



The Hazard Evaluation and Emergency Response (HEER) Office is part of the Hawai'i Department of Health Environmental Health Administration whose mission is to protect human health and the environment. The HEER Office provides leadership, support, and partnership in preventing, planning for, responding to, and enforcing environmental laws relating to releases or threats of releases of hazardous substances under Hawai'i Revised Statute (HRS) 128D, Hawai'i Environmental Response Law (HERL). For additional information on HRS 128D please reference:

What Is Hydrogen Sulfide (H₂S)?

Hydrogen sulfide (H₂S) is a colorless gas recognized by its strong “rotten egg” odor. People can detect H₂S at extremely low concentrations, with reported odor thresholds ranging from approximately 0.5 to 300 parts per billion (ppb), which are far below the levels associated with adverse health effects. Although the odor can be noticeable, these low concentrations typically are not associated with human health effects.

Where Does H₂S Naturally Occur?

H₂S develops through a range of natural processes, particularly anaerobic decomposition of organic matter. Common natural sources include:

- Wetlands, marshes, and tidal flats
- Volcanic gases and geothermal vents
- Stagnant or oxygen-poor water bodies
- Natural gas and petroleum formations
- Organic-rich sediments and soils

How Does H₂S Behave In The Environment?

Since H₂S is slightly heavier than air, it tends to settle in low lying areas, particularly when there is little air circulation. In outdoor environments, it usually disperses quickly with wind and natural air flow. Once released, H₂S does not remain in the air for long, since it readily breaks down into other sulfur compounds. Sunlight and oxygen further speed this process, helping the gas dissipate and degrade naturally over time.

How Are People Exposed?

Inhalation is the primary route of exposure to H₂S. In natural environments, concentrations are generally low and exposures are short in duration, resulting in odor detection rather than toxic effects. H₂S does not accumulate in the body because it is rapidly metabolized and eliminated through normal biological processes.

What Are The Signs And Symptoms Of H₂S Exposure?

While low levels of H₂S exposure are not expected to produce symptoms in healthy individuals, certain individuals may be more sensitive to H₂S and may experience mild irritation or odor-related symptoms, even when ambient air levels are low. This includes:

- Individuals with asthma or other chronic respiratory conditions
- Individuals with chemical or odor sensitivities (persons with migraine, chemical intolerance, heightened sense of smell)
- Immunocompromised individuals or those with comorbidities (cardiovascular disease, chronic illness)

These effects are usually short lived and improve once a person moves into fresh air or the H₂S dissipates from the environment.

Severe symptoms (e.g., respiratory distress, loss of consciousness and balance issue) are typically associated with exposure to high concentrations usually in industrial or confined-space settings and are not expected in outdoor community environments. However, anyone experiencing symptoms that are persistent or worsening should contact their primary care provider.

How Do You Protect Yourself?

Mitigation measures are intended to reduce odor-related discomfort and minimize irritation when H₂S is present at low levels in the air.

- Consider moving indoors if the odor is strong or bothersome.
- Closing windows and doors can help limit the odor from entering the home.
- If available, using an air conditioner on recirculation mode may further reduce indoor odors.
- During times when odors are noticeable, it may be helpful to limit strenuous outdoor activity (e.g., gardening, landscaping, outdoor fitness etc.).

- If you begin to experience mild irritation (such as eye, nose, or throat discomfort), move to areas with fresh air.

Short-term low-level exposures are not expected to cause lasting health effects when ambient concentrations remain low.

For More Information See Agency For Toxic Substances And Disease Registry (ATSDR)

References Below:

1. ATSDR. (2016). Toxicological Profile for Hydrogen Sulfide and Carbonyl Sulfide.
<https://www.atsdr.cdc.gov/toxprofiles/tp114.pdf>
2. ATSDR. (2016). ToxFAQs™ for Hydrogen Sulfide.
<https://www.atsdr.cdc.gov/toxfaqs/tfacts114.pdf>
3. ATSDR. (2016). Public Health Statement: Hydrogen Sulfide.
<https://wwwn.cdc.gov/TSP/PHS/PHS.aspx?phsid=387&toxid=67>
4. ATSDR. (2016). Medical Management Guidelines for Hydrogen Sulfide.
<https://wwwn.cdc.gov/TSP/MMG/MMGDetails.aspx?mmgid=385&toxid=67>