# Proposed Plan
# St. Regis Paper Company Superfund Site
# Leech Lake Reservation, Minnesota

## Community Participation

EPA provides information regarding the St. Regis Paper Company Superfund site to the community by maintaining an Administrative Record for the site, updating the St. Regis site web page (please see www.epa.gov/superfund/st-regis-paper), sending fact sheets to those on our site mailing list, and publishing announcements in *The Bemidji Pioneer* and *Cass Lake Times*.

Through these means, EPA encourages the public to gain a more comprehensive understanding of the Superfund activities that have been conducted at the site.

EPA maintains the site Administrative Record, which contains the information EPA used to develop the preferred alternative, at the following locations:

Cass Lake Public Library
223 Cedar Avenue
Cass Lake, MN 56633

Leech Lake Band of Ojibwe Division of Resource Management
6350 Highway 2 NW
Cass Lake, MN 56633

EPA Region 5
Records Center,
7th floor
77 W. Jackson Blvd.
Chicago, IL 60604

Cass Lake City Clerk
332 Second St. NW
Cass Lake, MN 56633

EPA will be accepting written comments from the public on this Proposed Plan from March 28, 2016 to May 27, 2016. Comments may be sent to:

Heriberto León
Community Involvement Coordinator
By fax: 312-697-2754
By email: leon.heriberto@epa.gov
By U.S. mail: U.S. Environmental Protection Agency
Mail Code SI-7J
77 W. Jackson Blvd. Chicago, IL 60604

## 1 Introduction

The U.S. Environmental Protection Agency (EPA), in consultation with the Leech Lake Band of Ojibwe (LLBO) and the Minnesota Pollution Control Agency (MPCA), is issuing this Proposed Plan to present its preferred cleanup method for addressing dioxin-contaminated soil in residential areas at the St. Regis Paper Company Superfund site ("St. Regis site" or "Site") on the Leech Lake Reservation (Cass Lake), Minnesota. EPA refers to the residential areas as "operable unit 7" (OU7) of the St. Regis Site.

EPA's recommended cleanup plan is **Alternative 15B,** which consists of the excavation of contaminated soil from residential properties, backfilling the excavations using clean soil, and managing most of the excavated soil in an on-site facility. Heavily-contaminated soil would be trucked off site for disposal. EPA would also monitor the stored soil. The estimated total cost of Alternative 15B is $18.5 million. It would take about three construction seasons to complete the residential area soil cleanup work.

EPA will explain the rationale for proposing the preferred alternative in this document, as well as describe all the cleanup alternativesevaluated to address OU7. This document also describes St. Regis site history, including previous investigations and response actions performed.

EPA, as the lead agency for the St. Regis site, is issuing this Proposed Plan as part of its public participation responsibilities under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C Section 9617, commonly known as Superfund, and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The LLBO and MPCA are providing support. This Proposed Plan summarizes information from the December 2015 Supplemental Feasibility Study (SFS) Report and other documents that comprise the site Administrative Record. EPA encourages the public to review the Administrative Record to gain a more comprehensive understanding of the cleanup and investigative activities that have been conducted at the site.

EPA, in consultation with LLBO and MPCA, will select a remedy to clean up OU7 in a document called a Record of Decision (ROD) after reviewing and considering all information submitted during a 60-day public comment period. The ROD will include a Responsiveness Summary that summarizes EPA's responses to public comments on this Proposed Plan. EPA may modify the preferred alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan. The public is encouraged to review the supporting documents for the St. Regis Paper Company site at any of the following locations: the Cass Lake Library, the LLBO Division of Resource Management, and the Cass Lake City Clerk's Office. EPA will hold a public meeting at the Cass Lake-Bena Elementary School at 15 4th Street NW, Cass Lake, Minnesota, on Saturday, April 9, 2016, at 2:00 p.m. to present the alternatives evaluated in this proposed plan and take public comments at the meeting.

This would be the final remedial action proposed for OU7. EPA plans to address the remainder of the St. Regis site at a later date.

## 2 Site Background

### 2.1 Site Location and Description

The St. Regis site is located in the city of Cass Lake, Cass County, Minnesota and is fully within the exterior boundaries of the Leech Lake Reservation (see Figure 1). The site is located on approximately 125 acres of commercial and railroad property that were used by a wood treatment facility as well as some surrounding residential properties. Creosote and other chemicals were used to treat wood, and wastewater was placed in ponds and occasionally used for irrigation. Sludge from the wood treatment process was disposed of on the eastern edge of the site and was also burned in a waste pit at the Cass Lake City Dump.

EPA placed the St. Regis Paper Company site on the National Priorities List (NPL) in 1984 and is currently managing the site in several operable units (see Figure 2). OU1 consists of the northern former facility operations area, OU2 is a former operations area to the southwest of OU1, and OU3 is the city dump site. OU7 is comprised of residential areas and the LLBO Department of Resource Management property, although many of the residential properties are vacant. Some of the OU7 properties are occupied by residents and small businesses. For administrative convenience, some phases of work at the Site were assigned OU numbers 4, 5 and 6, but these were not official designations and do not correspond to areas of the Site. Portions of

the site are owned by International Paper Corp. (IP), BNSF Railway Company (BNSF), the City of Cass Lake, and Cass Forest Products, Inc.

**Figure 1: The St. Regis Paper Company Superfund Site**

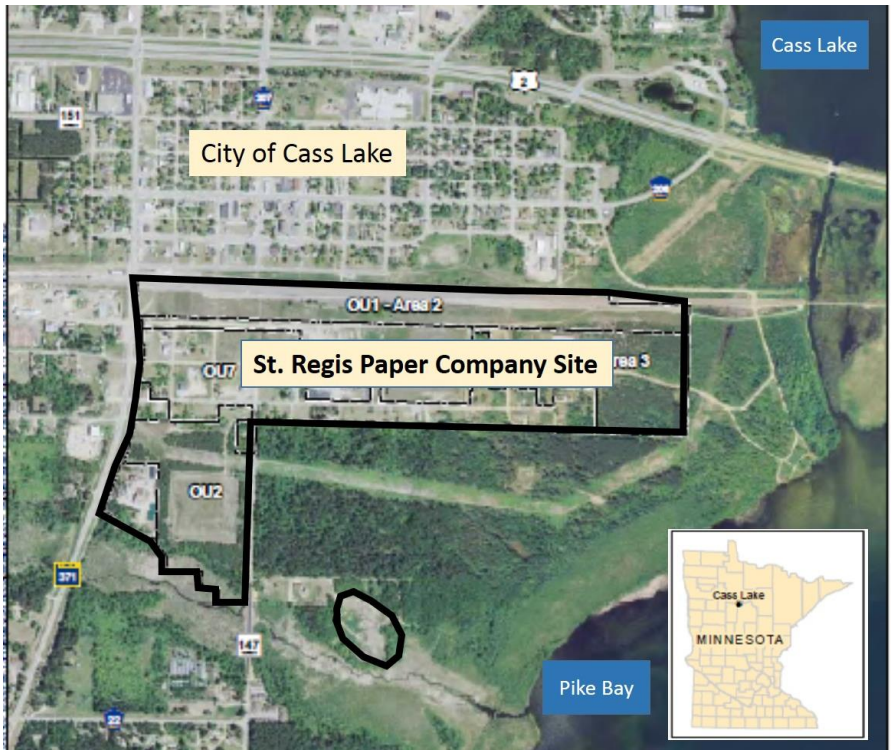
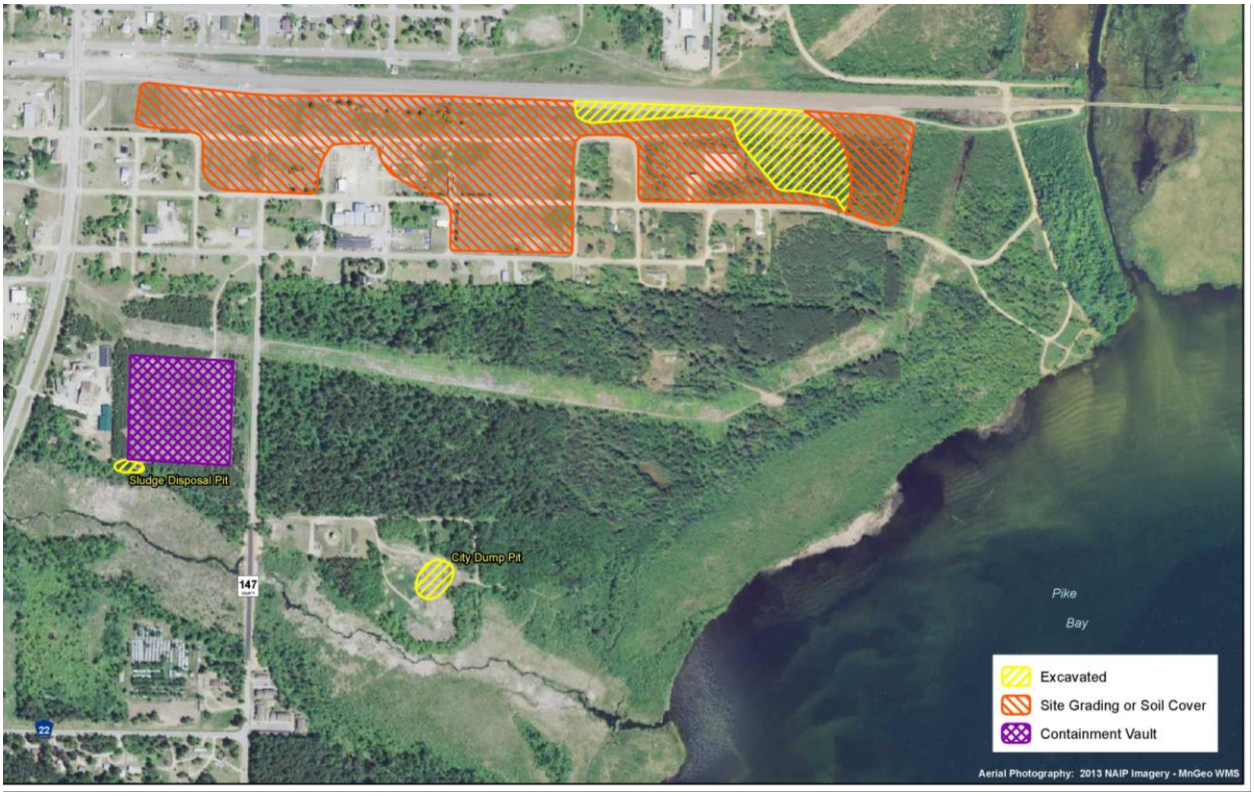



**Figure 2: St. Regis Paper Company Site Operable Units (OU3 not shown)**

## 2.2 Site History

The wood treatment facility operated from about 1958 until 1985. Between 1985 and 1988, the former owner/operator, Champion International Corp. (Champion), conducted a remedial investigation (RI) and feasibility study (FS) at the site and then performed several remedial actions under MPCA oversight. Champion excavated visibly contaminated soil and sludge and placed it into a RCRA Subtitle C-compliant unit (containment vault) it had constructed on site (see Figure 3). Champion also addressed groundwater contamination by constructing and operating a groundwater pump-and treat system. Champion was subsequently acquired by IP.

**Figure 3: Previous soil excavations, cover/grading, and vault construction**




## 2.3 EPA Early Response Actions

In 1995, EPA became the lead agency for the St. Regis site. In 2000, EPA issued a Five-Year Review Report for the St. Regis site in which it raised concerns about residual contaminant levels in site soil. In response, in 2001 EPA sampled site soil, sediment, surface water, fish, and groundwater to analyze them for site contaminants. In 2003, EPA required IP to sample soil in the former operations areas. In 2004, EPA required IP to collect additional samples of soil, sediment, surface water, house dust, groundwater, plants, and animals, and to use the analytical results to prepare a Human Health and Ecological Risk Assessment (HHERA) to determine the potential current and future effects of wood treating contaminants on human health and the environment.

Between 2004 and 2006, EPA oversaw several soil removal actions on OU1 properties having surface soil dioxin concentrations greater than 1,000 nanograms per kilogram (ng/kg or "parts per trillion" (ppt)). In 2004, IP excavated shallow soil on city-owned property that exceeded 1,000 ppt dioxin and backfilled the excavations with clean soil (Figure 3). In 2005, BNSF, excavated shallow soil on its property that exceeded 5,000 ppt dioxin and covered and fenced areas that exceeded 1,000 ppt dioxin. In 2006, IP addressed two areas on a commercial property operated by Cass Forest Products property on which soil exceeded 1,000 ppt by either capping with fabric and gravel or fencing the area to prevent exposure. In all, these removal actions resulted in the excavation and off-site disposal of more than 3,900 tons of dioxin-contaminated soil from the former operations areas.

In the residential area (OU7), EPA found that indoor settled dust samples collected from five homes exceeded the screening level (SL) value of 2 nanograms per square meter for dioxin (the SL value is based on the New York World Trade Center response). Thus, in 2005, EPA issued an interim Record of Decision (ROD) that called for cleaning the interiors of residences, applying a 3-inch layer of clean soil and grass on yards, and applying dust suppressant to unpaved roads. EPA subsequently ordered IP to conduct this work and IP continues to periodically clean the interiors of residences and apply dust suppressant to unpaved roads as required.

In 2011, IP completed the HHERA for EPA approval. The HHERA estimated potential health risks for residential-use, commercial-use, recreational-use, tribal lifeway, and ecological pathways for exposure to site contaminants in soil, indoor dust, shallow groundwater, sediment, forested property, wetland surface waters, homegrown produce, fish, and wild rice. EPA then issued a proposed cleanup plan to address potential health risks posed by contaminated soil, but it did not subsequently issue a ROD to select a remedy. Instead, based on public comments received, EPA worked with the LLBO, MPCA, IP, and other stakeholders to take further soil samples to better determine the extent of contamination. IP took the extra soil samples in 2013 and 2014 and completed a SFS Report for soils in December 2015.

# 3 Site Characterization

## 3.1 Contaminants of Concern

EPA has identified dioxin and polycyclic aromatic hydrocarbons (PAHs), expressed as benzo(a) pyrene equivalent [B(a)PE], as contaminants of concern (COCs) in soil. These compounds are being designated as COCs because they are persistent and present in the soil at concentrations above risk-based levels. Dioxin was an impurity in pentachlorophenol (PCP), a chemical that was used in the wood treatment process as a preservative and an insecticide. Dioxin has been shown to be very toxic in animal studies and, in humans, can cause toxic effects and is a probable carcinogen. 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. Long-term, low level exposure to PAHs could cause carcinogenic and/or non-carcinogenic human health effects.

Table 1 shows the range of concentrations of COCs in site soils by OU. Concentrations in the top foot are listed independently of other depths because surface soil concentrations account for direct contact risks to workers and residents.

**Table 1: Dioxin and B(a)PE Levels by Operable Unit and Depth**

| OU | Depth (feet) | Dioxin Concentration Detected (ppt) | | | | B(a)PE Concentration Detected (mg/kg) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | # of Samples | Min | Max | Median | # of Samples | Min | Max | Median |
| 1 | 0-1 | 122 | 3.6 | 6,300 | 324 | 75 | 0.01 | 3.16 | 0.23 |
| | >1 | 110 | 0.10 | 23,700 | 1.0 | 100 | 0.001 | 26 | 0.001 |
| 2 | 0-1 | 26 | 3.9 | 834 | 185 | 26 | 0.007 | 9.73 | 0.163 |
| | >1 | 20 | 0.20 | 205 | 0.43 | 18 | 0.001 | 0.04 | 0.001 |
| 7 | 0-1 | 35 | 6.56 | 537 | 34 | 20 | 0.011 | 11.7 | 0.239 |
| | >1 | 34 | 0.13 | 2550 | 0.87 | 37 | 0.001 | 2.9 | 0.003 |

### 3.2 Site Geology

The St. Regis site is located in an area of the City of Cass Lake primarily used by industry but containing residential properties. The terrain is relatively flat with sandy soil. The water table is shallow and is generally less than 15 feet below ground surface.

## 4 SUMMARY OF SITE RISKS

IP conducted the HHERA to determine the current and future health effects caused by site contaminants on human health and the environment. The EPA-approved HHERA estimated potential health risks for residential use, commercial use, recreational use, tribal lifeways, and ecological pathways for exposure to site contaminants in soil, indoor dust, shallow groundwater, sediment, forested property, wetland surface waters, homegrown produce, fish, and wild rice. The HHERA evaluated current and potential future residential exposure in OU7 because it is zoned residential by the City of Cass Lake.

### 4.1 Human Health Risks

In assessing the risks to humans, contaminant screening levels for residential and industrial/commercial workers were based on a target excess lifetime cancer risk (ELCR) of $1 \times 10^{-6}$, or one additional instance of cancer in one million persons exposed over a lifetime, and a noncancer hazard index (HI) quotient of one (1). The HI quotient is a way of expressing the potential for noncarcinogenic health effects that may occur due to exposure to a dose of a chemical. A HI quotient greater than one indicates that there may be a concern for potential health effects. EPA's target acceptable cancer risk range is $10^{-6}$ to $10^{-4}$ ELCR.

The HHERA found the following unacceptable risks to human health:

- In OU7, potential increased risk of adverse noncarcinogenic health effects at one property that may have a future child resident – HI = 2.

- In OU1, potential increased risk of adverse noncarcinogenic health effects to a short-term utility worker who digs a trench in the immediate vicinity of the groundwater extraction

systems at the Site without adequate protective wear. These risks will be addressed in a future remedial action.

The HHERA found that exposure to groundwater was an incomplete exposure pathway in OU7. This means that residents and other persons in OU7 are not in contact with contaminated groundwater.

Primary uncertainties in the HHERA are found in the collection and use of soil data, for example use of sampled homes to represent unsampled properties, as well as in the assumptions made concerning the carcinogenic potential of dioxin; characterization of tribal lifeways; and quantifying exposure levels.

### 4.2 Ecological Risks

EPA evaluated the potential for adverse effects on ecological receptors by establishing baseline conditions at the site and then calculating potential impacts based on factors such as exposure levels of site contaminants and the potential effects that the chemicals could have on organisms. As for human health risks, EPA calculates a hazard quotient (HQ) for organisms, with a threshold value of 1. Generally, the higher the HQ, the greater the likelihood an effect will occur. Although probabilities cannot be specified based on a point-estimate approach, an HQ of 1 is usually regarded as indicating a low probability of adverse ecological effects. An HQ greater than 1, however, does not imply that adverse effects will occur – only that adverse effects could occur.

The HHERA evaluated ecological risks associated with the site former wood treating operations at the site and found that one sample taken near the contaminated soil containment vault in OU2 was acutely toxic to soil invertebrates and had high values of Site-related contaminants. This ecological risk will be addressed in a future remedial action. The HHERA found no unacceptable ecological risks in soils in OU7.

### 4.3 Conclusion

It is EPA's 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 at OU7.

## 5 SCOPE AND ROLE OF THE ACTION

The proposed action will address contaminated soil in OU7, which comprises residential properties. EPA is addressing contaminated groundwater in OU1 and OU3 by an established pump and treat remedy. Future remedial actions will address contaminated groundwater in OU2, the risk of direct contact with groundwater to utility/construction workers in OU1, and contaminated soil in OU1, OU2 and OU3.

EPA expects that this remedial action will be the final action in OU7.

### 5.1 Principal Threat Waste

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. They include liquids and other highly mobile materials, or materials having high concentrations of toxic compounds.

EPA has determined that dioxin and PAHs in OU7 soil do not constitute principal threat waste. Although the maximum concentrations of dioxin and B(a)PE from some individual sample points (as listed in Table 1) are high, the median concentrations in the top foot are more representative of the levels to which exposure occurs. In addition, at the most contaminated OU7 property, the ELCR is less than $10^{-4}$ and the hazard index to one receptor is at most approximately 2, which does not indicate highly toxic material. Dioxin and PAHs also are not mobile in OU7 soil because they are not moving from the shallow layers of soil, where contamination is greater, into the underlying soil that has much lower concentrations.

## 6 REMEDIAL ACTION OBJECTIVE

EPA developed the following Remedial Action Objective (RAO) to protect the public and the environment from potential health risks posed by dioxin and PAHs in OU7 soil:

- Prevent unacceptable potential risk to human health from future exposure to site-related COCs in OU7 soil through ingestion of soil and garden produce, inhalation of soil and indoor dust and dermal adsorption routes of exposure at residential properties in OU7.

The proposed action will reduce potential human health risks associated with exposure to contaminated soil to below $10^{-6}$ ELCR. The RAO will be achieved by excavating and removing contaminated soil and replacing it with clean soil so that exposure to residual contaminants is at or below proposed target clean up levels.

## 7 PRELIMINARY CLEAN UP LEVELS

### 7.1 Contaminants of Concern

The COCs identified in the HHERA include dioxin and B(a)PE. These contaminants are described in the *Site Characterization* section of this Proposed Plan.

### 7.2 Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) are used in developing and evaluating alternative remedial actions for a site. Final cleanup 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 federal and tribal regulations, which are referred to as Applicable or Relevant and Appropriate Requirements (ARARs). Table 2 summarizes the PRGs, background concentrations, and estimated depths to reach PRGs in OU7.

Based on the results of the HHERA, EPA considers 63 ppt for dioxin (Level 2 PRG-R) and the background level of 1.6 milligrams per kilogram (mg/kg (or "parts per million" (ppm); Level 1 and Level 2 PRG-R) for B(a)PE in soil to be protective of human health in OU7. These values represent the middle of EPA's target risk range of $10^{-6}$ to $10^{-4}$ ELCR. EPA selected this level of protection, $10^{-5}$ ELCR, based on uncertainties identified in the HHERA, including consideration of LLBO tribal lifeways and uncertainties associated with estimating dioxin cancer risks.

In 2000, LLBO promulgated the Hazardous Substances Control Act (HSCA) which established contaminant cleanup levels for Leech Lake Reservation lands. HSCA establishes a 10 ppt cleanup level for dioxin in soil (Level 1 PRG), which represents approximately $2 \times 10^{-6}$ ELCR for residential use and is at the low end of EPA's target risk range. The dioxin soil remediation value, as described in HSCA, is a potential ARAR for the proposed OU7 soil cleanup. Therefore, in addition to considering alternatives that meet EPA's acceptable risk range, EPA considered alternatives that lower the dioxin concentrations in surface soil to 10 ppt or less.

**Table 2: Cleanup levels for COCs in OU7 soil**

| Chemical | Basis | PRG Level | Cleanup Level | Background (95% percentile) | Estimated Average Depth to PRG in OU7 (ft.) |
|---|---|---|---|---|---|
| Dioxin | Regulatory requirement; HSCA | Level 1 | 10 ppt | 7.5 ppt | 2.0 |
| | Risk-based; $10^{-5}$ ELCR (residential) | Level 2-R | 63 ppt | | 1.3 |
| B(a)PE | Background Concentration | Level 1 and Level 2-R | 1.6 ppm | 1.6 ppm | 1.3 |

Figure 3 illustrates, of those properties that have been sampled, which ones are known to exceed the Level 1 PRG. Figure 4 illustrates, of those properties that have been sampled, which ones are known to exceed Level 2 PRG-R. For both figures, properties that are not shaded either yellow or green have not yet been sampled but likely have contaminant levels similar to other adjacent properties.

**Figure 3: OU7 Properties that exceed the Level 1 PRG.**

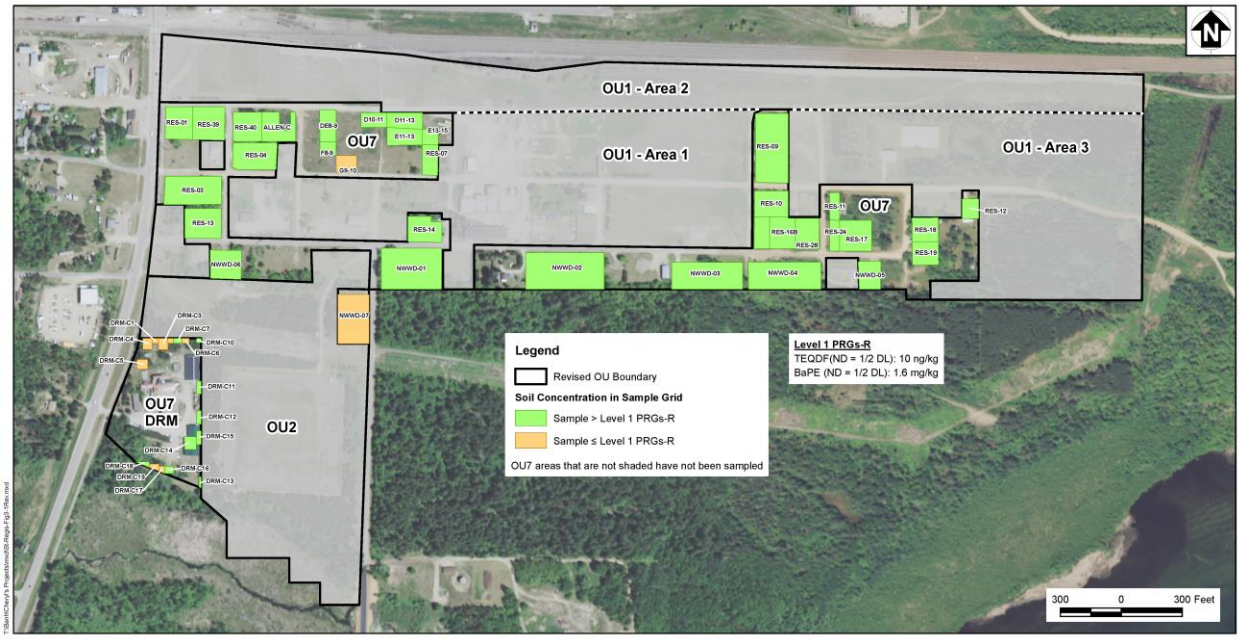
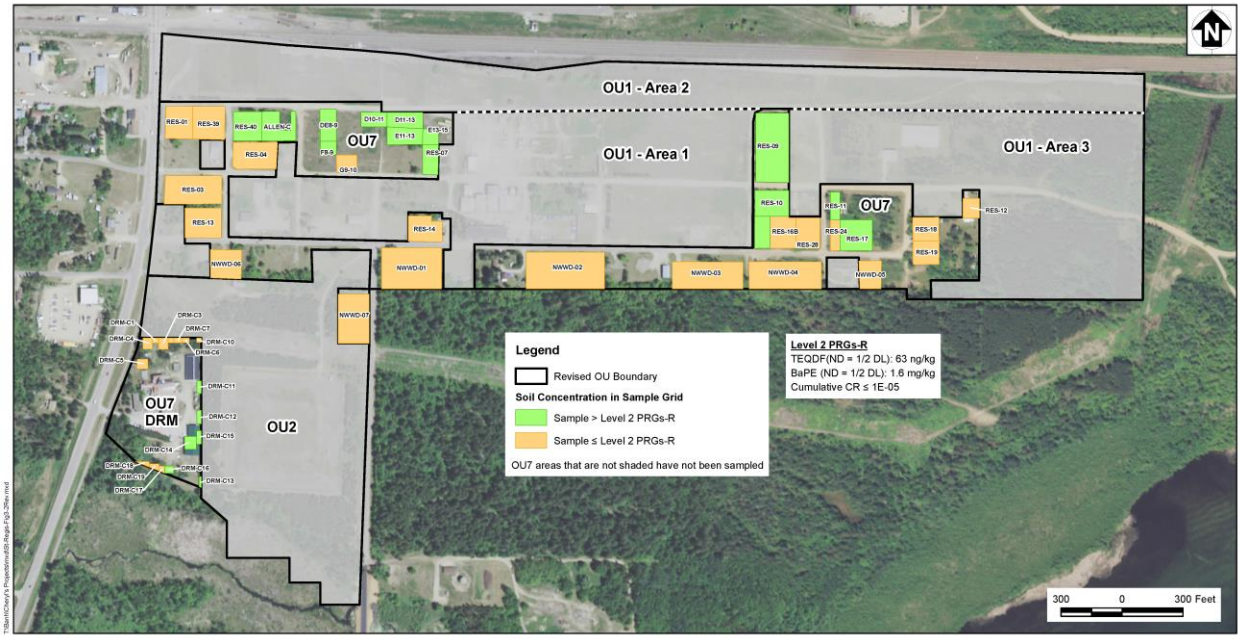



**Figure 4: Properties that exceed the Level 2 PRG-R.**




## 8 SUMMARY OF REMEDIAL ALTERNATIVES

EPA considered six alternatives for addressing residential surface soil at the St. Regis Paper Company site. The alternatives are summarized below and further explained in the SFS Report. Each alternative was evaluated against EPA's nine criteria as described in Section 9.

**Table 3: Summary of the OU7 Remedial Alternatives**

| Alternative | Description of Alternative |
|---|---|
| S10 | No further action. |
| S11 | Excavate soil on properties exceeding Level 2-R PRGs. |
| S12 | Excavate soil on properties exceeding Level 2-R PRGs; place a 12 inch clean soil cover on properties exceeding Level 1 PRGs. |
| S13 | Excavate soil on properties currently in residential use exceeding Level 1 PRGs and place a 12-inch clean soil cover on other properties exceeding Level 1 PRGs. |
| S14 | Excavate soil on properties not owned by IP exceeding Level 1 PRGs, and place 12-inch clean soil cover on properties owned by IP exceeding Level 1 PRGs. |
| S15 | Excavate soil exceeding Level 1 PRGs. |

### 8.1 Common Elements

All of the alternatives, with the exception of the "No Action" alternative (Alternative S10), contain common components. The shared features of Alternatives S11 through S15 include:

- Excavation of soil on some or all properties in OU7 to the depth needed to reach the selected PRG. Excavated areas would be backfilled with tested clean soil and revegetated.

- Two options for managing excavated soil: trucking to an off-site landfill (the "A" alternatives), and containment on-site (the "B" alternatives).

    - For the "A" alternatives, excavated soil would be tested and classified according to its suitability for disposal in a RCRA Subtitle D landfill or RCRA Subtitle C disposal facility.

    - For the "B" alternatives, excavated soil would be tested and classified according to its suitability for onsite consolidation, containment in a RCRA Subtitle D landfill, or offsite disposal in a RCRA Subtitle C disposal facility.

- All OU7 properties would be suitable for future residential use at the completion of the remedial action.

- Monitoring and control of air quality (dust) during construction.

- Once construction is final, the interim remedy for OU7, which being performed by the PRPs under a 2005 Unilateral Administrative Order, would no longer be performed.

- Until soil in OU1 and OU2 is remediated, collection of soil samples from the OU7 soil excavation or cover work in representative residential properties to confirm that no recontamination from the adjacent OUs is occurring.

Alternatives S12, S13 and S14 also share the following features:

- Clean soil cover, rather than excavation, in a portion of OU7, comprised of a marker material covered by the layer of clean fill and top soil, followed by vegetation.

- Institutional Controls (ICs) in OU7 to restrict activities in the covered portions of the site property to preserve the soil cover. For example, a deed notice might be filed on a covered property that notifies future owners of the contamination below the cover, and prohibits any digging below the cover unless proper precautions are taken.

### 8.2 Cleanup Alternative S10 – No action

*Estimated Capital Cost: $0*
*Estimated O&M Cost: $0*
*Estimated Present Worth Cost (30 years): $0*
*Estimated Construction Timeframe: Not Applicable*
*Estimated Time to Achieve RAOs: Not Applicable*

EPA includes a "No-Action" Alternative as a basis for comparison to the other cleanup alternatives. Interim Action activities–house cleaning and dust suppression–would no longer be performed. Since no action would be taken, this option would not protect human health and the environment from either current or future risk.

### 8.3 Cleanup Alternative S11-A and -B

*Estimated Capital Cost: $12,000,000 (A) / $7,900,000 (B)*
*Estimated O&M Cost: $62,000 (A) / $62,000 (B)*
*Estimated Present Worth Cost (30 years): $12,100,000 (A) / $8,000,000 (B)*
*Estimated Construction Timeframe: 1 year*
*Estimated Time to Achieve RAOs: 1 year*

Alternative S11 would excavate contaminated soil above Level 2 PRGs-R, which for most properties will be achieved in the first foot of excavation.

### 8.4 Cleanup Alternative S12-A and -B

*Estimated Capital Cost: $14,200,000 (A) / $9,900,000 (B)*
*Estimated O&M Cost: $93,000 (A) / $93,000 (B)*
*Estimated Present Worth Cost (30 years): $14,300,000 (A) / $10,000,000 (B)*
*Estimated Construction Timeframe: 2 years*
*Estimated Time to Achieve RAOs: 2 years*

Alternative S12 would excavate contaminated soil above Level 2 PRGs-R, which for most properties will be achieved in the first foot of excavation, and would apply a clean soil cover to properties with soil contamination that exceeds Level 1 PRGs but is less than Level 2 PRGs-R.

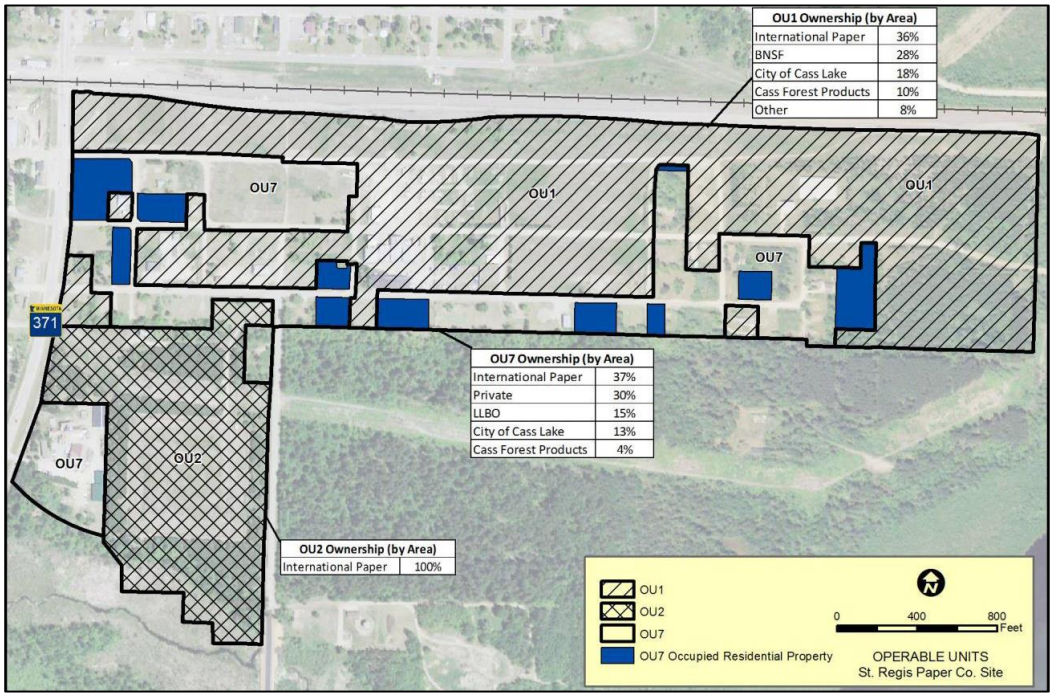
### 8.5 Cleanup Alternatives S13-A and -B

*Estimated Capital Cost: $13,500,000 (A) / $10,200,000 (B)*
*Estimated O&M Cost: $96,000 (A) / $96,000 (B)*

*Estimated Present Worth Cost (30 years): $13,600,000 (A) / $10,300,000 (B)*
*Estimated Construction Timeframe: 2 years*
*Estimated Time to Achieve RAOs: 2 years*

Alternative S13 would excavate contaminated soil that exceeds Level 1 PRGs on properties with current residents and/or habitable buildings (see Figure 5), and would apply a clean soil cover to other properties with soil contamination that exceeds Level 1 PRGs.

**Figure 5: Properties in OU7 with Current Residents and/or Habitable Buildings**

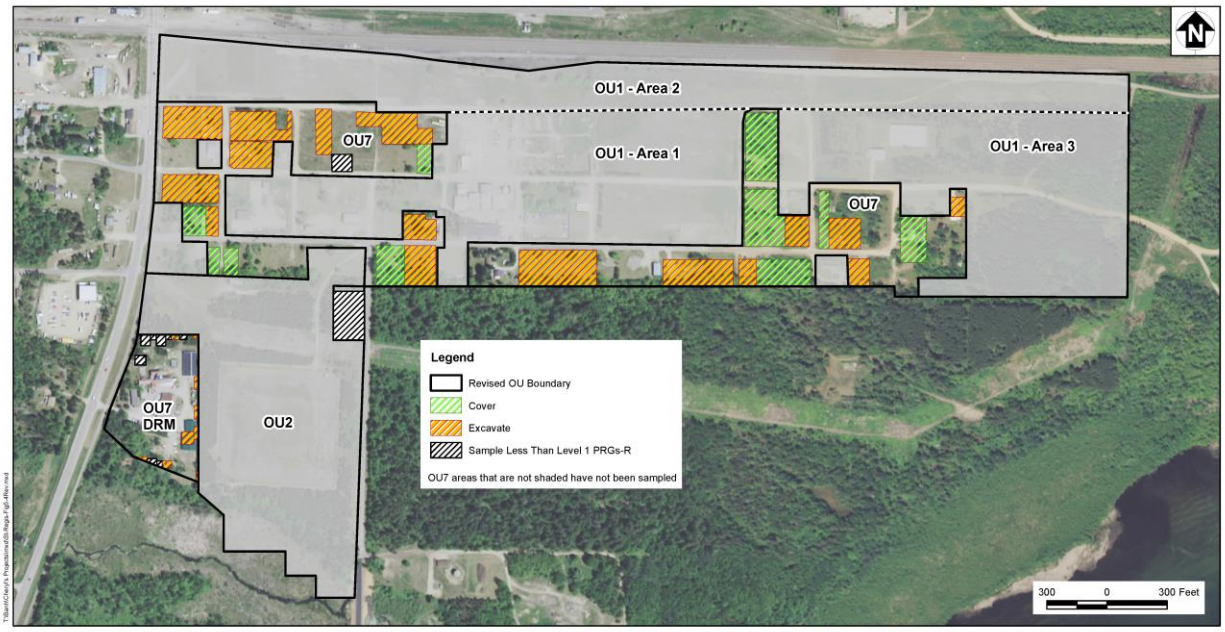



## 8.6 Cleanup Alternatives S14-A and -B

*Estimated Capital Cost: $22,500,000 (A) / $15,300,000 (B)*
*Estimated O&M Cost: $80,000 (A) / $80,000 (B)*
*Estimated Present Worth Cost (30 years): $22,500,000 (A) / $15,400,000 (B)*
*Estimated Construction Timeframe: 2 years*
*Estimated Time to Achieve RAOs: 2 years*

Alternative S14 would excavate contaminated soil that exceeds Level 1 PRGs on properties not owned by the Responsible Parties, and would apply a clean soil cover to other properties with soil contamination that exceeds Level 1 PRGs. The expected remedy (excavation or clean soil cover) for those OU7 properties that have been sampled is shown in Figure 6.

**Figure 6: Excavation and Cover of OU7 Properties under Alternative S14[1]**




## 8.7 Cleanup Alternatives S15-A and -B

*Estimated Capital Cost: $29,900,000 (A) / $18,400,000 (B)*
*Estimated O&M Cost: $62,000 (A) / $62,000 (B)*
*Estimated Present Worth Cost (30 years): $30,000,000 (A) / $18,500,000 (B)*
*Estimated Construction Timeframe: 3 years*
*Estimated Time to Achieve RAOs: 3 years*

Alternative S15 would excavate all soil on OU7 with contamination above Level 1 PRGs. No ICs would be required.

# 9 COMPARISON OF ALTERNATIVES

EPA uses nine criteria to evaluate remedial alternatives in order to select a remedy:

**Table 4: Evaluation Criteria for Superfund Remedial Alternatives**

| **Threshold Criteria** |
|---|
| **1. Overall Protection of Human Health and the Environment** determines whether an alternative eliminates, reduces, or controls threats to the public health and the environment through institutional controls, engineering controls, or treatment**.** |

[1] Properties in OU7 that are not shaded have not been sampled, but will receive remedial action under Alternative S14 appropriate to each parcel's property ownership and contamination level.

| |
|---|
| **2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirement that pertain to the site, or whether a waiver is justified. |
| **Balancing Criteria** |
| **3. Long-term Effectiveness and Performance** considers the ability of an alternative to maintain protection of human health and the environment over time. |
| **4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present. |
| **5. Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation. |
| **6. Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as relative availability of goods and services. |
| **7. Cost** includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total of an alternative over time in today's dollar value. Cost estimates are expected to be accurate within a range of +50% to -30%. |
| **Modifying Criteria** |
| **8. State Acceptance** considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and the Proposed Plan. |
| **9. Community Acceptance** considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance. |

## 9.1 Comparison of Remedial Alternatives

The comparison of the OU7 cleanup alternatives with respect to the nine criteria is discussed below and summarized in Table 8.

### 9.1.1 Overall Protection of Human Health and the Environment

Alternative S10, 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. Therefore, Alternative S10 is not discussed below, although the evaluation of the other criteria in relation to Alternative S10 is shown in Table 10. All of the other alternatives would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through excavation, cover, engineering controls and ICs.

### 9.1.2 Compliance with ARARs

Alternative S11 does not meet all potential ARARs because it does not prevent exposure to soil that exceeds the 10 ppt cleanup level for dioxin specified in HSCA. Therefore, Alternative S11 is not discussed below, although the evaluation of the other criteria in relation to Alternative S11 is shown in Table 10. Alternatives S12 through S15 all comply with all ARARs. Alternatives S12, S13 and S14 achieve the HSCA dioxin cleanup level by means of a combination of excavation and a soil cover; Alternative S15 achieves HSCA cleanup levels by excavation of contaminated soil that exceeds the HSCA dioxin clean up level.

### 9.1.3 Long-term Effectiveness and Permanence

Unremediated soil in OU1 and OU2 will remain at the end of the remedial action for OU7, so until these OUs are remediated, there is the potential for recontamination by deposition of soil carried by wind or surface water runoff. However, follow-up sampling of the soil in OU7 properties until the adjacent OUs are remediated will provide assurance that the OU7 properties remain under PRGs.

Both a clean soil cover and excavation can permanently reduce exposure to soil contamination. Excavation removes contaminated soil permanently, while use of a clean soil cover requires ICs and ongoing monitoring and maintenance of the soil cover to prevent exposure. Monitoring the integrity of the clean soil cover compliance with ICs and is not difficult, as disturbed soil is easy to identify and remedy. Factors in the evaluation of the long-term effectiveness of the soil cover include the number of property owners of the area subject to ICs, the current and reasonably-anticipated future uses of the properties, and the property owners' intended future uses of their property and stated interest in implementing ICs.

In OU7, the anticipated future use of all property is residential. Alternative S12 would require many different property owners to comply with ICs on many properties in OU7, while Alternative S13 reduces this number by excavating all soil that exceeds Level 1 PRGs on properties with a current resident or habitable residence. Alternative S14 would only require the RP to comply with ICs. The RP would be required by an enforcement agreement with EPA to place ICs on their property, and has unmediated access to these properties, so there is a high degree of long-term effectiveness for soil cover as specified in Alternatives S14, as well as the excavation specified in Alternative S15.

*Off-site Disposal and On-site Soil Containment*

The on-site disposal options rely on monitoring and maintenance activities to ensure that the excavated and re-emplaced soil is properly contained. The on-site containment area is on property owned by an RP, so access would be available to perform the ongoing monitoring and maintenance.

A small percentage of excavated soil may contain high concentrations of mobile contaminants, or present a potential leaching threat, and would not be placed in the containment area. The containment area would be above the water table and would present the same conditions (redox, pH, etc.) which currently characterizes the soil. Therefore, on-site management of the soil would be very unlikely to increase the mobility of the contaminants.

### 9.1.4 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 soils with residual levels of dioxin that is being addressed in this remedy does not lend itself to treatment.

### 9.1.5 Short-term Effectiveness

Short-term effectiveness considers the amount of time until remedy completion and the potential adverse effects to the community, workers, and the environment during remedy implementation. Table 5 compares the estimated construction time of the alternatives. A minimum of two years is estimated for Alternatives S12 through S14 due to the relatively short construction season in northern Minnesota, and an additional year is required for Alternative S15.

**Table 5: Comparison of Estimated Construction Time, Time to Meet RAOs, and Soil Excavation Volume**

| Alternative | S11 | S12 | S13 | S14 | S15 |
|---|---|---|---|---|---|
| Estimated Construction Time | 1 year | 2 years | | | 3 yrs |
| Estimated time to meet RAOs | 1 year | 2 years | | | 3 yrs |
| Estimated Soil Excavation Volume (cubic yards) | 36,800 | 36,800 | 24,900 | 67,400 | 111,100 |

Greater volumes of soil excavation, stockpiling, off-site transport, and import of clean soil for cover increase the potential for adverse effects to the community and workers. Two of these impacts are the potential to impact air quality from the temporary stockpiling of contaminated soil and the potential risk to workers from earth-moving activities. Table 5 shows the estimated volume of soil to be excavated for each alternative, which is an indication of the potential for these adverse effects.

For all excavation alternatives, it is assumed that a small percentage of excavated soil will be classified as hazardous waste and will have to be trucked to an incinerator in Texas, approximately 1400 miles from Cass Lake. For the “A” alternatives, the remainder of the excavated soil would be transported to a RCRA Subtitle D disposal facility in Buffalo, Minnesota, approximately 150 miles from Cass Lake. For all cover alternatives, clean fill and top soil that would be imported to the site would be trucked in from an assumed distance of 20 miles. Table 6 shows the number of truck trips associated with those alternatives that have the most off-site disposal (the “A” alternatives) and those with the least off-site disposal (the “B” alternatives).

The most significant adverse potential impact to the public is the potential for traffic accidents and deaths due to additional truck traffic. Alternatives with greater amounts of excavation, off-site disposal, and clean soil import are associated with greater truck traffic.

The total distance trucks would have to travel for a given alternative may be correlated with the risk of traffic fatalities by multiplying the total miles driven by the fatality risk per mile. Table 7

presents the estimated fatality risk range from the truck traffic associated with each OU7 alternative. The low end of each range is calculated using the 2013 Minnesota Department of Public Health mortality per mile statistic[1], while the high end of each range is calculated using the U.S. Department of Transportation fatality statistic for large trucks and buses[2]. For nearly all alternatives, the risk of traffic fatality to a member of the public is greater than the risk posed by unremediated surface soil at the St. Regis Site. Alternative S15-A for OU7 is associated with the highest risk of traffic fatality, while Alternatives S13-B and S14-B are associated with the lowest.

**Table 6: Comparison of Estimated Truck Trips and Estimated Increased Fatality Risk from Truck Traffic**

| Alternative | | Truck Trips (at 15 cy/truck) | Range of Estimated Fatality Risk from Truck Traffic |
|---|---|---|---|
| **S11** | **A** | 4,900 | $7.2 \times 10^{-3}$ to $1.8 \times 10^{-2}$ |
| | **B** | 670 | $1.8 \times 10^{-3}$ to $4.7 \times 10^{-3}$ |
| **S12** | **A** | 6,700 | $7.7 \times 10^{-3}$ to $2.0 \times 10^{-2}$ |
| | **B** | 1,800 | $2.2 \times 10^{-3}$ to $5.5 \times 10^{-3}$ |
| **S13** | **A** | 5,200 | $4.7 \times 10^{-3}$ to $1.2 \times 10^{-2}$ |
| | **B** | 1,400 | $4.7 \times 10^{-4}$ to $1.9 \times 10^{-3}$ |
| **S14** | **A** | 10,000 | $1.2 \times 10^{-2}$ to $3.1 \times 10^{-2}$ |
| | **B** | 1,500 | $2.1 \times 10^{-3}$ to $5.3 \times 10^{-3}$ |
| **S15** | **A** | 14,800 | $1.9 \times 10^{-2}$ to $4.9 \times 10^{-2}$ |
| | **B** | 7,500 | $4.2 \times 10^{-3}$ to $1.1 \times 10^{-2}$ |

### 9.1.6 Implementability

All of the alternatives can be implemented. Implementation would be more difficult with larger amounts of soil for off-site disposal due to the limited amount of appropriate landfill space available in Minnesota. However, a larger number of property owners who must agree to implement ICs on their properties would also increase the difficulty of implementation.

OU7 has multiple property owners who would need to place ICs on their properties in Alternatives S12 and S13. For Alternative S14, only one property owner, who is a RP and would be required by an enforcement agreement with EPA to place ICs on their property, would need to do so. Alternative S15 does not require ICs of any property owners, but the greater volume of soil to be excavated in Alternative S15 increases the difficulty of implementation of the "A" alternative.

[1] https://dps.mn.gov/divisions/ots/reports-statistics/Documents/2013-crash-facts.pdf
[2] U.S. DOT, 2014, Large Truck and Bus Crash Facts 2012, U.S. DOT Analysis Division, Federal Motor Carrier Safety Administration, June 2014.

### 9.1.7 Cost

Table  summarizes the total estimated costs of Alternatives S12 through S15 for OU7. Alternative S15-A is the most costly at $30.2 million, while alternative S12-B is the least expensive alternative at $10.0 million.

**Table 7: Comparison of Estimated Total Costs**[1]

| | Cost (Millions) | |
|---|---|---|
| **Alternative** | **A** | **B** |
| S12 | $14.3 | $10.0 |
| S13 | $13.6 | $10.3 |
| S14 | $22.5 | $15.4 |
| S15 | $30.0 | $18.5 |

### 9.1.8 Tribal/State Acceptance

EPA conducted government-to-government consultation with LLBO in June and July 2015 on several Site issues, including concerns with the SFS Report and EPA's preliminary selection of its preferred alternative for OU7. LLBO has not clearly expressed either agreement or disagreement with EPA's preferred alternative, S15-B. LLBO supports excavation of all soil that exceeds HSCA cleanup levels and disposal of the excavated soil off of the Leech Lake Reservation; this is consistent with Alternative S15-A. LLBO believes that EPA does not have adequate information to make the proposed decision on soil in OU7 because LLBO believes: 1) the Site is inadequately characterized, and 2) the SFS Report is of poor quality and does not consider leaching threats to groundwater. LLBO has noted in communications to EPA that alternatives that involve a cover (Alternatives S12, S13, and S14) are not consistent with the intent of HSCA. LLBO also noted concerns regarding their potential future acquisition and use of site properties that have residual contamination and require the placement of ICs. LLBO believes that selection and implementation of alternatives that involve a cover directly compromise potential future options to make full use of its reservation lands and place them in trust.  However, at the conclusion of formal government-to-government consultation in July 2015, LLBO expressed cautious optimism that the EPA's preferred S15-B remedy for OU7 was acceptable with the understanding that EPA is committed to further studying and addressing the remaining soil contamination issues in OU1 and OU2, as well as following up on the groundwater contamination issues at the Site-as later noted in EPA's 2015 Five year Review Report.

While LLBO has identified numerous potential ARARs for the St. Regis Site as a whole, EPA is addressing only those potential standards which pertain to our proposed soils remedy for OU7. LLBO has notified EPA of three Leech Lake Reservation Business Committee Resolutions amending or relating to HSCA that may be potential ARARs for this remedial action: No. 05-16

[1] Costs may differ slightly from those presented in the SFS Report due to differences in rounding. The cost for S15B assumes use of onsite soil borrowing.

(July 15, 2004), No 2009-11 (July 9, 2008), and No. 2015-27 (August 7, 2014). EPA does not consider these Resolutions on their own or in the context of HSCA to be either "applicable" or "relevant and appropriate." Resolution 05-16 requests that EPA comply with the Land Acquisition Policy when cleaning up the St. Regis site. Resolution 2009-11 states the Tribal Council's position that EPA should conduct further site characterization activities at the St. Regis Site in support of LLBO's Land Acquisition Policy. The "Letter Health consultation," adopted by Resolution 2015-27, provides a location-specific sampling protocol for residential properties within the St. Regis Site. Because each of these resolutions pertain specifically to the St. Regis Site, EPA cannot determine that either Resolution is a statute of general applicability.

EPA also consulted with the State of Minnesota, both prior to and during the development of the December 2015 SFS. The State of Minnesota conditionally supports Alternative S15-B because it will meet or exceed PRGs established for residential property for this project for all of OU7, and because no ICs would be required on the residential properties post-remediation. The State conditions its support on assurances of timely future remedial actions at the other OUs to prevent recontamination of remediated OU7 properties.

LLBO's and MPCA's comments on the SFS Report and PP, and EPA's responses to those comments, are contained within the Administrative Record for this decision.

### 9.1.9 Community Acceptance

Community Acceptance will be evaluated after the public comment period ends. EPA will address public comments in the Responsiveness Summary of the ROD for OU7.

## 9.2 EPA's Preferred Alternative: Alternative S15B

Under Superfund law, the selected remedy must meet the threshold criteria of Overall Protection of Human Health and the Environment, and Compliance with ARARs. The preferred alternative meets these threshold criteria by excavating all soil contamination in OU7 above ARAR-based (HSCA) limits, which will protect to a $2 \times 10^{-6}$ ELCR, and consolidating those soils in a managed area. There will be no need for ICs in OU7. Soil sampling will be conducted after remedy implementation to insure that contaminated soil from nearby OUs is not re-contaminating the residential properties. 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. The preferred alternative provides long-term and permanent protection against exposure to site-related contaminants by soil excavation. On-site management of excavated soil significantly reduces the short-term impacts due to increased truck traffic that would be required to dispose of soil offsite. None of the alternatives reduce toxicity, mobility or volume of the contamination through treatment because effective alternative treatment technologies or resource recovery technologies are not practical for large quantities of soil containing low levels of dioxin contamination. The preferred alternative is implementable. Finally, Alternative S15-B meets the evaluation criteria at a much lower cost than alternatives that dispose of soil off-site.

Figure 3 shows how Alternative S15B would be applied in OU7; green regions denote excavation while yellow regions already meet Level 1 PRGs and do not need remedial action. Uncolored properties will be sampled during the remedial design or remedial action phase of the project as necessary to determine whether they need to be excavated.

### 9.3 Next Steps

EPA 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 that is discussed in this PP. 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.

**Table 8: Comparison of OU7 Cleanup Options with the Nine Superfund Remedy Selection Criteria**

| Evaluation Criteria | S10 | S11 | | S12 | | S13 | | S14 | | S15 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | A | B | A | B | A | B | A | B** |
| 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 | ● | ● | ● | ◉ | ● | ◉ | ● | ◉ | ● | ◉ | ◉ |
| Implementability | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Cost (Millions) | $0 | $12.1 | $8.0 | $14.3 | $10.0 | $13.6 | $10.3 | $22.5 | $15.4 | $30.0 | $18.5 |
| Tribal and State Acceptance | LLBO and MPCA conditionally support S15B. | | | | | | | | | | |
| Community Acceptance | Will be evaluated after the public comment period ends. | | | | | | | | | | |

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

** EPA's preferred alternative