Environmental Health Information

St. Regis Superfund Site
Groundwater, Surface Water and Sediments

February 2006

What is this Health Consultation report about?

Since 2002, the Leech Lake Band of Ojibwe (LLBO), the Minnesota Department of Health (MDH), and the Agency for Toxic Substances and Disease Registry (ATSDR) have been working together to evaluate contamination at the St. Regis Superfund site and ensure that the community's health is protected. To date, Health Consultation reports have been written on ways people may be exposed (come into contact) to site contaminants through soil, and also a review of community health concerns and available information about community health. Possible exposure through eating fish is currently being evaluated.

This information sheet is a summary of the report on groundwater, surface water and sediments as pathways of exposure to site contaminants. The Health Consultation report is based on file reviews, government reports, a survey of well owners, and interviews with former employees, current and former residents.

What is the history of this site?

The St. Regis Paper Company Superfund Site is a former wood preserving facility that operated from 1957 to 1985 in the City of Cass Lake on the Leech Lake Reservation (Map 1). Groundwater, surface water, sediment and soil on and near the site are contaminated as a result of the wood preserving process and waste disposal activities. While cleanup actions have occurred in the past, contamination remains on site in areas that are residential or easily accessed by people.

How did the groundwater, lakes, channel, creek and sediments become contaminated?

Both creosote and pentachlorophenol (PCP or "penta") were used to treat the wood. The process of pressure treating the wood with steam required large amounts of water. In the early years, the wastewater had little treatment before passing through a series of unlined ponds. Leftover sludge from the wastewater was taken to the city dump and burned. Wastewater was also sprayed on the ground and dumped on the facility and the southwest area properties. From 1980 until the facility closed in 1985, the waste left over after water evaporated was hauled to a hazardous waste site.

During the years of operation, solid wastes were burned in two tall open burners on site, including the containers from the pressure treatment chemicals. Smoke, soot and steam from these burners may have spread contaminants beyond the site. Timber waste, metal scraps and other wastes were deposited in a landfill at the eastern edge of the site, in the southwest area and the city dump.

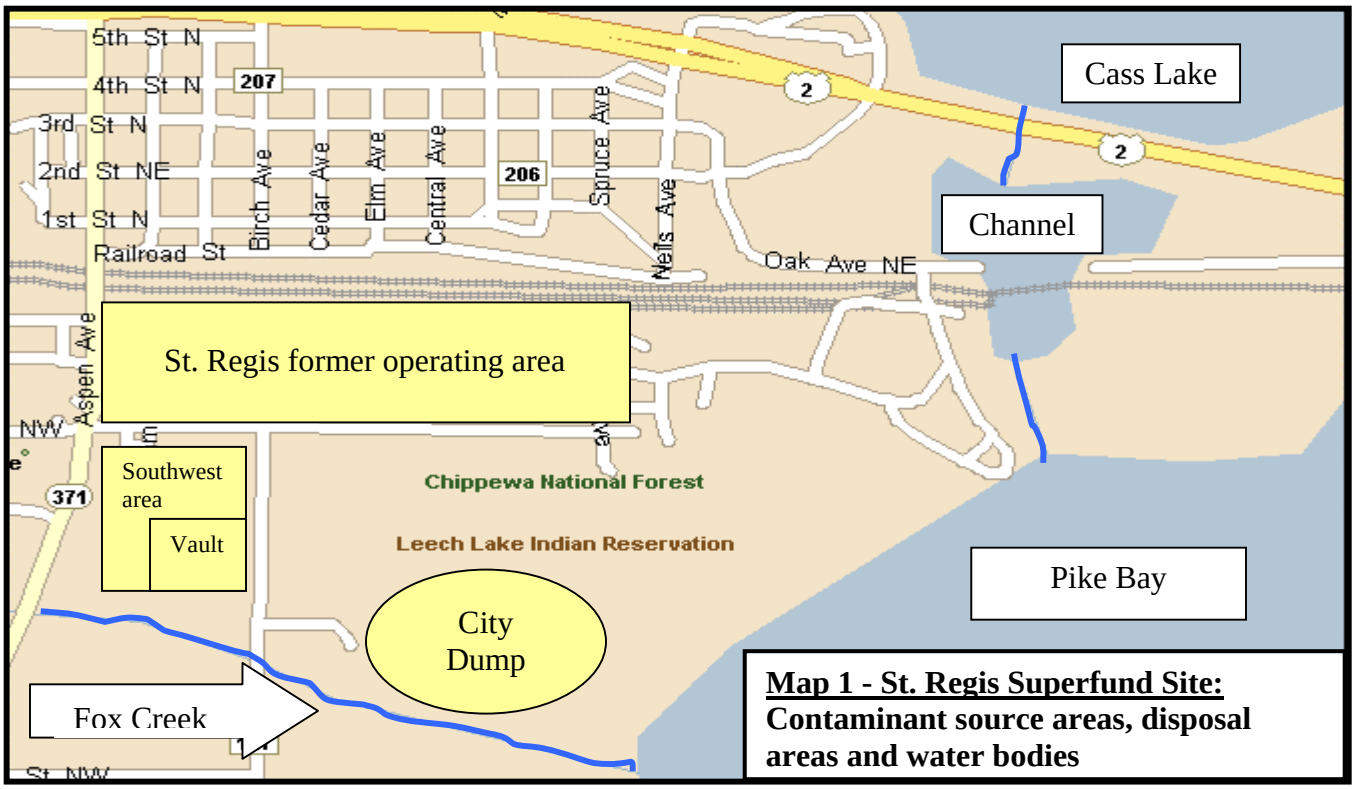
As a result of both facility operations and waste disposal, portions of Fox Creek, Pike Bay, Cass Lake, the channel connecting Pike Bay and Cass Lake, the sediments of these water bodies and

the groundwater underneath the site appear to be contaminated at varying levels. Most of the contamination is a result of treating the wood with oil containing "penta". The oil also contained a group of chemicals called polyaromatic hydrocarbons (PAHs). PAHs have been found in soil, groundwater, surface water, and sediment at and near the site.

Dioxins and furans, another large group of related chemicals, were impurities in the penta. Dioxins and furans tend to stick to sediments and larger molecules containing carbon and do not freely move in water. Dioxins have been detected in some water samples.

For a short time, the wood was also treated with copper and arsenic. These metals have also been found at the site, but generally not at levels of concern for human health. Occasionally, other chemicals such as polychlorinated biphenyls (PCBs), phenols, and volatile organic compounds (VOCs) have also been detected.

More information about pentachlorophenol, dioxins, furans, copper and arsenic and their health effects are available from MDH or online at ATSDR's Web site at http://www.atsdr.cdc.gov/toxfaq.html .



Map 1 - St. Regis Superfund Site: Contaminant source areas, disposal areas and water bodies

How has the site been cleaned up?

From 1985 to 1988, the owner at that time, under government supervision, dug up and removed 26,000 cubic yards of soil and sludge that was clearly seen to be contaminated. The soil and sludge were placed in a vault that was constructed to hold the contaminated soil and then covered with clean soil.

Because the contamination moved from the surface down through the soil into the groundwater, water pump out and treatment systems were built both at the site and at the city dump in the

1990's. To date, the system has removed an estimated 22,114 pounds of penta and 7,900 pounds of PAHs. These systems are intended to capture contaminated groundwater and prevent it from moving away from the site and contaminating nearby lakes and creeks. However, sampling indicates that high levels of contamination remain at the site and that the groundwater pump-out system is not completely capturing or controlling the contamination.

In 1983, testing of well water from homes on the site found one well with chemical contamination above the State drinking water criteria. More testing in 1984, 1992 and 2003 found no contamination above the drinking water criteria. All homes, except for one, were connected to the city water supply.

Recent reviews of contamination at the site found that the clean up actions taken in the mid-1980's were not protecting people's health and the environment. This led to more soil removal, a proposal to limit residents' exposure to indoor dust, and a risk assessment that is currently being reviewed by government agencies.

How Can I Be Exposed To These Chemicals?

When evaluating a site, public health scientists look at how the chemical moves from the site to people (exposure pathway) to see how people might be exposed. Even when a chemical is present in water or sediments, people may not come in contact with it. If there is no contact with the chemical, people have not been exposed. When there is contact with the chemical in water or sediments, whether or not it could affect people's health depends on many factors including the amount of the chemical. Unborn children, young children, elders and those with compromised immune systems may be more affected by exposures to chemicals.

People living or visiting near the former St. Regis property could come into contact with the chemicals discussed above in a number of ways, including:

- Direct skin contact with contaminated soil, dust, sediment, or water
- Drinking contaminated water
- Accidental ingestion of contaminated soil, dust, or sediment
- Eating contaminated plants or animals
- Inhaling contaminated particles when plants or animals are burned or cooked
- Inhaling chemicals that evaporate from contaminated soil or groundwater

While we find these exposure pathways at and near the St. Regis site, most are likely to result in only very low levels of exposure. For example, surface water sampling suggests that contaminant concentrations are very low and may not be a public health hazard, regardless of how often someone goes swimming. In a similar way, some of the exposure pathways have been prevented. For example, even though the groundwater is very contaminated in some places, it appears that no one is drinking it so it may not pose a public health hazard. But there are some pathways that could pose a public health hazard, and these are discussed in more detail below.

There is also evidence that workers at the St. Regis facility, and residents who lived near it while it was operating, may have had much higher levels of exposure or been exposed through more pathways than are currently occurring today. This could affect how those workers and residents are affected by current, lower level exposures, since some of the chemicals, particularly dioxin, tend to stay in the body for several years.

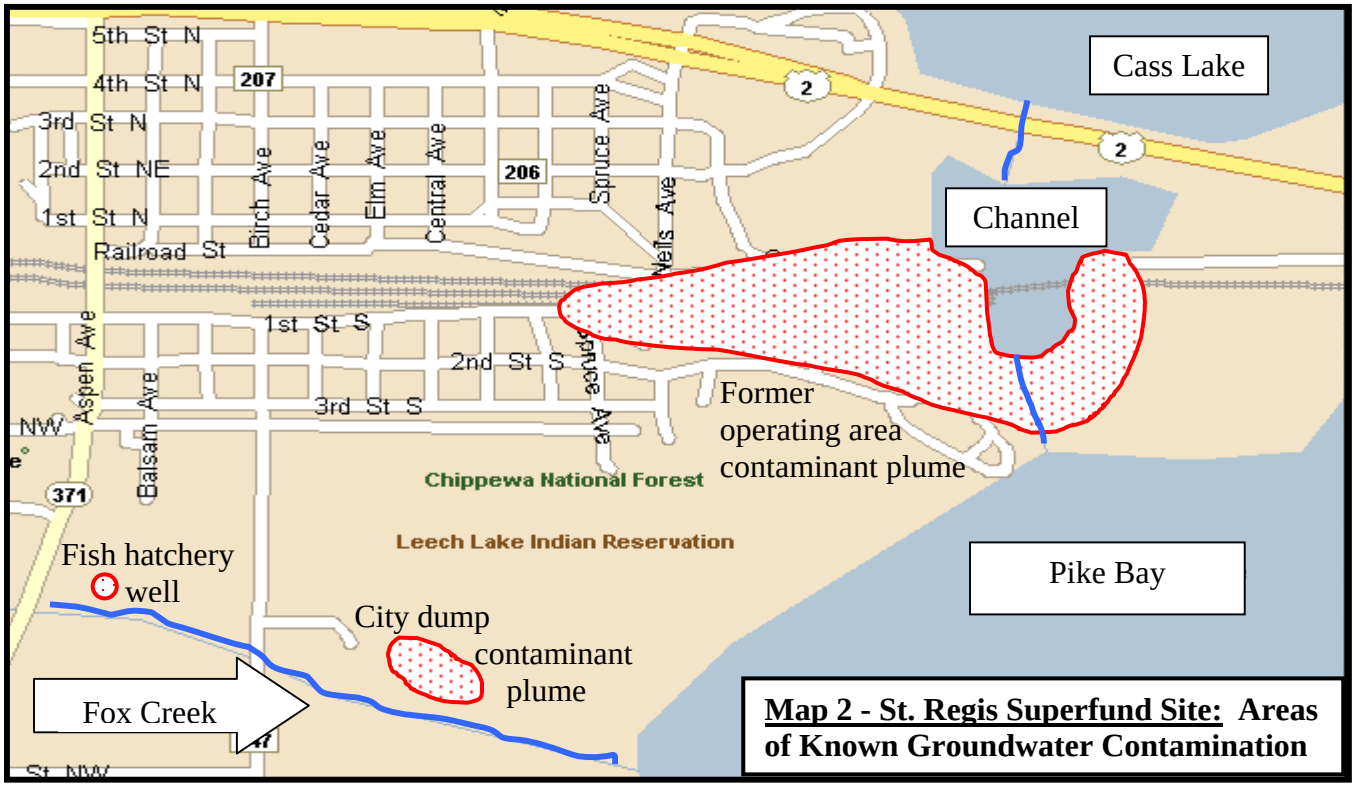
What do we know about the levels of contaminants and possible exposures?

Groundwater

A network of monitoring wells was installed at the site and a large number of groundwater samples have been collected. However, because of inadequacies in the monitoring network, not much is known about how much contaminated groundwater there is or how deep the contamination has spread in the groundwater. Nothing is known about where groundwater enters nearby water bodies, such as Fox Creek and Pike Bay.

Groundwater contamination with penta and PAHs is of particular concern in the former operating area of the St. Regis site and in the city dump (Map 2). In these two areas there are also places where a layer of oily liquid is floating on top of the water table. As a result of the soil excavations in the 1980's and the groundwater pump-out system, penta and PAH concentrations in the former operating area and city dump have decreased over time. In the southwest area, very low levels of PAHs have been detected, but only one deep well for the LLBO fish hatchery ever exceeded drinking water standards. PAHs have not been detected in that well since 2000.

Dioxins have also been detected in the groundwater, but sampling for dioxins occurred only occasionally and was stopped in 1988.



Map 2 - St. Regis Superfund Site: Areas of Known Groundwater Contamination

In the past some residents were exposed to contaminated groundwater through private wells and/or the city water supply. In some cases, the levels of contamination were above the drinking water standards we have today. How long these exposures lasted is unknown, but they may have lasted as long as several decades.

It does not appear that people are being exposed to contaminants through groundwater at this time. Most of the contaminated wells were sealed and those that were not sealed are not used for drinking water. The city water system uses new wells that are not contaminated.

Groundwater is still a potential exposure pathway due to the high levels of contamination remaining in the groundwater. Drinking the groundwater from under the site could still expose people to contaminants. Also, contaminated groundwater continues to enter nearby water bodies and contaminate sediments. Additional investigation and cleanup of the groundwater will prevent future exposures and eliminate movement of contaminants to nearby creeks and lakes.

Surface Water (lakes, channels and creeks)

Surface water was sampled by the U.S. Environmental Protection Agency (EPA) in 2001. Low levels of penta, PAHs, VOCs, and metals were detected in Fox Creek, Pike Bay, and the channel. Some of the results exceeded Minnesota's surface water criteria, which are developed to protect both people and aquatic life. Samples from Cass Lake were found to have low levels of metals, one PAH, and one VOC. Samples were also collected from nearby lakes to see how much of these chemicals are present in lakes not affected by the St. Regis site. In these lakes only low concentrations of metals and PAHs were found, generally at concentrations lower than those found in Fox Creek and Pike Bay.

The levels of contaminants detected in Fox Creek, Pike Bay and the channel do not appear to pose a public health hazard. However, no samples were collected near the shore of Pike Bay at the city park, where people are likely to swim or wade. More sampling is needed to learn about contaminant concentrations in areas most often used for swimming and wading. More information is also needed about how often people use the lakes, creek and channel. For these reasons, the public health hazard associated with surface water near the site is considered to be unknown at this time.

Sediment

Sediment sampling in 1983 detected PCBs and phenols in Fox Creek, Pike Bay and the channel. The concentrations of PCBs in several of the samples exceeded both human health and ecological sediment screening criteria. Only Fox Creek was sampled in 1995. The samples were analyzed for PCBs, which were not detected, but the test methods used would not be able to find low levels of PCBs.

In 2001, the U.S. EPA sampled sediments in Fox Creek, Pike Bay, Cass Lake, and the channel. They found dioxins, PCB, and PAH contamination in most of the sediment samples at concentrations much higher than the human health and ecological sediment screening criteria. The levels were also higher than in lakes and creeks not affected by the St. Regis site.

Contact with the sediments in both Fox Creek, Pike Bay and the channel is a way for people to be exposed to site contaminants. Frequent exposure to these sediments could represent a public health hazard, but we don't have enough information about how often people come into contact with these sediments. At this time, the human health hazard associated with sediments at the site is considered to be unknown. We do recommend that people limit their exposure to sediments in Fox Creek and the channel between Pike Bay and Cass Lake.

What Happens Next?

In 2004 and 2005, International Paper, at the direction of the EPA, collected additional soil, groundwater, sediment, surface water, and fish samples. This information is being used to develop a human health risk assessment that evaluates the cumulative risk from all exposure pathways. This risk assessment is currently being reviewed by state, federal, and tribal agencies, and will be used to decide if additional clean up is needed.

What do ATSDR, MDH, and the LLBO Recommend?

1. People should avoid contact with the sediments in Fox Creek and the channel. Warning signs should be posted. These signs should remain until the risk assessment is completed and any needed clean up actions are done.

2. Any open wells drawing groundwater from under the site should be properly sealed to prevent future exposures from contaminated water.

3. More monitoring wells are needed to define the extent and magnitude of groundwater contamination. This includes finding where the groundwater enters nearby creeks and lakes.

4. Groundwater samples should be tested for dioxins.

5. Movement of contaminants from the site to the channel should be stopped.

6. Exposure through eating fish, other wildlife, or plants is still being evaluated. People are advised to avoid harvesting plant materials from contaminated areas and to garden in raised beds of clean soil in their yards.

To obtain a copy of the full Health Consultation, call the MDH phone number listed below or download the report from the MDH St. Regis Paper Company website at www.health.state.mn.us/divs/eh/hazardous/sites/cass/stregis/index.html.

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

To obtain a copy of this document in an accessible format (electronic ASCII text, Braille, large print, or audio) please call 651-201-5000. Consumers with hearing or speech disabilities may reach us by calling Minnesota Relay at 1-800-627-3529 or dialing 7-1-1.

This information sheet was prepared in cooperation with the federal Agency for Toxic Substances and Disease Registry.