

**FIFTH FIVE-YEAR REVIEW REPORT FOR  
TORCH LAKE SUPERFUND SITE  
HOUGHTON COUNTY, MICHIGAN**



**Prepared by**

**U.S. Environmental Protection Agency  
Region 5  
Chicago, Illinois**

3/20/2023

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## **LIST OF ABBREVIATIONS & ACRONYMS**

|        |   |
|--------|---|
| AOC    | Administrative Order on Consent   |
| ARAR   | Applicable or Relevant and Appropriate Requirement                          |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act       |
| CFR    | Code of Federal Regulations   |
| COC    | Contaminant of Concern  |
| EGLE   | Michigan Department of Environment, Great Lakes, and Energy (formerly MDEQ) |
| EPA    | United States Environmental Protection Agency                               |
| FYR    | Five-Year Review  |
| GLNPO  | Great Lakes National Program Office   |
| HCRC   | Houghton County Road Commission   |
| ICs    | Institutional Controls  |
| ICIAP  | Institutional Control Implementation and Assurance Plan                     |
| KBIC   | Keweenaw Bay Indian Community   |
| MDEQ   | Michigan Department of Environmental Quality                                |
| MDNR   | Michigan Department of Natural Resources                                    |
| NCP    | National Oil and Hazardous Substances Pollution Contingency Plan            |
| NPL    | National Priorities List  |
| NRCS   | National Resource Conservation Service                                      |
| O&M    | Operation and Maintenance   |
| OU     | Operable Unit   |
| LTS    | Long-Term Stewardship   |
| MCL    | Maximum Contaminant Level   |
| PAHs   | Polycyclic Aromatic Hydrocarbons  |
| PCBs   | Polychlorinated Biphenyls   |
| PFAS   | Perfluoroalkyl and Polyfluoroalkyl Substances                               |
| PLWSA  | Portage Lake Water and Sewage Authority                                     |
| PPA    | Prospective Purchaser Agreement   |
| RAO    | Remedial Action Objective   |
| RC     | Restrictive Covenant  |
| RI     | Remedial Investigation  |
| ROD    | Record of Decision  |
| RPM    | Remedial Project Manager  |
| Site   | Torch Lake Superfund Site   |
| TBC    | To be considered  |
| UU/UE  | Unlimited Use and Unrestricted Exposure                                     |
| WUPHD  | Western Upper Peninsula Health Department                                   |

## **I. INTRODUCTION**

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Torch Lake Superfund Site (Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three Operable Units (OUs):

- OU1 includes select surface tailings, drums, and slag piles on the western shore of Torch Lake. These areas include Lake Linden, Hubbell/Tamarack City (Hubbell) and Mason Sands (Mason).
- OU2 includes groundwater, surface waters, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Channel, Keweenaw Waterway, North Entry to Lake Superior, Boston Pond, and Calumet Lake.
- OU3 includes select tailing and slag deposits located at North Entry, Michigan Smelter, Quincy Smelter, Calumet Lake, Isle-Royale Sands, Boston Pond, Dollar Bay, Grosse-Point (Point Mills), and Scales Creek.

All three OUs are addressed in this FYR.

The Torch Lake Superfund Site FYR was led by Glenn Lautenbach, Remedial Project Manager (RPM), EPA Region 5. Participants included Walelign Wagaw, Project Manager, Michigan Department of Environment, Great Lakes, and Energy (EGLE). A letter was sent to the state Project Manager at EGLE on 3/22/2022, indicating the start of the review.

### **Site Background**

The Site is located on the Keweenaw Peninsula in Houghton County, Michigan. The Site includes Torch Lake, the western shore of Torch Lake, the northern portion of Portage Lake, the Portage Lake Canal, Keweenaw Waterway, North Entry to Lake Superior, Boston Pond, and Calumet Lake. Select tailing and slag pile deposits located along the western shore of Torch Lake, Northern Portage Lake, Keweenaw Waterway, Lake Superior, Boston Pond, and Calumet Lake are included as part of the Site. In addition to several tailing piles located throughout these areas, slag piles located at Quincy Smelter, Michigan Smelter, and Hubbell and stamp sands at Scales Creek are also included as part of the Site. See Appendix C for Figures showing the location of these Site areas.

The Torch Lake area was the site of copper milling and smelting facilities, which operated for over 100 years. The first mill opened on Torch Lake in 1868. At the mills, copper was extracted through a series

of technologies over the years. First, copper was extracted by crushing or “stamping” the rock into smaller pieces, then by grinding the pieces and driving them through successively smaller meshes. The copper and crushed rocks were separated by gravimetric sorting in a liquid medium. The copper was then sent to a smelter. The crushed rock particles, called “tailings” or “stamp sands”, were discarded along with mill processing water, typically by pumping it into lakes and streams. The Lake was a repository for all the mining industry-related waste and served as a waterway for transportation to support the area. The areas which comprise the Site are ones where the mining wastes were placed. The Site was proposed for inclusion on the National Priorities List (NPL) in October 1984 and placed on the NPL in June 1986. Additional background can be found in Appendix B.

Current land use is varied across different areas of the Site and includes residential, recreational, and industrial uses. During the review period, parcels that are part of the Michigan Smelter area were rezoned from residential to recreational land use. There are no other reasonably anticipated changes to future land use for the Site. There are no known or reasonably anticipated changes to future land use for areas surrounding the Site.

While not conducted as part of remedial efforts to address contamination subject to cleanup under the Superfund program, other work is underway within the Torch Lake Superfund Site footprint. EPA’s Great Lakes National Program Office (GLNPO) designated Torch Lake an Area of Concern under the 1987 Great Lakes Water Quality Agreement. A pilot study is currently in progress as a collaboration between EGLE and EPA. The pilot study tests sediment capping and habitat restoration in shallow and near-shore areas of Torch Lake and includes multiple types of monitoring, including groundwater testing. Monitoring data from this project are not yet available. In 2019, GLNPO signed a Great Lakes Legacy Act Project Agreement to perform a focused feasibility study to address contaminated sediments at the Lake Linden Recreational and the Hubbell Processing Areas within the Torch Lake Area of Concern. The focused feasibility study is anticipated to be completed later in 2023.

**FIVE-YEAR REVIEW SUMMARY FORM**

| SITE IDENTIFICATION   |  |                                       |
|---|--|---------------------------------------|
| <b>Site Name:</b> Torch Lake  |  |                                       |
| <b>EPA ID:</b> MID 980901946  |  |                                       |
| <b>Region:</b> 5  | <b>State:</b> MI   | <b>City/County:</b> Houghton/Houghton |
| SITE STATUS   |  |                                       |
| <b>NPL Status:</b> Final  |  |                                       |
| <b>Multiple OUs?</b><br>Yes   | <b>Has the site achieved construction completion?</b><br>Yes |                                       |
| REVIEW STATUS   |  |                                       |
| <b>Lead agency:</b> EPA   |  |                                       |
| <b>Author name (Federal or State Project Manager):</b> Glenn Lautenbach |  |                                       |
| <b>Author affiliation:</b> EPA  |  |                                       |

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|--|
| <b>Review period:</b> 3/22/2022 - 11/23/2022                         |
| <b>Date of site inspection:</b> 7/19/2022 - 7/21/2022                |
| <b>Type of review:</b> Statutory                                     |
| <b>Review number:</b> 5  |
| <b>Triggering action date:</b> 3/22/2018                             |
| <b>Due date (five years after triggering action date):</b> 3/22/2023 |

## II. RESPONSE ACTION SUMMARY

### Basis for Taking Action

The following compounds were selected as Contaminants of Concern (COCs) for OU1 tailings.

**Table 1:** OU1 COCs

| <b>Organic Compounds:</b>  | <b>Inorganic Compounds:</b> |
|----------------------------|-----------------------------|
| Bis(2-Ethylhexyl)phthalate | Aluminum                    |
| PAHs                       | Antimony                    |
| Naphthalene                | Arsenic                     |
| 2-Methylnaphthalene        | Barium                      |
| Acenaphthylene             | Beryllium                   |
| Phenanthrene               | Boron                       |
| Fluoranthene               | Chromium                    |
| Pyrene                     | Cobalt                      |
| Benzo(a)fluoranthene       | Copper                      |
| Chrysene                   | Lead                        |
| Benzo(b)fluoranthene       | Manganese                   |
| Benzo(k)fluoranthene       | Mercury                     |
| Benzo(a)pyrene             | Nickel                      |
| Ideno(1,2,3-cd)pyrene      | Silver                      |
| Dibenzo(a,h)anthracene     | Titanium                    |
| Benzo(g,h,i)perylene       | Vanadium                    |

The following compounds were selected as COCs for OU3 tailings.

**Table 2: OU3 COCs**

| <b>Organic Compounds:</b>  | <b>Inorganic Compounds:</b> |           |
|----------------------------|-----------------------------|-----------|
| Bis(2-Ethylhexyl)phthalate | Aluminum                    | Copper    |
| Benzo(b)fluoranthene       | Antimony                    | Lead      |
| Butylbenzylphthalate       | Arsenic                     | Manganese |
| Diethylphthalate           | Barium                      | Mercury   |
| Fluoranthene               | Beryllium                   | Nickel    |
| Pyrene                     | Cadmium                     | Silver    |
| Chrysene                   | Chromium                    | Vanadium  |
| Benzo(k)fluoranthene       | Cobalt                      |           |

OU1 and OU3 slag piles/beach presented risks that formed the basis for taking action. These risks included cancer risk to current and future residents from inhaling and/or ingesting certain tailings/slag piles, the adverse impact of the tailings on Torch Lake and other water bodies, and the adverse impact of the tailing piles on the natural habitat surrounding Torch Lake, including the loss of wetlands.

A Baseline Risk Assessment was conducted for OU2. Risks that formed the basis for taking action included the ingestion of groundwater by future residents. The ingestion of groundwater by future residents was found to be the primary human health risk (Life Systems, 1992 (1)).

An ecological risk assessment was also conducted for the Site to determine the current and potential future effects of contaminants on ecological receptors. Severe ecological risks were determined to exist as the result of contaminant exposure to aquatic, terrestrial and wetland species from the tailings, slag, and sediment. The continuous release of stamp sands into the surface water bodies was determined to present an unacceptable and actionable source of ecological risk. The most significant impact associated with the tailing deposits was found to be the severe degradation of benthic communities and the absence of wetlands. Field and laboratory studies indicated that the toxicity due primarily to the elevated copper concentrations in sediments was responsible for the environmental degradation.

Prior to implementation of the remedy beginning in 1999, most of the tailing and slag piles were barren. Vegetation and colonization by indigenous species were limited by a combination of chemical and nonchemical stressors, which include poor water retention, extreme temperature fluctuations, low macronutrient availability and presence of growth inhibitor/toxic substances (Life Systems, 1992 (2)).

## **Response Actions**

### **Initial Response Actions**

In the 1970s, environmental concern developed regarding the century-long deposition of tailings into Torch Lake. In 1983, the Michigan Department of Public Health announced an advisory against the consumption of sauger and walleye in Torch Lake. In 1985, the International Joint Commission Water Quality Board designated Torch Lake as a Great Lakes Area of Concern. In 1986, Torch Lake was added to the NPL. In 1988, Michigan Department of Natural Resources (MDNR) conducted a water quality and fish tissue study. Mercury, polychlorinated biphenyls (PCBs), and 4-4'-DDE were observed in trace levels in northern pike, smallmouth bass and walleye in samples taken from Torch Lake (MDNR,1987). These chemicals are likely to be associated with sources other than contaminated

tailings (EPA, 1992 (1)). Fish consumption advisories were updated in 2002 and are currently in place for several types of fish in the Site waterbodies with mercury and PCBs being the chemicals of concern, based upon fish monitoring conducted by the Michigan Department of Health and Human Services.

On June 21, 1989, EPA collected a total of eight samples from drums located in the old Calumet and Hecla Smelting Mill Site near Lake Linden, the Ahmeek Mill Site near Hubbell, and the Quincy Site near Mason. On August 1, 1990, nine more samples were collected from drums located above the Tamarack Site near Tamarack City. Based on the sampling results, EPA determined that some of these drums may have contained hazardous substances. During the week of May 8, 1989, EPA also conducted ground penetrating radar and a sub-bottom profile (seismic) survey of the Torch Lake bottom. The area in which this survey was conducted is immediately offshore from the former Calumet and Hecla Smelting Mill Site. The survey located several point targets (possibly drums) on the bottom of Torch Lake. Based on the drum sampling results and seismic survey, EPA executed an Administrative Order on Consent (AOC), dated July 30, 1991, which required six companies and individuals to sample and remove drums located on the shore and lake bottom. Pursuant to the AOC, these entities removed 20 drums with unknown contents offshore from Hubbell and the old Calumet and Hecla Smelting Mill Site in September 1991. Eight-hundred and eight (808) drums were found in the lake bottom, some of which were believed to have contained slag and recycled circuit boards. The remainder were deteriorated drum carcasses; these were left in place. Additionally, 82 drums and minor quantities of underlying soils were removed from the upland areas of Torch Lake. The removed drums and soils were sampled, over-packed, and disposed of off-site at a hazardous waste landfill (EPA, 2013).

### Remedial Decisions

#### *1992 Record of Decision for OU1 and OU3*

EPA signed the Record of Decision (ROD) for OU1 and OU3 on September 30, 1992 (1992 ROD) (EPA, 1992 (1)).

The 1992 ROD lists the following Remedial Action Objectives (RAOs) for OU1 and OU3:

- Reduce or minimize potential risks to human health associated with the inhalation of airborne contaminants from the tailings and/or slag located at the Site.
- Reduce or minimize potential risks to human health associated with direct contact with and/or the ingestion of the tailings and/or the slag located at the Site.
- Reduce or minimize the release of contaminants in tailings to the groundwater through leaching.
- Reduce or minimize the release of contaminants in tailings to the surface water and sediment by soil erosion and/or air deposition.

The components of the selected remedy from the 1992 ROD were as follows:

- Deed restrictions to control the use of tailing piles so that tailings will not be left in a condition which is contrary to the intent of this ROD, which could cause human and ecological exposures and/or increase the potential for run-off of contaminants into the lake.
- Removal of debris such as wood, empty drums, and other garbage in the tailing piles for off-site disposal in order to effectively implement the soil cover with vegetation.



- Soil cover with vegetation in the following areas:
  - OU1 tailings in Lake Linden, Hubbell/Tamarack City, and Mason.
  - OU3 tailings in Calumet Lake, Boston Pond, Michigan Smelter, Dollar Bay, and Grosse-Point (Point Mills).
  - OU1 slag pile/beach in Hubbell.

The 1992 ROD also identified areas that were excluded from the areas to be covered with soil and vegetation. These areas were excluded based on Site conditions, planned uses, and limitations on activities planned at the excluded areas(s). The excluded areas, with EPA's rationale for and conditions upon their exclusion per the 1992 ROD, are as follows:

- Isle-Royale
  - The portion of the Isle-Royale tailings in OU3 which is being developed as a sewage treatment plant will be excluded from the area to be covered with soil and vegetation under this ROD. The part of this area to be covered by conventional sewage treatment tanks is approximately 12 acres. The remaining part, approximately 48 acres, will be covered with soil and vegetation by the Portage Lake Water and Sewage Authority (PLWSA) as part of the sewage treatment facility development plan. If this area is not covered and vegetated within 5 years after the date that the final Remedial Design is submitted, then this area shall be subject to the requirements of this ROD. The completed sewage treatment facility will achieve the remedial objectives by reducing the release of contaminants into the air.
  - The portion of the Isle-Royale tailings which is designated to be developed as residential area will be excluded from the area to be covered with soil and vegetation under this ROD. This area covers approximately 90 acres. However, if this area is not developed as a residential area within 5 years after the date that the final Remedial Design is submitted, then this area shall be subject to the requirements of this ROD.
  - The portion of the Isle-Royale tailings which is currently being used as source material to make cement blocks and as a finished block storage area for the Superior Block Company will be excluded from the area to be covered with soil and vegetation under this ROD. The use of tailings as a storage area for cement blocks would somewhat achieve the remedial objectives by reducing the release of contaminants into the area. The owner and/or operator of Superior Block Co. must use dust control measures such as water spray during the operation of mining and other activities in order to reduce the release of dust into the air. If any portion of the area is no longer to be used as a storage area, soil cover with vegetation must be implemented pursuant to this ROD.
- Houghton County Road Commission (HCRC) borrow area
  - The area designated by the HCRC as source material to spread on the road during winter to provide traction for motor vehicles will be excluded from the area to be covered with soil and vegetation. This area is located in Grosse-Point I (Point Mills) OU3 and is estimated to be 46 acres. While this area is being utilized, the following procedures must be observed:
    - The area should be covered with enough soil to prevent the release of tailings to the air and lake.
    - Excavation should stop at seven feet above the water table.

- Once the entire area is excavated to seven feet above the water table, it must be covered with soil and vegetation pursuant to this ROD.
- Quincy Smelter slag pile
  - Assuming the slag pile located in the Quincy Smelter area (approximately 25 acres) will be developed as part of a National Park, no action will be taken. If this area is not developed as a National Park in the future, deed restrictions will be sought to prevent the development of residences in the slag pile area.
- North Entry, Redridge, and Freda tailings
 

The North Entry, Redridge, and Freda tailings are excluded from the areas to be covered under this ROD. These locations are along Lake Superior shore where pounding waves and water currents will likely retard or destroy any remedial action. However, the North Entry and Freda tailings, approximately 46 acres, are to be studied during the remedial design. If EPA determines that any portion of these areas is sufficiently unaffected by Lake Superior wave activity such that it could be effectively covered with soil and vegetated, then the unaffected area or areas shall be subject to the requirements of this ROD.

### *1994 ROD for OU2*

EPA signed the ROD for OU2 on March 31, 1994 (1994 ROD) (EPA, 1994).

EPA selected a “No Action” remedy for OU2. As a result, the 1994 ROD did not identify RAOs and cleanup levels for OU2. The 1994 ROD for OU2 takes into consideration and relies upon the following conditions for this decision:

- The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action planned for OU1 and OU3 as selected in the 1992 ROD.
- Ongoing natural sedimentation and detoxification such as that which was occurring in other surface water bodies in the area.
- Institutional programs and practices controlling potential future exposure to site-affected groundwater which are administered at the county and state level.
- The long-term monitoring and the FYR process monitoring requirements of the remedy selected for OU1 and OU3 under the 1992 ROD.

As detailed in the 1994 ROD for OU2, EPA determined that the sediment and surface water contamination associated with OU2 does not pose an unacceptable threat to human health based on sample data available at that time. The shallow groundwater associated with OU2, which comes into contact with the stamp sands, exhibits inorganic contamination and results in unacceptable potential future risks. However, these risks arise only if, in the future, the stamp sands are developed for residential use or if drinking water is taken from the shallow groundwater. The 1994 ROD stated that the practice in the region was to drill drinking water wells into the sandstone aquifer, so any future risk due to the contaminated groundwater appeared unlikely.

The 1994 ROD also stated that the Western Upper Peninsula Health Department (WUPHD) and the Michigan Department of Public Health regulated the installation of drinking water wells in the vicinity of the Site. These local authorities have been alerted of the potential future threat and currently have permitting programs and development review procedures in place. Thus, the 1994 ROD determined that treatment of groundwater to reduce the toxicity, mobility and volume of contaminants permanently and significantly was not found to be necessary to protect human health.

Contamination associated with Torch Lake sediments, was determined to pose a limited ecological threat. This was documented in the 1994 ROD for OU2 and later, in the 2001 Baseline Study (EPA, 2001 (2)). The lake bottom sediment along the western shoreline consists of stamp sands that were deposited in the lake over many years of active disposal of copper ore milling and associated mining wastes into the lake. The most significant ecological impact is the severe degradation of the benthic communities in Torch Lake as a result of metal loadings from the mine tailings. However, given the wide distribution and large volumes of stamp sands deposited in Torch Lake, remediation of the lake bottom was considered not practical, feasible, nor potentially, in the long run necessary.

Preliminary research information seemed to suggest that Torch Lake may be undergoing a recovery in those deeper areas which are not directly subject to the sands eroded from the shoreline. EPA was hopeful that once the remedy for OU1 and OU3 had been implemented, Torch Lake would cease to be affected by sands eroding from the shore and thus may be able to recover naturally. The 1994 ROD stated that the monitoring of the OU2 study area would be provided for as an outgrowth of the remedy and FYR process for OU1 and OU3. The monitoring program would be included as part of the Operation and Maintenance (O&M) Plan for OU1 and OU3 to provide sufficient information on the status of the OU2 study areas. These reasons are why the “No Action” decision for OU2 was made (EPA, 1994).

The OU2 1994 ROD selected “No Action”, despite the selected remedy relying on multiple conditions, including ICs already in place. Section 1.5.6 of the “Comprehensive Five-Year Review Guidance” states that RODs that select “No Action” where protectiveness relies on an IC may need to conduct a FYR of the remedy (EPA, 2001 (1)). A decision document or other documentation to the Site file that will provide more clarity regarding the selected remedy is recommended and is included as an issue and recommendation in this FYR.

### *2009 ROD Amendment for OU3*

EPA issued a ROD Amendment for OU3 in 2009. The document addresses the Quincy Smelter portion of the Site. The 1992 ROD had determined that no action should be taken at Quincy Smelter, as it had been slated for development as a national historic park. Data presented in the second FYR in 2008 showed that no development had occurred and the stamp sands and slag at the Site continued to erode into the Portage Channel (EPA, 2008) The amendment called for:

- Installation of a soil and vegetative cover consistent with the other stamp sand areas in OU3 over the exposed tailings at Quincy Smelter, consisting of the approximately 6.5 acres of land situated outside of the fenced buildings and structures.
- The areas of the Quincy Smelter Property still not planned for cover include: the fenced area with the historic buildings (approximately 6 acres), the three large slag piles (approximately 4 acres), the recreational trail (approximately 3 acres), the wooded/brush area immediately adjacent to M-26 which is already vegetated (approximately 1 acre).
- The original remedy of no action for this area would still apply for the fenced in area of the property as it still may be developed as part of the Keweenaw Historic Park. However, the amended remedy calls for markers to be installed to notify site visitors of restrictions within the currently fenced area. The fence will be maintained as an access restriction until the area is developed as a historic park or other future uses are approved by authorized entities.

- Assessment and, if necessary, improvement of erosion control along the shoreline where exposed stamp sands can erode into Portage Lake.
- Establishing Institutional Controls (ICs) in the form of restrictive covenants (RCs) to protect and maintain the cover and access restrictions. EPA, in consultation with the State of Michigan, will develop a RC enforceable under Michigan law that will prevent future residential use at Quincy Smelter in order to reduce potential risks at the Site.
- Long-term cover and IC monitoring to ensure its long-term integrity and protectiveness (EPA, 2009).

The RAOs selected in the 1992 ROD for OUs 1 and 3 apply to the amended remedy selected for the Quincy Smelter property in the 2009 ROD Amendment. In addition, regarding the objectives of the selected remedy components, the 2009 ROD Amendment noted the following:

- The soil and vegetative cover was selected to minimize erosion and aerial deposition of the stamp sands; and
- ICs were selected to protect the long-term integrity of cover materials, restrict residential use at the Quincy Smelter, and minimize direct contact with the stamp sands and slag piles.

### **Status of Implementation**

In 1994, the EPA entered into AOCs with several landowners, giving the landowners covenants not to sue and contribution protection in exchange for agreements to provide access and record RCs. The RCs were to be recorded within six months of the AOC's effective date and required the property owner to ensure cover material remained in place over the tailings. EPA closed out cost recovery actions for the Site in 1997. The landowners recorded these covenants.

In addition, on January 10, 1997, EPA entered into a prospective purchaser agreement (PPA) with the landowners at the Mason tailing pile, specifically, Quincy Development Landowners and Lakeshore Estates Associates. This action was undertaken to address potential concerns purchasers might otherwise have regarding CERCLA liability, and thereby encourage redevelopment. Under the PPA, the landowners provided specific benefits to EPA, including access and borrow soil located on land owned by Lakeshore Estates Associates.

EPA signed an Interagency Agreement with the Natural Resource Conservation Service (NRCS) to perform the remedial design work for OU1 and OU3. The remedial design was completed for the entire Site in 1998. On-Site construction for OU1 and OU3 began in June 1999 and was completed in 2005. A Preliminary Close-Out Report documenting the construction completion was signed on September 23, 2005 (EPA, 2005 (2)).

Remedial action construction activities at OU1 were performed according to approved design and specifications at Lake Linden, Hubbell/Tamarack City, and Mason Sands. EPA anticipates that cover material and shoreline protection will continue to meet RAOs established for the Site. The areas remediated included cover material consisting of six to ten inches of sandy-loam soil and a vegetative mat (EPA, 2013).

In 2001, EPA completed the *Baseline Study Report Torch Lake Superfund Site* to establish the physical, chemical, and benthic community conditions of Torch Lake and chemical conditions of nearby groundwater before the completion of the remedial action. The baseline study included:

- Surface water sampling
- Surface sediment and core sediment sampling
- Sediment toxicity tests
- Benthic community sample collection
- Groundwater sampling
- Sedimentation testing

It was EPA's objective for the baseline sampling to establish methods and data which can be used as a guide for the sampling efforts of future long-term monitoring activities and as a comparison to future long-term monitoring data (EPA, 2001 (2)).

For Lake Linden, EPA and the Michigan Department of Environmental Quality (MDEQ) (now EGLE) determined that the remedy was functioning as intended, and in April 2002, EPA conducted a partial deletion of Lake Linden and all of OU2 from the NPL. Hubbell/Tamarack City were deleted from the NPL via a partial deletion in 2004.

Remedial action construction activities at OU3 were performed according to approved design and specifications at Dollar Bay, Point Mills, Calumet Lake (14 acres), Boston Pond (25 acres), and Michigan Smelter (14 acres). EPA anticipates that cover material and shoreline protection installed at the Site will continue to meet RAOs established for the Site. No remedial action was taken for the Freda and Redridge locations because EPA has continued to determine it to be technically impracticable to implement the chosen remedy at these locations due to those areas being heavily impacted by pounding waves and water currents.

The basis for the exclusions to the Isle Royale and HCRC areas in the 1992 ROD have remained unchanged. Development of the Isle Royale areas as a residential area and as part of a sewage treatment facility is complete. The area within Isle Royale to be used by the Superior Block Company and the HCRC are still used as such.

In 2002, several area citizens and local government officials communicated verbally and by correspondence to EPA that they observed large clouds of stamp sand dust blowing from Gull Island into Torch Lake. Gull Island is located approximately 1500 feet off of the western shore of Torch Lake at Hubbell/Tamarack. It is approximately 13.6 acres in size and is made primarily of stamp sands. In 2003 and 2004, EPA undertook action at the island not specifically laid out in the OU1 or OU3 RODs. Specifically, EPA, with MDEQ and NRCS assistance, planted approximately 38,000 individual trees, shrubs and beach grass into the stamp sands that comprise the island, without the use of clean cover material. A Memorandum to File was created on December 13, 2002, to document the decision. EPA believed that the potential for exposed stamp sands on the island to contribute to the degradation of the benthic community in Torch Lake was high enough to justify taking an action consistent with the 1992 ROD (EPA, 2002).

In 2004, EPA conducted a removal action to remove drums, vats, tanks, and small containers from Quincy Smelter. In 2005, EPA removed asbestos from two of the structures of the Quincy Smelter part of the Site (EPA, 2005). The 2009 ROD Amendment required remedial actions including the placement

of the soil and vegetative cover and shoreline protection to portions of the Quincy Smelter area. This work was completed during 2011 (EPA, 2009).

The Scales Creek (19 acres) and North Entry (32 acres) remediation plans were created as a part of the remedial design completed for other areas in 1998. These locations were under review to determine whether remedy implementation was needed. Scales Creek was added as a Site location in 1996 during the remedial design phase. The construction of the soil and vegetative cap was completed for both locations in 2005 (EPA, 2003).

During 2007, as a result of historical low water levels, EPA conducted a removal assessment along the western shoreline of Torch Lake. Areas within the Lake Linden recreation area exhibited exposed sediments and clay-like material containing high levels of lead, PCBs, and arsenic. EPA then conducted a removal action at the Lake Linden beach and marina to remove the identified materials (EPA, 2007).

In 2008, EPA conducted a removal action at the Mason Sands portion of the Site. The action included the removal of approximately 30 tons of arsenic contaminated soil and 10 drums containing residual waste, and backfilling of soil removal areas with clean fill (EPA, 2008).

In 2010, SulTRAC conducted additional sampling in order evaluate the effectiveness of the remedy selected in the 1992 ROD. The sampling plan would focus on areas that were discussed in the 2008 FYR. This included sampling of surface water and sediments in Boston Pond and Calumet Lake. Additionally, groundwater sampling was conducted, including at monitoring wells and residential wells installed in stamp sands. The residential groundwater samples were taken on parcels suspected of having wells screened in the stamp sands (SulTRAC, 2010). The results from the residential groundwater sampling did not have exceedances of the relevant Safe Drinking Water Act Maximum Contaminant Levels (MCLs)<sup>1</sup>, while exceedances of the MCLs were found in two of the monitoring wells sampled. (EPA, 2013).

In 2012, EPA conducted a partial deletion for the Michigan Smelter, Isle Royale Sands, and Mason Sands areas and, in 2013, conducted a partial deletion for the Calumet Lake and Quincy Smelter areas.

### **Institutional Controls**

Table 3 below summarizes ICs either planned or in place for the restricted areas of the Site. A map depicting the current Site conditions and areas that do not allow for UU/UE will be developed in the Institutional Control Implementation and Assurance Plan (ICIAP) discussed below.

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<sup>1</sup> MCLs are the highest level of a contaminant that is allowed in drinking water under the federal Safe Drinking Water Act.

**Table 3: Summary of Planned and/or Implemented ICs**

| Media, engineered controls, and areas that do not support UU/UE based on current conditions | ICs Needed | ICs Called for in the Decision Documents | Impacted Parcel(s)                        | IC Objective   | Title of IC Instrument Implemented and Date (or planned)   |
|---|------------|--|---|--|--|
| Soils with residual contamination in OU1 and OU3.   | Yes        | Yes                                      | Approximately 85 Parcels across the Site. | Protect vegetative cover and prevent residual mining contamination from entering surface water by ensuring that: (1) no disturbance of the vegetative cover occurs, or (2) owner is required to replace soil and repair vegetative cover.  | Approximately 25 RCs, have been completed.<br><br>Approximately 60 additional properties require RCs.  |
| Groundwater associated with the entire Site (OU2).  | Yes        | Yes                                      | NA  | Prohibit well installation or screening at depths where groundwater will be impacted by residual mining wastes.  | Institutional programs and practices administered by the local government. Including Western Upper Peninsula District Health Department Ordinance dated 3/14/1998. |
| Quincy Smelter Superfund Area (OU3 ROD Amendment).  | Yes        | Yes                                      | Quincy Smelter Area                       | Protect vegetative cover and prevent residual mining contamination from entering surface water by ensuring that: (1) no disturbance of the vegetative cover occurs, or (2) owner is required to replace soil and repair vegetative cover.<br><br>Prevent future residential use. | Quincy Smelter parcel RC completed, recorded on 1/24/13.   |

### Status of Access Restrictions and ICs:

The 1992 ROD and 2009 ROD Amendment required that a soil and vegetative cover be constructed over large portions of tailings piles. The 1992 ROD further required that deed restrictions be placed on those properties where the vegetative cover had been constructed in order to prevent future erosion of mining wastes into Torch Lake. Specifically, the 1992 ROD required deed restrictions to ensure that stamp sands and/or slag material are ultimately re-vegetated after any activity which disturbs the soil cover. The 2009 ROD Amendment required that the Quincy Smelter parcel also receive a soil and vegetative cover and ICs. The Quincy Smelter ICs, in the form of an RC, were recorded on January 24, 2013.

In 1994, EPA entered into an AOC with certain affected landowners requiring them, within six months of the AOC's effective date, to implement the appropriate deed restriction on their property. The deed restrictions were to bind future owners by running with the land. The landowners complied with the AOC and recorded these covenants.

Not all properties requiring RCs have them; during this review period EGLE and EPA worked on identifying all of the remaining properties for which ICs are needed, created draft RCs, and conducted outreach to property owners (EPA, 2018 (2)). EPA should continue working to implement these controls for the properties where they are still required.

ICs were also discussed in EPA's No Action decision in the component of the 1994 OU2 ROD discussing Site-wide groundwater. The decision relied on county and local government programs and practices to control potential future exposure to Site-affected groundwater. It was expected that these governmental controls would ensure no new wells would be installed within existing stamp sands but drilled further down into bedrock where there is no known Site-related contamination. The Western Upper Peninsula Health Department controls groundwater use through a policy, review and permitting process. The Houghton County Health Department also has a permitting program for the installation of private wells. Local governmental units responsible for well installation permitting are aware of the stamp sands' location. EPA provided the Houghton County Health Department and every well permitting office with maps showing the areas of stamp sands with each parcel's respective locators, which included Township, Range, and section. EPA contacted the Western Upper Peninsula Health Department via email in August 2022 and confirmed that the department continues the review and permitting process, to ensure potable drinking water wells are not screened in the stamp sands areas.

The Amendment for OU3 included the requirement for fencing and markers in the Quincy Smelter locations which were not planned for cover. The fence would be maintained as an access restriction until the area was developed as a historic park and the markers will be installed to notify site visitors of the restrictions of the fenced in area.

### Current Compliance:

Not all of the required ICs have been implemented. There are approximately sixty parcels which still need ICs to be implemented. Based upon the annual site visit, the capped areas appeared to be in compliance with use restrictions.

### IC Follow up Actions Needed:

EPA and EGLE should implement the additional ICs that are needed and required per the RODs. Further, to assure proper maintenance and monitoring of effective ICs, an Institutional Control



Implementation and Assurance Plan (ICIAP) should be created as a way to ensure that the ICs are in place and properly implemented. The ICIAP should include Long-Term Stewardship (LTS) actions to ensure that effective procedures are in place to properly maintain and monitor the Site. As part of the IC monitoring and maintenance procedures an update to the O&M Plan to include an annual report which demonstrates that the Site was inspected to ensure no inconsistent uses have occurred, to certify that ICs remain in place and are effective, and to document that any necessary contingency actions have been executed is recommended. The previous FYR recommended the creation of an ICIAP. That recommendation is carried forward in this FYR.

### **Systems Operations/Operation & Maintenance**

A June 2015 Site-wide O&M Plan for Torch Lake established an O&M program for OU1 and OU3 (CDM Smith, 2015). The 1994 ROD stated that monitoring of the OU2 study area will be done in part by the monitoring program for OU1 and OU3. The 1994 ROD lists monitoring which includes groundwater, surface water, sediment, and general ecological monitoring will be included as part of the OU1 and OU3 O&M activities. The goal of this monitoring is to be used to reflect the protectiveness of the vegetative cover in preventing further stamp sand releases into Torch Lake. However, the current O&M program and plan does not incorporate this type of monitoring, and therefore, an update to the O&M plan to include these monitoring elements is needed.

The overall goal of the current O&M program is to assess and maintain the soil cover, as well as the vegetation establishment by conducting inspections and maintenance activities of those remedies. Based on findings and recommendations from the inspections, necessary repairs to the soil cover can be made in a timely manner to allow them to function as designed and continue to prevent the migration of stamp sands into the air and/or adjacent water bodies.

Soil cover inspections are a key component of O&M and provide the information used to track progress on establishment of vegetation and identify areas of the remedy susceptible to damage from erosional forces and/or other activities. EGLE is responsible for implementing the Site-wide O&M Plan.

EGLE and their contractors conduct yearly visits to the Site. These visits include inspections of the implemented remedy across all of the areas of the Site in which remedial actions took place. The most recent Site O&M activities took place in July 2022. The yearly Site activities include cap inspections and noting areas that may need further maintenance work. Maintenance work is then conducted on areas of need.

In 2019, SulTRAC completed work repairing the soil and vegetative cap at one of the properties that is a part of OU3 Point Mills. EPA collected samples from the cover and confirmed that the cover originally installed did not meet the required specifications. The cap restoration included disking the soil and adding additional topsoil, fertilizer, and a native species seed mix. During the most recent Site visit (July 2022), the quality of the soil cap and vegetative cover appeared to have improved (SulTRAC, 2019).

In 2019, EGLE conducted O&M work in different areas of the Site. Part of the work was to address issues caused by a flash flooding event which occurred in 2018. The areas of the Site where work was completed were Boston Pond, Lake Linden, Mason Sands, Michigan Smelter, and Point Mills. Work included addressing areas of erosion where there were exposed stamp sands. The work generally consisted of repair by application of gravel, topsoil and/or riprap followed by seeding/mulching if appropriate. The completed work controlled the exposed stamp sands and erosion issues within the locations where maintenance work took place.

In 2022, O&M repairs took place in two of the Site areas, North Entry and Hubbell/Tamarack. Work at North Entry included addressing surface disturbances and erosion of the cap. Ruts and surface disturbances were filled, and a parking lot area which is part of the cap was expanded to provide additional parking; boulders and signage were installed to prevent trespassing and future cap damage. Work at Hubbell/Tamarack included the repair of multiple patches where erosion of the cap was evident. The repair work included the addition of topsoil and seeding to repair the soil and vegetative cap.

### III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

**Table 4:** Protectiveness Determinations/Statements from the 2018 FYR

| OU #     | Protectiveness Determination | Protectiveness Statement  |
|----------|------------------------------|---|
| 1/3      | Short-term Protective        | The remedy at OU1 and OU3 is currently protective of human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands into the surface water of Torch Lake while it recovers over time. Approximately sixty properties have effective RCs in place. However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness: ensure the area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles is properly covered with soil and vegetation; develop an ICIAP; identify the remaining properties that require ICs and implement them; and update the O&M Plan to incorporate LTS procedures that provide for monitoring and tracking compliance with existing ICs and annual certifications to EPA that ICs are in place and effective. |
| 2        | Short-term Protective        | The remedy at OU2 is currently protective of human health and the environment because existing residential wells screened in the stamp sands are not contaminated above drinking water standards and effective ICs are in place to prevent future wells being screened in the stamp sands. However, in order for remedy to be protective in the long term, the following action needs to be taken to ensure protectiveness: update the O&M Plan to incorporate LTS procedures that provide for monitoring and tracking compliance with existing ICs and annual certifications to EPA that ICs are in place and effective.   |
| Sitewide | Short-term Protective        | The remedy at the Torch Lake Superfund Site currently protects human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands to Torch Lake   |

|  |  |  |
|--|--|--|
|  |  | <p>while it recovers over time. Approximately sixty properties have effective RCs in place. Existing residential wells screened in the stamp sands are not contaminated above drinking water standards and effective ICs are in place to prevent future wells being screened in the stamp sands. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: ensure the area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles is properly covered with soil and vegetation; develop an ICIAP; identify the remaining properties that require ICs and implement them, and update the O&amp;M Plan to incorporate LTS procedures that provide for monitoring and tracking compliance with existing ICs and annual certifications to EPA that ICs are in place and effective.</p> |
|--|--|--|

**Table 5: Status of Recommendations from the 2018 FYR**

| <b>OU #</b> | <b>Issue</b>   | <b>Recommendations</b>  | <b>Current Status</b> | <b>Current Implementation Status Description</b>  | <b>Completion Date (if applicable)</b> |
|-------------|--|---|-----------------------|---|--|
| 1,3         | <p>The area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles was excluded from the area to be covered with soil and vegetation. Excavation was to stop at seven (7) feet above the water table. This portion subsequently was to be covered with soil or soil and vegetation. It appears the excavation may have extended below the water table. It must be covered with soil and vegetation pursuant to the ROD.</p> | <p>Ensure that this area is covered with soil and vegetation pursuant to the ROD.</p> | Ongoing               | <p>Outreach was made to the HCRC in August 2022 to learn of their future plans regarding the designated area and to confirm that the area's use is still consistent with the 1992 ROD. HCRC responded that they continue to use the area for source material and plan to spread cover once the pit is ready to be closed. EPA will work with the HCRC to ensure that the area is maintained according to the ROD.</p> |  |

|       |   |   |                           |   |  |
|-------|---|---|---------------------------|---|--|
| 1,3   | Not all required ICs are in place.  | Develop and submit an ICIAP. The purpose of the ICIAP is to conduct IC evaluation activities to determine which ICs are required by the decision documents are already in place, to ensure that any already-implemented ICs are effective, to evaluate the specific additional ICs that are needed, and to ensure that LTS procedures are put in place so that all ICs, once implemented, are properly maintained, monitored, and enforced. | Addressed in Next FYR     | EPA continues to work towards putting all ICs in place at all properties where they are required. An ICIAP has not yet been developed and is still recommended for the Site.  |  |
| 1,3   | Properties at OU1 and OU3 require deed restrictions. RCs have been implemented at many, but not all properties. | Identify the remaining properties that require ICs and implement them.  | Addressed in the Next FYR | During this review period EGLE and EPA worked on identifying all of the remaining properties for which ICs are needed, created draft RCs, and conducted outreach to property owners (EPA, 2018 (2)). EPA is working to implement these controls for the properties where they are still required. |  |
| 1,2,3 | Procedures are not in place to ensure LTS of ICs at the Site.   | Once all required ICs are implemented, update the O&M Plan to incorporate LTS procedures which include monitoring and tracking compliance with existing ICs and providing annual certifications to EPA that the   | Addressed in the Next FYR | LTS procedures are still recommended to be implemented at the Site and will be included in the ICIAP.   |  |

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  | required ICs are in place and effective. |  |  |  |
|--|--|--|--|--|--|

OTHER FINDINGS from 2018 Five-Year Review:

In addition, the following recommendations were identified during the 2018 FYR (and which may improve performance of the remedy, reduce costs, improve management of O&M, accelerate site close-out, conserve energy, promote sustainability, etc.), but do not affect current or future protectiveness. A status update for each recommendation is provided below.

1-In 2014, one of the property owners at Point Mills expressed significant concerns and disappointment in the type of soil and vegetative cover they received. They were promised cover with grasses and wildflowers, and sandy loam material. Although the cover is functioning to prevent erosion, it is mostly clay, rocks, and weeds, and does not drain when wet. In 2015, EPA collected samples from the cover and confirmed that the cover installed did not meet the required specification. EPA is working with the property owner on improving the quality of the vegetation cover.

- *Status update:* EPA conducted work on the property in 2019 to improve the cover and vegetative cap. During the most recent Site inspection, it was observed that the new cover has improved the quality of vegetation on the property.

2-Once ICs are in place, the Site could be considered for deletion from the NPL. EPA and MDEQ plan to pursue deleting the four remaining areas at the Site.

- *Status update:* EPA and EGLE (formerly MDEQ) are still working towards placing ICs in all areas where they are needed. When an area has all ICs in place, that area can be considered for deletion.

3-The Portage Lake Water and Sewage Authority (PLWSA) is spreading biosolids on the Mason Sands area of the Site. MDEQ is regulating and monitoring this activity. Monitoring results from previous years indicated no impacts to the Torch Lake from biosolids application. However, it is recommended that PLWSA resume monitoring to confirm the lack of biosolids impact to the lake.

- *Status update:* The 2018 FYR indicated that the process of spreading biosolids on the Mason Sands area is acceptable under the ROD and that EGLE (formerly MDEQ) is regulating and monitoring the activity (EPA, 2018). The PLWSA was contacted regarding the spreading of the biosolids at the Mason Sands location. The PLWSA response indicated that the PLWSA is still spreading biosolids at the Mason Sands location but at a lesser rate than what was done previously. Additionally, soil monitoring is conducted every two years and groundwater monitoring was conducted annually for a 17-year period but has been omitted with the grace of MDEQ at the time.

4-Considering the fact that per and polyfluoroalkyl substances (PFAS) may have been used as surfactants to enhance recovery of metals from ores in copper, MDEQ (now EGLE) has recommended a PFAS evaluation or sampling where there is information suggesting that PFAS was likely used or released at Superfund Sites. EPA and MDEQ (now EGLE) will further discuss and determine what next steps to take.

- *Status update:* No action was taken regarding sampling for PFAS compounds during this review period. In 2022, EPA updated the regional screening level and health advisories for certain PFAS compounds. PFAS sampling is an issue/recommendation in this FYR.

5-Because groundwater monitoring wells at the Site have indicated concentrations of arsenic and lead above maximum contaminant levels (MCLs), EPA and MDEQ will evaluate the need for periodic monitoring of residential wells screened in the stamp sands. EPA and MDEQ will also evaluate the need for monitoring of sediments nearest the vegetated covers as a measure of their effectiveness in preventing stamp sands migration into Torch Lake.

- *Status update:* No sampling of residential wells was conducted or need for sampling was recommended during this review period. As background, per the 2013 FYR under Data Review: *In May and August 2010, the U.S. EPA collected groundwater samples from residential and monitoring wells potentially screened in the stamp sands; and reviewed existing data collected from municipal water supply wells. This investigation was conducted to assess the current human health exposure to contaminated groundwater from the site stamp sands. Data generated from this investigation indicates there is no current unacceptable exposure of site-related contaminants via groundwater. The residential wells sampled in May and August of 2010 and the municipal well data reviewed revealed no metal concentrations in excess of the Safe Drinking Water Act MCLs. Two of the ten monitoring wells sampled had concentrations of arsenic above the MCL of 10 parts per billion (ppb). Groundwater from a monitoring well in Hubbell/Tamarack had arsenic concentration of 22.5 ppb and groundwater from a monitoring well in Lake Linden had arsenic concentration of 14.8 ppb. However, there are no residential wells currently screened in stamp sands in these areas. Water from municipal wells located in the Torch Lake area (Osceola Township and the City of Houghton) had no concentrations of arsenic or copper above MCLs.* (EPA, 2013; SulTRAC, 2010) The 2013 FYR included a recommendation to include groundwater and residential well monitoring when the O&M Plan was finalized. However, the 2015 O&M Plan did not include such monitoring as it was not considered necessary based both on the 2010 SulTRAC report and the local permitting programs that are in place to prevent wells being screened in stamp sands. The 2018 FYR included the above recommendation to (re)evaluate the need for periodic monitoring of residential wells screened in stamp sands. Because the 1994 ROD calls for groundwater, surface water, sediment, and general ecological monitoring, including an evaluation of the rate and effectiveness of organic sediment build-up and the recovery of the benthic community, as part of the O&M plan for OUs I & III, this FYR includes an issue and recommendation for the O&M plan to be updated to include such monitoring. The need for periodic monitoring of residential wells installed in the stamp sands will be reconsidered as part of the updated O&M plan.

#### **IV. FIVE-YEAR REVIEW PROCESS**

##### **Community Notification, Involvement & Site Interviews**

A public notice was made available by newspaper posting in the Daily Mining Gazette on 9/22/2022, stating that there was a FYR and inviting the public to submit any comments to EPA. EPA received comments from the Keweenaw Bay Indian Community (KBIC) and from the Torch Lake Public Action Council. The KBIC had comments regarding the “Other Findings” issues presented in the 2018 FYR; updates to those issues are located in the Progress Since the Last Review section in this FYR. Other comments were made asking about the goal dates for identified issues; the milestone dates listed in Section VI are the dates that the issues are estimated to be completed. The results of the review and the

report will be made available at the Site information repository located at the Portage Lake District Library, 58 Huron St., Houghton, Michigan, and the Lake Linden/Hubbell Public Library, 601 Calumet St., Lake Linden, Michigan. A copy of the public notice is included as Appendix D.

### **Data Review**

No monitoring data was collected during the period of this FYR, therefore there is no data to review.

### **Site Inspection**

The inspection of the Site was conducted from July 19 to July 21, 2022. In attendance were Glenn Lautenbach, EPA; Walelign Wagaw and Robert Franks of EGLE; and Clara Austin and Nic Ropotos from EGLE's contractor, AECOM. The purpose of the inspection was to assess the protectiveness of the remedy, evaluate the performance of the soil and vegetative cap where applied, and evaluate future remedy implementation problems and needs. The inspection visited all locations of the Site where the remedy was conducted. Erosion of the cap, areas of sparse vegetation and other potential issues were noted during the inspection.

EGLE has documented shoreline erosion at multiple Site locations (Lake Linden, Hubbell/Tamarack City, Mason Sands, Michigan Smelter, and Point Mills). The erosion of the cap can cause the stamp sands to become exposed. EPA and EGLE will evaluate this issue and take the appropriate action. Additional information regarding the Site inspection can be found in Appendix E.

## **V. TECHNICAL ASSESSMENT**

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

### **Question A Summary:**

Answer: Yes

Based on a review of relevant documents, applicable or relevant or appropriate requirements (ARARs), risk assumptions, and the results of the annual Site inspections, the soil cover and vegetation remedy implemented per the 1992 ROD and 2009 ROD Amendment is functioning as intended, by reducing potential risks associated with direct contact or inhalation of contaminants in the tailings and preventing erosion of stamp sands into the surface water of Torch Lake.

Properties at OU1 and OU3 require deed restrictions to ensure no disturbance of the vegetative cover occurs or, if disturbance occurs, the owners are required to replace the soil and repair the vegetative cover. RCs have been implemented at some but not all properties.

The OU2 ROD addressing groundwater relies on governmental controls to prevent use of groundwater impacted by contaminants from the Site, specifically, to prevent wells from being screened in the stamp sands.

### ***System Operations/O&M***

Through this review period EGLE has been the lead for Site O&M. O&M includes an annual Site inspection, which includes inspection of soil caps and vegetative covers. The inspections review all areas in which capping was conducted as part of the 1992 ROD and 2009 ROD Amendment. Areas in which additional work is needed to repair the cap to preserve the remedy are noted. The annual Site inspections and conducted repairs appear effective in maintaining the effectiveness of the remedy. Repairs to the Site cap were conducted in 2019 (Boston Pond, Lake Linden, Mason Sands, Michigan Smelter, and Point Mills) and 2022 (North Entry and Hubbell/Tamarack City). The Site O&M plan does not currently include any environmental monitoring. An update to the O&M plan to include these monitoring elements is needed and should be done to ensure that this type of monitoring occurs at the Site. The goal of this monitoring is to investigate whether the actions taken at OU1 and OU3 are improving the OU2 area. This sampling was not conducted during this FYR period. EPA has determined that since Torch Lake will take an unprecedented amount of time to recover, monitoring should occur relatively infrequently (EPA, 2013).

In Site inspections, EGLE has documented multiple locations where rip rap was placed to deter erosion, but shoreline erosion has still occurred. The area of the erosion is minimal compared to the total area which has been covered during the Site remedial action work. The capped areas are still achieving the 1992 ROD RAOs of reducing the movement and minimizing the release of tailings into the environment. This issue was also noted in the previous FYR and continues in this review. EPA and EGLE will continue to evaluate this issue and take appropriate action.

The previous FYR and current comments from EGLE identified the HCRC area and its compliance with procedures listed in the 1992 ROD as an issue. In the 1992 ROD Responsiveness Summary, it is stated that the tailing pile used by the HCRC as source material to spread on the road during winter to provide traction for motor vehicles did not pose an unacceptable risk to human health (EPA, 1992 (2)). The requirements of the ROD are in place to prevent the release of tailings into the waterbodies. In 2001, 31 of the 46 acres included in this area were capped, including the land abutting Portage Lake, and currently only 15 acres are in such use further limiting the area used by the HCRC. EPA will work with the HCRC to ensure that the tailing excavation practices are consistent with the 1992 ROD.

### ***Implementation of Institutional Controls and Other Measures***

Properties at OU1 and OU3 require RCs to ensure no disturbance of the soil and vegetative cover occurs. If a disturbance occurs, the owner is required to replace the soil and repair the vegetative cover. RCs have been implemented at some, but not all, of the Site properties. EPA is working to get the remaining RCs in place. Even though required ICs have not all been implemented, annual Site visits confirm that the capped areas appear to be in compliance with the use restrictions. The area used by the HCRC needs to be reviewed to ensure compliance with the use restrictions listed in the 1992 ROD.

The OU2 ROD addressing groundwater relies on governmental controls to prevent use of groundwater impacted by contaminants from the Site, specifically, to prevent wells from being screened in the stamp sands. EPA contacted the WUPHD during the FYR process by email and confirmed that they have a policy, review, and permitting process to ensure that drinking water wells are not screened in the stamp sands.



The 2018 FYR also contained recommendations for IC plans to be developed. The recommendations regarding the ICs are carried forward in this FYR and include the development of an ICIAP to include LTS procedures to ensure Site ICs are properly maintained, monitored, and enforced.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Answer: No

The RAOs in place at the time of the remedy selection are still valid. There have been no known changes in ARARs, newly promulgated standards and/or changes or to be considered (TBCs) which could call into question the protectiveness of the remedy.

PFAS substances may have been used as surfactants to enhance recovery of metals from ores at the Site. A PFAS evaluation or sampling event is recommended where there is information suggesting that PFAS was used or released at a Superfund Site. Sampling for PFAS substances is recommended as part of this FYR.

There was a change in the land use designation for the Michigan Smelter area during the FYR period. This changed the land use from residential to recreational land use. This change in land use does not affect the remedy or protectiveness as the ICs at this area of the Site is still in place and effective.

### **Question B Summary:**

#### ***Changes in Standards and TBCs***

Standards outlined and updated in the decision document and discussed in the previous FYR reports are still valid at the Site. There have been no known changes in ARARs or standards affecting the protectiveness of the remedy since the time of remedy selection.

#### ***Changes in Toxicity and Other Contaminant Characteristics***

Neither the toxicity factors for the COCs nor other toxicity factors have changed in a way that could affect the protectiveness of the remedy during this FYR period. The remedy required stamp sands to have a soil and vegetative cover, and the owners of affected parcels to record RCs to protect the covers. Therefore, changes in the COC toxicity generally would not affect the remedy's effectiveness.

#### ***Changes in Exposure Pathways***

OU1 and OU3: The exposure assumptions used to develop the Human Health Risk Assessment included exposure to contaminated tailings and slag from a possible current and future ingestion, inhalation, and dermal contact pathway.

OU2: The exposure assumptions used to develop the ecological assessment included high toxicity to benthic communities from high metal concentrations in sediments. Human health risk assessment exposure routes included ingestion and dermal exposure to surface water, ingestion of fish, and ingestion of sediments.

There have been no changes in the potential exposure pathways at the Site since the time of remedy selection. No other changes in the Site conditions that affect exposure pathways were identified as part of this FYR.

**QUESTION C:** Has any other information come to light that could call into question the protectiveness of the remedy?

Answer: No

No additional information was discovered to call into question the protectiveness of the remedy. There was damage to parts of the Site cap due to a storm causing flooding in 2018. O&M repairs were conducted in 2019 to address some of the damaged areas. Currently, there are no known Site issues related to climate change not apparent during the remedy selection, remedy implementation, or O&M that would interfere with the protectiveness of the remedy. Primary potential climate change impacts which could impact the Site remedy should they occur include rise in Torch Lake, Lake Superior and other Site waterbodies water levels, changes in precipitation, and increasing risk of floods due to the proximity of remedy areas to Torch Lake and Lake Superior; however, no data are known at this time indicating that these potential climate change impacts are actually occurring or will occur to an extent that they will impact the Site.

**VI. ISSUES/RECOMMENDATIONS**

| Issues/Recommendations  |  |
|---|--|
| <b>OU(s) without Issues/Recommendations Identified in the Five-Year Review:</b> |  |
| None  |  |

| Issues and Recommendations Identified in the Five-Year Review: |
|--|
|--|

| <b>OU(s): 1, 2, 3</b>         | <b>Issue Category: Institutional Controls</b>  |                   |                 |                |
|-------------------------------|--|-------------------|-----------------|----------------|
|                               | <b>Issue:</b> An ICIAP that includes procedures for LTS of ICs is required.  |                   |                 |                |
|                               | <b>Recommendation:</b> Prepare and implement an ICIAP containing LTS procedures to ensure that effective ICs will be monitored and maintained at the Site. |                   |                 |                |
| Affect Current Protectiveness | Affect Future Protectiveness   | Party Responsible | Oversight Party | Milestone Date |
| No                            | Yes  | EPA/State         | EPA             | 12/1/2024      |

|                       |   |  |  |  |
|-----------------------|---|--|--|--|
| <b>OU(s): 1 and 3</b> | <b>Issue Category: Institutional Controls</b>   |  |  |  |
|                       | <b>Issue:</b> Not all required ICs are in place.  |  |  |  |
|                       | <b>Recommendation:</b> Continue to work to emplace ICs at all properties where they are required. |  |  |  |

| Affect Current Protectiveness | Affect Future Protectiveness | Party Responsible | Oversight Party | Milestone Date |
|-------------------------------|------------------------------|-------------------|-----------------|----------------|
| No                            | Yes                          | EPA               | EPA             | 8/31/2025      |

| OU(s): 1 and 3                | <b>Issue Category: Operations and Maintenance</b>   |                   |                 |                |
|-------------------------------|---|-------------------|-----------------|----------------|
|                               | <b>Issue:</b> EGLE has documented shoreline erosion is occurring in some of the capped areas.                                     |                   |                 |                |
|                               | <b>Recommendation:</b> Work with EGLE to evaluate the issue and take appropriate action to control the erosion in affected areas. |                   |                 |                |
| Affect Current Protectiveness | Affect Future Protectiveness  | Party Responsible | Oversight Party | Milestone Date |
| No                            | Yes   | State             | EPA             | 3/1/2025       |

| OU(s): 1 and 3                | <b>Issue Category: Other</b>  |                   |                 |                |
|-------------------------------|---|-------------------|-----------------|----------------|
|                               | <b>Issue:</b> The area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles was excluded from the area to be covered with soil and vegetation. Excavation was to stop at seven (7) feet above the water table. This portion subsequently was to be covered with soil or soil and vegetation. It appears the excavation may have extended below the water table. It must be covered with soil and vegetation pursuant to the ROD. |                   |                 |                |
|                               | <b>Recommendation:</b> Ensure that this area is covered with soil and vegetation pursuant to the ROD.   |                   |                 |                |
| Affect Current Protectiveness | Affect Future Protectiveness  | Party Responsible | Oversight Party | Milestone Date |
| No                            | Yes   | EPA               | EPA/State       | 6/31/2025      |

| OU(s): 1 and 3                | <b>Issue Category: Monitoring</b>   |                   |                 |                |
|-------------------------------|---|-------------------|-----------------|----------------|
|                               | <b>Issue:</b> Plans for environmental monitoring as called for in the 1994 ROD have not been developed.   |                   |                 |                |
|                               | <b>Recommendation:</b> Update the O&M Plan for OUs 1 and 3 to include an environmental monitoring program for groundwater, surface water, sediment, and general ecological monitoring, including an evaluation of the rate and effectiveness of organic sediment build-up and the recovery of the benthic community. Periodic monitoring of residential wells installed in the stamp sands should also be reconsidered as part of the updated O&M Plan. |                   |                 |                |
| Affect Current Protectiveness | Affect Future Protectiveness  | Party Responsible | Oversight Party | Milestone Date |
| No                            | Yes   | State             | EPA/State       | 12/1/2025      |

|                                      |   |                          |                        |                       |
|--------------------------------------|---|--------------------------|------------------------|-----------------------|
| <b>OU(s): 2</b>                      | <b>Issue Category: Other</b>  |                          |                        |                       |
|                                      | <b>Issue:</b> OU2 has a selected remedy of “No Action” despite relying on ICs to make that determination.   |                          |                        |                       |
|                                      | <b>Recommendation:</b> Issue a remedial decision document or other documentation to the Site file clarifying OU2’s selected remedy, and the process to review OU2 in future FYRs. |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>   | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes   | EPA                      | EPA                    | 6/31/2024             |

|                                      |  |                          |                        |                       |
|--------------------------------------|--|--------------------------|------------------------|-----------------------|
| <b>OU(s): 1 and 3</b>                | <b>Issue Category: Monitoring</b>  |                          |                        |                       |
|                                      | <b>Issue:</b> Emerging contaminants such as PFAS have not been screened for or investigated.   |                          |                        |                       |
|                                      | <b>Recommendation:</b> Groundwater sampling and analysis for PFAS compounds should be conducted to determine if it is present at the Site. |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>  | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes  | EPA                      | EPA/State              | 12/31/2026            |

|                                      |   |                          |                        |                       |
|--------------------------------------|---|--------------------------|------------------------|-----------------------|
| <b>OU(s): 3</b>                      | <b>Issue Category: Other</b>  |                          |                        |                       |
|                                      | <b>Issue:</b> Remedial actions took place at Scales Creek. The area was not explicitly identified in the 1992 ROD, but remedial action was taken at this location consistent with the RAOs for OU3. |                          |                        |                       |
|                                      | <b>Recommendation:</b> Create a decision document to document the inclusion and actions taken at Scales Creek.  |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>   | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes   | EPA                      | EPA/State              | 6/31/2024             |

**VII. PROTECTIVENESS STATEMENT**

| <b>Protectiveness Statement(s)</b>  |   |
|---|---|
| <i>Operable Unit: 1</i>   | <i>Protectiveness Determination:</i><br>Short-term Protective |
| <i>Protectiveness Statement:</i><br>The remedy at OU1 currently protects human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands into the surface water of Torch |   |

Lake while it recovers over time. However, in order for the remedy to be protective in the long term, the following actions needs to be taken to ensure protectiveness:

- Develop and implement an ICIAP containing LTS procedures for ICs.
- Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.
- Ensure HCRC borrow area is covered with soil and vegetation pursuant to the ROD.
- Implement ICs in properties that still require them.
- Update the O&M Plan to include an environmental monitoring program.
- Sample for emerging contaminants, PFAS compounds, to determine if they are present in the Site groundwater.

**Protectiveness Statement(s)**

*Operable Unit:2*

*Protectiveness Determination:*  
Short-term Protective

*Protectiveness Statement:*

The remedy at OU2 currently protects human health and the environment because effective ICs are in place to prevent future wells being screened in the stamp sands. A no action determination was made for the OU2 ROD. However, in order for the remedy to be protective in the long term, the following action needs to be taken to ensure protectiveness:

- Develop and implement an ICIAP containing LTS procedures.
- Clarify the selected remedy of OU2 in a decision document or other documentation to the Site file.

**Protectiveness Statement(s)**

*Operable Unit:3*

*Protectiveness Determination:*  
Short-term Protective

*Protectiveness Statement:*

The remedy at OU3 currently protects human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands into the surface water of Torch Lake while it recovers over time. However, in order for the remedy to be protective in the long term, the following actions needs to be taken to ensure protectiveness:

- Develop and implement an ICIAP containing LTS procedures for ICs.
- Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.
- Ensure HCRC borrow area is covered with soil and vegetation pursuant to the ROD.
- Implement ICs in properties that still require them.
- Update the O&M Plan to include an environmental monitoring program.
- Sample for emerging contaminants, PFAS compounds, to determine if they are present in the Site groundwater.
- Create a decision document to document the inclusion and actions taken at Scales Creek.

## Sitewide Protectiveness Statement

*Operable Unit:*  
Sitewide

*Protectiveness Determination:*  
Short-term Protective

*Protectiveness Statement:*

The sitewide remedy currently protects human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands to Torch Lake while it recovers over time. Effective ICs are in place to prevent future wells being screened in the stamp sands. However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness:

- Develop and implement an ICIAP containing LTS procedures for ICs.
- Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.
- Ensure HCRC borrow area is covered with soil and vegetation pursuant to the ROD.
- Implement ICs in properties that still require them.
- Update the O&M Plan to include an environmental monitoring program.
- Sample for emerging contaminants, PFAS compounds, to determine if they are present in the Site groundwater.
- Create a decision document to document the inclusion and actions taken at Scales Creek.
- Develop and implement an ICIAP containing LTS procedures.
- Clarify the selected remedy of OU2 in a decision document or other documentation to the Site file.

## VIII. NEXT REVIEW

The next FYR report for the Torch Lake Superfund Site is required five years from the completion date of this review.

## APPENDIX A – REFERENCE LIST

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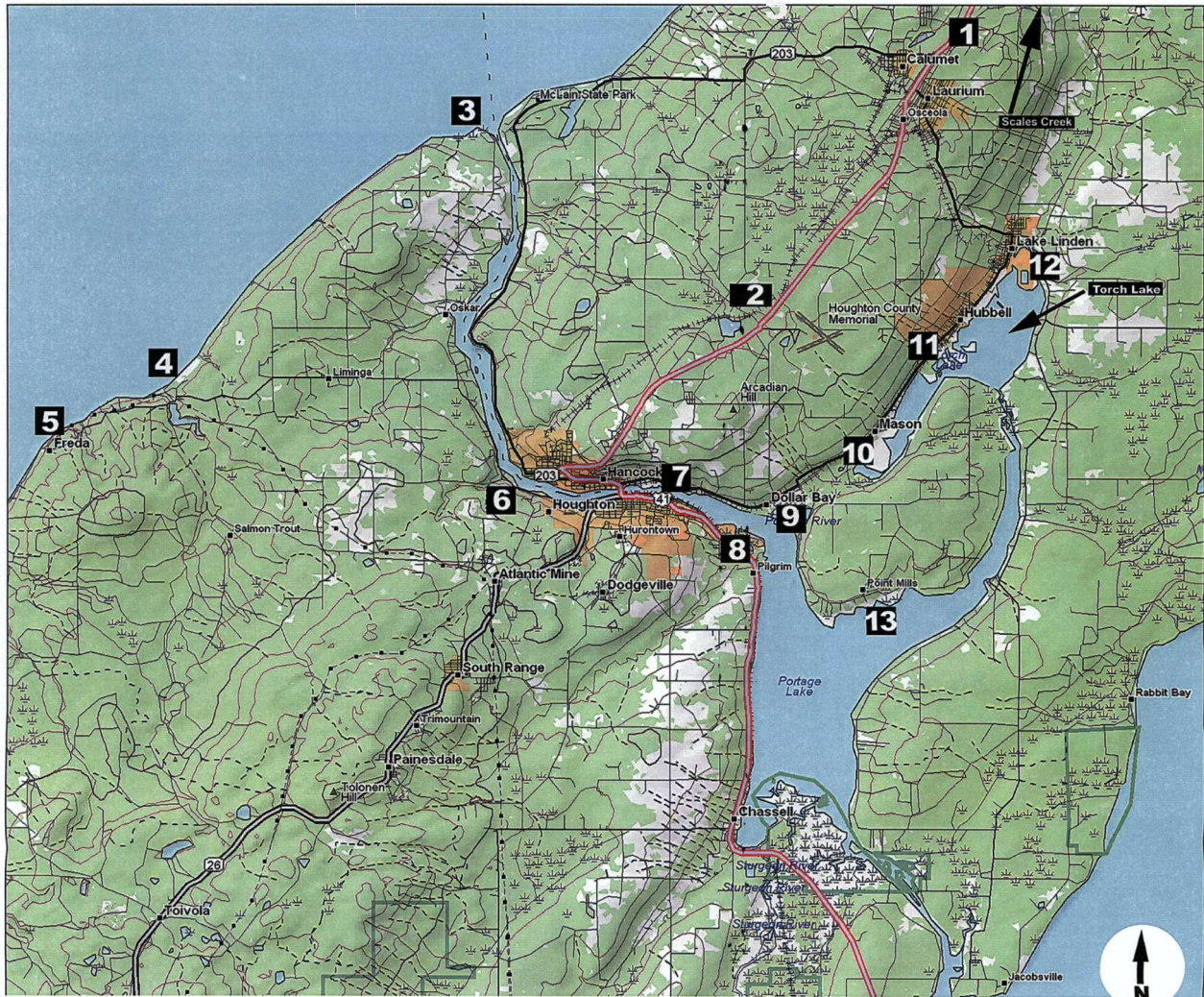
## **APPENDIX B – ADDITIONAL SITE BACKGROUND**

Mining output, milling activity, and tailing production peaked in the Keweenaw Peninsula in the early 1900s to 1920. All of the mills at Torch Lake were located on the western shore of the lake and many other mining mills and smelters were located throughout the peninsula. In about 1916, advances in technology allowed recovery of copper from tailings previously deposited in Torch Lake. Dredges were used to collect submerged tailings, which were then screened, re-crushed, and gravity separated. An ammonia leaching process involving cupric ammonium carbonate was used to recover copper and other metals from conglomerate tailings. During the 1920s, chemical reagents were used to further increase the efficiency of reclamation. The chemical reagents included lime, pyridine oil, coal tar creosotes, wood creosote, pine oil and xanthates. After reclamation activities were complete, chemically treated tailings were returned to the lakes. In the 1930s and 1940s, the Torch Lake mills operated mainly to recover tailings in Torch Lake and to reclaim copper from sources nationwide for the war effort. Mining continued until 1968 when all mining and related activities ceased.

Over 5 million tons of native copper were produced from the Keweenaw Peninsula and more than half of this was processed along the shores of Torch Lake. Between 1868 and 1968, approximately 200 million tons of milling, tailing, and reclamation wastes were dumped into Torch Lake filling at least 20 percent of the lake's original volume. While the Rivers and Harbors Act of 1890 did prohibit the filling or obstruction of any navigable waterway in the United States without prior consent of the Secretary of War, one locality in the country, Torch Lake, was specifically exempted from this prohibition. In addition, dumping in Torch Lake was further permitted during World War II when the War Production Board operated copper mining, milling, reclamation, and smelting activities for the war effort.

## **APPENDIX C**

# Torch Lake Superfund Site Individual Areas Map



## Legend

| Superfund Area Number | Area Name             | Operable Unit | Year Remedy Completed | Delisted from NPL? |
|-----------------------|-----------------------|---------------|-----------------------|--------------------|
| 1                     | Calumet Lake          | 3             | 2003                  | Yes 2013           |
| 2                     | Boston Pond           | 3             | 2003                  | No (planned)       |
| 3                     | North Entry           | 3             | 2005                  | No (planned)       |
| 4                     | Redridge              | 3             | No remedial action    | Not applicable     |
| 5                     | Freda                 | 3             | No remedial action    | Not applicable     |
| 6                     | Michigan Smelter      | 3             | 2003                  | Yes 2012           |
| 7                     | Quincy Smelter        | 3             | 2005 removal action   | Yes 2013           |
| 8                     | Isle Royale Sands     | 3             | 2004                  | Yes 2012           |
| 9                     | Dollar Bay            | 3             | 2002                  | No (planned)       |
| 10                    | Mason Sands           | 1             | 2002                  | Yes 2012           |
| 11                    | Hubbell/Tamarack City | 1             | 2000                  | Yes 2004           |
| 12                    | Lake Linden Sands     | 1             | 1999                  | Yes 2002           |
| 13                    | Point Mills           | 3             | 2002                  | No (planned)       |
| 14                    | Scales Creek          | 3             | 2005                  | No (planned)       |

Lake Superior

Keweenaw Bay

Portage Lake

Scates Creek  
Figure 1-15

Calumet Lake  
Figure 1-17

Lake Linden  
Figure 1-8

Hubbell Beach  
Figure 1-4

Hubbell/Tamarack City  
Figure 1-5

Mason Sands  
Figure 1-9

Point Mills (East)  
Figure 1-12

Dollar Bay  
Figure 1-13

Point Mills (West)  
Figure 1-13

Boston Pond  
Figure 1-2

Quincy Smelter  
Figure 1-14

Iste Royale  
Figure 1-6

North Entry  
Figure 1-11

Michigan Smelter  
Figure 1-10

Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community

### TORCH LAKE SUPERFUND SITE OVERVIEW

HOUGHTON COUNTY, MICHIGAN

#### Legend

Engineering Cover Limits

#### MAP AREA



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GIS\_Data\GIS\Torch\_Lake\GIS\2016\_Site\_Investigation\_Results\_Overview.mxd



|                |          |           |
|----------------|----------|-----------|
| Drawn:         | NS       | 11/9/2016 |
| Approved:      | DB       | 11/9/2016 |
| Scale:         | AS SHOWN |           |
| PROJECT NUMBER | 60300096 |           |
| FIGURE NUMBER  | 1 - 1    |           |

## **APPENDIX D**



## **APPENDIX E**

## Site Inspection Checklist

| I. SITE INFORMATION  |  |
|--|--|
| <b>Site name:</b><br><b>Torch Lake</b>   | <b>Date of inspection:</b><br><b>7/21/2022</b>   |
| <b>Location and Region:</b><br><b>Houghton County, Michigan</b>  | <b>EPA ID:</b><br><b>MID980901946</b>  |
| <b>Agency, office, or company leading the FYR:</b><br>EPA Region 5   | <b>Weather/temperature:</b><br>70's Sunny  |
| <b>Remedy Includes:</b> (Check all that apply)   |  |
| <input checked="" type="checkbox"/> Landfill cover/containment<br><input type="checkbox"/> Access controls<br><input checked="" type="checkbox"/> Institutional controls<br><input type="checkbox"/> Groundwater pump and treatment<br><input type="checkbox"/> Surface water collection and treatment | <input type="checkbox"/> Monitored natural attenuation<br><input type="checkbox"/> Groundwater containment<br><input type="checkbox"/> Vertical barrier walls<br><input type="checkbox"/> Other: <small>Click or tap here to enter text.</small> |
| <b>Attachments:</b>  |  |
| <input type="checkbox"/> Inspection team roster attached   | <input type="checkbox"/> Site map attached   |





## Site Inspection Checklist

| <b>III. ON-SITE DOCUMENTS &amp; RECORDS VERIFIED</b> (Check all that apply)              |   |   |   |
|--|---|---|---|
| <b>1. O&amp;M Documents</b>  |   |   |   |
| <input checked="" type="checkbox"/> O&M manual   | <input checked="" type="checkbox"/> Readily available | <input type="checkbox"/> Up to date                   | <input type="checkbox"/> N/A            |
| <input type="checkbox"/> As-built drawings   | <input type="checkbox"/> Readily available            | <input type="checkbox"/> Up to date                   | <input checked="" type="checkbox"/> N/A |
| <input checked="" type="checkbox"/> Maintenance logs                                     | <input checked="" type="checkbox"/> Readily available | <input checked="" type="checkbox"/> Up to date        | <input type="checkbox"/> N/A            |
| Remarks: <a href="#">Click or tap here to enter text.</a>                                |   |   |   |
| <b>2. Site-Specific Health and Safety Plan</b>   |   |   |   |
| <input checked="" type="checkbox"/> Readily available                                    |   | <input checked="" type="checkbox"/> Readily available |   |
| <input type="checkbox"/> Contingency Plan/Emergency Response Plan                        |   | <input type="checkbox"/> Readily available            |   |
| Remarks: N/A for Contingency Plan/Emergency Response Plan                                |   |   |   |
| <b>3. O&amp;M and OSHA Training Records</b>  |   |   |   |
| <input type="checkbox"/> Readily available   |   | <input checked="" type="checkbox"/> Up to date        |   |
| <input type="checkbox"/> Readily available   |   | <input type="checkbox"/> N/A                          |   |
| Remarks: <a href="#">Click or tap here to enter text.</a>                                |   |   |   |
| <b>4. Permits and Service Agreements</b>   |   |   |   |
| <input type="checkbox"/> Air discharge permit  | <input type="checkbox"/> Readily available            | <input type="checkbox"/> Up to date                   | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Effluent discharge  | <input type="checkbox"/> Readily available            | <input type="checkbox"/> Up to date                   | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Waste disposal, POTW  | <input type="checkbox"/> Readily available            | <input type="checkbox"/> Up to date                   | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Other permits: <a href="#">Click or tap here to enter text.</a> |   |   |   |
| Remarks: <a href="#">Click or tap here to enter text.</a>                                |   |   |   |
| <b>5. Gas Generation Records</b>   |   |   |   |
| <input type="checkbox"/> Readily available   |   | <input type="checkbox"/> Up to date                   |   |
| <input type="checkbox"/> Readily available   |   | <input checked="" type="checkbox"/> N/A               |   |
| Remarks: <a href="#">Click or tap here to enter text.</a>                                |   |   |   |
| <b>6. Settlement Monument Records</b>  |   |   |   |
| <input type="checkbox"/> Readily available   |   | <input type="checkbox"/> Up to date                   |   |
| <input type="checkbox"/> Readily available   |   | <input checked="" type="checkbox"/> N/A               |   |
| Remarks: <a href="#">Click or tap here to enter text.</a>                                |   |   |   |
| <b>7. Groundwater Monitoring Records</b>   |   |   |   |
| <input type="checkbox"/> Readily available   |   | <input type="checkbox"/> Up to date                   |   |
| <input type="checkbox"/> Readily available   |   | <input checked="" type="checkbox"/> N/A               |   |
| Remarks: <a href="#">Click or tap here to enter text.</a>                                |   |   |   |
| <b>8. Leachate Extraction Records</b>  |   |   |   |
| <input type="checkbox"/> Readily available   |   | <input type="checkbox"/> Up to date                   |   |
| <input type="checkbox"/> Readily available   |   | <input checked="" type="checkbox"/> N/A               |   |

## Site Inspection Checklist

Remarks: Click or tap here to enter text.

### 9. Discharge Compliance Records

- |   |  |                                     |   |
|---|--|-------------------------------------|---|
| <input type="checkbox"/> Air              | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
| <input type="checkbox"/> Water (effluent) | <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |

Remarks: Click or tap here to enter text.

### 10. Daily Access/Security Logs

- |  |                                     |   |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input checked="" type="checkbox"/> N/A |
|--|-------------------------------------|---|

Remarks: Click or tap here to enter text.

## IV. O&M COSTS

### 1. O&M Organization

- |  |  |
|--|--|
| <input type="checkbox"/> State in-house            | <input checked="" type="checkbox"/> Contractor for State |
| <input type="checkbox"/> PRP in-house              | <input type="checkbox"/> Contractor for PRP              |
| <input type="checkbox"/> Federal Facility in-house | <input type="checkbox"/> Contractor for Federal Facility |

Remarks: EGLE is the lead for O&M

### 2. O&M Cost Records

- |  |                                     |   |
|--|-------------------------------------|---|
| <input type="checkbox"/> Readily available | <input type="checkbox"/> Up to date | <input type="checkbox"/> Funding mechanism/agreement in place |
|--|-------------------------------------|---|

Original O&M cost estimate Click or tap here to enter text.  Breakdown attached

Total annual cost by year for review period if available

|                                       |                                     |  |   |
|---------------------------------------|-------------------------------------|--|---|
| From<br>Click or tap to enter a date. | To<br>Click or tap to enter a date. | Total cost<br>Click or tap here to enter text. | <input type="checkbox"/> Breakdown attached |
|---------------------------------------|-------------------------------------|--|---|

|                                       |                                     |  |   |
|---------------------------------------|-------------------------------------|--|---|
| From<br>Click or tap to enter a date. | To<br>Click or tap to enter a date. | Total cost<br>Click or tap here to enter text. | <input type="checkbox"/> Breakdown attached |
|---------------------------------------|-------------------------------------|--|---|

|                                       |                                     |  |   |
|---------------------------------------|-------------------------------------|--|---|
| From<br>Click or tap to enter a date. | To<br>Click or tap to enter a date. | Total cost<br>Click or tap here to enter text. | <input type="checkbox"/> Breakdown attached |
|---------------------------------------|-------------------------------------|--|---|

|                                       |                                     |  |   |
|---------------------------------------|-------------------------------------|--|---|
| From<br>Click or tap to enter a date. | To<br>Click or tap to enter a date. | Total cost<br>Click or tap here to enter text. | <input type="checkbox"/> Breakdown attached |
|---------------------------------------|-------------------------------------|--|---|

|                                       |                                     |  |   |
|---------------------------------------|-------------------------------------|--|---|
| From<br>Click or tap to enter a date. | To<br>Click or tap to enter a date. | Total cost<br>Click or tap here to enter text. | <input type="checkbox"/> Breakdown attached |
|---------------------------------------|-------------------------------------|--|---|

### 3. Unanticipated or Unusually High O&M Costs During Review Period

Describe costs and reasons:

## Site Inspection Checklist

Repairs for O&M work in response to a flash flood event in 2018.

### V. ACCESS AND INSTITUTIONAL CONTROLS

Applicable

N/A

**1. Fencing Damaged**

Location shown on site map

Gates secured

N/A

Remarks: Fencing is required at the Quincy Smelter location as part of the 2009 ROD Ammendment. The fencing in this location was in good condition.

**2. Other Access Restrictions**

Location shown on site map

Gates secured

Remarks: Click or tap here to enter text.

**3. Institutional Controls (ICs)**

**A. Implementation and Enforcement**

Site conditions imply ICs not properly implemented

Yes

No

N/A

Site conditions imply ICs not being fully enforced

Yes

No

N/A

Type of monitoring (*e.g.*, self-reporting, drive by)

Inspection

Frequency

Yearly

Responsible party/agency

EGLE

Contact: Name \_\_\_\_\_, Title \_\_\_\_\_, Click or tap to enter a date., P: Phone Number \_\_\_\_\_

Reporting is up-to-date

Yes

No

N/A

Reports are verified by the lead agency

Yes

No

N/A

Specific requirements in deed or decision documents have been met

Yes

No

N/A

Violations have been reported

Yes

No

N/A

Other problems or suggestions:

Click or tap here to enter text.

**B. Adequacy**

ICs are adequate

ICs are inadequate

N/A

Remarks: **All ICs are not yet in place.**

**4. General**

**A. Vandalism/Trespassing**

Location shown on site map

No vandalism evident

Remarks: Trespassing has been noted at several areas of the site.

**B. Land use changes on site**

N/A

Remarks: Michigan Smelter had a recent change in land use designation, more information in the Site Background section of the FYR.

## Site Inspection Checklist

|   |   |   |
|---|---|---|
| <b>C. Land use changes off site</b>   | <input type="checkbox"/> N/A                        |   |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>VI. GENERAL SITE CONDITIONS</b>  |   |   |
| <b>1. Roads</b>   | <input checked="" type="checkbox"/> Applicable      | <input type="checkbox"/> N/A  |
| <b>A. Roads damaged</b>   | <input type="checkbox"/> Location shown on site map | <input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>B. Other Site Conditions</b>   |   |   |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>VII. LANDFILL COVERS</b>   |   |   |
| <b>1. Landfill Surface</b>  | <input checked="" type="checkbox"/> Applicable      | <input type="checkbox"/> N/A  |
| <b>A. Settlement (Low Spots)</b>  | <input type="checkbox"/> Location Shown on Site Map | <input checked="" type="checkbox"/> Settlement Not Evident                      |
| Areal Extent: Click or tap here to enter text.  |   | Depth: Click or tap here to enter text.   |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>B. Cracks</b>  | <input type="checkbox"/> Location Shown on Site Map | <input checked="" type="checkbox"/> Cracking Not Evident                        |
| Lengths: Click or tap here to enter text.   | Widths: Click or tap here to enter text.            | Depths: Click or tap here to enter text.  |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>C. Erosion</b>   | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> Erosion Not Evident                                    |
| Areal Extent: Click or tap here to enter text.  |   | Depth: Click or tap here to enter text.   |
| Remarks: Erosion of the cap was noted in several locations, mainly along the shorelines. EGLE keeps track of areas of erosion through their site inspections. |   |   |
| <b>D. Holes</b>   | <input type="checkbox"/> Location Shown on Site Map | <input checked="" type="checkbox"/> Holes Not Evident                           |
| Areal Extent: Click or tap here to enter text.  |   | Depth: Click or tap here to enter text.   |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>E. Vegetative Cover</b>  | <input type="checkbox"/> Grass                      | <input type="checkbox"/> Cover Properly Established                             |
| <input type="checkbox"/> Tress/Shrubs (indicate size and locations on a diagram)  |   | <input type="checkbox"/> No Signs of Stress                                     |
| Remarks: Areas of sparse vegetation were noted in areas of the Site.  |   |   |
| <b>F. Alternative Cover (armored rock, concrete, etc.)</b>  |   | <input checked="" type="checkbox"/> N/A   |
| Remarks: Click or tap here to enter text.   |   |   |
| <b>G. Bulges</b>  | <input type="checkbox"/> Location Shown on Site Map | <input checked="" type="checkbox"/> Bulges Not Evident                          |
| Areal Extent: Click or tap here to enter text.  |   | Height: Click or tap here to enter text.  |

## Site Inspection Checklist

|  |  |   |
|--|--|---|
| Remarks: Click or tap here to enter text.  |  |   |
| <b>H. Wet Areas/Water Damage</b>   | <input checked="" type="checkbox"/> Wet Areas/Water Damage Not Evident |   |
| <input type="checkbox"/> Wet Areas   | <input type="checkbox"/> Location Shown on Site Map                    | Areal Extent: Click or tap here to enter text.                    |
| <input type="checkbox"/> Ponding   | <input type="checkbox"/> Location Shown on Site Map                    | Areal Extent: Click or tap here to enter text.                    |
| <input type="checkbox"/> Seeps   | <input type="checkbox"/> Location Shown on Site Map                    | Areal Extent: Click or tap here to enter text.                    |
| <input type="checkbox"/> Soft Subgrade   | <input type="checkbox"/> Location Shown on Site Map                    | Areal Extent: Click or tap here to enter text.                    |
| Remarks: Click or tap here to enter text.  |  |   |
| <b>I. Slope Instability</b>  | <input type="checkbox"/> Location Shown on Site Map                    | <input checked="" type="checkbox"/> Slope Instability Not Evident |
|  | <input type="checkbox"/> Slides  | Areal Extent: Click or tap here to enter text.                    |
| Remarks: Click or tap here to enter text.  |  |   |
| <b>2. Benches</b>  | <input type="checkbox"/> Applicable                                    | <input checked="" type="checkbox"/> N/A                           |
| (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)                                   |  |   |
| <b>A. Flows Bypass Bench</b>   | <input type="checkbox"/> Location Shown on Site Map                    | <input type="checkbox"/> N/A or Okay                              |
| Remarks: Click or tap here to enter text.  |  |   |
| <b>B. Bench Breached</b>   | <input type="checkbox"/> Location Shown on Site Map                    | <input type="checkbox"/> N/A or Okay                              |
| Remarks: Click or tap here to enter text.  |  |   |
| <b>C. Bench Overtopped</b>   | <input type="checkbox"/> Location Shown on Site Map                    | <input type="checkbox"/> N/A or Okay                              |
| Remarks: Click or tap here to enter text.  |  |   |
| <b>3. Letdown Channels</b>   | <input type="checkbox"/> Applicable                                    | <input checked="" type="checkbox"/> N/A                           |
| (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.) |  |   |
| <b>A. Settlement</b>   | <input type="checkbox"/> Location Shown on Site Map                    | <input type="checkbox"/> Settlement Not Evident                   |
| Areal Extent: Click or tap here to enter text.   |  | Depth: Click or tap here to enter text.                           |
| Remarks: Click or tap here to enter text.  |  |   |
| <b>B. Material Degradation</b>   | <input type="checkbox"/> Location Shown on Site Map                    | <input type="checkbox"/> Degradation Not Evident                  |
| Material Type: Click or tap here to enter text.  |  | Areal Extent: Click or tap here to enter text.                    |

## Site Inspection Checklist

Remarks: Click or tap here to enter text.

### C. Erosion

Location Shown on Site Map

Erosion Not Evident

Areal Extent: Click or tap here to enter text.

Depth: Click or tap here to enter text.

Remarks: Click or tap here to enter text.

### D. Undercutting

Location Shown on Site Map

Undercutting Not Evident

Areal Extent: Click or tap here to enter text.

Depth: Click or tap here to enter text.

Remarks: Click or tap here to enter text.

### E. Obstructions

Location Shown on Site Map

Undercutting Not Evident

Type: Click or tap here to enter text.

Areal Extent: Click or tap here to enter text.

Size: Click or tap here to enter text.

Remarks: Click or tap here to enter text.

### F. Excessive Vegetative Growth

Location Shown on Site Map

Excessive Growth Not Evident

Areal Extent: Click or tap here to enter text.

Vegetation in channels does not obstruct flow

Remarks: Click or tap here to enter text.

## 4. Cover Penetrations

Applicable

N/A

### A. Gas Vents

Active

Passive

Properly secured/locked

Functioning

Routinely sampled

Good condition

Evidence of leakage at penetration

Needs Maintenance

N/A

Remarks: Click or tap here to enter text.

### B. Gas Monitoring Probes

Properly secured/locked

Functioning

Routinely sampled

Good condition

Evidence of leakage at penetration

Needs Maintenance

N/A

Remarks: Click or tap here to enter text.

### C. Monitoring Wells

Properly secured/locked

Functioning

Routinely sampled

Good condition

Evidence of leakage at penetration

Needs Maintenance

N/A

## Site Inspection Checklist

Remarks: Monitoring wells inside that capped areas were installed as part of the EGLE Water Resources Division work as part of the Torch Lake Area of Concern.

### D. Leachate Extraction Wells

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Properly secured/locked | <input type="checkbox"/> Functioning                        | <input type="checkbox"/> Routinely sampled |
| <input type="checkbox"/> Good condition          | <input type="checkbox"/> Evidence of leakage at penetration |  |
| <input type="checkbox"/> Needs Maintenance       | <input checked="" type="checkbox"/> N/A                     |  |

Remarks: Click or tap here to enter text.

### E. Settlement Monuments Located Routinely Surveyed N/A

Remarks: Click or tap here to enter text.

### 5. Gas Collection and Treatment Applicable N/A

#### A. Gas Treatment Facilities

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Flaring        | <input type="checkbox"/> Thermal Destruction | <input type="checkbox"/> Collection for Reuse |
| <input type="checkbox"/> Good condition | <input type="checkbox"/> Needs Maintenance   |   |

Remarks: Click or tap here to enter text.

#### B. Gas Collection Wells, Manifolds, and Piping

- |   |  |                              |
|---|--|------------------------------|
| <input type="checkbox"/> Good condition | <input type="checkbox"/> Needs Maintenance | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks: Click or tap here to enter text.

#### C. Gas Monitoring Facilities (e.g. gas monitoring of adjacent homes or buildings)

- |   |  |                              |
|---|--|------------------------------|
| <input type="checkbox"/> Good condition | <input type="checkbox"/> Needs Maintenance | <input type="checkbox"/> N/A |
|---|--|------------------------------|

Remarks: Click or tap here to enter text.

### 6. Cover Drainage Layer Applicable N/A

#### A. Outlet Pipes Inspected Functioning N/A

Remarks: Click or tap here to enter text.

#### B. Outlet Rock Inspected Functioning N/A

Remarks: Click or tap here to enter text.

### 7. Detention/Sediment Ponds Applicable N/A

#### A. Siltation Siltation Not Evident N/A

Areal Extent: Click or tap here to enter text.                      Depth: Click or tap here to enter text.

Remarks: Click or tap here to enter text.

#### B. Erosion Erosion Not Evident



## Site Inspection Checklist

|   |   |  |
|---|---|--|
| Areal Extent: Click or tap here to enter text.            |   | Depth: Click or tap here to enter text.          |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>C. Outlet Works</b>                                    | <input type="checkbox"/> Functioning                | <input type="checkbox"/> N/A                     |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>D. Dam</b>   | <input type="checkbox"/> Functioning                | <input type="checkbox"/> N/A                     |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>8. Retaining Walls</b>                                 | <input type="checkbox"/> Applicable                 | <input checked="" type="checkbox"/> N/A          |
| <b>A. Deformations</b>                                    | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> Deformation Not Evident |
| Horizontal Displacement: Click or tap here to enter text. |   |  |
| Vertical Displacement: Click or tap here to enter text.   |   |  |
| Rotational Displacement: Click or tap here to enter text. |   |  |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>B. Degradation</b>                                     | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> Deformation Not Evident |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>9. Perimeter Ditches/Off-Site Discharge</b>            | <input type="checkbox"/> Applicable                 | <input checked="" type="checkbox"/> N/A          |
| <b>A. Siltation</b>                                       | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> Siltation Not Evident   |
| Areal Extent: Click or tap here to enter text.            |   | Depth: Click or tap here to enter text.          |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>B. Vegetative Growth</b>                               | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> N/A                     |
| <input type="checkbox"/> Vegetation Does Not Impede Flow  |   |  |
| Areal Extent: Click or tap here to enter text.            |   | Type: Click or tap here to enter text.           |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>C. Erosion</b>   | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> Erosion Not Evident     |
| Areal Extent: Click or tap here to enter text.            |   | Depth: Click or tap here to enter text.          |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>D. Discharge Structure</b>                             | <input type="checkbox"/> Functioning                | <input type="checkbox"/> N/A                     |
| Remarks: Click or tap here to enter text.                 |   |  |
| <b>VIII. VERTICAL BARRIER WALLS</b>                       |   |  |
| <input type="checkbox"/> Applicable                       |   | <input checked="" type="checkbox"/> N/A          |
| <b>1. Settlement</b>                                      | <input type="checkbox"/> Location Shown on Site Map | <input type="checkbox"/> Settlement Not Evident  |

## Site Inspection Checklist

Areal Extent: Click or tap here to enter text.

Depth: Click or tap here to enter text.

Remarks: Click or tap here to enter text.

**2. Performance Monitoring**      Type of Monitoring: Click or tap here to enter text.

Performance Not Monitored

Evidence of Breaching

Frequency: Click or tap here to enter text.

Head Differential: Click or tap here to enter text.

Remarks: Click or tap here to enter text.

### IX. GROUNDWATER/SURFACE WATER REMEDIES

Applicable

N/A

**1. Groundwater Extraction Wells, Pumps, and Pipelines**       Applicable       N/A

**A. Pumps, Wellhead Plumbing, and Electrical**       N/A

Good Condition

All Required Wells Properly Operating

Needs Maintenance

Remarks: Click or tap here to enter text.

**B. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

Good Condition

Needs Maintenance

Remarks: Click or tap here to enter text.

**C. Spare Parts and Equipment**

Needs to be Provided

Readily Available

Good Condition

Requires Upgrade

Remarks: Click or tap here to enter text.

**2. Surface Water Collection Structures, Pumps, and Pipelines**       Applicable       N/A

**A. Collection Structures, Pumps, and Electrical**

Good Condition

Needs Maintenance

Remarks: Click or tap here to enter text.

**B. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**

Good Condition

Needs Maintenance

Remarks: Click or tap here to enter text.

**C. Spare Parts and Equipment**

Needs to be Provided

Readily Available

Good Condition

Requires Upgrade

Remarks: Click or tap here to enter text.

**3. Treatment System**       Applicable       N/A

**A. Treatment Train (Check components that apply)**

## Site Inspection Checklist

- Metals removal
  - Oil/Water Separation
  - Bioremediation
  - Air Stripping
  - Carbon Absorbers
  - Filters Click or tap here to enter text.
  - Additive (e.g. chelation agent, flocculent) Click or tap here to enter text.
  - Others Click or tap here to enter text.
  - Good Condition
  - Needs Maintenance
  - Sampling ports properly marked and functional
  - Sampling/maintenance log displayed and up to date
  - Equipment properly identified
  - Quantity of groundwater treated annually Click or tap here to enter text.
  - Quantity of surface water treated annually Click or tap here to enter text.
- Remarks: Click or tap here to enter text.

### **B. Electrical Enclosures and Panels (properly rated and functional)**

- N/A
  - Good Condition
  - Needs Maintenance
- Remarks: Click or tap here to enter text.

### **C. Tanks, Vaults, Storage Vessels**

- N/A
  - Proper Secondary Containment
  - Good Condition
  - Needs Maintenance
- Remarks: Click or tap here to enter text.

### **D. Discharge Structure and Appurtenances**

- N/A
  - Good Condition
  - Needs Maintenance
- Remarks: Click or tap here to enter text.

### **E. Treatment Building(s)**

- N/A
  - Good condition (esp. roof and doorways)
  - Needs repair
  - Chemicals and equipment properly stored
- Remarks Click or tap here to enter text.

### **F. Monitoring Wells (Pump and Treatment Remedy)**

- Properly secured/locked
  - Functioning
  - Routinely sampled
  - All required wells located
  - Good condition
  - Needs Maintenance
- Remarks Click or tap here to enter text.

## Site Inspection Checklist

### 4. Monitoring Data

#### A. Monitoring Data:

Is Routinely Submitted on Time

Is of Acceptable Quality

#### B. Monitoring Data Suggests:

Groundwater plume is effectively contained

Contaminant concentrations are declining

### 5. Monitored Natural Attenuation

#### A. Monitoring Wells (natural attenuation remedy)

N/A

Properly secured/locked

Functioning

Routinely sampled

All required wells located

Needs Maintenance

Good condition

Remarks: [Click or tap here to enter text.](#)

### X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

### XI. OVERALL OBSERVATIONS

#### 1. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy was implemented to contain the stampsands to reduce inhalation/ingestion and loading into the nearby surface water bodies. The remedy is generally effective in accomplishing its designed functions. There are areas where shoreline erosion is allowing parts of the stampsands which were covered to enter into the surface water bodies.

#### 2. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The O&M procedures are effective in detailing areas where maintenance is or will be needed.

#### 3. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

No early indicators that may affect the O&M procedures.

#### 4. Early Indicators of Potential Remedy Problems

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

## Site Inspection Checklist

No suggestions for optimization in monitoring.

## **APPENDIX F**



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, ILLINOIS 60604-3590

**Via Electronic Mail Only**

March 22, 2022

Mr. Wally Wagaw  
Senior Project Manager  
Michigan Department of Environment, Great Lakes, and Energy  
525 W. Allegan Street  
Lansing, MI 48933

Re: Notification of Five-Year Review Start for Torch Lake Superfund Site, Houghton County, Michigan

Dear Mr. Wagaw:

This letter is to notify you that the U.S. Environmental Protection Agency (EPA) is starting the fifth five-year review for the Torch Lake Superfund site (Torch Lake).

EPA is conducting a statutory five-year review for the site as required by Section 121 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The purpose of the review is to evaluate the remedy implemented at the site and determine if the remedy remains protective of human health and the environment.

The five-year review for Torch Lake is due on March 22, 2023. Notice has been provided so EPA and the Michigan Department of Environment, Great Lakes, and Energy can begin coordination activities such as scheduling a site inspection.

If you have any questions, please feel free to call me at (312) 353-8892 or email me at [lautenbach.glenn@epa.gov](mailto:lautenbach.glenn@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Glenn Lautenbach".

Glenn Lautenbach  
Remedial Project Manager  
U.S. EPA Region 5

cc: B. Eleder, EPA, via email  
J. Elkins, EPA, via email  
T. Williams, EPA, via email  
K. Safakas, EPA, via email

## **APPENDIX G**





GRETCHEN WHITMER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY  
LANSING



LIESL EICHLER CLARK  
DIRECTOR

November 29, 2022

VIA E-MAIL

Mr. Glenn Lautenbach  
Superfund Division  
United States Environmental Protection Agency  
Region 5  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3507

Dear Mr. Glenn Lautenbach:

SUBJECT: Issues and Recommendations for Inclusion in the Upcoming Five-Year Review (FYR) Report, Torch Lake Superfund Site, Houghton, Michigan

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) staff would like to provide the United States Environmental Protection Agency (USEPA) the following list of issues that have yet to be completed at Torch Lake Superfund Site. Little or no progress has been made since the last FYR in terms of completing the recommendations and follow-up actions listed in 2018. The unaddressed issues will prevent meeting remedial action goals and thus the protectiveness of the remedy. Following are the issues that need to be completed at this Site:

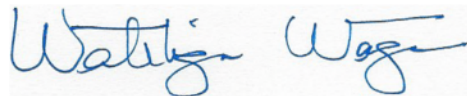
- Develop an Institutional Control Implementation and Assurance Plan ([ICIAP] also referred to as an Institutional Control [IC] Plan in the 2013 and 2018 Five-Year Reviews). The purpose of the ICIAP is to: evaluate and determine which ICs required by the Record of Decisions (RODs) and ROD Amendment remain to be implemented; ensure that any already implemented ICs are effective; evaluate the specific additional ICs that are needed; and ensure that Long Term Stewardship procedures are put in place so that all the ICs, once implemented, are properly maintained, monitored, and enforced.
- The Draft Declaration of Restrictive Covenants that were completed and provided to the USEPA since the last FYR should be approved and implemented without any further delay. EGLE staff in consultation with the USEPA completed Draft ICs for 57 parcels located in Boston Pond, North Entry, Dollar Bay, Point Mills (East and West), and Scales Creek after the 2018 FYR. However, there has not been any documented progress on the part of the USEPA to place ICs on these parcels. The milestone date for placement of ICs on these parcels was December 30, 2019.
- Placement of ICs on the above parcels is essential if these sites are eventually to be delisted and attain a Site-Wide Ready for Anticipated Use designation and site closeout.

- At Point Mills, the stamp sand excavation area owned by the Houghton County Road Commission has potential ROD compliance issues that have not been addressed to date.
- As indicated in the previous FYR, considering the fact that per- and polyfluoroalkyl substances (PFAS) may have been used as surfactants to enhance recovery of metals from ores in copper, EGLE recommends PFAS evaluation sampling in groundwater where there is information suggesting that PFAS was likely used or released at Superfund Sites.

The most recent site inspections indicate widespread shoreline erosion at multiple locations (Hubble Beach, Hubble/Tamarack City, Lake Linden, Mason Sands, Michigan Smelter, and Point Mills) where rip rap was placed to deter continued erosion. It appears that these are the result of insufficient engineering design to account for historic high-water levels. This situation does not seem to fall under what would be considered Operation and Maintenance of the cover, rather a design oversight that will require substantial work to repair (rip rap elevation and design). In the meantime, the cover and stamp sands are collapsing into the lakes thereby causing significant sedimentation to surface water and allowing additional stamp sands into the lake. We recommend for the USEPA to take the appropriate measures to remedy the problem of rip rap erosion before conditions get worse.

We appreciate the opportunity to provide these preliminary comments on the Torch Lake FYR. We look forward to receiving and commenting on the Draft FYR. If you have additional questions regarding this matter, please contact Walelign Wagaw, Project Manager, Remediation and Redevelopment Division, at 517-648-1540; [WagawW@Michigan.gov](mailto:WagawW@Michigan.gov); or EGLE, P.O. Box 30426, Lansing, Michigan 48909-7926.

Sincerely,

A handwritten signature in blue ink that reads "Walelign Wagaw". The signature is written in a cursive style with a horizontal line underlining the name.

Walelign Wagaw  
Project Manager  
517-618-1540

cc: Ms. Jennifer Elkins, USEPA  
Mr. Timothy Fischer, USEPA  
Mr. David Kline, EGLE  
Mr. Robert Franks, EGLE

## Lautenbach, Glenn

---

**From:** Wagaw, Wally (EGLE) <WAGAWW@michigan.gov>  
**Sent:** Wednesday, February 1, 2023 1:08 PM  
**To:** Lautenbach, Glenn  
**Subject:** Torch FYR follow up comments post SRT Meeting on 1/31/23

Hi Glenn,

We had our Superfund Review team Meeting yesterday to discuss the Torch draft FYR. Following are EGLE staff comments:

1. The EPA proposed milestone date (3/1/2025) for placement of DRCs on the 57 plus parcels at Dollar Bay, Boston Pond, Point Mills East/West and North Entry is too far out. We suggest to have it completed by late 2023 at the latest. These DRCs were supposed to have been completed by 2019 according to the last FYR (2018). You and I can discuss this further, if necessary.
2. Question A, in the "Questions" section asks: Is the remedy functioning as intended by the decision documents? The answer should be NO because, although the remedy is by and large functioning as intended in most areas, we still have major shoreline erosion issues at certain locations (e.g. Lake Linden, Mason Sands, Michigan Smelter) where the rip rap is misplaced or no rip rap at all where there should have been. This appears to be a design issue and not an O&M issue. At any rate, this calls into question the protectiveness of the remedy.

We would like for our comments to be included in the FYR as part of the public record.

Please contact me if you any questions on our comments.

Thank You,

Wally

Walelign Wagaw, M.S., M.P.H.  
Senior Project Manager  
RRD/Superfund Section  
Michigan Department of Environment, Great Lakes, and Energy  
Phone: 517-648-1540  
FAX: 517-335-4887  
E-MAIL: [wagaww@michigan.gov](mailto:wagaww@michigan.gov)  
[www.michigan.gov/egle](http://www.michigan.gov/egle)

**FIFTH FIVE-YEAR REVIEW REPORT FOR  
TORCH LAKE SUPERFUND SITE  
HOUGHTON COUNTY, MICHIGAN**



**Prepared by**

**U.S. Environmental Protection Agency  
Region 5  
Chicago, Illinois**

**X**

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Douglas Ballotti, Director  
Superfund & Emergency Management Divisi...

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## LIST OF ABBREVIATIONS & ACRONYMS

|        |   |
|--------|---|
| AOC    | Administrative Order on Consent                                       |
| ARAR   | Applicable or Relevant and Appropriate Requirement                    |
| BRA    | Baseline Risk Assessment  |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR    | Code of Federal Regulations   |
| COC    | Contaminants of Concern   |
| EGLE   | Michigan Department of Environment, Great Lakes, Energy               |
| EPA    | United States Environmental Protection Agency                         |
| FYR    | Five-Year Review  |
| HCRC   | Houghton County Road Commission                                       |
| ICs    | Institutional Controls  |
| ICIAP  | Institutional Control Implementation and Assurance Plan               |
| MDCH   | Michigan Department of Community Health                               |
| MDNR   | Michigan Department of Natural Resources                              |
| NCP    | National Oil and Hazardous Substances Pollution Contingency Plan      |
| NPL    | National Priorities List  |
| NCRS   | National Resource Conservation Service                                |
| O&M    | Operation and Maintenance   |
| OU     | Operable Unit   |
| IC     | Institutional Controls  |
| LTS    | Long Term Stewardship   |
| MCL    | Maximum Contaminant Level   |
| PAHs   | Polycyclic Aromatic Hydrocarbons                                      |
| PCBs   | Polychlorinated Biphenyls   |
| PCOR   | Preliminary Close Out Report  |
| PFAS   | Perfluoroalkyl and Polyfluoroalkyl Substances                         |
| PLWSA  | Portage Lake Water and Sewage Authority                               |
| PPA    | Prospective Purchaser Agreement                                       |
| PRP    | Potentially Responsible Party   |
| RAO    | Remedial Action Objectives  |
| RC     | Restrictive Covenants   |
| RI     | Remedial Investigation  |
| ROD    | Record of Decision  |
| RPM    | Remedial Project Manager  |
| Site   | Torch Lake Superfund Site   |
| TBC    | To be considered  |
| UU/UE  | Unlimited Use and Unrestricted Exposure                               |
| WUPHD  | Western Upper Peninsula Health Department                             |

## **I. INTRODUCTION**

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Torch Lake Superfund Site. The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of three (3) Operable Units (OU):

- OU1 includes select surface tailings, drums, and slag piles on the western shore of Torch Lake. These areas include Lake Linden, Hubbell/Tamarack and Mason Sands.
- OU2 includes groundwater, surface waters submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Channel, Keweenaw Waterway, North Entry to Lake Superior, Boston Pond, and Calumet Lake.
- OU3 includes select tailing and slag deposits located at North Entry, Michigan Smelter, Quincy Smelter, Calumet Lake, Isle-Royale, Boston Pond, Dollar Bay, Grosse-Point (Point Mills), and Scales Creek.

All three OUs are addressed in this FYR.

The Torch Lake Superfund Site FYR was led by Glenn Lautenbach, Remedial Project Manager. Participants included Walelign Wagaw, Project Manager, Michigan Department of the Environment, Great Lakes, and Energy (EGLE). The review began on 3/22/2022.

### **Site Background**

The Torch Lake Superfund Site is located on the Keweenaw Peninsula in Houghton County, Michigan. The Site includes Torch Lake, the western shore of Torch Lake, the northern portion of Portage Lake, the Portage Lake Canal, Keweenaw Waterway, North Entry to Lake Superior, Boston Pond, and Calumet Lake. Select tailing and slag pile deposits located along the western shore of Torch Lake, Northern Portage Lake, Keweenaw Waterway, Lake Superior, Boston Pond, and Calumet Lake are included as part of the Site. In addition to several tailing piles located throughout these areas, slag piles are located at Quincy Smelter, Michigan Smelter, and Hubbell. These slag piles are also included as part of the Site.

The Torch Lake area was the site of copper milling and smelting facilities, which operated for over 100 years. The Lake was a repository for all the mining industry-related waste and served as a waterway for

transportation to support the area. The first mill opened on Torch Lake in 1868. At the mills, copper was extracted through a series of technologies over the years. First, copper was extracted by crushing or “stamping” the rock into smaller pieces, then by grinding the pieces and driving them through successively smaller meshes. The copper and crushed rocks were separated by gravimetric sorting in a liquid medium. The copper was then sent to a smelter. The crushed rock particles, called “tailings” or “stamp sands”, were discarded along with mill processing water, typically by pumping it into lakes and streams. Additional background can be found in Appendix B.

**FIVE-YEAR REVIEW SUMMARY FORM**

| SITE IDENTIFICATION  |   |                                |
|--|---|--------------------------------|
| Site Name: Torch Lake  |   |                                |
| EPA ID: MID 980901946  |   |                                |
| Region: 5  | State: MI   | City/County: Houghton/Houghton |
| SITE STATUS  |   |                                |
| NPL Status: Final  |   |                                |
| Multiple OUs?<br>Yes   | Has the site achieved construction completion?<br>Yes |                                |
| REVIEW STATUS  |   |                                |
| Lead agency: EPA   |   |                                |
| Author name (Federal or State Project Manager): Glenn Lautenbach |   |                                |
| Author affiliation: Remedial Project Manager, EPA                |   |                                |
| Review period: 3/22/2022 - 11/23/2022                            |   |                                |
| Date of site inspection: 7/19/2022 - 7/21/2022                   |   |                                |
| Type of review: Statutory  |   |                                |
| Review number: 5   |   |                                |
| Triggering action date: 3/22/2018                                |   |                                |
| Due date (five years after triggering action date): 3/22/2023    |   |                                |

**II. RESPONSE ACTION SUMMARY**

**Basis for Taking Action**

The following compounds were selected as Contaminants of Concern for OU1.

**Table 1:** OU1 Contaminants of Concern

| Organic Compounds: | Inorganic Compounds: |
|--------------------|----------------------|
|                    |                      |



|                            |           |
|----------------------------|-----------|
| Bis(2-Ethylhexyl)phthalate | Aluminum  |
| PAHs                       | Antimony  |
| Napthalene                 | Arsenic   |
| 2-Methylnapthalene         | Barium    |
| Acenaphthylene             | Beryllium |
| Phenanthrene               | Boron     |
| Flouranthene               | Chromium  |
| Pyrene                     | Cobalt    |
| Benzo(a)fluoranthene       | Copper    |
| Chrysene                   | Lead      |
| Benzo(b)fluoranthene       | Manganese |
| Benzo(k)fluoranthene       | Mercury   |
| Benzo(a)pyrene             | Nickel    |
| Ideno(1,2,3-cd)pyrene      | Silver    |
| Dibenzo(a,h)anthracene     | Titanium  |
| Benzo(g,h,i)perylene       | Vanadium  |

The following compounds were selected as contaminants of concern for OU3.

**Table 2:** OU3 Contaminants of Concern

| <b>Organic Compounds:</b>  | <b>Inorganic Compounds:</b> |           |
|----------------------------|-----------------------------|-----------|
| Bis(2-Ethylhexyl)phthalate | Aluminum                    | Copper    |
| Benzo(b)fluoranthene       | Antimony                    | Lead      |
| Butylbenzylphthalate       | Arsenic                     | Manganese |
| Diethylphthalate           | Barium                      | Mercury   |
| Fluoranthene               | Beryllium                   | Nickel    |
| Pyrene                     | Cadmium                     | Silver    |
| Chrysene                   | Chromium                    | Vanadium  |
| Benzo(k)fluoranthene       | Cobalt                      |           |

The baseline risk assessment for OU1 was conducted for both current and future populations and was based on the following scenarios. Current populations assessed included adult and child off-site residents exposed to tailings, slag, and particulates; occupational workers exposed to tailings, slag, and particulates; adult and child campers exposed to tailings, and particulates. Future populations assessed included adult and child residents of on-site dwellings exposed to tailings and particulates and adult and child residents of off-site dwellings exposed to tailings and particulates. The risk assessment for OU3 included the scenarios from OU1 and additionally assessed for adult and child visitors exposed to the tailings and particulates; and teenage and adult scavengers exposed to tailings and particulates (Donohue 1992).

A baseline risk assessment was conducted for OU2 for both current and future populations and was based on the following scenarios. Current exposures scenarios assessed adult residents and campers, and child residents and campers. Future exposure scenarios assessed adult and child residents. Exposure routes included ingestion and dermal exposure to surface water, ingestion of fish and ingestion of sediments (Life Systems, 1992 (1)).

An ecological risk assessment was also conducted for the Site to determine the current and potential future effects of contaminants on ecological receptors. Severe ecological risks were determined to exist as the result of contaminant exposure to aquatic, terrestrial and wetland species from the tailings, slag, and sediment. The continuous release of stampsands into the surface water bodies were deemed to present an unacceptable and actionable source of ecological risk. The most significant impact associated with the tailing deposits was found to be the severe degradation of benthic communities and the absence of wetlands. Field and laboratory studies indicated that the toxicity due primarily to the elevated copper concentrations in sediments is responsible for the environmental degradation.

Prior to implementation of the remedy beginning in 1999, most of the tailing and slag piles were barren. Vegetation and colonization by indigenous species were limited by a combination of chemical and nonchemical stressors which include poor water retention, extreme temperature fluctuations, low macronutrient availability and presence of growth inhibitor/toxic substances (Life Systems, 1992 (2)).

### **Response Actions**

In October 1987, the Michigan Department of Natural Resources (MDNR) completed a Remedial Action Plan (RAP) for the Site to address the contamination problems and to recommend remedial actions for the Lake. The recommended remedial actions in the RAP were (1) vegetate lakeshore tailings to minimize air-borne and water-borne particulate matter; (2) prevent erosion into Torch Lake; (3) upgrade wastewater treatment plants; and (4) monitor natural attenuation for Torch Lake due to the wide distribution and large volumes of contaminated sediments (MDNR, 1987).

In 1988, in response to the RAP, MDNR conducted a water quality and fish tissue study. Tissue from 458 fish was collected from both Torch and Portage Lakes. Only 4 of the 56 fish analyzed for mercury had concentrations that exceeded the 0.5 mg/kg consumption advisory action limit, and none exceeded the 1.0 mg/kg limit. No internal or external growth anomalies were discovered and no liver neoplasms (i.e., cancerous growths) were found among the 47 walleye examined. Saugers were not collected during this survey because of an extended population decline, which began in the 1960s. In 1993, the Michigan Department of Public Health lifted the fish consumption advisory for tumors, but added a mercury advisory for walleye, sauger, and smallmouth bass. Based on the Michigan Department for Environmental Quality Surface Water Quality Division's routine fish monitoring activities conducted for the Michigan Department of Community Health (MDCH), the MDCH issued fish consumption advisories in 1999 for polychlorinated biphenyls (PCBs) for walleye and smallmouth bass in Portage Lake and Torch Lake. In 2002, the MDCH added northern pike to the mercury and PCBs consumption advisories. There are fish advisories are still in effect for Torch Lake.

In November 1988, EPA contracted with Donohue & Associates to perform the Remedial Investigation/Feasibility Study (RI/FS) at the Site (Donohue, 1990). Due to the Site's size and complex nature, three OUs were defined, OU1, OU2 and OU3:

OU1 includes select surface tailings, drums, and slag piles on the western shore of Torch Lake. These areas include Lake Linden, Hubbell/Tamarack and Mason Sands. Approximately 442 acres of tailings were located in OU1. A smaller deposit of smelter slag, encompassing approximately 9 acres, is located near Hubbell.

OU2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Channel, Keweenaw Waterway, North Entry to Lake Superior, Boston Pond, and Calumet Lake.

OU3 includes select tailing and slag deposits located at North Entry, Michigan Smelter, Quincy Smelter, Calumet Lake, Isle-Royale, Boston Pond, Dollar Bay, Grosse-Point (Point Mills), and Scales Creek. Approximately 229 acres of tailings were located in OU3.

On June 21, 1989, EPA collected a total of eight samples from drums located in the old Calumet and Hecla Smelting Mill Site near Lake Linden, the Ahmeek Mill Site near Hubbell, and the Quincy Site near Mason. On August 1, 1990, nine more samples were collected from drums located above the Tamarack Site near Tamarack City. Based on the sampling results, EPA determined that some of these drums may have contained hazardous substances. During the week of May 8, 1989, EPA also conducted ground penetrating radar and a sub-bottom profile (seismic) survey of the Torch Lake bottom. The area in which this survey was conducted is immediately offshore from the former Calumet and Hecla smelting mill site. The survey located several point targets (possibly drums) on the bottom of Torch Lake. Based on the drum sampling results and seismic survey, EPA executed an Administrative Order on Consent (AOC), dated July 30, 1991, which required six companies and individuals to sample and remove drums located on the shore and lake bottom. Pursuant to the AOC, these entities removed 20 drums with unknown contents from offshore of Hubbell, and the old Calumet and Hecla smelting mill site, in September 1991. Eight-hundred and eight (808) drums were found in the Lake bottom, some of which were removed from the upland areas of Torch Lake. The removed drums and soils were sampled, over-packed, and disposed of off-site at a hazardous waste landfill (EPA, 1991).

Remedial investigations were completed for all three OUs. The RI and BRA reports for OU1 were finalized in July 1991 (Life Systems, 1991). The RI and BRA reports for OU3 were finalized on February 7, 1992. The RI and BRA reports for OU2 were finalized in April 1992. The ecological assessment for the Site was finalized in May 1992. A Proposed Plan identifying EPA's recommended remedy for OU1 and OU3 was presented to the public on May 5, 1992, starting the period for public comment. A Proposed Plan identifying EPA's recommended remedy for OU2 was presented to the public on February 17, 1994.

In 1994, the EPA entered into AOCs with several landowners, giving the landowners covenants not to sue and contribution protection in exchange for agreements to provide access and record restrictive covenants (RCs). The RCs were to be recorded within six months of the AOC's effective date and required the property owner to ensure cover material remained in place over the tailings. EPA closed out cost recovery actions for the Site in 1997. The landowners recorded these covenants.

In addition, on January 10, 1997, EPA entered into a prospective purchaser agreement (PPA) with the landowners at the Mason tailing pile, specifically, Quincy Development Landowners and Lakeshore Estates Associates. This action was undertaken to address potential concerns purchasers might otherwise have regarding CERCLA liability, and thereby encourage redevelopment. Under the PPA, the landowners provided specific benefits to EPA, including access and borrow soil located on land owned by Lakeshore Estates Associates at no cost.

The ROD for OU1 and OU3 was signed on September 30, 1992 (EPA,1992); and the ROD for OU2 was signed on March 31, 1994 (EPA,1994).

The following were the RAOs for OU1 and OU3 as listed in the ROD:

- Reduce or minimize potential risks to human health associated with the inhalation of airborne contaminants from the tailings and/or slag located at the Site.
- Reduce or minimize potential risks to human health associated with direct contact with and/or the ingestion of the tailings and/or the slag located at the Site.
- Reduce or minimize the release of contaminants in tailings to the groundwater through leaching.
- Reduce or minimize the release of contaminants in tailings to the surface water and sediment by soil erosion and/or air deposition.

The components of the selected remedy were as follows:

- Deed restrictions to control the use of tailing piles so that tailings will not be left in a condition which is contrary to the intent of this ROD.
- Removal of debris such as wood, empty drums, and other garbage in the tailing piles for off-site disposal in order to effectively implement the soil cover with vegetation.
- Soil cover with vegetation in the following areas:
  - OU1 tailings in Lake Linden, Hubbell/Tamarack City, and Mason.
  - OU3 tailings in Calumet Lake, Boston Pond, Michigan Smelter, Dollar Bay, and Grosse-Point.
  - OU1 slag pile/beach in Hubbell.
- Areas that were excluded from the remedy include:
  - Isle-Royale
    - The portion of the Isle-Royale tailings in OU3 which is being developed as a sewage treatment plant will be excluded from the area to be covered with soil and vegetation under this ROD. The part of this area to be covered by conventional sewage treatment task is approximately 12 acres. The remaining part, approximately 48 acres, will be covered with soil and vegetation by the Portage Lake Water and Sewage Authority as part of the sewage treatment facility development plan.
    - The portion of the Isle-Royale tailings which is designated to be developed as residential area will be excluded from the area to be covered with soil and vegetation under this ROD. This area covers approximately 90 acres.
    - The portion of the Isle-Royale tailings which is currently being used as source material to make cement blocks and as a finished block storage area for the Superior Block Company will be excluded from the area to be covered with soil and vegetation under this ROD. The owner and/or operator of Superior Block Co. must use dust control measures such as water spray during the operation of mining and other activities in order to reduce the release of dust into the air.

- The area designated by the Houghton County Road Commission (HCRC) as source material to spread on the road during winter to provide traction for motor vehicle will be excluded from the area to be covered with soil and vegetation. This area to be covered with soil and vegetation. This area is located in Grosse-Point I OU3 and is estimated to be 46 acres. While this area is being utilized, the following procedures must be observed:
  - The area should be covered with enough soil to prevent the release of tailings to the air and lake.
  - Excavation should stop at seven feet above the water table, it must be covered with soil or soil and vegetation.
  - Once the entire area is excavated to seven feet above the water table, it must be covered with soil and vegetation pursuant to this ROD.
- Assuming the slag pile located in the Quincy Smelter area (approximately 25 acres) will be developed as part of a National Park, no action will be taken. If this area is not developed as a National Park in the future, deed restrictions will be sought to prevent the development of residences in the slag pile area. The North Entry, Redridge, and Freda tailings are excluded from the areas to be covered under this ROD. These locations are along Lake Superior shore where pounding waves and water currents will likely retard or destroy any remedial action. However, the North Entry and Freda tailings, approximately 46 acres were to be studied during the remedial design. If EPA determined that any portion of these areas was sufficiently unaffected by Lake Superior wave activity such that it could be effectively covered with soil and vegetated, then the unaffected area or areas shall be subject to the requirement of this ROD.

**Commented [WW(1):** This topic is brought up a few times throughout the document. Table 5 on page 15 states that an outreach was made but the EPA has not received a response and that further investigation will continue.

During our site inspection landowners at point mills east commented on the usage of the area by the road commission. The primary concern was the stamp sands in the area being kicked up, and transported through the air.

The table on page 22 states that the EPA is the responsible party for this topic and the milestone date is September of 2023. This issue merits priority. It needs to be fixed without any further delay.

EPA selected a “No Action” remedy for OU2.

The remedy selected for OU2 takes into consideration and relies upon:

- The reduction of stampsand loading to surface water bodies expected as a result of the remedial action which will be taken at OUs 1&3.
- Ongoing natural sedimentation and detoxification such as that which is occurring in other surface water bodies in the area.
- Institutional programs and practices controlling potential future exposure to site-affected groundwater which are administered at the county and state level.
- The long-term monitoring and the five-year review process monitoring requirements of the remedy selected for OUs 1&3 under a previous ROD for the Site.

As detailed in the ROD for OU2, EPA determined that the sediment and surface water contamination associated with OU2 does not pose an unacceptable threat to human health based on sample data available at that time. The shallow groundwater associated with OU2, which comes into contact with the stamp sands, exhibits inorganic contamination and results in unacceptable potential future risks. However, these risks arise only if, in the future, the stamp sands are developed for residential use or if drinking water is taken from the shallow groundwater. The ROD stated that the practice in the region

was to drill drinking water wells into the sandstone aquifer, so any future risk contaminated groundwater appeared unlikely.

The ROD also stated that the Western Upper Peninsula Health Department (WUPHD) and the Michigan Department of Public Health regulated the installation of drinking water wells in the vicinity of the Site. These local authorities have been alerted of the potential future threat and currently have permitting programs and development review procedures in place. Thus, the ROD determined that treatment of groundwater to reduce the toxicity, mobility and volume of contaminants permanently and significantly was not found to be necessary to protect human health.

Contamination associated with Torch Lake sediments, however, was determined to pose an ecological threat, this was documented in the 1994 ROD for OU2 and later, in the 2001 Baseline Study. The lake bottom sediment along the western shoreline consists of stamp sands that were deposited in the lake over many years of active disposal of copper ore milling and associated mining wastes into the lake. The most significant ecological impact is the severe degradation of the benthic communities in Torch Lake as a result of metal loadings from the mine tailings.

A ROD Amendment was created for OU3 in 2009. The document addresses the Quincy Smelter portion of the Site. The 1992 ROD determined that no action should be taken at Quincy Smelter as it was slated for development as a national historic park. Data presented in the second FYR in 2008, showed that no development has occurred and the stamp sands and slag at the Site continue to erode into the Portage Channel. The amendment called for:

- Extending the soil and vegetative cover to areas that are part of Quincy Smelter.
- The original no further action decision would still apply for the fenced in area of the property. However, the amended remedy calls for markers to be installed to notify site visitors of restrictions within the currently fenced area.
- Assessment and, if necessary, improvement of erosion control along the shoreline where exposed stamp sands can erode into Portage Lake.
- Establishing Institutional Controls (ICs) in the form of restrictive covenants to protect and maintain the cover and access restrictions.
- Long-term cover and IC monitoring (EPA, 2009)

### **Status of Implementation**

An Interagency Agreement was signed with the Natural Resource Conservation Service (NRCS) to perform the remedial design work for OU1 and 3. The remedial design was completed for the entire Site in 1998. On-Site construction for OU1 and OU3 began in June 1999 and was completed in 2005. A Preliminary Close-Out Report (PCOR) documenting the construction completion was signed on September 23, 2005 (EPA, 2005 (2)).

Remedial action construction activities at OU1 were performed according to approved design and specifications at Lake Linden, Hubbell/Tamarack City, and Mason Sands; and it is anticipated that cover material and shoreline protection will continue to meet RAOs established for the Site.

**Commented [WW(2)]:** This states that the cover material and shoreline protection will continue to meet RAOs established for the Site. In general, this may be true with the following exceptions:

Mason Sands has a significant area where a natural disaster (flash flooding of 2018) created a washout exposing stamp sands.

Lake Linden has long shoreline areas with notable erosion likely due to insufficient rip-rap coverage during times of high water/ice erosion (see Issues and recommendation letter-2022)

For Lake Linden, EPA and MDEQ determined that the remedy was functioning as intended, and in April 2002, EPA delisted Lake Linden, and all of OU2 from the National Priorities List (NPL). Hubbell/Tamarack City were delisted from the NPL via a partial deletion in 2004.

Remedial action construction activities at OU3 were performed according to approved design and specifications at Dollar Bay, Point Mills, Calumet Lake (14 acres), Boston Pond (25 acres), Michigan Smelter (14 acres), and Scales Creek, and it is anticipated that cover material and shoreline protection installed at the Site will continue to meet RAOs established for the Site.

**Commented [WW(3)]:** Point Mills and Michigan Smelter have significant shoreline erosion resulting from inadequate shoreline protection systems

In 2002, several area citizens and local government official communicated verbally and by correspondence to EPA that they observed large clouds of stamp sand dust blowing from Gull Island into Torch Lake. Gull Island is located approximately 1500 feet off of the western shore of Torch Lake at Hubbell/Tamarack. It is approximately 13.6 acres in size and is made primarily of stamp sands. In 2003 and 2004, EPA undertook action at the island not specifically laid out in the OU1 And OU3 ROD. Specifically, EPA, with MDEQ and NRCS assistance, planted approximately 38,000 individual trees, shrubs and beach grass into the stamp sands that comprise the island, without the use of clean cover material. A Memorandum to File was created to document the decision. EPA believed that the potential for exposed stamp sands on the island to contribute to the degradation of the benthic community in Torch Lake was high enough to justify taking an action consistent with the 1992 ROD (EPA, 2002).

During 2007, as a result of historical low water levels, EPA conducted a removal assessment along the western shoreline of Torch Lake. A specific concern was areas in the Lake Linden recreation area that had exposed sediments and clay like material which showed high levels of lead, PCBs, and arsenic. An EPA removal action was conducted at the Lake Linden Beach and Marina to remove the identified materials (EPA, 2007).

In 2008, EPA conducted a removal action at the Mason Sands portion of the Site. The action included the removal of approximately 30 tons of arsenic contaminated soil and 10 drums containing residual waste. The area from which contaminated soils were removed was backfilled with clean fill (EPA, 2008).

In 2004 EPA Removal and a contractor removed drums, vats, tanks, and small containers from Quincy Smelter. In 2005, EPA removed asbestos from two of the structures of the Quincy Smelter part of the Site (EPA, 2005). In 2009, a ROD Amendment required remedial actions including the placement of the soil and vegetative cover and shoreline protection to portions of the Quincy Smelter area. This work was completed during 2011 (EPA, 2009).

Further delisting's from the NPL occurred in 2012 (Michigan Smelter, Isle Royale Sands, and Mason Sands and in 2013 (Calumet Lake and Quincy Smelter).

In 2019, work involving the repair of the cap was conducted at one of the properties that is a part of OU3 Point Mills. EPA collected samples from the cover and confirmed that the cover installed did not meet the required specification. The cap restoration included disking the soil and adding additional topsoil, fertilizer and a native species seed mix. During the most recent site visit, the quality of the soil cap and vegetative cover appeared to have improved (SulTRAC, 2019)

### **Institutional Controls**

**Table 3:** Summary of Planned and/or Implemented ICs

| Media, engineered controls, and areas that do not support UU/UE based on current conditions | ICs Needed | ICs Called for in the Decision Documents | Impacted Parcel(s)     | IC Objective  | Title of IC Instrument Implemented and Date (or planned)  |
|---|------------|--|------------------------|---|---|
| Soils with residual contamination in OU1 and OU3.   | Yes        | Yes                                      | Included In Appendix C | Protect vegetative cover and prevent residual mining contamination from entering surface water by ensuring that: (1) no disturbance of the vegetative cover occurs, or (2) owner is required to replace soil and repair vegetative cover. | Declaration of Restrictive Covenants, included in Appendix C.<br><br>Additional properties that need RCs (planned) are included in Appendix C.<br><br>Quincy Smelter parcel RC completed, recorded on 1/24/13 |
| Groundwater associated with the entire Site (OU2).  | Yes        | Yes                                      | NA                     | Prohibit well installation or screening at depths where groundwater will be impacted by residual mining wastes.   | Institutional programs and practices administered by the local government. Including Western Upper Peninsula District Health Department Ordinance dated 3/14/1998   |

A map showing the area in which the ICs apply is included in Appendix D.

Status of Access Restrictions and ICs:

The 1992 ROD and 2009 ROD Amendment for OU1 and OU3 required that a soil and vegetative cover be constructed over large portions of tailings piles. The 1992 ROD further required that deed restrictions be placed on those properties where the vegetative cover had been constructed in order to prevent future erosion of mining wastes into Torch Lake. Specifically, the ROD required deed restrictions to ensure that mine tailings and/or slag material are ultimately re-vegetated after any activity which disturbs the soil cover. The 2009 ROD Amendment to the 1992 ROD required that the Quincy Smelter parcel also receive a soil and vegetative cover and ICs. The Quincy Smelter ICs, in the form of an RC, were recorded on January 24, 2013.

In 1994, EPA entered into an AOC with certain affected landowners requiring them, within six months of the AOC's effective date, to implement the appropriate deed restriction on their property.



The deed restrictions were to bind future owners by running with the land. The landowners complied with the AOC and recorded these covenants.

ICs were also discussed in the no action decision by EPA in the 1994 OU2 ROD's Site-wide groundwater component. The decision relied on country and local government programs and practices to control potential future exposure to Site-affected groundwater. The groundwater use is controlled by the Western Upper Peninsula Health Department through a policy, review and permitting process. The Houghton County Health Department also has a permitting program for the installation of private wells. Both local governmental units responsible for well installation permitting are aware of the stamp sands' location. EPA provided the Houghton County Health Department and every well permitting office with maps showing the areas of stamp sands with each parcel's respective locators, which included Township, Range, and section. EPA contacted the Western Upper Peninsula Health Department via email in August 2022 and confirmed that the department continues the review and permitting process, to ensure potable drinking water wells are not screened in the stamp sands areas.

#### Current Compliance:

Deed restrictions are required on properties where a soil and vegetive cover was to be placed over the remaining waste piles, for OU1 and OU3. Not all properties requiring RCs have them, Appendix C includes a list of parcel numbers, owners and address of properties that require RCs. During this review period EGLE and EPA worked on identifying all of the remaining properties in which ICs are needed, created draft RCs, and conducted outreach to property owners (EPA, 2018 (2)). EPA is working to implement these controls for the properties where they are still required. Getting RCs implemented at the remaining properties is an issue/recommendation in this FYR.

The OU2 ROD relies on governmental controls to prevent use of groundwater impacted by contaminants from the Site, specifically, to prevent wells from being screened in the stamp sands. The 2018 FYR recommended that the existing ICs be evaluated for effectiveness. This recommendation is carried forward in this FYR.

#### Long Term Stewardship:

Compliance with ICs is necessary to assure the protectiveness of the remedy. Planning for long-term stewardship (LTS) is required to ensure that the ICs are maintained, monitored, and enforced so that the remedy continues to function as intended. LTS involves assuring effective procedures are in place to properly maintain and monitor the Site. LTS procedures are recommended to be developed and implemented to ensure continued effectiveness of the ICs in place.

#### IC Follow up Actions Needed:

EPA and EGLE should implement the additional ICs that are needed. Once the required ICs for all parcels have been implemented, to assure proper maintenance and monitoring of effective ICs, the Operations and Maintenance (O&M) Plan should be updated to include the mechanisms and procedures for inspecting and monitoring compliance with the ICs, as well as communications procedures. An annual report should be created to demonstrate that the Site was inspected to ensure no inconsistent uses have occurred, to certify that ICs remain in place and are effective, and to document that any necessary contingency actions have been executed. The previous FYR recommended the creation of an Institutional Control Implementation and Assurance Plan (ICIAP) as a way to ensure that the ICs are in place and properly implemented. That recommendation is carried on in this FYR.

### Systems Operations/Operation & Maintenance

A June 2015 Site-wide O&M Plan for Torch Lake established a monitoring program for OU1 and OU3. The overall goal of the O&M program is to assess the soil cover, as well as the vegetation establishment by conducting inspections. Based on findings and recommendations from the inspections, necessary repairs to the soil cover can be made in a timely manner to allow them to function as designed and continue to prevent the migration of stamp sands into the air and/or adjacent water bodies.

Soil cover inspections are a key component of O&M and provide the monitoring information used to track progress on establishment of vegetation and identify areas of the remedy susceptible to damage from erosional forces and/or other activities. EGLE is responsible for implementing the Site-wide O&M Plan.

EGLE and their contractors conduct yearly visits to the Site. These visits include inspections of the implemented remedy across all of the areas of the Site in which remedial actions took place. The most recent Site O&M activities took place in July 2022. The yearly Site activities includes cap inspections and areas that may need further maintenance work is noted. Maintenance work is than conducted on areas of need. In 2022, O&M repairs took place in two of the Site areas, North Entry and Hubbell/Tamarack.

### III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

**Table 4:** Protectiveness Determinations/Statements from the 2018 FYR

| OU # | Protectiveness Determination | Protectiveness Statement  |
|------|------------------------------|---|
| 1/3  | Short-term Protective        | The remedy at OU1 and OU3 is currently protective of human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands into the surface water of Torch Lake while it recovers over time. Approximately sixty properties have effective RCs in place. However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness: ensure the area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles is properly covered with soil and vegetation; develop an ICIAP; identify the remaining properties that require ICs and implement them; and update the O&M Plan to incorporate LTS procedures that provide for monitoring and tracking compliance with existing ICs and annual certifications to EPA that ICs are in place and effective. |

|          |                       |   |
|----------|-----------------------|---|
| 2        | Short-term Protective | The remedy at OU2 is currently protective of human health and the environment because existing residential wells screened in the stamp sands are not contaminated above drinking water standards and effective ICs are in place to prevent future wells being screened in the stamp sands. However, in order for remedy to be protective in the long term, the following action needs to be taken to ensure protectiveness: update the O&M Plan to incorporate LTS procedures that provide for monitoring and tracking compliance with existing ICs and annual certifications to EPA that ICs are in place and effective.   |
| Sitewide | Short-term Protective | The remedy at the Torch Lake Superfund Site currently protects human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands to Torch Lake while it recovers over time. Approximately sixty properties have effective RCs in place. Existing residential wells screened in the stamp sands are not contaminated above drinking water standards and effective ICs are in place to prevent future wells being screened in the stamp sands. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness: ensure the area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles is properly covered with soil and vegetation; develop an ICIAP; identify the remaining properties that require ICs and implement them, and update the O&M Plan to incorporate LTS procedures that provide for monitoring and tracking compliance with existing ICs and annual certifications to EPA that ICs are in place and effective. |

**Table 5: Status of Recommendations from the 2018 FYR**

| OU # | Issue   | Recommendations  | Current Status        | Current Implementation Status Description  | Completion Date (if applicable)            |
|------|---|--|-----------------------|--|--|
| 1,3  | The area HCRC designated as source material to spread on the road during winter to provide traction for motor vehicles was excluded from the area to be covered with soil and vegetation. Excavation was to | Ensure that this area is covered with soil and vegetation pursuant to the ROD. | Addressed in Next FYR | Outreach was made to the HCRC to learn of their future plans regarding the designated area and to confirm that the areas use is still consistent with the 1992 ROD. EPA has not yet received a response. Further investigation into this recommendation will continue. | <a href="#">Click here to enter a date</a> |

|     |  |  |                              |  |   |
|-----|--|--|------------------------------|--|---|
|     | <p>stop at seven (7) feet above the water table. This portion subsequently was to be covered with soil or soil and vegetation. It appears the excavation may have extended below the water table. It must be covered with soil and vegetation pursuant to the ROD.</p> |  |                              |  |   |
| 1,3 | <p>Not all required ICs are in place.</p>  | <p>Develop and submit an ICIAP. The purpose of the ICIAP is to conduct IC evaluation activities to determine which ICs are required by the decision documents are already in place, to ensure that any already-implemented ICs are effective, to evaluate the specific additional ICs that are needed, and to ensure that LTS procedures are put in place so that all ICs, once implemented, are properly maintained, monitored, and enforced.</p> | <p>Addressed in Next FYR</p> | <p>An ICIAP is still required for the Site.</p>  | <p><a href="#">Click here to enter a date</a></p> |
| 1,3 | <p>Properties at OUI and OU3 require deed restrictions. RCs have been implemented at many, but not all properties.</p>   | <p>Identify the remaining properties that require ICs and implement them.</p>  | <p>Ongoing</p>               | <p>Work to implement ICs throughout the Site have been ongoing. Outreach to property owners has occurred during the FYR review period and will continue.</p> |   |

|       |   |  |                           |   |  |
|-------|---|--|---------------------------|---|--|
| 1,2,3 | Procedures are not in place to ensure LTS of ICs at the Site. | Once all required ICs are implemented, update the O&M Plan to incorporate LTS procedures which include monitoring and tracking compliance with existing ICs and providing annual certifications to EPA that the required ICs are in place and effective. | Addressed in the Next FYR | LTS procedures are still recommended to be implemented at the Site. |  |
|-------|---|--|---------------------------|---|--|

Other Findings from 2017 Five-Year Review:

In 2014, one of the property owners at Point Mills expressed significant concerns and disappointment in the type of soil and vegetative cover they received. They were promised cover with grasses and wildflowers, and sandy loam material. Although the cover is functioning to prevent erosion, it is mostly clay, rocks, and weeds, and does not drain when wet. In 2015, EPA collected samples from the cover and confirmed that the cover installed did not meet the required specification. EPA is working with the property owner on improving the quality of the vegetation cover.

- EPA conducted work on the property in 2019 to improve the cover and vegetative cap. During the most recent site inspection it was observed that the new cover has improved the quality of vegetation on the property.

Once ICs are in place, the Site could be considered for delisting from the NPL. EPA and MDEQ plan to pursue delisting of the four remaining areas at the Site.

- EPA and MDEQ are still working towards placing ICs in all areas where they are needed. When an area has all ICs in place, that area can be considered for delisting.

The PLWSA is spreading biosolids on the Mason Sands area of the Site. MDEQ is regulating and monitoring this activity. Monitoring results from previous years indicated no impacts to the Torch Lake from biosolids application. However, it is recommended that PLWSA resume monitoring to confirm the lack of biosolids impact to the lake.

- The PWLSA was contacted regarding the spreading of the biosolids at the Mason Sands location. Their response indicated that the PWLSA is still spreading biosolids at the site but at a lesser rate than what was done previously. Soil monitoring is conducted every two years.

Considering the fact that per- and polyfluoroalkyl substances (PFAS) may have been used as surfactants to enhance recovery of metals from ores in copper, EGLE has recommended a PFAS evaluation or sampling where there is information suggesting that PFAS was likely used or released at Superfund Sites. EPA and EGLE will further discuss and determine what next steps to take.

- No action was taken regarding sampling for PFAS compounds during this review period. EGLE has continued this recommendation to this FYR. EPA has recently (2022) updated the regional screening level and health advisories for certain PFOS compounds. EPA and EGLE should further discuss and determine next steps regarding this.

Because groundwater monitoring wells at the Site have indicated concentrations of arsenic and lead above maximum contaminant levels (MCLs), EPA and MDEQ will evaluate the need for periodic monitoring of residential wells screened in the stamp sands. EPA and MDEQ will also evaluate the need for monitoring of sediments nearest the vegetated covers as a measure of their effectiveness in preventing stamp sands migration into Torch Lake.

- No sampling was conducted or need for sampling was recommended during the review period.

#### **IV. FIVE-YEAR REVIEW PROCESS**

##### **Community Notification, Involvement & Site Interviews**

A public notice was made available by newspaper posting in the Daily Mining Gazette on, on 9/22/2022, stating that there was a FYR and inviting the public to submit any comments to EPA. EPA received no comments regarding this FYR. The results of the review and the report will be made available at the Site information repository located at the Portage Lake District Library, 58 Huron St., Houghton, Michigan, and the Lake Linden/Hubbell Public Library, 601 Calumet St., Lake Linden, Michigan. A copy of the public notice is included as Appendix E.

##### **Data Review**

No monitoring data was collected during the period of this FYR. The overall goal of the Site O&M is to assess soil cover and Site structure conditions, as well as vegetative establishment by conducting soil cover inspections. Based upon the findings and recommendations of the inspections necessary repairs of the cap can be made to continue to protect the remedial goals.

While there was no sampling conducted this review period for the Torch Lake Superfund Site by the EPA or EGLE Superfund programs, there is currently other monitoring that is being conducted in parts of the Torch Lake Superfund Site. A pilot restoration project is currently in progress as a collaboration between EGLE and EPA. The project is aimed at testing sediment capping and habitat restoration in shallow and near-shore areas of Torch Lake. The project includes multiple types of monitoring with groundwater testing being one of the types used. Monitoring data from other sources including this project may be useful to inform decisions regarding the Site.

The ROD for OU2 stated that no action would be taken for OU2 beyond relying on ICs, so there are no specified sediment and/or groundwater monitoring requirements for OU2.

When MDEQ finalized the Site-wide O&M Plan in 2015, monitoring of residential wells screened in the stamp sands was considered but not implemented. The 2010 Investigation Report concluded that the

local groundwater quality has not been greatly impacted by stamp sands. However, moving forward, MDEQ may consider sampling of those wells again to ensure protectiveness of the remedy.

### **Site Inspection**

The inspection of the Torch Lake Site was conducted from 7/19/2022 to 7/21/2022. In attendance were Glenn Lautenbach, EPA, Waleign Wagaw and Robert Franks of Michigan EGLE, and Clara Austin and Nic Ropotos from AECOM the contractors for EGLE. The purpose of the inspection was to assess the protectiveness of the remedy, evaluate the performance of the soil and vegetative cap where applied, and evaluate future remedy implementation problems and needs.

EGLE completes an Annual Site Inspection in part to identify areas where O&M work is recommended. Cover repair work at the North Entry and Hubbell/Tamarack City Superfund Areas was conducted in summer/fall 2022.

EGLE has documented shoreline erosion at multiple locations. EPA and EGLE will evaluate this issue and take the appropriate action. Additional information regarding the site inspection can be found in Appendix F.

## **V. TECHNICAL ASSESSMENT**

**QUESTION A:** Is the remedy functioning as intended by the decision documents?

### **Question A Summary:**

Answer: Yes

Based on a review of relevant documents, applicable or relevant or appropriate requirements (ARARs), risk assumptions, and the results of the annual site inspections, the soil cover and the vegetations remedy implemented per the 1992 ROD and 2009 ROD Amendment for OU1 and OU3 for OU1 and OU3 is functioning as intended by reducing potential risks associated with direct contact or inhalation of contaminants in the tailings and erosion of stamp sands into the surface water of Torch Lake.

**Commented [WW(4)]:** It should also be noted that EGLE has conducted significant amount of cover repair work and installation of culverts wherever needed since the flashflood of 2018. We recommend that documentation of this effort by EGLE be included in Appendix F as well.

**Commented [WW(5)]:** Annual site inspections documented by EGLE indicate widespread shoreline erosion at multiple locations (Hubble Beach, Hubble/Tamarack City, Lake Linden, Mason sands, Michigan Smelter, and Point Mills) where rip rap was placed to deter continued erosion. It appears that these are the result of insufficient engineering design to account for historic high-water levels. This situation does not fall under what would be considered Operation and Maintenance of the cover, rather a design oversight that will require substantial work to repair( rip rap elevation and design). In the meantime, the cover and stamp sands are collapsing into the lakes thereby causing significant sedimentation to surface water and allowing additional stamp sands into the lakes. We have repeatedly recommended for the USEPA to take the appropriate measures to remedy the problem of rip rap erosion before conditions get worse.

Properties at OU1 and OU3 require deed restrictions to ensure no disturbance of the vegetative cover occurs; or if disturbance occurs, the owners is required to replace the soil and repair the vegetative cover. RCs have been implemented at many but not all properties.

The OU2 ROD addressing groundwater relies on governmental controls to prevent use of groundwater impacted by contaminants from the Site, specifically, to prevent wells from being screened in the stamp sands. Sampling of groundwater was not conducted during this review period.

#### ***System Operations/O&M***

Through this review period EGLE has been the lead for Site O&M. O&M includes an annual site inspection which looks at the cap and vegetative cover. The inspections review all areas in which capping was conducted as part of the OU1 and OU2 ROD. Areas in which additional work is needed to repair the cap to preserve the remedy are noted. The annual site inspections appear effective in maintaining the effectiveness of the remedy.

#### ***Implementation of Institutional Controls and Other Measures***

Properties at OU1 and OU3 require deed restrictions to ensure no disturbance of the soil and vegetative cover occurs. If a disturbance occurs the owner is required to replace the soil and repair the vegetative cover. Restrictive Covenants have been implemented at some, but not all of the Site properties. EPA is working to get the remaining Restrictive Covenants in place. Even though all required ICs have not been implemented, based upon annual site visits; there appears to be compliance with the use restrictions.

The OU2 ROD addressing groundwater relies on governmental controls to prevent use of groundwater impacted by contaminants from the Site, specifically, to prevent wells from being screened in the stamp sands. The Western Upper Peninsula Health Department (WUPHD) was contacted during the FYR process by email and confirmed that they have a policy, review, and remitting process to ensure that drinking water wells are not screened in the stamp sands.

The 2018 FYR also contained recommendations for IC plans to be developed. The recommendations regarding the ICs are carried forward in this FYR and includes the development of an ICIAP; IC evaluation activities; and development of LTS procedures to ensure ICs are properly maintained, monitored, and enforced. Once all required ICs are implemented an update to the O&M plan is recommended to include the mechanisms and procedures for inspecting and monitoring compliance with the ICs. LTS procedures would ensure that the ICs are in place and are effective, and to document that any necessary contingency actions have been executed.

**Commented [WW(6)]:** The draft DRCs that were completed and provided to the USEPA since the last FYR should be approved and implemented without any further delay. EGLE staff in consultation with the USEPA staff completed the draft ICs for 57 parcels located in Boston Pond, North Entry, Dollar Bay, Point Mills, and Scales Creek after the 2018 FYR. However, there has not been any documented progress on the part of the UDEPA to place ICs on these parcels. The milestone date for placement of ICs on these parcels was December 30, 2019. Long overdue.

**QUESTION B:** Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Answer: Yes

The RAOs in place at the time of the remedy selection are still valid.

#### **Question B Summary:**



***Changes in Standards and TBCs***

Standards outlined and updated in the decision document and discussed in the previous FYR reports are still valid at the Site. There have been no known changes in ARARs or standards affecting the protectiveness of the remedy since the last FYR report.

***Changes in Toxicity and Other Contaminant Characteristics***

Neither the toxicity factors for the contaminants of concern nor other toxicity factors have changed in a way that could affect the protectiveness of the remedy. Because the remedy implemented Ics to reduce erosion of the cover with contaminants that remain at the Site, changes in COC toxicity generally would not impact the effectiveness of the remedy.

***Changes in Exposure Pathways***

OU1 and OU3: The exposure assumptions used to develop the Human Health Risk Assessment included exposure to contaminated tailings and slag from a possible current and future ingestion, inhalation, and dermal contact pathway.

OU2: The exposure assumptions used to develop the ecological assessment included high toxicity to benthic communities from high metal concentrations in sediments.

There have been no changes in the potential exposure pathways at the Site since the 2018 FYR. No other changes in the Site conditions that affect exposure pathways were identified as part of this FYR.

**QUESTION C:** Has any other information come to light that could call into question the protectiveness of the remedy?

Answer: Yes

In Site inspections, EGLE has documented multiple locations in which there has been shoreline erosion where rip rap was placed to deter erosion. This issue was also noted in the previous FYR and continues in this review. EPA and EGLE will continue to evaluate this issue and take appropriate action.

The selected Site remedy relies on shoreline protection in the form of geotextile and rip rap to prevent erosion from depositing more stamp sands into the Site water bodies. The Site may be affected by climate change if climate change effects include changes in the water level of Torch Lake and other Site water bodies.

**VI. ISSUES/RECOMMENDATIONS**

| Issues/Recommendations  |
|---|
| <b>OU(s) without Issues/Recommendations Identified in the Five-Year Review:</b> |
| <i>None</i>   |

**Issues and Recommendations Identified in the Five-Year Review:**

|                                      |  |                          |                        |                       |
|--------------------------------------|--|--------------------------|------------------------|-----------------------|
| OU(s): 1,2,3                         | <b>Issue Category: Institutional Controls</b>  |                          |                        |                       |
|                                      | <b>Issue:</b> An ICIAP is required which include procedures for LTS and ICs.   |                          |                        |                       |
|                                      | <b>Recommendation:</b> Prepare and implement an ICIAP containing a LTS plan to ensure that effective ICs will be implemented, monitored, and maintained at the Site. |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>  | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes  | EPA/State                | EPA                    | 12/1/2024             |

|                                      |   |                          |                        |                       |
|--------------------------------------|---|--------------------------|------------------------|-----------------------|
| OU(s): 1 and 3                       | <b>Issue Category: Institutional Controls</b>   |                          |                        |                       |
|                                      | <b>Issue:</b> Not all ICs are in place.   |                          |                        |                       |
|                                      | <b>Recommendation:</b> Continue to work to put in place required ICs at all properties where they are required. |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>   | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes   | EPA                      | EPA                    | 3/1/2025              |

|                                      |   |                          |                        |                       |
|--------------------------------------|---|--------------------------|------------------------|-----------------------|
| OU(s): 1 and 3                       | <b>Issue Category: Operations and Maintenance</b>   |                          |                        |                       |
|                                      | <b>Issue:</b> EGLE has documented shoreline erosion is in some of the capped areas.   |                          |                        |                       |
|                                      | <b>Recommendation:</b> Work with EGLE to evaluate the issue and take appropriate action to control the erosion in affected areas. |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>   | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes   | State                    | EPA                    | 3/1/2024              |

|                                      |   |                          |                        |                       |
|--------------------------------------|---|--------------------------|------------------------|-----------------------|
| OU(s): 1 and 3                       | <b>Issue Category: Other</b>  |                          |                        |                       |
|                                      | <b>Issue:</b> Confirm that the HCRC is following the OU1 and OU3 ROD requirements.                  |                          |                        |                       |
|                                      | <b>Recommendation:</b> Confirm that the HCRC borrow area is following the terms written in the ROD. |                          |                        |                       |
| <b>Affect Current Protectiveness</b> | <b>Affect Future Protectiveness</b>   | <b>Party Responsible</b> | <b>Oversight Party</b> | <b>Milestone Date</b> |
| No                                   | Yes   | EPA                      | EPA                    | 9/1/2023              |

|  |  |  |  |  |
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|--|--|--|--|--|

**OTHER FINDINGS**

In addition, the following are recommendations that were identified during the FYR, but do not affect current nor future protectiveness:

- In the previous FYR EGLE had recommended evaluation or sampling for PFOS compounds for the Site due to the possibility of PFOS compounds used as surfactants in the stamp sand creation process. EPA and EGLE will further discuss and determine what next steps to take.
- The OU2 ROD relied on existing governmental controls as ICs for the prevention of groundwater wells being screened in the stamp sands. Review of this process should be conducted to ensure that new groundwater wells are not screened in the stamp sands.

**VII. PROTECTIVENESS STATEMENT**

| Protectiveness Statement(s)   |   |  |
|---|---|--|
| <i>Operable Unit:1</i>  | <i>Protectiveness Determination:</i><br>Short-term Protective | <i>Planned Addendum Completion Date:</i><br><a href="#">Click here to enter a date</a> |
| <p><i>Protectiveness Statement:</i><br/>The remedy at OU1 and OU3 is currently protective of human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands into the surface water of Torch Lake while it recovers over time. However, in order for the remedy to be protective in the long term, the following actions needs to be taken to ensure protectiveness:</p> <ul style="list-style-type: none"> <li>• Develop and implement an ICIAP containing LTS procedures.</li> <li>• Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.</li> <li>• Confirm that the HCRC borrow area is compliant with the ROD.</li> <li>• Implement ICs in properties which still require them.</li> </ul> |   |  |

| Protectiveness Statement(s)   |   |  |
|---|---|--|
| <i>Operable Unit:2</i>  | <i>Protectiveness Determination:</i><br>Short-term Protective | <i>Planned Addendum Completion Date:</i><br><a href="#">Click here to enter a date</a> |
| <p><i>Protectiveness Statement:</i><br/>The remedy at OU2 is currently protective of human health and the environment because effective ICs are in place to prevent future wells being screened in the stamp sands. A no action determination was made for the OU2 record of decision However, in order for the remedy to be protective in the long term, the following actions needs to be taken to ensure protectiveness:</p> <ul style="list-style-type: none"> <li>• Develop and implement an ICIAP containing LTS procedures.</li> </ul> |   |  |

- Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.
- Confirm that the HCRC borrow area is compliant with the ROD.
- Implement ICs in properties which still require them.

**Protectiveness Statement(s)**

|                        |   |  |
|------------------------|---|--|
| <i>Operable Unit:3</i> | <i>Protectiveness Determination:</i><br>Short-term Protective | <i>Planned Addendum</i><br><i>Completion Date:</i><br><a href="#">Click here to enter a date</a> |
|------------------------|---|--|

*Protectiveness Statement:*

The remedy at OU1 and OU3 is currently protective of human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands into the surface water of Torch Lake while it recovers over time. However, in order for the remedy to be protective in the long term, the following actions needs to be taken to ensure protectiveness:

- Develop and implement an ICIAP containing LTS procedures.
- Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.
- Confirm that the HCRC borrow area is compliant with the ROD.
- Implement ICs in properties which still require them.

**Sitewide Protectiveness Statement**

|  |   |  |
|--|---|--|
| <i>Operable Unit:</i><br><i>Sitewide</i> | <i>Protectiveness Determination:</i><br>Short-term Protective | <i>Planned Addendum</i><br><i>Completion Date:</i><br><a href="#">Click here to enter a date</a> |
|--|---|--|

*Protectiveness Statement:*

The sitewide remedy is currently protective of human health and the environment because the soil and vegetative covers have reduced potential risks associated with direct contact or inhalation of contaminants in the tailings and are functioning as intended to reduce erosion of stamp sands to Torch Lake while it recovers over time. Effective ICs are in place to prevent future wells being screened in the stamp sands. However, in order for the remedy to be protective in the long term, the following actions need to be taken to ensure protectiveness:

- Develop and implement an ICIAP containing LTS procedures.
- Work with EGLE to evaluate and take appropriate action regarding shoreline erosion.
- Confirm that the HCRC borrow area is compliant with the ROD.
- Implement ICs in properties which still require them.

**VIII. NEXT REVIEW**

The next FYR report for the Torch Lake Superfund Site is required five years from the completion date of this review.

## APPENDIX A – REFERENCE LIST

- MDNR, 1987. *Remedial Action Plan for Torch Lake Area of Concern*. October 27, 1987.
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- EPA, 2008. *Pollution Report Mason Sand Removal*. December 12, 2008.
- EPA, 2009. *Record of Decision Amendment Operable Unit 3*. July 2009.
- EPA, 2018. *Fourth Five-Year Review Report for The Torch Lake Superfund Site*. March 22, 2018.
- EPA, 2018 (2). *EPA Requesting Property Owners to Add Deed Restrictions*, November 2018.
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## **APPENDIX B – ADDITIONAL SITE BACKGROUND**

Mining output, milling activity, and tailing production peaked in the Keweenaw Peninsula in the early 1900s to 1920. All of the mills at Torch Lake were located on the western shore of the lake and main other mining mills and smelters were located throughout the peninsula. In about 1916, advances in technology allowed recovery of copper from tailings previously deposited in Torch Lake. Dredges were used to collect submerged tailing, which were then screened, re-crushed, and gravity separated. An ammonia leaching process involving cupric ammonium carbonate was used to recover copper and other metals from conglomerate tailings. During the 1920s, chemical reagents were used to recover copper and other metals from conglomerate tailings. During the 1920s, chemical reagents were used to further increase the efficiency of reclamation. The chemical reagents included lime, pyridine oil, coal tar creosotes, wood creosote, pine oil and xanthates. After reclamation activities were complete, chemically treated tailings in Torch Lake and to reclaim copper from sources nationwide for the war effort. Mining continued until 1968 when all mining and related activities ceased.

Over 5 million tons of native copper were produced from the Keweenaw Peninsula and more than half of this was processed along the shores of Torch Lake. Between 1868 and 1968, approximately 200 million tons of milling, tailing, and reclamation wastes were dumped into Torch Lake filling at least 20 percent of the lake's original volume. While the Rivers and Harbors Act of 1890 did prohibit the filling or obstruction of any navigable waterway in the United States without prior consent of the Secretary of War, one locality in the country, Torch Lake, was specifically exempted from the prohibition. On addition, dumping in Torch Lake was further permitted during World War II when the War Production Board operated copper mining, milling, reclamation, and smelting activities for the war effort.