Colorado Department of Public Health and Environment
Colorado Cooperative Program for Environmental Health Assessments

Evaluation of Current and Future Soil Exposures at a Former Explosives Manufacturing Facility (Unrestricted Use Area) – DuPont Louviers Site Village of Louviers, Douglas County, Colorado

Colorado Department of Public Health and Environment

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The DuPont-Louviers site is a former explosives manufacturing facility that operated during most of the 20th century. Manufacturing operations ceased at the site in 1989 and most of the facility has been dismantled. The Hazardous Waste and Waste Management Division of the Colorado Department of Public Health and Environment requested that the Colorado Cooperative Program for Environmental Health assessments (CCPEHA) conduct a health consultation to evaluate the potential public health hazards associated with site-related contamination that remains on the property. Due to the size and varying former land-uses, the evaluation was split into a series of health consultations focusing on specific areas of the site. This health consultation addresses the area of the DuPont-Louviers site that is outside of the security fence. This area includes four areas of concern: (1) Solid Waste management Unit (SWMU) 11 also known as DuPont Landfill #5; (2) SWMU 20 also known as Indian Creek Landfill; (3) SWMU 24 also known as Former Village of Louvier Landfill; and (4) Trap Range.

Site Background

- Dynamite production began at the DuPont-Louviers site in 1908 and continued until May 1971, with a total production of approximately 1 billion pounds of dynamite. In addition, other explosives and ingredients for making explosives were manufactured at this facility.
- Solid explosive wastes were produced at the site as a byproduct of the manufacturing process. These wastes were stored in a U.S. Bureau of Firearms and Tobacco approved storage magazine and were typically burned or destroyed to render them non-hazardous. Non-hazardous and non-burnable wastes (such as metals and building materials) were deposited in onsite landfills, which were typically located in natural ravines.
- The primary environmental medium of concern in this health consultation is soil because individuals can come into contact with contaminants found in surface and sub-surface soil at the site.

What did CCPEHA find in the Health Consultation?

- Accidentally eating soil in the Trap Range area during residential activities could harm future hypothetical residents, particularly children. The currently available data suggests that the potential for developing cancer and noncancer health effects is high due to high levels of arsenic, antimony, and lead. In particular, there are very high levels of lead, which could harm young children and developing babies.
- Accidentally eating soil while trespassing is not expected to harm trespassers (ages 7-16 years) now or in the future. The levels of contamination in the SWMUs 11, 20, and 24, as well as at the Trap Range do not appear to be high enough to cause significant noncancer or cancer health effects.
- Accidentally eating soil during residential activities in SWMUs 11, 20, and 24 is not expected to harm future potential residents. The levels of arsenic contamination suggest the potential for developing cancer effects is low.
- Accidentally eating soil during construction activities is not expected to harm future construction workers. This conclusion was reached because the currently available data suggests that the potential for developing cancer and noncancer health effects is low.

What's next?

- Remediation of the Trap Range Area of Concern will be conducted by DuPont under the oversight of Hazardous Materials and Waste Management Division of CDPHE.
- CCPEHA will conduct additional health consultation activities at the DuPont-Louviers site on the remaining areas of the property (i.e., Restricted-use area inside the fence) that were not addressed in this evaluation.
- CCPEHA will review any additional data collected from the DuPont-Louviers site and evaluate the public health implications of the new data.
- Upon request, CCPEHA will provide assistance to DuPont and State environmental officials on sampling plans and analysis.
- CCPEHA will provide appropriate health education activities on the findings of this health consultation to stakeholders and the community.

FREQUENTLY ASKED QUESTIONS:

What is a health consultation? A health consultation provides advice on a specific public health issue related to real or possible human exposure to toxic material. A Health Consultation is a way for the Colorado Department of Public Health and Environment to respond quickly to a need for health information on toxic substances and to make recommendations for actions to protect the public's health. Health Consultations may consider:

1. The levels (or "concentrations") of hazardous substances;
2. If and how people might be exposed to contamination (through "exposure pathways" such as breathing air, drinking or contacting water, contacting or eating soil, or eating food);
3. The harm the substances might cause to people (or the contaminants' "toxicity");
4. If and how working or living nearby might affect people's health; and 5. Other dangers to people, such as unsafe buildings, abandoned mine shafts, or other physical hazards.

Where can I find this health consultation?
An electronic copy of this health consultation can be found at: http://www.cdphe.state.co.us/dc/ehs/healthconsult.html. To request a free copy of this health consultation, call Shannon Rossiter, Health Educator/Community Involvement Specialist, at 303-692-2617. For more information about the health consultation, please feel free to contact Thomas Simmons, Health Assessor, at 303-692-2961. For other site-related concerns, call Colleen Brisnehan, Colorado Department of Public Health and Environment Site Project Manager, at 303-692-3357 (direct) or toll free at 1-888-569-1831, ext. 3357.

How can the site's contaminants affect human health?

Arsenic
Arsenic is a known human carcinogen. It has been shown in animal and human studies that long-term exposure to low levels of arsenic can result in cancer and other non-cancer health effects. Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet. Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso. Skin contact with inorganic arsenic may cause redness and swelling. Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys.

Lead
The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production. Children are more vulnerable to lead poisoning than adults. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Antimony
Exposure to antimony at high levels can result in a variety of adverse health effects. Breathing high levels for a long time can irritate your eyes and lungs and can cause heart and lung problems, stomach pain, diarrhea, vomiting, and stomach ulcers. Ingesting large doses of antimony can cause vomiting. We don't know what other effects may be caused by ingesting it. Long-term animal studies have reported liver damage and blood changes when animals ingested antimony. Antimony can irritate the skin if it is left on it. Antimony can also have beneficial effects when used for medical reasons. It has been used as a medicine to treat people infected with parasites.