



Evaluation of Current and Future Soil Exposures at a Former Explosives Manufacturing Facility: Part –II. On-Site Restricted Use Area – DuPont Louviers Site, Village of Louviers, Douglas County, Colorado

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The DuPont-Louviers site is a former explosives manufacturing facility that operated during most of the 20th century. 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. Three primary groups of people have been identified that could come into contact with soil contaminants inside of the security fence at the DuPont-Louviers site: 1) current and future trespassers, 2) future construction workers, and 3) future industrial workers.

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 9 areas of the former explosives manufacturing area at the DuPont-Louviers site. Two health consultations have already been completed on this site. The first health consultation focused on unrestricted use areas outside of the security fence on DuPont property and the second health consultation focused on highly contaminated restricted use areas inside the security fence. The nine areas of concern that this health consultation addresses are: Solid Waste management Units (SWMUs) 8, 9, 10, 12, 14, 18, 31E, 31L, and 310.

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.
- Future potential exposures to construction workers and industrial workers are also evaluated because the area inside of the security fence on the DuPont property could be developed into industrial/commercial properties in the future following ongoing corrective action.

What did CCPEHA find in the Health Consultation?

- Accidentally eating surface soil in all areas (SWMUs 8, 9, 10, 12, 14, 18, 31E, 31L and 310) evaluated in this investigation is not expected to harm trespassers, construction workers, and industrial workers.

What's next?

- On-going remediation will be conducted by DuPont under the oversight of Hazardous Materials and Waste Management Division of CDPHE. Arsenic is a known human carcinogen. To be prudent of public health, DuPont should reduce exposure to arsenic in the area so that the estimated cancer risks are at the background level for arsenic or at the CDPHE long-term cancer risk goal of one in a million.
- DuPont should consider adding a land-use restriction of SWMU 31L to the Environmental Covenant to protect the developing fetus or female construction worker from lead exposure.
- CCPEHA will review any additional data collected from the DuPont-Louviers site and evaluate the public health implications of the new data.
- 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, explosive hazards, 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, 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, please call Colleen Brisnehan, CDPHE 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 International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans. Lead can affect almost every organ and system in your body, yet 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. Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.