Colorado Department of Public Health and Environment

FACT SHEET

Evaluation of Onsite Human Exposures to Mining Related Contaminants in Sediment and Surface Water at Captain Jack Mill – Ward, Colorado

June 2008

Health Consultation Completed

The Colorado Department of Public Health and Environment (CDPHE) in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR) has recently completed a health consultations titled: "Evaluation of Onsite Exposures of Mining Related Contaminants in Sediment and Surface Water". The consultation focused on exposures to contaminants found at the Captain Jack Mill Superfund Site.

Site Background

The Captain Jack Mill site is a former mining and milling operation, which operated intermittently from the late 1800s through 1995. Metal-contaminated mine workings are present on the surface and can contribute to the contamination of groundwater, surface water, sediment, and other surface soils. The EPA added the Captain Jack site to the National Priorities List (NPL) in September 2003, and clean up continues today.

What did CDPHE find in the Health Consultation?

- A public health hazard exists for children and adults from exposure to sediments and surface water. This hazard exists especially for:
  - Children who live or play on-site and chronically exposed to iron by ingestion of sediments in the upper portions of the site (i.e., Big Five area above the mill). Minor health effects such as gastrointestinal illness are likely to occur.
  - Residents, recreational visitors, and construction workers acutely exposed (1-day duration) to copper by ingestion of surface water and sediment in the upper portion of the site (i.e., Big Five area above the mill). Less serious gastrointestinal effects (e.g., nausea, vomiting, and /or abdominal pain) may occur.
- There is no apparent public health hazard:
  - Exposure to arsenic in sediments in the upper portion of the site (i.e., area above the mill).
- The drinking water source for all residents is not known. If residents are using surface water for drinking, the concentrations of copper, iron, and manganese pose a public health hazard.
- All exposures that occurred before the Remedial Investigation are considered an Indeterminate Public Health Hazard due to a lack of environmental data needed to appropriately characterize site conditions.

What's next?

- CDPHE and EPA will continue with clean-up.
- CDPHE will install signs to warn visitors and residents of potential public health hazards in highly contaminated areas.
- CDPHE will provide ongoing health education, as requested.

Where can I find this health consultation?

An electronic copy of the consultation can be found at: http://www.cdphe.state.co.us/dc/ehs/CaptainJackMillHC121107.pdf. Printed copies of the consultation can be found at the Ward Public Library Post Office / Town Hall Building Ward, Colorado 80481. To request a free copy of the health consultation, call Shannon Rossiter, Health Educator/Community Involvement Specialist, at 303-692-2617.For more information, please feel free to contact Thomas Simmons, Health Assessor, at 303-692-2961.

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 CDPHE to respond quickly to a need for health information on toxic substances and to make recommendations for actions to protect the public's health. CDPHE staff evaluate information available about toxic material at the site, determine whether people might be exposed to it, and report what harm exposure might cause.

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.

What is public health hazard? ATSDR defines a public health hazard as sites where evaluation of available relevant information suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions.

What is no apparent public health hazard? ATSDR uses this category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.

What uncertainties are associated with the conclusions of these health consultations? A number of uncertainties exist in this evaluation: (a) The drinking water source for all residents has not been determined; (b) The exposure point concentrations for surface water are biased high due to sampling from mine drainage and the settling pond areas, which are not likely to be used as a drinking water source; (c) It is unknown if the form of copper used in the critical toxicological study is the same as the form of copper that exists on the site; and (d) the occurrence of the incidental ingestion of large amount of sediment (400 mg/day) for acute exposure is uncertain.

How do the site's metals affect human health?

Copper: Everyone must absorb small amounts of copper every day because copper is essential for good health. High levels of copper can be harmful. Breathing high levels of copper can cause irritation of your nose and throat. Ingesting high levels of copper can cause nausea, vomiting, and diarrhea. Very-high doses of copper can cause damage to your liver and kidneys, and can even cause death.

Manganese: Some individuals exposed to very high levels of manganese for long periods of time in their work developed mental and emotional disturbances and slow and clumsy body movements. This combination of symptoms is a disease called "manganism." Workers usually do not develop symptoms of manganism unless they have been exposed to manganese for many months or years. Manganism occurs because too much manganese injures a part of the brain that helps control body movements. Exposure to high levels of airborne manganese, such as in a manganese foundry or battery plant, can affect motor skills such as holding one's hand steady, performing fast hand movements, and maintaining balance. Exposure to high levels of the metal may also cause respiratory problems and sexual dysfunction.

Arsenic: 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.

Where do the health hazards exist on the site?_The site itself consists of 3 major components (please see the image below). Health hazards that are identified as being present in the upper portion of the site include the areas near the Big Five Mine, the middle portion of the site includes areas near the Captain Jack mill works, and the lower portion of the site includes the areas near the White Raven Mine.