producers who are impacted by the derailment and have questions or concerns can contact the Pennsylvania **Department of Agriculture hotline at 855-777-6735**.

PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY

The Pennsylvania Emergency Management Agency (PEMA) is working to coordinate the Commonwealth's response to this incident. More information is available on PEMA's **Train Derailment Dashboard** at www.pema.pa.gov.

ADDITIONAL FEDERAL RESOURCES

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

The Federal Emergency Management Agency (FEMA) deployed a Regional Incident Management Assistance Team (IMAT) on Feb. 18 to support ongoing operations, including incident coordination and ongoing assessments of potential long term recovery needs.

U.S. ENVIRONMENTAL PROTECTION AGENCY

The U.S. EPA has been conducting air and water quality monitoring since the controlled vent and burn on February 6th. To view their results and for more information on the EPA's response, visit <https://www.epa.gov/east-palestine-oh-train-derailment>.

EPA Information Line: 330-775-6517, available during the Welcome Center Hours, Monday-Friday 8AM-8PM, Saturday 10AM-4PM, Sunday closed (Eastern Time).

NATIONAL TRANSPORTATION SAFETY BOARD (NTSB) UPDATES

The National Transportation Safety Board continues to investigate and provide updates related to the train derailment. For more information on their ongoing investigation, view their updates at www.nts.gov/tda/family/Pages/tda-rail.aspx.

The NTSB's [Transportation Disaster Assistance Division](mailto:assistance@ntsb.gov) (TDA) also provides assistance to survivors via email: assistance@ntsb.gov

RESOURCES PROVIDED BY NORFOLK SOUTHERN

Norfolk Southern is offering assistance to residents in both Pennsylvania and Ohio. View their resources below. You can also look for updates on the Family Assistance Center website at www.nsmakingitright.com.

Norfolk Southern Assistance Center

Phone: 1-800-230-7049

Claims to Norfolk Southern:

Norfolk Southern has discontinued its reimbursement claim form. Residents who were evacuated or impacted by the derailment can visit the Family Assistance Center.

Family Assistance Center by Norfolk Southern

Abundant Life Church

46469 State Route 46, New Waterford, OH

Monday through Saturday: 10 a.m. to 8 p.m.

Sunday: 10 a.m. to 4 p.m.

Toxicologists Contracted by Norfolk Southern, CTEH

234-542-6474 (Questions specific about odor, health, animals, houses, etc.)

Toxicologists Contracted by Norfolk Southern for Testing & Sampling

Phone: 330-849-3919

(In home testing and monitoring within the 1-mile evacuation zone only)

FACT SHEETS

- [ATSDR ToxFAQs Vinyl chloride](#)
- [ATSDR ToxFAQs Hydrogen chloride](#)
- [ATSDR ToxFAQs Phosgene](#)
- [Facts About Phosgene](#)
- [ATSDR ToxFAQs Dioxins - CDDs](#)
- [ATSDR ToxFAQs Acrolein](#)
- [ATSDR ToxFAQs DEHP](#)
- [PA DOH Carbon monoxide Factsheet](#)
- [US EPA Acute Exposure Guideline Levels \(AEGLs\) for airborne chemicals](#)
- [CDC Particulate Pollution](#)
- [US EPA Indoor Air Quality Information](#)

ARCHIVED INFORMATION

I HAVE RETURNED HOME OR LIVE OUTSIDE OF THE ONE-MILE EVACUATION AREA

WHAT ARE SOME SYMPTOMS I SHOULD BE LOOKING OUT FOR?

General acute (duration of exposure 14 days or less) symptoms or effects from air

- Some of these chemicals have low odor thresholds, which means you can smell a chemical at a very low concentration, and in many cases, far below the concentration that would cause significant health effects
- Some of these chemicals are skin or eye irritants – which means they can cause acute symptoms such as watery eyes or eye, nasal, or respiratory irritation, but are unlikely to cause long-term effects
- Some of these chemicals are potential sensitizers, which means they can cause a person to become sensitive or allergic to a chemical after repeated exposure
- Particulate matter can also cause eye, nose, throat, and respiratory irritation, and trouble breathing
- These are reversible effects. Once the exposure is removed, such as moving further away from the derailment site, the symptoms should resolve

WHEN SHOULD I SEEK MEDICAL ASSISTANCE?

Please contact your healthcare provider if you experience any of the following and were near (up to 2 miles away) from the derailment site:

- Eye, lung, skin, and/or throat irritation
- Coughing
- Wheezing
- Headache
- Nausea
- Vomiting
- Dizziness
- Sleepiness
- Confusion

If you or a loved one experience any of the following symptoms, you should call 911 immediately.

- Rapid breathing
- Chest pain or tightness
- Difficulty breathing
- Rapid heartbeat
- Feeling out of breath
- Unusual fatigue

- Narrowing of small breathing airways
- Accumulation of fluid in the lungs
- Swelling of lungs
- Blue coloring of skin
- Unconsciousness

I AM PREGNANT OR HAVE A BABY AND LIVE OUTSIDE OF THE 2-MILE RADIUS FROM THE SITE, AM I SAFE IN MY HOME?

Air monitoring does not indicate any long-term or increased risk of health effects to vulnerable populations, such as those who are pregnant, babies, children, or elderly specific to the derailment. If you are concerned or interested about air quality in your neighborhood, you can check air quality alerts for your location at EPA's <http://www.airnow.gov> website. These websites show daily air quality information regarding certain air pollutants for your zip code. With this information, you can choose to limit the time children or sensitive populations spend outside on days with a rating of "Unhealthy for Sensitive Groups" or worse.

The farther away a person or household is from the derailment site, the lower the concentration of any contaminant in the air. While there are very limited measured air quality values outside of the 2-mile radius, all that have been recorded have not shown any elevated readings. It is extremely unlikely that anyone further than 2 miles from the incident would be exposed to any chemicals or particles of concern

RETURNING HOME RECOMMENDATIONS (if resident was within the 1-mile evacuation)

Returning home after a disaster can be challenging. It is important that you take steps to protect your physical, mental, and emotional health as you return home.

Ways to do this include:

- Rest when you need to
- Decide which cleanup tasks are most important and focus on those first. That way, you're less likely to be overwhelmed
- Try to work with other people, so you aren't alone
- Get support from family members, friends, counselors, or therapists

SHOULD I AIR OUT MY HOUSE UPON RETURNING HOME?

If you opt to have home monitoring conducted as part of the re-entry plan, the monitoring will provide helpful information as to whether you need to air out your house. If chemicals are detected at or above the screening level, it will be required that your home is aired out professionally.

Regardless of whether you have your home monitored or not, you should open windows and doors and use fans pointed outdoors, if possible, to air out your house.

HOW SHOULD I CLEAN THE SURFACES INSIDE AND OUTSIDE MY HOME?

Cleaning is an important first step to make sure you remove chemicals from surfaces in your home. Using household cleaners that contain soap or detergent will remove many contaminants from surfaces.

It is recommended that you wipe down any surfaces that could have been exposed to chemicals, including anything used for the preparation or eating of food, any children’s or infant’s toys, anything touched frequently, such as light switches, remotes, etc. After cleaning any surface, it is important to wash your hands thoroughly.

For hard surfaces, such as counters, certain toys, light switches, and floors:

- Clean surfaces with soap and water or with cleaning products appropriate for use on the surface.

For soft surfaces such as carpet, rugs, and drapes:

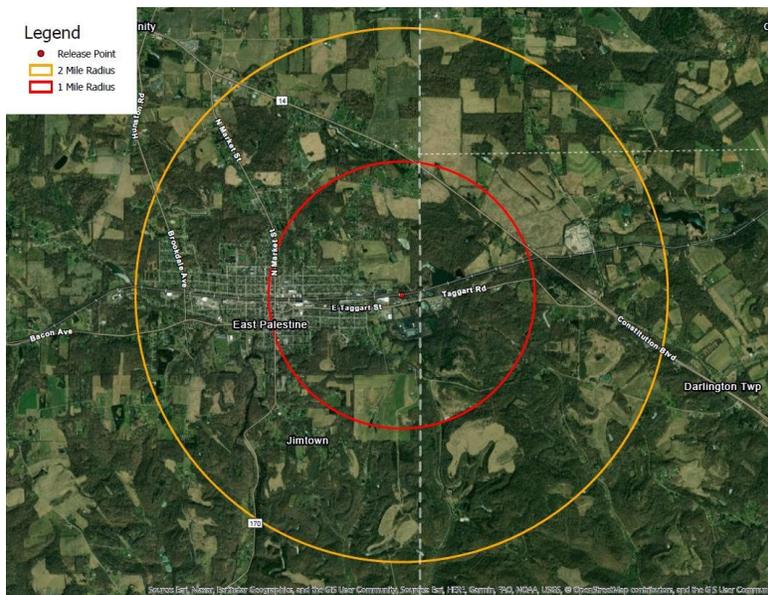
- Clean the surface with cleaning products appropriate for use on these surfaces.
- Launder items (if possible) according to the manufacturer’s instructions. Use the warmest appropriate water setting and dry items completely.
- Vacuum surfaces (such as carpets and rugs) and dispose of the dirt safely.
- Out of an abundance of caution, while vacuuming you may follow the steps of airing out your home, and vacuum small amounts at a time and take frequent breaks by walking outdoors.

For laundry items, such as clothing, towels, cloth toys, and linens:

- Launder using detergent and recommended water temperature.
- Dry items completely.
- Clean clothes hamper or laundry baskets according to guidance for surfaces.

QUESTIONS ABOUT THE AREA

WHAT AREA WAS IMMEDIATELY IMPACTED?



Out of an abundance of caution, a **1-mile evacuation radius (red circle in the above graphic)** surrounding the controlled vent and burn of five railcars in East Palestine, OH and a **shelter-in-place**

for those within 2-miles (orange circle), was determined necessary from February 6 to 3:00PM on February 8, based on air modeling with site-specific information. The evacuation area only contained a small number of Pennsylvania residences. The evacuation and shelter in place conditions have since been lifted.

Air modeling included estimates of vinyl chloride in the railcars; meteorological data including temperature, wind speed, and direction; precipitation; and assumptions regarding amount of potential combustion products (e.g., hydrogen chloride and phosgene) for the controlled vent and burn. This modeling produced a map to indicate locations at risk for immediate, or acute effects that relies on US EPA acute exposure guideline levels (AEGLs) for airborne chemicals. These levels are determined safe for public health and include the protection of sensitive populations, such as the elderly and children, as well as individuals with asthma or other illnesses.

The further away from the center of the controlled vent and burn, the lower an individual's exposure risk. Additionally, air monitors positioned in PA and OH surrounding the site are collecting information on hydrogen chloride, phosgene, carbon monoxide, PM_{2.5}, PM₁₀, and VOCs.

WHAT CHEMICALS WERE INVOLVED IN THE SPILL?

The train cars involved in the controlled vent and burn were carrying vinyl chloride. **Vinyl chloride** is a flammable gas and if involved in a fire, could break down into hydrogen chloride, phosgene, carbon dioxide, and carbon monoxide vapors when burned. Continuous and roaming air monitoring for these chemicals, as well as particulate matter (PM_{2.5} and PM₁₀) and volatile organic chemicals (VOCs), is being conducted throughout the areas affected by the derailment. The monitors are positioned near the incident and also several miles away to monitor chemicals of concern. Many of the air monitors used are mobile and were repositioned as necessary to ensure proper placement in reference to current and forecasted meteorological data. The following is further information on each of these chemicals, listed in alphabetical order.

Carbon monoxide

Carbon monoxide is a colorless, tasteless, and odorless gas that is invisible. Carbon monoxide can occur naturally in the environment and is released by erupting volcanoes and forest fires. It is also produced any time a carbon-based fuel is burned, such as coal, natural gas, or wood. Carbon monoxide is a major component of motor vehicle exhaust fumes and is also in tobacco smoke.

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 was not detected surrounding the site during and after the controlled vent and burn of vinyl chloride. Phosgene is a colorless, non-flammable 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.

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.

Intermediate exposure (15 – 364 days) to vinyl chloride may cause liver effects, such as fatty liver or liver cell hypertrophy (increased size of liver cells). A public health protective screening level for liver effects from intermediate exposure to vinyl chloride in air is 0.05 mg/m³ (0.02 ppm). To date, there have been no detections of vinyl chloride close to the intermediate screening level.

An air sample was collected by US EPA on February 8, 2023 (**Figure 1**. Green box on Constitution Blvd in PA). Vinyl chloride and benzene were not detected in this sample. Phosgene and hydrogen chloride (HCl) were a concern during the initial phase of the “vent and burn” of vinyl chloride on February 6, 2023. However, phosgene was not detected in any samples collected surrounding the site or at any of the monitor locations in PA. In PA, monitors with measurable HCl had maximums of 0.075 and 0.017 ppm HCl on February 7 at 12:39 AM and 12:48 AM respectively, and are located on Constitution Blvd in PA on either side of the **Figure 1** green box. **These levels are well below the 1.8 ppm HCl threshold for mild irritation.** There were no other measured concentrations of HCl in PA between February 4-8, 2023.

All US EPA-collected samples, including continuous air monitoring, roving monitors, and fixed monitor data are available on the US EPA East Palestine Train Derailment [documents website](#). The most up-to-date maps are available, and being updated daily, on the [US EPA website](#).

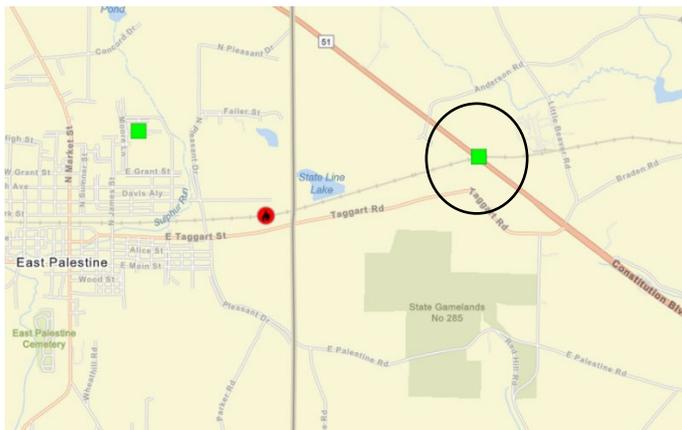


Figure 1. Map of train derailment site (red circle) and air sampling location in PA (green square on Constitution Blvd in black circle).

Chronic exposure (long-term exposure more than one year), which is not likely for this incident, to vinyl chloride can cause permanent liver damage, immune reactions, nerve damage, and liver cancer. A public health protective cancer risk screening level for chronic (>1 year) vinyl chloride in air is $0.11 \mu\text{g}/\text{m}^3$ (0.044 ppb). There are no detectable levels of vinyl chloride in PA.

n-Butyl acrylate

Health effects from low-level n-butyl acrylate exposure include eye, nose, and respiratory irritation. n-Butyl acrylate is considered a potential sensitizer, which means it can cause a person to become sensitive or allergic to a chemical after repeated exposure. There are currently no established public health screening values for intermediate or chronic inhalation exposure to n-butyl acrylate for the general population. An emergency response planning guideline level-1 (ERPG-1) (mild effects), which are developed by the American Conference of Governmental Industrial hygienists (ACGIH), was used for emergency response of 50 ppb ($267 \mu\text{g}/\text{m}^3$) for irritation effects.

Additional chemicals of interest

A list of railcars involved in the derailment are [provided](#) on US EPA's document site of chemicals. This list also includes the car type, commodity, whether the railcar was loaded or empty, hazard classification, and status of the railcar. Additional chemicals besides vinyl chloride include polyethylene, dipropylene glycol, propylene glycol, diethylene glycol, ethylene glycol monobutyl ether, polyvinyl, isobutylene, butyl acrylates, and petroleum lube oil.