



November 29, 2023

MEMORANDUM

SUBJECT: Return to Nature Funeral Home, 31 Werner St., Penrose, Colorado

FROM: Scott Sudweeks, Toxicologist, R08-LSASD-TAB-TS

SDS

TO: Joyce Ackerman, On-Scene Coordinator, R08-SEMD-EMB-RS

ISSUE

Improper operations and storage of human remains at the Return to Nature Funeral Home ("site") in Penrose, Colorado resulted in a release to the environment of contaminants that pose a public health hazard to the local community.

EPA contacted the Agency for Toxic Substances and Disease Registry (ATSDR) on October 18, 2023 with a request for consultation. A representative of the ATSDR emergency management unit concluded that the situation did not fall within the ATSDR CERCLA mandate and recommended referral to EPA Region 8 toxicologist and the Colorado Department of Public Health and Environment.¹

The purpose of this memo is to respond to a request from the EPA Region 8 Emergency Management Branch to the Technical Assistance Branch to provide documentation and information to support decisions on an appropriate course of action to address threats to human health and the environment.

DISCUSSION

This section provides pertinent information about the background and implications of the issue.

Site history and conditions

Law enforcement officials reported at least 189 bodies various stages of decomposition in the

¹ Email communication from Chris Poulet, ATSDR R8, 10/20/2023

facility. They learned some of the bodies had been at the facility as early as 2019.² (references include County Order and Arrest Warrant), numbering. Remains and body fluids are present throughout and uncontained. Identification of the remains indicated that some had been present in the facility for a year or more. Presence of liquid, solid and sludge-like “gels” of organic material was observed throughout building.³

The EPA conducted a removal site inspection of the facility on November 15 and noted the following:⁴

1. The sludge from the decomposing bodies was observed to have spread throughout the building and soaked into walls, through woodwork, into the building foundation, and building stucco. There was visible evidence of liquids leaking from the building - the foundation was stained in many locations by seepage of fluids from the interior of the building.
2. There were thousands of flies inside the building, both dead and alive.
3. There are signs that animals, possibly rodents, are attempting to burrow into the building near the front door. Observations made indicating evidence of potential vectors such as rodents or other animals entering/exiting the building.
4. There was a 5-gallon bucket of an unknown liquid in the utility closet. and at least one 5-gallon bucket of lye under contaminated bins in a freezer room.
5. All security measures installed by local officials are temporary, i.e., boards nailed on windows and doors, and a temporary fence.
6. The Site is located adjacent to a United States Postal Office with heavy foot and car traffic. The building is adjacent to Colorado Highway 115, and homes and businesses are located nearby.

I am not able to identify information on the number and frequency of postal customers, but the fact that there are people nearby implies they could be at increased risk of infection if there is a release to the environment.

Potential release to environment

1. Documentation of sludge and liquid materials exiting building. The Director of the Fremont County Department of Health and Environment provided a photo of the front entrance of the funeral home showing attempts by animal vectors trying to enter the building by digging through rocks at the front entrance. There also appeared to be leakage of the sludge outside

² Public health order, Fremont County Board of Health. 10/26/2023

³ EPA R8. Record of Communication to Fremont County Sheriff's Office. 10/20/2023

⁴ EPA R8. Penrose Funeral Home Removal Site Inspection memo. 11/28/2023

the building in that area (Figure 1).⁵

2. Presence of animal and insect vectors results in possible transport of contaminants away from structure and into the community providing a secondary route of transmission and contact with infectious material.
3. Potential groundwater and soil contamination as contaminants exit building via septic and leaks around doors and building foundation.

Biological hazards

1. Contact with infectious microorganisms in body fluids can result in exposure to disease producing agents (pathogens) that can be transmitted to individuals through various routes of exposure (Figure 2).⁶
2. Human remains can harbor dangerous pathogens. Individuals in contact with or in proximity to human remains without adequate personal protective equipment or not following proper infection control protocols can potentially be exposed to these hazards, resulting in acute or chronic health conditions.⁷
3. Trespassers can have direct contact with infectious material. Presence of disease vectors (animal, insect) can cause off-site transport of pathogens with potential for secondary transmission in the nearby community.
4. During an October 6 press conference, the Fremont County Coroner stated that improper storage of human remains created a hazardous scene. Authorities have taken special care to avoid biohazards after an employee with the county coroner's office sustained a rash upon initially entering the facility.⁸

Chemical hazards

1. Alkaline hydrolysis is used to process human remains at the facility. Alkaline hydrolysis uses caustic bases and acids.⁹ In addition to caustic substances, additional hazardous chemicals potentially present at the facility include chemical disinfectants and sterilants for maintenance.

⁵ Email communication from Paula Buser, Fremont County Health Department, 10/23/2023

⁶ CDC NIOSH. Safety Culture in Healthcare Settings. <https://www.cdc.gov/niosh/learning/safetyculturehc/healthcare-workers.html>

⁷ HSE 2018. Managing infection risks when handling the deceased. <https://www.hse.gov.uk/biosafety/blood-borne-viruses/mortuary-funeral-services.htm>

⁸ National Public Radio. <https://www.npr.org/2023/10/19/1207147316/colorado-funeral-home-investigation>

⁹ Alkaline hydrolysis: <https://www.malsparo.com/hydrolysis.htm>

2. Residues of hazardous pharmaceuticals (e.g., chemotherapy drugs like cyclophosphamide, alkylating agents) may be present in human remains or body fluids. Several studies have shown that exposure to antineoplastic drugs can cause toxic reproductive and carcinogenic effects.¹⁰

CONCLUSIONS and RECOMMENDATIONS

Actual or threatened releases of contaminants from this site may present an imminent and substantial endangerment to public health, or welfare, or the environment, if not adequately addressed.

This conclusion is based on 1) the conditions at the Site; 2) the nature of the known and suspected contaminants at the Site; 3) the potential for actual or threatened releases into the environment; and 4) potential for human exposure to biological hazards.

I recommend that response action is implemented as appropriate to reduce actual or threatened contaminant releases into the environment and potential for human contact and health harm.

FIGURES

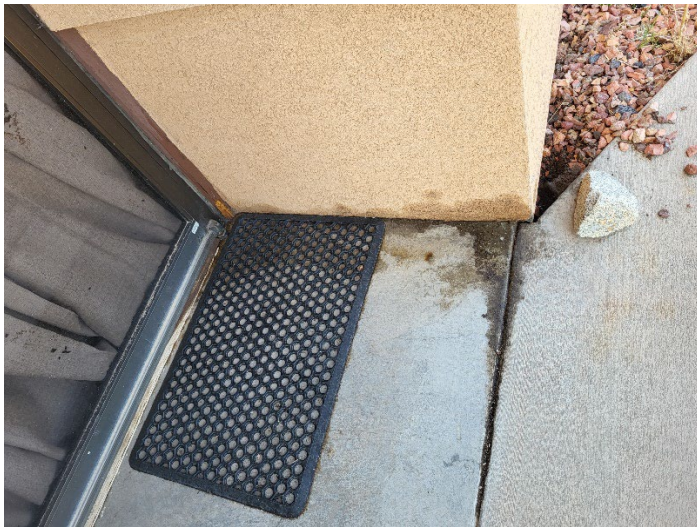


Figure 1. Front entrance with evidence of sludge leakage and rodent burrows

¹⁰ Fransman W, et.al. Occupational dermal exposure to cyclophosphamide in Dutch hospitals: a pilot study. Ann Occup Hyg. 2004 Apr;48(3):237-44.

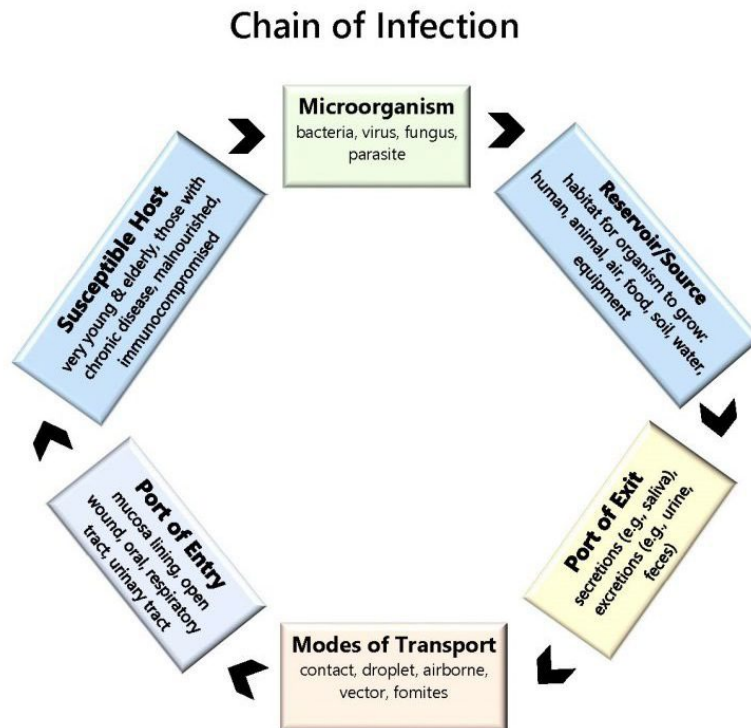


Figure 2. Chain of infection components (source: CDC NIOSH)

The chain has six elements that need to be present for infection to occur. They include:

- **Microorganisms:** Disease producing, also called pathogens
 - Virus, parasite, fungus, bacterium
 - Risk factors: Virulence, pathogenicity, ability to enter host.
- **Reservoir/Source:** Environment/habitat where a pathogen can live and multiply.
 - Environmental surfaces/equipment, body fluids (blood, saliva), urine/fecal material, food/water, soil, skin, respiratory tract
- **Portal of Exit:** How the pathogen exits or leaves reservoir
 - Skin to skin, skin to surface, blood, mucous membranes, oral cavity, fecal.
 - Other potentially infectious material (OPIM): Seminal fluid, joint fluid, saliva, urine/fecal material, any body fluid contaminated with blood.
- **Modes of Transport:** How a pathogen moves from reservoir to susceptible host
 - Direct Transmission: Airborne, droplet, contact (e.g., skin), bite, needlestick or other sharps injury
 - Indirect Transmission: Fomites – contaminated equipment or medication (multidose vials, single dose vials), animal and/or insect vectors, food, water
- **Portal of Entry:** Opening where the pathogen may enter.
 - Body openings (e.g., mouth, eyes, urinary tract, respiratory tract), incisions, wounds
- **Susceptible Host:** The person at-risk: patient or healthcare worker
 - Factors affecting susceptibility (e.g., age, health, co-morbidities, immune system, nutrition, infective dose, medications).