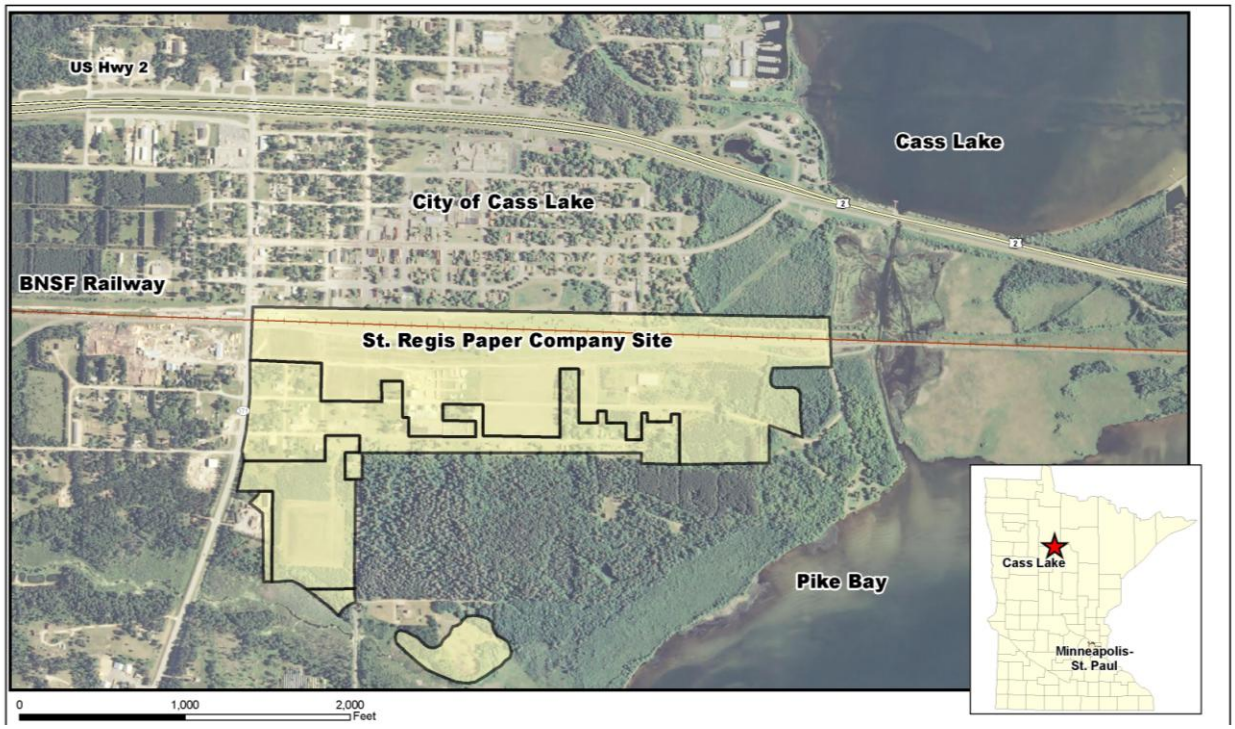
EPA Proposes Soil Cleanup Plan for St. Regis Paper Company Site

St. Regis Paper Company Site **Date: June 17, 2011**
Leech Lake Reservation
Cass County, Minnesota

The purpose of this Proposed Plan is to give background information about the St. Regis Paper Company site, describe the various cleanup alternatives considered, and identify EPA's preferred cleanup alternative. The public is encouraged to comment on this Proposed Plan. EPA will be accepting comments for 30 days from the issuance of this Proposed Plan. Members of the public are also encouraged to attend and participate in a public meeting at the Cass Lake-Bena Elementary School at 15 4th Street NW, Cass Lake, Minnesota, on Thursday, June 23, 2011, at 6:30 pm.



The St. Regis Paper Company Site Location

To clean up soil contamination at the St. Regis Paper Company site, the U.S. Environmental Protection Agency Region 5 (EPA) is proposing the following remedial measures: 1) excavate or cover contaminated soil on impacted residential properties and backfill excavated soil with clean soil; 2) cover contaminated soil on industrial/commercial properties owned by the site responsible parties with one foot of clean soil and maintain the cover; 3) pave commercial/industrial work areas that use heavy equipment and pave residential/commercial unpaved roads; 4) excavate contaminated soil in a former site work area due to ecological risks;

5) transport the excavated contaminated soil to an off-site facility for disposal, 6) monitor surface water in the nearby forested wetland; and 7) place institutional controls on property where hazardous substances above cleanup levels remain below the cover or soil backfill area.

These measures to remediate the site will be protective of human health and the environment, meet applicable and/or relevant and appropriate regulations, be cost effective, and will be effective in the long term.

After review and consideration of information provided by the public during a comment period and at a public meeting, and consultation with its Tribal partner the Leech Lake Band of Ojibwe (LLBO) and its State partner the Minnesota Pollution Control Agency (MPCA), EPA will select a final cleanup plan for contaminated soil at the site. The final cleanup plan, which will be announced in local newspaper notices and presented in an EPA document called the Record of Decision (ROD), could differ from this Proposed Plan depending on information or comments EPA receives during the public comment period.

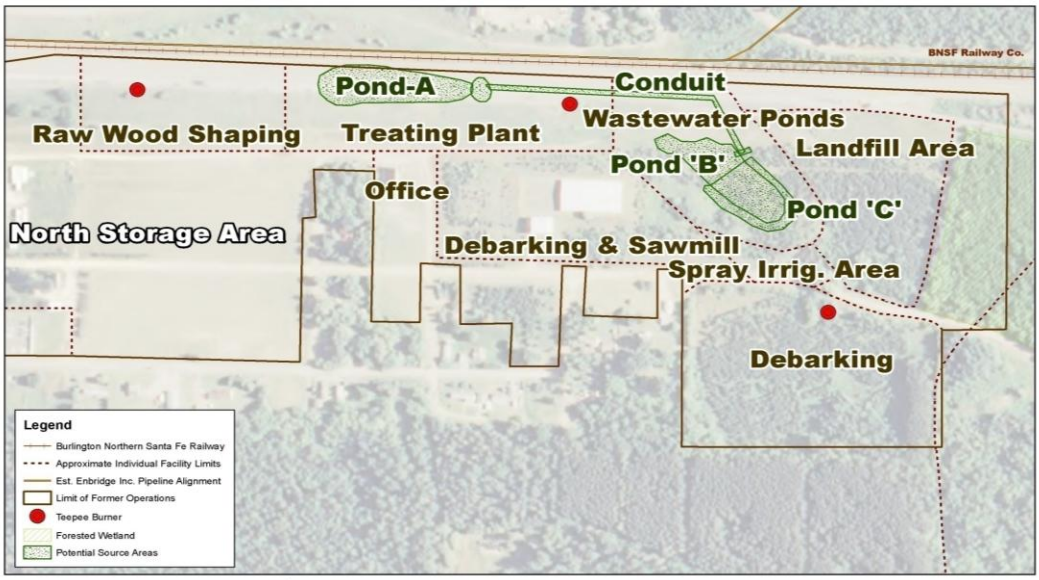
The public is also encouraged to review the supporting documents for the St. Regis Paper Company site at any of the following locations: the Cass Lake Library, the Bemidji State University Library, the LLBO Division of Resource Management, and the Cass Lake City Clerk's Office. The supporting documents include, but are not limited to, the 1985 *Remedial Investigation Report*, the 1988 *Response Action Reports for the Treating Facility and the City Dump*, and the soil sampling results from investigations by EPA and responsible parties for the site, including the 2002 *Data Evaluation Report*, the 2004 *Final Report for the 2003 St. Regis Site Soil Sampling*, the 2006 *Soil Removal Action Implementation Report for BNSF Industrial Property*, the 2006 *Completion of Voluntary Response Action at Cass Forest Products*, and the 2011 *Human Health and Ecological Risk Assessment* (HHERA) and the 2011 Site Feasibility Study (FS) Report. The HHERA studied the potential for health effects to residents and workers from the remaining site soil contamination; and effects on the environment from contamination at the site. The FS identified, evaluated, and compared different cleanup alternatives.

About the St. Regis Paper Company Site

The St. Regis Paper Company site (site) is located in the City of Cass Lake, Cass County, Minnesota and is fully within the exterior boundaries of the LLBO Reservation. The former operations area of the site is primarily on 125 acres of property south of the BNSF Railway tracks, and east of Highway 371, and was used as a wood treatment facility from about 1958 until 1985. The site includes any areas where contamination from the wood treatment facility has migrated. The site includes residential properties near the former operations area and areas of site-related contamination adjacent to the City of Cass Lake's former municipal dump which is located south of a portion of the Chippewa National Forest, east of County Road 147, and north of Fox Creek.

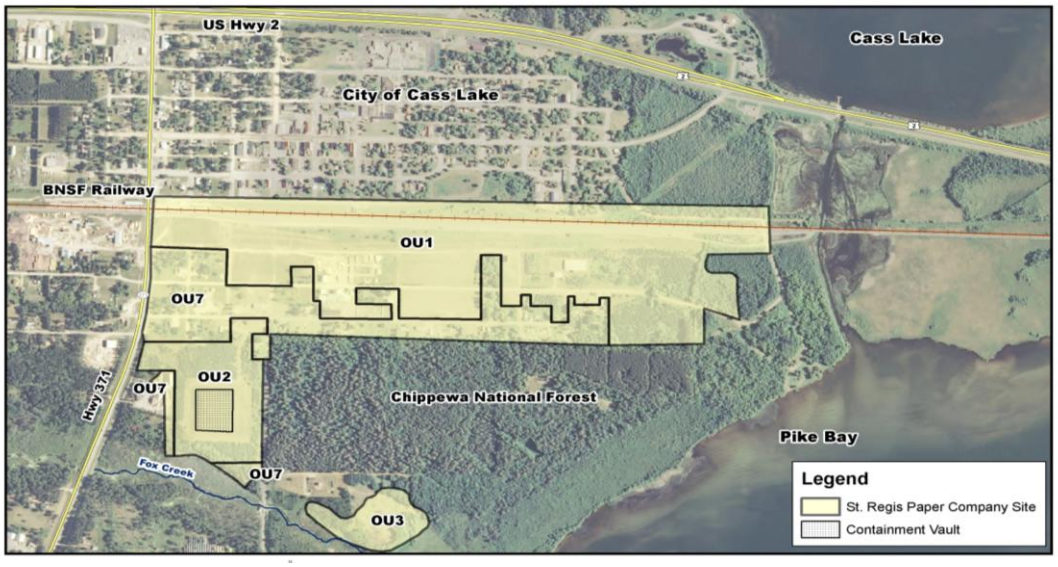
The wood treating process at the site consisted primarily of pressure treating wood with creosote and other chemicals. Wastewater from wood treating was placed in ponds on the site between 1957 and 1980. This wastewater was also used occasionally to spray grass near the ponds and other areas of the site. After 1980, site wastewater was reused, evaporated in tanks, or disposed

in a sewage drain located in Chippewa National Forest that led to the City of Cass Lake sewage treatment tank near the City Dump. Sludge from wood treatment was disposed of on the eastern edge of the site and in a waste pit near the Cass Lake City Dump. Sludges and waste oil from the site were occasionally burned in that waste pit.



St. Regis Key Site Operations: OU1

In 1984, the St. Regis Paper Company site was listed on the EPA National Priorities List (NPL). In 1985, the MPCA and the former owner/operator of the wood treating facility, Champion International Corporation (Champion), reached an agreement on clean up for the site. MPCA and Champion signed two clean up orders, one for the wood treatment area and one for the waste pit near the City Dump. Wood preserving operations ceased in the fall of 1985.



St. Regis Paper Company Site Operable Units

Site Characteristics

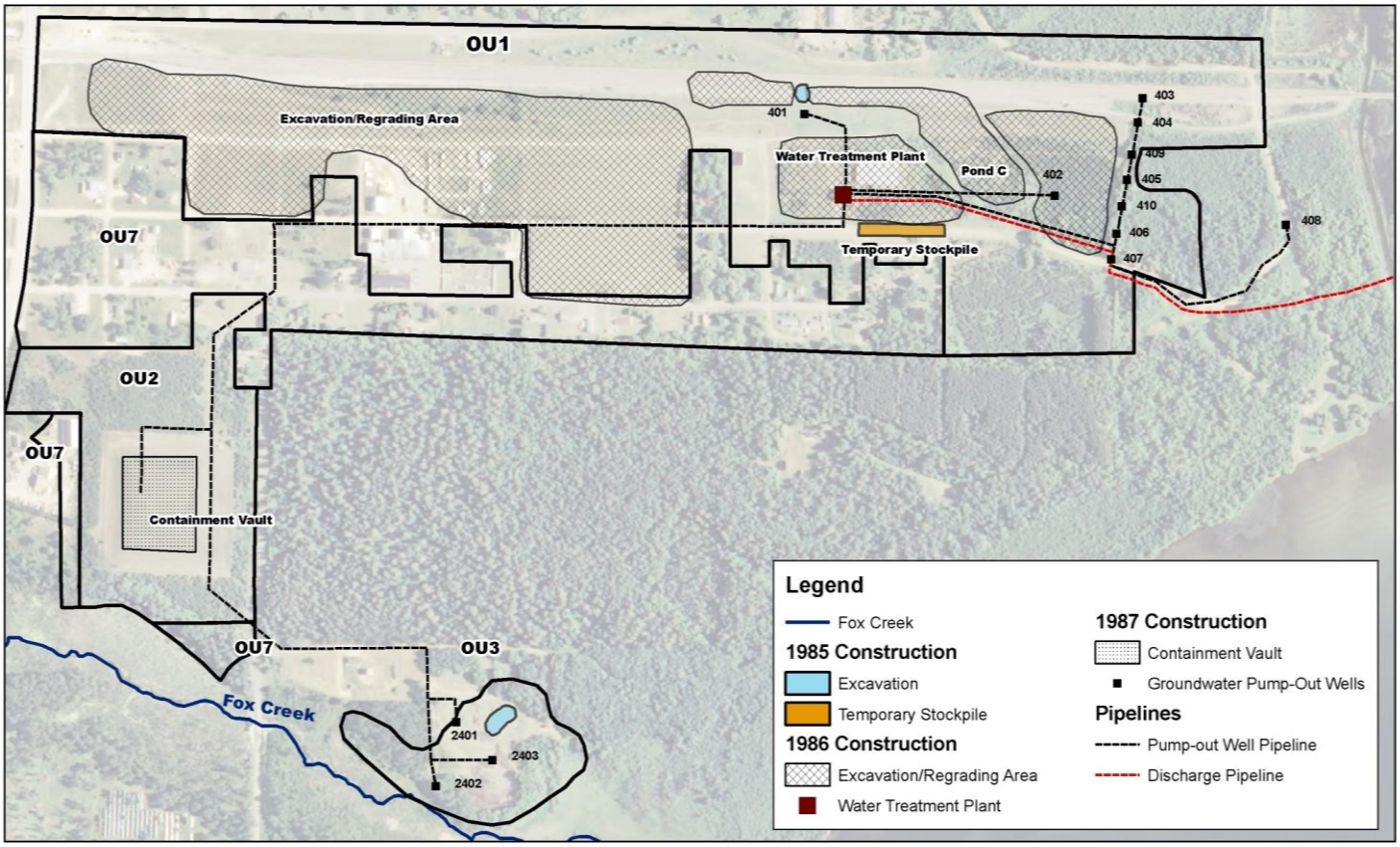
A Remedial Investigation and Feasibility Study (RI/FS), completed in 1984 under MPCA oversight, identified contaminants of concern (COCs) that pose potential risks to human health and/or the environment including; pentachlorophenol, dioxin, and polycyclic aromatic hydrocarbons. Pentachlorophenol (PCP) was used as a part of the wood treatment process at the site. PCP is a manufactured chemical that is used for wood preservation and as an insecticide.

PCP can cause liver effects, damage to the immune system, reproductive effects, and developmental effects. Dioxin was an impurity in the PCP that was used at the St. Regis site. Dioxin has been shown to be very toxic in animal studies and, in humans, causes effects on the skin and probably causes cancer. Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals formed during the incomplete burning of coal, oil, gasoline, wood, garbage, or any plant or animal material. It is found in cigarette smoke, soot, and creosote. Animal studies show some PAHs caused birth defects and decreased body weight. In humans, breathing or long periods of skin contact to mixtures that contain PAHs can cause cancer. EPA's evaluations further identified high molecular weight PAHs (HPAHs) and benzo(a)pyrene equivalent B(a)PE, which are groups of PAHs. HPAHs are a useful combination of PAHs for determining ecological risk. B(a)PE is a group of PAHs used to determine human health risk.

The MPCA developed three Operable Units as a part of the RI/FS for the site. Operable Unit 1 (OU1), located approximately between South 3rd Street and the BNSF Railway tracks, consists of the north former operations area, of which portions are currently owned by the site responsible parties: International Paper Company (IP) who acquired Champion, BNSF Railway Company (BNSF), the City of Cass Lake, and Cass Forest Products. Operable Unit 2 (OU2) is a former operations area to the southwest of OU1. IP is the sole owner of OU2. OU3 is that portion of the former City of Cass Lake dump on which site-related wood preservation contaminants were located. OU3 is owned by the City of Cass Lake. EPA also identified Operable Unit 7 (OU7) which is composed of the predominantly residential area surrounding the site. Operable Units 4, 5, and 6 are for administrative purposes only.

The 1984 RI/FS identified large areas of soil contamination in OU1 and OU2 and a smaller area of soil contamination in OU3. Former ponds, used for the disposal of contaminated sludges, were also evaluated. In addition, two areas of groundwater contamination were identified in OU1 and OU3 with high concentrations of PCP and PAH.

Work performed by Champion under state oversight to address site contamination included clean up of the soil and containment and treatment of the contaminated groundwater as well as monitoring the remaining contamination. Specifically, the clean up involved: (1) excavating over 40,000 cubic yards of visibly contaminated soil and the sludge from excavated ponds and the city dump pit and placing the material in a newly constructed on-site RCRA-standard hazardous waste cell, commonly referred to as the "containment vault"; (2) installing contaminated groundwater extraction wells at OU1 and OU3 and a groundwater treatment system; (3) long-term operation and maintenance of the groundwater extraction and treatment system; (4) long-term operation and maintenance of the containment vault; and (5) long-term monitoring of the groundwater.



MPCA Site Remedial Actions

In 1995, EPA became the lead agency for the St. Regis site. Because the standard at the time of the first site remedy was to clean up contaminated soil to visual standards (if visible staining was removed, the area was considered clean), no confirmatory sampling was conducted after completion of the cleanup. Concerns were later raised during the Remedy Reviews, conducted every 5 years, about possible remaining contamination. As a result, in 2001, EPA conducted additional sampling, including soil sampling. EPA concluded that OU1 and OU2 needed to be further evaluated for possible additional soil removal. EPA also determined that a risk assessment was needed to evaluate how protective the remedy was to residents, workers, and the environment. During 2003 and 2004, samples of soil, sediment, surface water, house dust, groundwater, plants, and animals were collected and evaluated by EPA, LLBO, and IP. Soil sampling was predominantly surficial with some additional samples at the one-foot and two-foot depths. EPA collected mostly shallow samples because human health risk assessments are based on the shallow soils to which residents and workers are mostly exposed.

Sampling on OU1 showed soil dioxin values as high as 7,100 parts per trillion (ppt) on city property and 6,200 ppt on BNSF property. OU2 had dioxin soil values as high as 3,300 ppt. OU3 showed dioxin values in the soil as high as 385 ppt. B(a)PE values in OU1 ranged from below the average background concentration of 1.6 milligrams per kilogram (mg/kg) to 11.6

mg/kg. At OU2, two values of 33 mg/kg and 12 mg/kg were present. No other values for B(a)PE in OU2 exceeded 3.9 mg/kg.

Soil sampling conducted on the residential properties of OU7 in 2001, 2003, and 2004 showed contaminant concentrations for dioxin ranging from below the average background level of about 7.5 ppt to 480 ppt. B(a) PE values on residential properties were all below 1.47 mg/kg. Indoor settled dust samples were also collected in ten of the neighborhood homes that were selected based on the yard dioxin soil concentrations. The screening value of 2 nanograms per square meter for dioxin, based on the New York World Trade Center response, was exceeded at five of the sampled residences. For that reason, in 2005 as an interim measure, EPA issued an interim Record of Decision (ROD) and ordered IP to clean the inside of nearby residences, apply a three-inch layer of clean soil and grass on yards, and apply dust suppressant to unpaved roads.

Based on soil sampling results that exceeded EPA policy standards, EPA ordered IP to excavate shallow soil on the City-owned property above 1,000 ppt for dioxin. Also, through a 2005 Consent Order with EPA, BNSF excavated shallow soil on its property that was above 5,000 ppt and the remaining soil in the excavation, with a concentration of 1,100 ppt, was covered with clean soil. Two other contaminated soil areas on the BNSF property that were between 1,000 and 1,900 ppt for dioxin were vegetated and fenced. Two contaminated soil areas were also identified on Cass Forest Products property with values that were 1,600 ppt and 1,200 ppt for dioxin. These areas were either capped with fabric and gravel or fenced by IP to prevent exposures to workers. In all, these EPA-lead cleanups resulted in excavation of more than 3,900 tons of contaminated soil from former operations areas. The soil was disposed off site.

Although this proposed remedy concerns site soils only, EPA also continues to evaluate the site groundwater. Groundwater contamination at the site remains at OU1 and OU2 and continues to be treated by the extraction system put in place by the responsible parties in the late 1980s. Since the original remedial actions, over 20 years of monitoring data have shown a measurable reduction in the contaminant concentration of the groundwater plume. Nine of the thirteen remedy extraction wells have seen significant reductions in the concentration of PCP over time. Currently, the average concentration of PCP pumped from the extraction wells into the treatment system from the site is 1,670 parts per billion (ppb), indicating the system continues to pump elevated PCP concentrations. The pump-and-treat system has also been effectively reducing the mass of contaminants in the groundwater. As of the end of the 2009 calendar year over 12,000 kg of PCP and over 6,000 kg of PAHs had been removed from groundwater by the treatment system. Annual reports indicate that the annual PCP mass removal rates were approximately steady from 1991 to 2006 and have shown a decreasing rate from 2006 through 2009. These facts indicate that the groundwater pump-and-treat system continues to be effective and that there is a gradually diminishing area releasing contaminants to groundwater.

SCOPE AND ROLE OF THE ACTION

EPA expects that this action will be the final action for contaminated soil at the site. IP, under the oversight of EPA with assistance from LLBO and MPCA, will continue to evaluate the site groundwater remedy and monitor the remainder of the site to make sure that it is protective of human health and the environment. IP will also continue to operate the groundwater treatment

system and monitor the groundwater until drinking water standards are reached. The Remedial Action Objectives for the St. Regis Soil Remedy are to prevent current and future exposure to contaminated soil through a combination of excavation, clean soil cover, and paving at the site.

SUMMARY OF SITE RISKS

IP conducted an HHERA under the oversight of EPA, in consultation with LLBO and MPCA, to determine the current and future effects of site contaminants on human health and the environment. OU7 is zoned residential by the City of Cass Lake. This is the current and reasonably anticipated future land use for this portion of the site. Therefore, the HHERA focused on health effects for both children and adults, in a residential setting in OU7, that could result from current and future direct contact with contaminated soil. OU1 is zoned industrial/commercial by the City of Cass Lake. OU2 is commercial property owned by IP and OU3 is the location of site-related contaminants adjacent to the city dump. The HHERA evaluated worker exposures in OU1, OU2, and OU3. Ecological risk was evaluated in all areas in and adjacent to the site. It is EPA's current judgment that the measures identified in the Preferred Alternative in this Proposed Plan, or other active measures considered in the Proposed Plan, are necessary to protect public health and the environment from actual or threatened releases of hazardous substances into the environment.

This proposed plan addresses only the risks from contaminants in soils.

Human Health Risks

The HHERA evaluated risks to human health resulting from site wood treating operations. In August 2008, the HHERA concluded that there were still risks to residents and workers at the site above EPA's acceptable levels. Based on these results, IP and BNSF Railway Company agreed in September 2008, to perform an FS to evaluate remedial alternatives for addressing the remaining site risks. EPA approved the FS Report in June 2011.

The HHERA showed that the following exposures to the contaminated soil and groundwater at the site present unacceptable risks to human health:

- Future exposure of residents to dioxin and B(a)PE contaminated soil in yards;
- Current and future exposure of industrial workers to dioxin and B(a)PE contaminated soil in industrial/commercial areas of the site; and
- Future exposure of utility workers to PCP and PAH contaminated groundwater by digging in either a portion of the former operations area or in the pit area near the former city dump.

Ecological Risks

The HHERA also evaluated ecological risks associated with the site former wood treating operations at the site and in adjacent areas that included Fox Creek, Cass Lake, and Pike Bay. The HHERA showed that the following exposures to contaminated soil at the site present unacceptable risks to invertebrates:

- Current exposure to PCP and HPAHs in a portion of the former operations area near the southwestern corner of the containment vault ("ecological risk area").

REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives for the site include:

- Prevent unacceptable potential risk to human health from future exposure to site-related COCs by eating soil or garden vegetables, breathing soil and indoor dust, and skin contact at residential properties in and adjacent to OU7.

- Prevent unacceptable potential risk to human health from future exposure to site-related COCs in OU1, OU2, and OU3 through eating or breathing of soil, skin contact, and indoor dust routes, from worker exposures.

- Prevent unacceptable potential risk to human health from future exposure to site-related COCs in OU1 and OU2 surface soil through transfer by runoff and/or windblown dust to nearby residential property and roads.

- Prevent unacceptable potential risk from future exposures to site-related COCs in OU1 and OU3 through eating, breathing, and skin contact during below-ground construction by workers in the areas of contaminated groundwater.

- Prevent unacceptable risks to organisms from exposure to site-related COCs in OU2 soil.

This proposed action will reduce the excess cancer risk associated with exposure to contaminated soil to about one in 1,000,000. This will be achieved by reducing the concentrations of the soil contaminants and covering soil to proposed target levels. EPA has also identified target contaminant levels for organisms in the OU2 area. The proposed action will reduce environmental exposures for these target organisms to acceptable levels.

PRELIMINARY CLEAN UP LEVELS

Contaminants of Concern

The Contaminants of Concern identified in the HHERA for human health include dioxin and B(a)PE. Contaminants of Concern identified for ecological risk include HPAHs and PCP. These contaminants are described in the *Site Characteristics* section of this Proposed Plan.

Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) are used in developing and evaluating alternative clean up actions for a site. Final clean up levels will be established in the ROD. EPA developed the proposed cleanup levels for the soil contaminants identified in the HHERA based on both protective risk-based calculations in the HHERA and a review of tribal and state clean up

regulations which are referred to as Applicable or Relevant and Appropriate Requirements (ARARs).

Based on the results of the HHERA, EPA considers 63 parts per trillion (ppt) for dioxin and the background level of 1.6 parts per million (ppm) for B(a)PE in soil to be protective of human health in OU7. For OU1, OU2, and OU3, the calculated clean up concentrations of 380 ppt for dioxin and 4.1 ppm for B(a)PE are protective of worker exposures. These values represent the middle of EPA's acceptable range of protectiveness from one in 10,000 to one in 1,000,000 excess cancer risk. EPA selected this level of protection, one in 100,000, based on a consideration of LLBO tribal lifeways and uncertainties identified in the HHERA, including dioxin cancer risks.

Groundwater contamination continues to be addressed by the groundwater pump and treatment system previously installed and currently operated by IP. EPA is evaluating the effectiveness of the groundwater system independent of the action proposed in this document. While there are no current industrial or residential uses of groundwater, potential exposure to that contaminated groundwater by utility workers digging in site soil will be addressed in this action.

For protection of the ecological risk area in OU2, EPA considers a clean-up level of 31 ppm for PCP and 18 ppm for HPAHs in soil to be protective of the environment based on studies of invertebrate toxicity.

Site ARARs

In 2000, LLBO promulgated the Hazardous Substances Control Act (HSCA) which establishes contamination clean up levels within the Reservation. The HSCA establishes a 10 ppt clean up level for dioxin in soil, which represents approximately a one in 1,000,000 excess cancer risk and is at the high end (most protective) of EPA's acceptable risk range. EPA considers the HSCA an ARAR for this site. Therefore, in addition to considering alternatives that meet the clean up levels identified by the site HHERA, alternatives with methods for lowering the residual surface soil contamination to less than or equal to 10 ppt for dioxin are also evaluated.

The HSCA requires a clean up level of 2 parts per billion (ppb) for PCP in soil. Therefore, EPA evaluated alternatives with methods that lower residual surface soil contamination in the ecological risk area of OU2 to less than or equal to 2 ppb PCP for soil.

HSCA does not have cleanup standards for either B(a)PE or HPAHs.

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives for the St. Regis Paper Company site are presented below. The alternatives are numbered to correspond with the numbers in the 2011 FS Report.

Common Elements

All of the alternatives, with the exception of the "No Action" alternative (Alternative 1), contain common components. All of the action alternatives require excavation of soil in OU7 and in the area of ecological risk in OU2. Except for Alternative 1, all of the alternatives include institutional controls (e.g. deed restrictions such as an easement or covenant) to limit the use of portions of the site property, preserve the soil cover, and to ensure that workers are not exposed to the contaminated groundwater. Institutional Controls, including deed restrictions and restrictive covenants and easements on OU1, OU2, and OU3 will be implemented under EPA oversight and with the necessary involvement of the appropriate Support Agency. Monitoring to ensure the effectiveness of the remedy, including effectiveness of deed restrictions, are a component of each alternative, except Alternative 1, and will be implemented by the property owners. Monitoring and control of air quality (dust) during construction will be required for all alternatives. All alternatives except Alternative 6 also include paving the unpaved roads in the site area and paving the work areas using heavy equipment on the Cass Forest Products property.

Cleanup Alternatives

EPA considered eight alternatives for cleaning up the St. Regis Paper Company site, each of which was evaluated against seven criteria required by Superfund law. The alternatives will be further evaluated against two criteria of tribal/state acceptance and community acceptance. See the "Explanation of the Nine Evaluation Criteria" section below. These alternatives are further explained in the FS. Here are summaries of the alternatives. Note that the soil cover and excavation volumes listed for each alternative are in cubic yards.

Cleanup Alternative 1 – No action

EPA includes a "No-Action" Alternative as a basis for comparison to the other cleanup alternatives. Since no action would be taken, this option would not protect human health and the environment from either current or future risk. House cleaning Interim Actions would also stop.

Cost: $0
Estimated O&M Cost: $0

Cleanup Alternatives 2A and 2B

Alternative 2A includes excavating contaminated soil on OU7 above 63 ppt dioxin and the site background concentration of 1.6 ppm for B(a)PE to a maximum depth of 2 feet. EPA anticipates that contamination on most residential properties will be reduced to background levels in the first foot of excavation. If soil remains contaminated above clean up levels at the two-foot depth, marker material would be placed in the excavation before clean soil is placed on the yard. Institutional Controls, such as deed notices, would be sought for residential properties that will have residual contamination below the two-foot excavation depth. Other Institutional Controls such as a city registry of soil contamination at depth, would also be considered.

At OU1, OU2, and OU3, marker material and a one-foot layer of clean fill and top soil, followed by vegetation, would be placed in all areas with surface contamination above 380 ppt for dioxin and 4.1 ppm for B(a)PE. Institutional controls, which consist of non-engineered requirements relating to property use, would then be implemented by the property owners, the responsible parties for these areas, to monitor, protect and maintain the cover. Additionally, the heavy machinery areas owned by Cass Forest Products and all unpaved commercial and residential streets in the site area would be paved. Contaminated soil would also be excavated in the ecological risk area of OU2 to a PCP concentration of 31 ppm and a HPAH concentration of 18 ppm. Institutional controls and warning signs would be placed in the contaminated groundwater areas of OU1 and OU3 by the responsible parties to prevent potential worker exposure by digging. Finally, the forested wetland area east of the former operations area would be monitored for any surface water contamination above acceptable levels.

Alternative 2B is identical to Alternative 2A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 2A	Alternative 2B
Estimated Cost: $ 22.5 million	Estimated Cost: $ $20.3 million
Estimated O&M Cost (30 Yrs): $313,252	Estimated O&M Cost(30 Yrs): $310,782
Estimated Construction Time: 3 Years	Estimated Construction Time: 3 Years
Estimated Soil Cover: 78,600	Estimated Soil Cover: 83,800
Estimated Soil Excavation: 31,300	Estimated Soil Excavation: 31,300
Estimated Truck Trips: 9,400	Estimated Truck Trips: 7,700

Cleanup Alternatives 3A and 3B

Alternative 3A includes all of the elements of Alternative 2 except that the marker and one-foot clean soil cover on OU1, OU2, and OU3 would be extended to include all areas with surface contamination of dioxin above 63 ppt and B(a)PE concentrations above 1.6 ppm. ICs and monitoring would be extended to include the additional areas of cover.

Alternative 3B is identical to Alternative 3A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 3A	Alternative 3B
Estimated Cost: $29.8 million	Estimated Cost: $ 27.7 million
Estimated O&M Cost(30 Yrs): $400,446	Estimated O&M Cost(30 Yrs): $400,446
Estimated Construction Time: 3 Years	Estimated Construction Time: 3 Years
Estimated Soil Cover: 154,000	Estimated Soil Cover: 161,400
Estimated Soil Excavation: 31,300	Estimated Soil Excavation: 31,300
Estimated Truck Trips: 14,400	Estimated Truck Trips: 12,800

Cleanup Alternatives 4A (EPA's Preferred Cleanup Alternative) and 4B

Alternative 4A includes all of the elements of Alternative 2 except that the one-foot clean soil cover and marker material on OU1, OU2, and OU3 would be extended to include any areas in OU1, OU2, and OU3 with surface dioxin soil contamination above 10 ppt for dioxin and also all unexcavated areas of OU7 that are above 10 ppt for dioxin. In addition, a one-foot soil cover and marker material would be placed over surface contamination above the HSCA clean up value of 2 ppb for PCP in the ecological risk area of OU2 that is not already addressed by excavation. ICs and monitoring would be extended to include the additional areas of cover.

Alternative 4B is identical to Alternative 4A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 4A	Alternative 4B
Estimated Cost: $ 45.8 million	Estimated Cost: $ 44 million
Estimated O&M Cost(30 Yrs): $598,925	Estimated O&M Cost(30 Yrs): $598,925
Estimated Construction Time: 5 Years	Estimated Construction Time: 5 Years
Estimated Soil Cover: 326,200	Estimated Soil Cover: 333,600
Estimated Soil Excavation: 31,300	Estimated Soil Excavation: 31,300
Estimated Truck Trips: 25,900	Estimated Truck Trips: 24,300

Cleanup Alternatives 5A and 5B

Alternative 5A includes all of the elements of Alternative 3, but instead of cover on OU1, OU2, and OU3, all site areas with soil contamination above 63 ppt for dioxin and background concentrations for B(a)PE would be excavated. The excavated soil would be transported to an off-site landfill and replaced with clean fill and topsoil.

Alternative 5B is identical to Alternative 5A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 5A	Alternative 5B
Estimated Cost: $103 million	Estimated Cost: $ 45 million
Estimated O&M Cost (30 Yrs): $401,050	Estimated O&M Cost (30 Yrs): $399,488
Estimated Construction Time: 3 Years	Estimated Construction Time: 3 Years
Estimated Soil Cover: 12,400	Estimated Soil Cover: 123,300
Estimated Soil Excavation: 607,700	Estimated Soil Excavation: 363,400
Estimated Truck Trips: 81,800	Estimated Truck Trips: 32,400

Cleanup Alternatives 6A and 6B

Alternative 6A is similar to Alternative 5 except that the excavation of contaminated soil in all site areas would be performed on soil that is above 10 ppt for dioxin and excavation in the area of ecological risk would be to the HSCA value of 2 ppb for PCP. The 10 ppt value for dioxin corresponds to about a one in 1,000,000 excess cancer risk.

Alternative 6B is identical to Alternative 6A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 6A	Alternative 6B
Estimated Cost: $ 201 million	Estimated Cost: $ 82 million
Estimated O&M Cost (30 Yrs): $616,988	Estimated O&M Cost (30 Yrs): $612,612
Estimated Construction Time: 5 Years	Estimated Construction Time: 5 Years
Estimated Soil Cover: 0	Estimated Soil Cover: 168,400
Estimated Soil Excavation: 1,157,000	Estimated Soil Excavation: 562,000
Estimated Truck Trips: 154,000	Estimated Truck Trips: 48,700

Cleanup Alternatives 7A and 7B

Alternative 7A is similar to Alternative 2 except it would excavate soil in OU7 that is above 190 ppt for dioxin in surface soil and 8.1 ppm for B(a)PE in surface soil. Cover would be applied in OU1, OU2 and OU3 to surface soil that exceeds 2,000 ppt for dioxin and 41 ppm for B(a)PE. These clean up levels correspond to a one in 10,000 excess cancer risk.

Alternative 7B is identical to Alternative 7A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 7A	Alternative 7B
Estimated Cost: $ 12.4 million	Estimated Cost: $ 10.5 million
Estimated O&M Cost (30 Yrs): $229,303	Estimated O&M Cost (30 Yrs): $226,420
Estimated Construction Time: 2 Years	Estimated Construction Time: 2 Years
Estimated Soil Cover: 9,200	Estimated Soil Cover: 16,600
Estimated Soil Excavation: 27,600	Estimated Soil Excavation: 27,600
Estimated Truck Trips: 4,300	Estimated Truck Trips: 2,800

Cleanup Alternatives 8A and 8B

Alternative 8A is like Alternative 7A except that cover in OU1, OU2, and OU3 would be applied to all areas with surface contamination above 190 ppt for dioxin.

Alternative 8B is identical to Alternative 8A, except that excavated soil under this alternative will be placed in a new on-site cell and covered.

Alternative 8A	Alternative 8B
Estimated Cost: $ 22 million	Estimated Cost: $ 19.9 million
Estimated O&M Cost (30 Yrs): $338,428	Estimated O&M Cost (30 Yrs): $338,428
Estimated Construction Time: 3 Years	Estimated Construction Time: 3 Years
Estimated Soil Cover: 103,800	Estimated Soil Cover: 111,200
Estimated Soil Excavation: 27,600	Estimated Soil Excavation: 27,600
Estimated Truck Trips: 10,600	Estimated Truck Trips: 9,300

Explanation of the Nine Evaluation Criteria

EPA uses the following nine criteria as required by Superfund law, to evaluate and compare cleanup alternatives. Each criterion is defined below, and a discussion of EPA's comparison of how each alternative meets or does not meet each one follows. See the table on the final page showing the summary of this evaluation.

1. **Overall protection of human health and the environment:** Alternatives are evaluated to determine whether they can protect human health and the environment from unacceptable risks posed by hazardous substances, pollutants, or contaminants at the site by eliminating, reducing, or controlling exposures.

2. **Compliance with applicable or relevant and appropriate requirements (ARARs):** Alternatives are evaluated to determine whether they attain requirements under federal, tribal, state, and local environmental laws and regulations, or provide grounds for invoking a waiver.

3. **Long-term effectiveness and permanence:** Alternatives are evaluated for the degree of long-term effectiveness and permanence they provide and for the degree of certainty that the alternative will prove to be successful.

4. **Reduction of toxicity, mobility, or volume through treatment:** Alternatives are evaluated to determine the degree to which they employ recycling or treatment to reduce toxicity, mobility, or volume, including how they use treatment to address hazardous substances posed by the site.

5. **Short-term effectiveness:** Short-term impacts on the community and workers during implementation of alternatives are evaluated. These impacts include transportation (including noise, dust, and traffic hazards), protection of workers, and the timeframe for implementing the remedy.

6. **Implementability:** The ease of implementing alternatives is evaluated, considering technical difficulties and reliability of a technology, coordination with other offices and agencies, and availability of services and materials.

7. **Cost:** Capital and ongoing costs are evaluated.

8. **State/Tribal Acceptance:** The State's and Tribe's positions and key concerns on the preferred alternative and other alternatives are considered, as well as comments on ARARs or proposed use of waivers. This assessment is completed after comments on this Proposed Plan are received.

9. **Community Acceptance:** The community's support of, reservations about, or opposition to components of the alternatives are considered. This assessment is completed after comments on this Proposed Plan are received.

COMPARISON OF ALTERNATIVES

1. Overall Protection of Human Health and the Environment

Alternative 1, the "No Action" alternative, does not provide adequate protection because it does not address the risks to human health and the environment identified in the HHERA. Alternatives 2, 3,4,5, 6, 7 and 8 would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through excavation, cover, engineering controls and/or institutional controls. In the different alternatives, COCs are removed or covered to different risk-based levels: one in 10,000 excess cancer risk in Alternatives 7 and 8; one in 100,000 in Alternatives 2,3, and 5; and one in 1,000,000 excess cancer risk in Alternatives 4 and 6. Alternatives 5 and 6 reach protectiveness by excavation of contaminated soil and disposal either off-site or in an on-site containment cell. Alternatives 2, 3, 4, 7, and 8 reach their protectiveness goal by a combination of excavation and clean soil cover. Long-term maintenance and monitoring of the soil cover would be required under Alternatives 2, 3, 4, 7, and 8 to ensure that the cover remained protective. Any potential future excavation in the cover areas would require work plans for proper sampling and disposal of excavated soil at depth in addition to repair and continued maintenance of the cover.

2. Compliance with ARARs

Alternatives 1, 2A/B, 3A/B, 5A/B, 7 A/B, and 8 A/B do not meet all ARARs. Alternatives 4A/B and 6A/B comply with all ARARs. Alternatives 4A/B achieve HSCA cleanup levels by means of a combination of excavation and a soil cover; Alternatives 6A/B achieve HSCA cleanup levels by excavation of contaminated soil to HSCA clean up levels.

3. Long-term Effectiveness and Permanence

Alternatives 2 through 8 provide long-term effectiveness and permanence at different health-based levels. Surface soil with contaminant concentrations at higher risk levels in residential areas is excavated and replaced with clean soil. Surface soil with lower residual contaminant concentrations but above the HSCA limits in residential areas is covered. In the industrial/commercial areas of the site, the alternatives (except 6A/B) include covering contaminated soil over areas, the size of which varies by the degree of risk-based protectiveness each alternative achieves. Alternative 6A requires no long-term maintenance because all contamination above the HSCA clean up level is taken off-site. Institutional Controls for the covers to mitigate exposures to contaminated soil at depth are needed for all other alternatives. Alternatives with smaller covers will require less long-term maintenance than those with larger covers. Off-site disposal alternatives require less long-term maintenance than the on-site disposal alternatives. Institutional Controls will be needed for all alternatives to mitigate exposures to contaminated groundwater at depth.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

None of the proposed alternatives reduce the toxicity, mobility, or volume of the soil contaminants through treatment. The large volume of relatively low soil contamination that is

being addressed in this remedy does not lend itself to any cost effective treatment.

5. Short-term Effectiveness

Short-term effectiveness of the alternatives decreases as more site soil is excavated and as more soil cover must be brought to the site. Greater amounts of off-site soil disposal will result in greater amounts of community disturbance related to transporting contaminated soil off-site and greater potential for worker injury. Because of this, on-site disposal alternatives are more effective in the short term than off-site disposal alternatives. Alternatives with larger soil covers will present some more short-term effectiveness issues than alternatives with smaller covers, associated with transporting the clean soil on-site and installing the covers.

6. Implementability

All of the alternatives can be readily implemented, although implementing alternatives with larger amounts of soil for off-site disposal are more difficult due to the limited amount of appropriate landfill space available in Minnesota.

7. Cost

Costs for site alternatives range from no cost to $201 million. Alternative 6A is the most costly at $201 million. The "No Action" alternative is the least expensive; and Alternative 7B, at $10.5 million, is the least expensive alternative among those requiring some clean up action. The cost for soil transportation by rail instead of trucks for the "A" Alternatives was considered in the FS Report and was estimated to be more costly than truck transportation. Therefore the costs for rail transportation are not presented.

8. Tribal/State Acceptance

LLBO does not support the proposed Alternative 4A, and instead, prefers Alternative 6A. LLBO has noted in communications to EPA its position that more characterization of the site is needed before selecting a remedy and that Alternative 4A is not consistent with the intent of the HSCA. LLBO also noted concerns regarding their potential future acquisition and use of site properties that have residual contamination and require the placement of Institutional Controls. LLBO believes that selection and implementation of Alternative 4A directly compromises potential future options to make full use of Reservation lands and place them in Trust.

The State of Minnesota has not yet formed an official position on EPA's preferred alternative. However, the State has expressed concerns that Alternative 4A does not require excavation to an appropriate depth in residential areas. Also, MPCA has stated that the magnitude and extent of soil contamination have not been adequately delineated at the site.

9. Community Acceptance

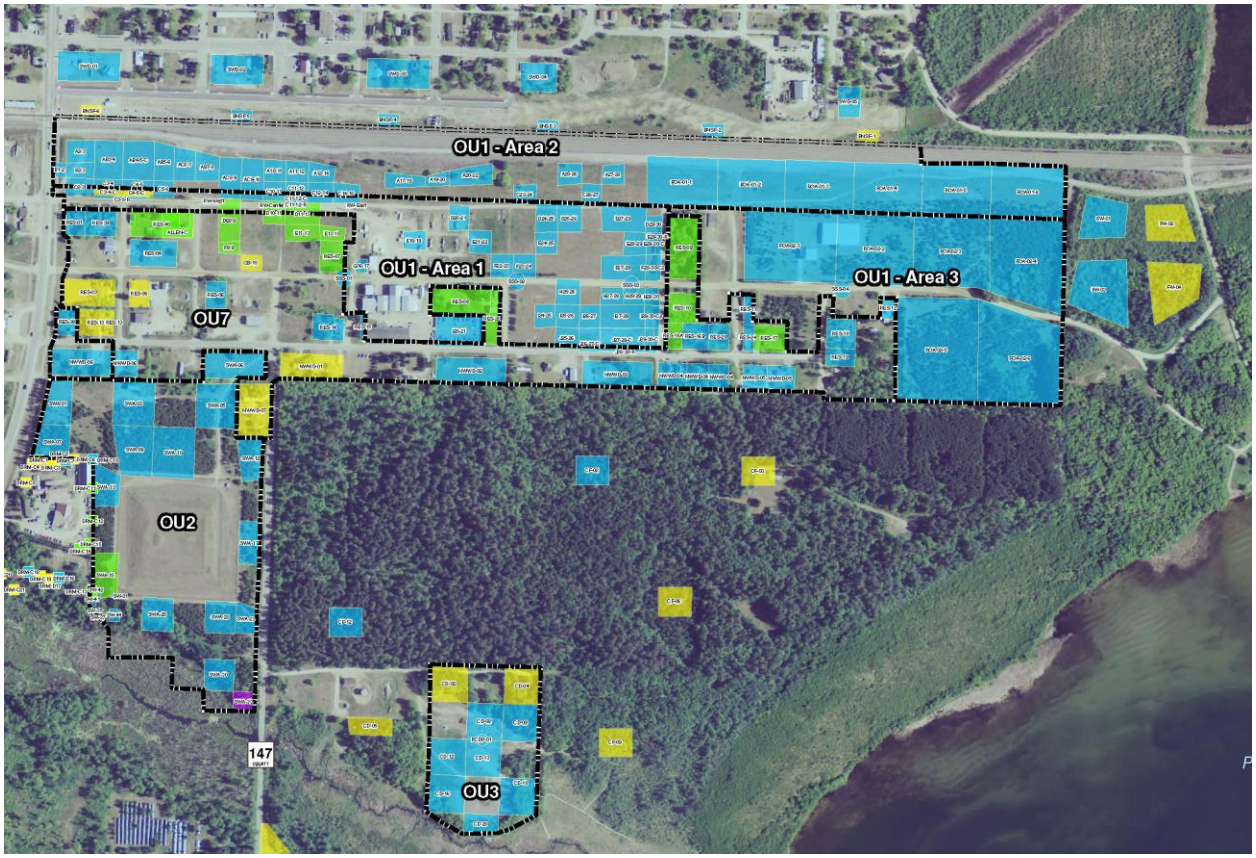
Community Acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD for the site.

EPA's Preferred Alternative: Alternative 4A

Under Superfund law, the selected remedy must meet the threshold criteria of Overall Protection of Human Health and the Environment, and Compliance with ARARs. Alternative 4A meets these threshold criteria by excavating soils in those portions of OU7 over a one in 100,000 excess cancer risk, and by covering those portions of OU7 with residual soil contamination above ARAR-based (HSCA) limits to provide additional protection to a one in 1,000,000 excess cancer risk. In addition, marker material and a cover would be placed in areas of OU1, OU2, and OU3 that exceed the HSCA-based cleanup levels. Soil above ecological risk limits in OU2 would be excavated; and the residual soil contamination above LLBO HSCA cleanup levels in OU2 that is not excavated would be covered. Institutional controls will monitor and maintain the soil cover and ensure that any future planned disturbance of these covered areas at depth requires adequate sampling and proper disposal of contaminated soil and that the cover is then restored. Institutional and Engineering Controls will also prevent future groundwater exposures to workers or others digging in the groundwater plume areas of OU1 and OU3. This remedy is protective and meets applicable ARARs.

In addition to meeting the two threshold criteria, the selected remedy must be evaluated by assessing: Long-term Effectiveness and Permanence; Reduction of Toxicity, Mobility or Volume Through Treatment; Short-Term Effectiveness; Implementability; and Cost. Alternative 4A provides long-term and permanent protection against exposure to site-related contaminants by the combination of soil excavation and cover, coupled with appropriate Institutional Controls. Off-site disposal of excavated soil allows for less long term maintenance than on-site disposal of excavated soil and better addresses concerns expressed by LLBO and the City of Cass Lake that excavated contaminated soil not be stored on site. Alternative 4A does not reduce toxicity, mobility or volume of the contamination because effective alternative treatment technologies or resource recovery technologies are not practical for large quantities of soil containing low levels of contamination. Alternative 4A also provides short-term effectiveness when proper health and safety measures are taken. Alternative 4A is implementable. Finally, Alternative 4A meets the evaluation criteria at a much lower cost than Alternative 6 (the only other protective alternative that meets the ARAR), and is therefore cost-effective.

In summary, Alternative 4A meets the two threshold criteria of Overall Protection of Human Health and the Environment, and Compliance with ARARs. It is comparable to Alternative 6, which also meets these threshold criteria, in terms of Long-Term Effectiveness and Permanence, Short-Term Effectiveness and Implementability. The cost for Alternative 4A is considerably less than for Alternative 6 which requires significantly more off-site or on-site disposal of soil. EPA believes Alternative 4A presents a remedy that is the best balance of our evaluation criteria.



EPA's Preferred Alternative 4 showing sampled locations in colors:
Green denotes excavation, blue denotes cover, yellow denotes below PRGs

Next Steps

EPA, in consultation with both LLBO and MPCA , will evaluate public reaction to the preferred cleanup alternative during the public comment period before deciding on a final cleanup alternative. Based on new information or public comments, EPA may modify its preferred alternative or choose another. EPA encourages the public to review and comment on the cleanup alternatives.

EPA will respond in writing to all significant comments in a Responsiveness Summary which is part of the final decision document called the Record of Decision. EPA will announce the selected cleanup alternative in local newspaper advertisements and will place a copy of the Record of Decision in the local information repositories.

Chart comparing cleanup options with the nine Superfund remedy selection criteria

	Alt 1	Alt2A/B	Alt 3A/B	Alt 4A*/B	Alt 5A/B	Alt 6A/B	Alt 7A/B	Alt 8A/B
Evaluation Criterion								
Overall Protection of Human Health and the Environment	○	●	●	●	●	●	●	●
Compliance with ARARs	○	○	○	●	○	●	○	○
Long-term Effectiveness and Permanence	○	●	●	●	●	●	●	●
Reduction of Toxicity, Mobility, or Volume through Treatment***	○	○	○	○	○	○	○	○
Short-term Effectiveness	N/A**	●	●	●	●	●	●	●
Implementability	N/A**	●	●	●	●	●	●	●
Alternative A Cost ($ millions)	$0	$22.5	$29.8	$45.8	$103	$201	$12.4	$22
Alternative B Cost ($ millions)	$0	$20.3	$27.7	$44	$45	$82	$10.5	$19.9
Tribal and State Acceptance	LLBO disagrees with Alternative 4A and favors Alternative 6A for reasons stated previously at p. 16. The State has not communicated a final official position on Alternative 4A but has disagreed with some aspects of the proposed remedy for reasons stated previously at p. 16.							
Community Acceptance	Will be evaluated after the public comment period							

● Fully meets criterion ◉ Partially meets criterion ○ Does not meet criterion

* EPA's preferred alternative

** N/A: not applicable, since no remedy is being implemented in the No-Action Alternative

*** Alternatives do not result in a reduction of toxicity, mobility, or volume through treatment because it is impractical to treat large volumes of soil having low contamination levels