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: Part –I. On-Site Restricted 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 inside the security fence. The available information suggests that individuals are currently trespassing onto portions of the site for recreational activity. Industrial and/or commercial development is a possibility in the former explosives manufacturing area once all remedial action is complete. This health consultation addresses seven areas of concern: (1) Solid Waste Management Unit (SWMU) 36; (2) SWMU 6; (3) SWMU 7; (4) SWMU 15; (5) SWMU 23A; (6) SWMU 23C; and (7) S& D Garage and Underground Storage Tank (UST).

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 Solid Waste Management Unit (SWMU) 36 could harm trespassers, construction workers, and industrial workers. This is considered a public health hazard. The currently available data suggests that the amount of arsenic potentially swallowed by trespassers, construction workers, and industrial workers is associated with a high increased risk of developing cancer and non-cancer health effects. In addition, the concentration of lead in soil could also harm the developing fetus of future female workers and trespassers.
- Accidentally eating soil in SWMU 7 could harm trespassers, construction workers, and industrial workers. This is considered a public health hazard. The available data suggests that that the amount of arsenic potentially swallowed by trespassers, construction workers, and industrial workers is associated with a high increased risk of developing cancer and/or non-cancer health effects.
- Accidentally eating soil in SWMU 23A could harm industrial workers. This is considered a public health hazard. The available data suggests that the amount of 2,4-DNT potentially swallowed by industrial workers during various activities at this location is associated with a high increased risk of developing cancer.
- Accidentally eating soil in SWMU 23A is not expected to harm trespassers and construction workers. The available data suggests that the amount of 2,4-DNT potentially swallowed by trespassers and construction workers at this location is associated with a low increased risk of developing cancer and a low potential for non-cancer health effects.
- Accidentally eating soil in SWMU 23C could harm trespassers and industrial workers. This is considered a public health hazard. The currently available data suggests that the amount of 2,4-DNT potentially swallowed by industrial workers and trespassers, at the levels found in soil at this location is associated with a high increased risk of developing cancer.

- Accidentally eating soil in SWMUs 23C is not expected to harm construction workers. The available data suggests that the amount of 2,4-DNT potentially swallowed through incidental soil ingestion by construction workers at this location is associated with a low increased risk of developing cancer and non-cancer health effects.
- Accidentally eating soil in the S&D Garage and UST AOC is not expected to harm trespassers, industrial workers, and construction workers. The available data suggests that the amount of arsenic potentially swallowed by trespassers, industrial workers, and construction workers at this location is associated with a low increased risk for developing cancer and non-cancer health effects
- Accidentally eating soil in SWMU 15 is not expected to harm trespassers, industrial workers, and construction workers. The currently available data indicates that the amount of arsenic potentially swallowed by trespassers, industrial workers, and construction workers at this location is associated with a low increased risk for developing cancer and non-cancer health effects.
- It cannot currently be determined if accidentally eating soil in SWMU 6 could harm people's health now or in the future. This conclusion was reached because the currently available data suggests high levels of PETN (up to 7,800 mg/kg) are present. Non-cancer and cancer health guidelines for PETN have not been established by the ATSDR or the EPA. Therefore, the health risk from exposure to PETN-contaminated soil in SWMU 6 cannot be evaluated.

What's next?

- On-going remediation 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 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.

2,4-DNT

The International Agency for Research on Cancer (IARC) has determined that 2,4-DNT is a possible human carcinogen. In addition, workers who have been exposed to 2,4-DNT showed a higher than normal death rate from heart disease. However, these workers were exposed to other chemical as well. 2,4-DNT may also affect the nervous system and the blood of exposed workers. The health effects of DNT on children have not been studied. It is not known if DNT affects children differently than adults, or what long-term effects might appear in adults exposed as children. Animal studies have indicated that animals exposed to high levels of DNT had lowered number of sperm and reduced fertility. Animals also showed a reduction in red blood cells, nervous system disorders, and liver and kidney damage.