



Environmental Health Information

Offsite Soils:CMC Heartland Lite Yard Site

September 2006

Where is the former CMC Heartland site?

The former CMC Heartland site is located in the Hiawatha industrial corridor on the eastern edge of the Phillips neighborhood in south Minneapolis. It is a triangle-shaped piece of land with Hiawatha Avenue to the east, 28th Street to the south, the Roof Depot to the west and the city of Minneapolis asphalt plant to the north. See map below.



What is the history of the CMC Heartland site?

The Reade Manufacturing Company leased the site from 1938 to 1963 to store pesticides that contained arsenic. From 1963 to 1968, the US Borax Company mixed, stored and distributed materials at the site. Contamination was discovered in 1994 during reconstruction of Hiawatha Avenue. High levels of arsenic were found in soil on the site and groundwater underneath the site. Clean up of the site was completed in 2005 and then it was redeveloped as an office/small warehouse building.

The Minnesota Department of Health (MDH), in cooperation with the federal Agency for Toxic Substances and Disease Registry (ATSDR), has completed three public health reports (dated January 16, 1998, April 8, 1999 and May 17, 2001) that look at ways in which people might be exposed to arsenic from the site. These reports note that dust contaminated with arsenic could have been carried north and northwest into the neighborhood by wind. The Minnesota

In 2004 the MDA requested assistance from the US Environmental Protection Agency (EPA). The EPA sampled 600 yards and found 61 yards that had levels of arsenic above 95 parts per million (ppm). In order to prevent acute sickness, such as stomach cramps, that could occur from eating dirt, EPA decided to remove soil from yards above 95 ppm arsenic. Cleanup of most of those yards happened in 2004 and 2005 with the remaining yards to be cleaned in 2006.

This is a detailed map of Minneapolis, Minnesota. A large black circle is drawn around the central part of the city. The map shows a grid of streets, including major thoroughfares like I-94, I-35W, and I-55. Key landmarks such as Powderhorn Park and the Mississippi River are visible. A white triangle icon is placed in the center of the black circle, indicating the city's downtown area. The map is labeled with street names, highway numbers, and exit numbers.

How did the arsenic get in people's yards?

Arsenic is an element that is naturally found in the earth's crust. While there are some natural processes (wind and volcanoes erupting) that release arsenic into the environment, most arsenic comes from human activities such as burning coal to generate electricity, mining, and use of pesticides. In Minnesota, it is not unusual to have naturally occurring arsenic in soil at levels of 6-20 ppm.

In the past, people may have used pesticides and fertilizers in their homes and yards in ways that result in higher than normal levels of arsenic in the soil. Older decks and other outdoor structures built with copper chromated arsenic (one kind of green treated wood) may also be a source. Wind blowing across the piles of stored pesticide at the CMC site could also have carried arsenic into people's yards.

Which yards will be cleaned up?

EPA will continue to remove soil from yards containing 95 ppm or more of arsenic. However, whether or not yards with lower levels of arsenic will be cleaned up depends upon development of a final soil cleanup value. Unintentionally swallowing small amounts of arsenic daily for many years, such as might occur while playing in the dirt or gardening, could increase the risk of developing some diseases, such as cancer and diseases of the circulatory system and nervous system. Because these diseases have multiple causes and take many years to develop, it is very difficult to determine exact risk or cause of illness. EPA is preparing a risk assessment, which aids in the development of cleanup values by taking into account people's exposures as well as the toxic effects of arsenic.

In the meantime, MDH advises people to take normal care when they come into contact with soil. Urban soils are commonly contaminated with many things, including other metals (such as lead and cadmium) and human or animal wastes.

How can arsenic affect people's health?

Despite its reputation as a deadly poison, arsenic is like any hazardous substance: its effects depend on how much, how often and for how long people are exposed to it. Most people are exposed to very low levels of arsenic in air, soil, water and food without any noticeable health effects. Short-term (acute) exposure (1-14 days) to higher levels (approximately 3 milligrams/day) of arsenic may result in facial swelling, nausea, vomiting, diarrhea, nerve problems in the hands and feet. Long-term (chronic) exposures (weeks to years) to approximately 0.5 - 1 milligram/day are linked with skin problems, and possibly heart and nervous system problems. Exposure to high levels in drinking water over many years has been linked to increased risk of skin, lung and bladder cancer. Health criteria for protection of public health from chronic arsenic exposures are based on limiting exposure to less than 1/100th of these amounts. For the CMC site investigation, exposure to contaminated soil (not air or water) is the only concern.

Is there an excess of cancer or other diseases in the neighborhood?

Many residents of the neighborhood have expressed concern about health problems that they or their neighbors are having and are wondering if those problems could be related to exposure to site contaminants. Residents report both cancers and non-cancer health problems such as skin rashes, respiratory problems, learning disabilities and urinary tract problems.

MDH does not collect information on most health problems about which people have complained. However, we do collect information about cancers in Minnesota communities. In response to residents' concerns, MDH examined data from the Minnesota Cancer Surveillance System (MCSS) from the 55404, 55406 and 55407 zip code areas for 1988-2002.

The MCSS is the tool used to track new cases of cancer (incidence) in Minnesota. Any time a new case of cancer is diagnosed, it must be reported to the MCSS. From years of tracking cancers, we know that about ½ of all Minnesotans will be diagnosed with cancer at some point in their lifetime. About ¼ of all Minnesotans will die from cancer, making it the second most common cause of death.

The MCSS records information about new cases of cancer along with the person's address at the time of diagnosis. This means that if someone lived near the CMC site for decades, but moved and was diagnosed somewhere else, their cancer would be included in the tracking for their new residence. Likewise, because cancer often takes years to develop, someone could develop cancer while living in another zip code, but be currently living in the south Minneapolis zip code area at the time of a cancer diagnosis. This is a limitation of the MCSS data.

The MCSS compared the actual (observed) number of cancers for these zip codes with the number of cancers that would be expected if the cancer rates were the same as the seven county metropolitan area.

Observed and Expected New Cases of Cancers in Selected Zip Codes, 1988-2002

Cancer Type	55404 zip code				55406 zip code				55407 zip code			
	Male		Female		Male		Female		Male		Female	
	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.
Esophagus	8	8	3	6	21	14	8	5	8	10	6	5
Stomach	↑ 18	10	10	9	18	19	13	13	18	14	10	11
Colo-rectal	↑ 85	65	106	91	127	117	141	135	85	87	106	116
Larynx	↑ 21	7	4	2	17	13	6	4	↑ 21	10	4	3
Lung/bronchus	↑ 156	78	↑ 105	70	↑ 186	145	↑ 176	130	↑ 158	105	105	106
Breast	3	1	180	202	1	2	371	377	3	2	↓ 180	320
Prostate	↓ 155	182	--	--	334	343	--	-	↓ 154	246	--	--
Bladder	39	40	24	20	80	73	29	31	↓ 39	54	24	27
Kidney	24	19	9	13	34	33	28	23	24	26	↓ 9	19
NH Lymphoma	40	30	30	31	49	51	58	50	40	41	↓ 30	43
Leukemia	21	21	↑ 32	19	41	36	36	29	21	30	32	26
All Cancers	↑ 752	613	↑ 723	669	1143	1084	↑ 1276	1157	↓ 752	827	↓ 723	998

↑ = the observed number of new cases of cancer was statistically **higher** than would be expected, compared with the seven county metropolitan area.

↓ = the observed number of new cases of cancer was statistically **lower** than would be expected, compared with the seven county metropolitan area.

No mark = the observed number of new cases of cancer was statistically **not different** than would be expected, compared with the seven county metropolitan area.

The table lists MCSS cancer rates for zip codes located near the CMC site. The MCSS data show elevated lung cancer rates for all three zip codes. Zip code 55404 had higher than expected numbers of stomach and colo-rectal cancers in males. Zip codes 55404 and 55407 had higher than expected numbers of cancer of the larynx in males. Bladder cancer, which is related to arsenic exposure in drinking water, was no different than expected in zip codes 55404 and 55406, and lower than expected for males in zip code 55407. Many different factors play a role in the development of a single case of cancer. Diet and smoking are very important factors that could contribute to the kinds of cancers that were found to be higher than expected.

Will there be a health study?

An epidemiological investigation is a scientific health study that looks at known exposures and patterns of disease in communities to see if there is any relationship. This kind of study could be recommended by MDH if there is a clear public health benefit and no likelihood of harm, is scientifically feasible, and if the necessary resources are available.

In order to find answers to the scientific question posed by the study, there must be an established link between exposure to a particular contaminant and a distinct health outcome. Many health effects resulting from arsenic exposure can also be attributed to other causes. Cancer for example, can be influenced by factors such as genetics, diet and smoking, which are difficult to sort out from contaminant (arsenic) exposures.

Scientists also need to be able to document how long people were exposed, how much of the contaminant might have entered their bodies and how often these exposures occurred. If all these conditions exist, health studies still require hundreds of individuals to participate, and many years to conduct in order to draw a conclusion. Even then, the conclusion may find no link between exposure and disease. For these reasons, and more, the MDH is not recommending a health study be conducted at this time

What are the next steps?

The MDH believes it is important to prevent exposures to hazardous substances because this will reduce health risk for diseases (such as cancer) that take a long time to develop and are difficult to study. MDH will review the sampling results from the 4,000 properties and work together with EPA and MDA to develop a clean up plan that will protect people's health. Until the clean up is complete, residents with contaminated soil should take steps to reduce their contact with the soil.

MDH released a fourth Health Consultation that describes recent site activities and community concerns in more detail. For related information, please see

- *Cancer and the Environment* booklet
- *Reducing Your Contact with Contaminated Soil* information sheet.

All of these materials are available from MDH at www.health.state.mn.us or by calling 651.201.4897.

For other questions, contact:

MDH/Site Assessment and Consultation: (651) 201-4897 or 1 (800) 657-3908, press "4" and leave a message.
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