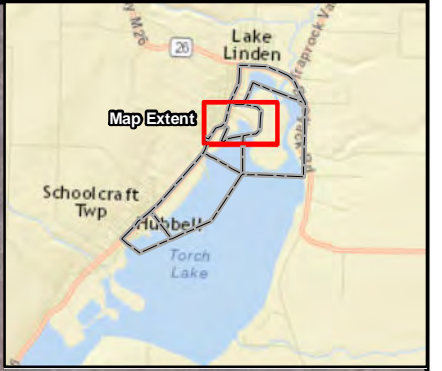
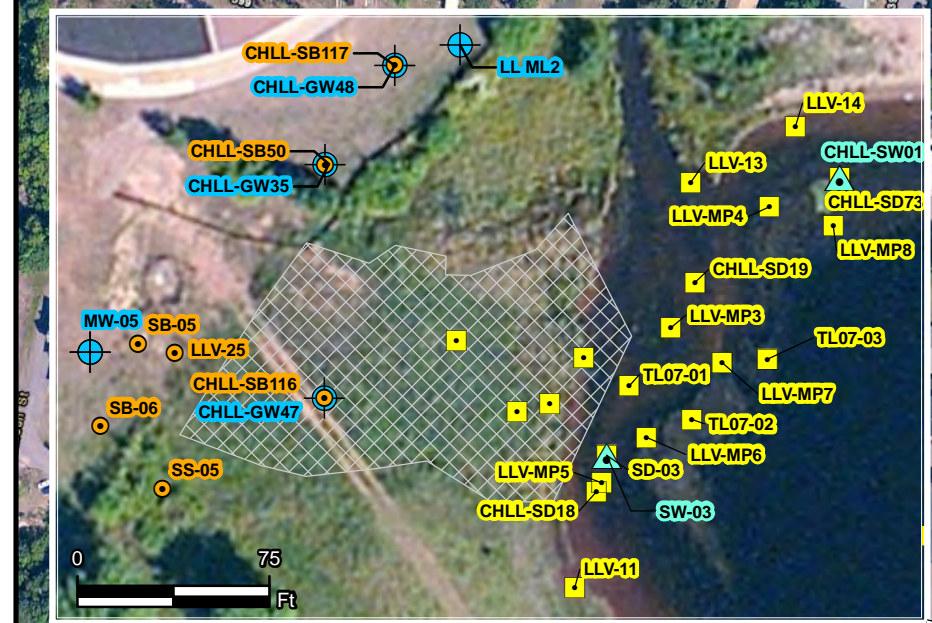

**DETAILED FINDINGS REPORT
LAKE LINDEN RECREATION AREA**

SECTION 7

**DETAILED FINDINGS REPORT – LAKE LINDEN RECREATION AREA
FIGURES**

Image Source: ESRI World Imagery (NAIP 2014)



Sampling Location Type

- Soil
- Groundwater
- Excavation Extent (2007)
- Surface Water
- Semi-Permeable Membrane Device
- Sediment
- Conceptual Site and Geographic Area Boundaries

0 250 Ft

Coordinate System: MGeoRef(m)

Prepared for:
Michigan Department of
Environmental Quality

Prepared By:
WESTON
SOLUTIONS of
MICHIGAN, INC
P.O. Box 577
Houghton, MI 49931

Figure 7-1

Sampling Location Map
Lake Linden Recreation Area
Lake Linden, Houghton County, Michigan

FILE: JGIS Projects\MDEQ\2017\001.001 Torch Lake.mxd 20160219.mxd 10:59:45 AM 2/19/2016 BROWN

FILE: J:\GIS Projects\MDEQ\2017\001.001 Torch Lake\mxd\2016 CHLL SL Report\Sec07-LLRec\Fig07.2 Soil Screening Results XRF -v20160219.mxd 12:03:14 PM 2/19/2016 BROWN

Image Source: ESRI World Imagery (NAIP 2014)



**Locations Screened for Metals -
At least one exceedance of:**

- Residential Direct Contact Criteria
- Residential Particulate Soil Inhalation Criteria
- Non Residential Direct Contact Criteria
- Non Residential Particulate Soil Inhalation Criteria

- Screening locations with no exceedances
- Locations are included within a different geographical area boundary
- ▨ Excavation Extent (2007)
- ▭ Conceptual Site and Geographic Area Boundaries


Xray Fluorescence screening results are from surface soils unless otherwise specified.

N


0200

Ft

Coordinate System: MGeoRef(m)



Prepared for:
**Michigan Department of
Environmental Quality**

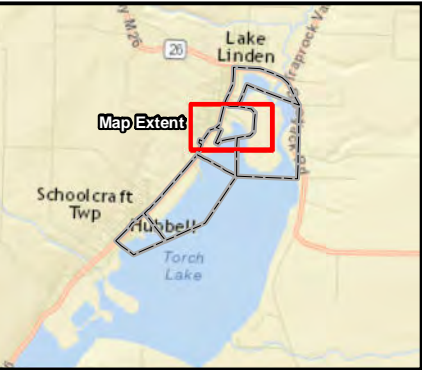


Prepared By:
**WESTON
SOLUTIONS of
MICHIGAN, INC**
P.O. Box 577
Houghton, MI 49931

Figure 7-2
Soil Screening Results Map - Soil
Lake Linden Recreation Area
Lake Linden, Houghton County, Michigan



Image Source: ESRI World Imagery (NAIP 2014)



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MDEQ Part 201 Cleanup Criteria for Response Action
1*=Residential Drinking Water Criteria
2*=Nonresidential Drinking Water Criteria
3*=Groundwater Surface Water Interface Criteria
4=Water Solubility
5=Residential Groundwater Vol to Indoor Air Inhalation
6=Nonresidential Groundwater Vol to Indoor Air Inhalation
7=Flammability and Explosivity Screening Level
* Exceedances of criteria 1, 2, and 3 are shown for organics and ammonia only

- Sampling locations with at least one exceedance
- Sampling locations with no exceedances
- Locations are included within a different geographical area boundary

Locations Analyzed for PCBs

- No Detections
- At Least One Detection
- Conceptual Site and Geographic Area Boundaries

Notes:
MG/L = milligrams per liter
UG/L = micrograms per liter
[#-#] = screen intervals
bgs = below ground surface

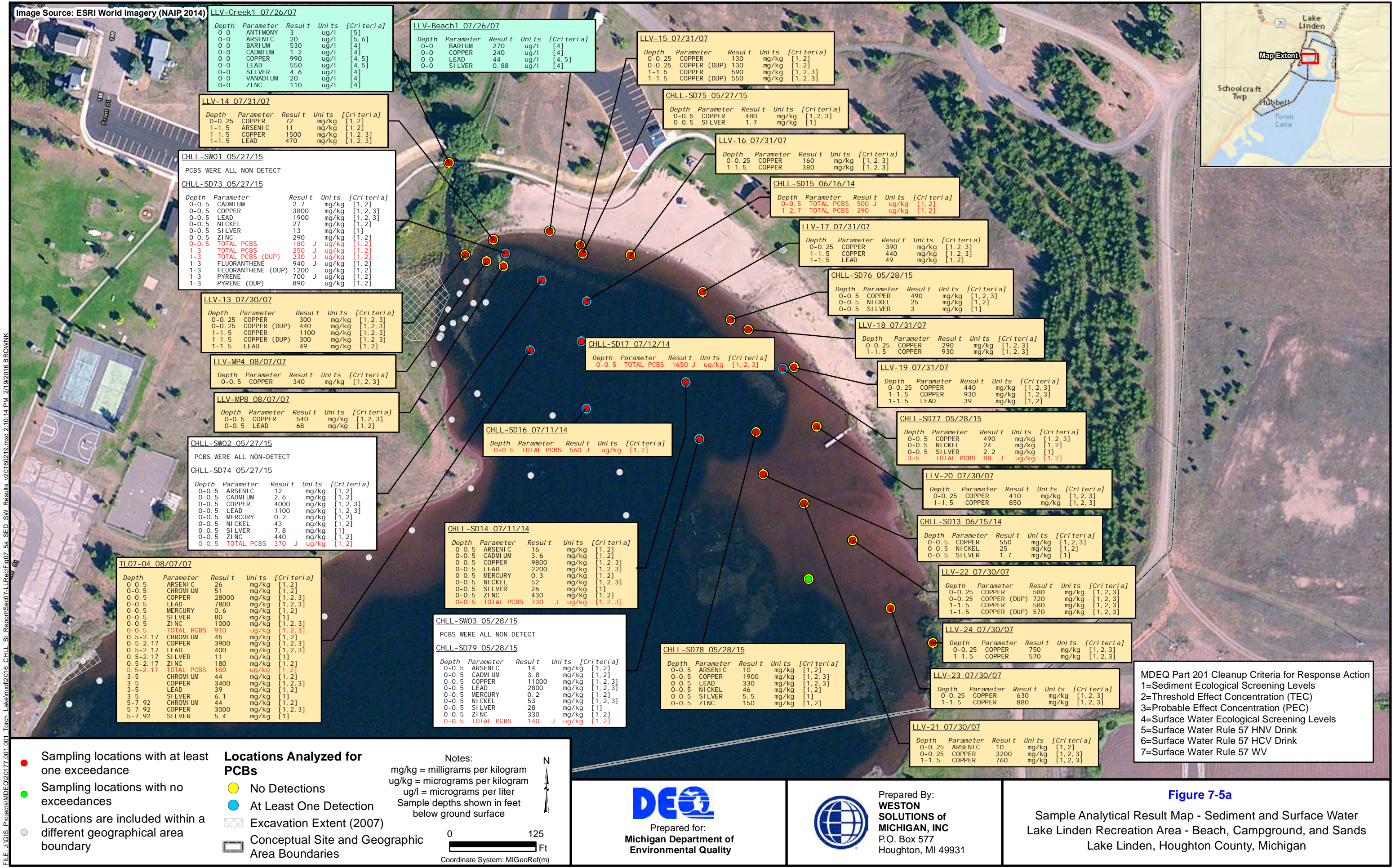
0 275 Ft
Coordinate System: MGeoRef(m)

DEQ
Prepared for:
Michigan Department of Environmental Quality



Prepared By:
WESTON SOLUTIONS of MICHIGAN, INC
P.O. Box 577
Houghton, MI 49931

Figure 7-4
Sample Analytical Result Map - Groundwater
Lake Linden Recreation Area
Lake Linden, Houghton County, Michigan



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Image Source: ESRI World Imagery (NAIP 2014)



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MDEQ Part 201 Cleanup Criteria for Response Action

- 1=Sediment Ecological Screening Levels
- 2=Threshold Effect Concentration (TEC)
- 3=Probable Effect Concentration (PEC)
- 4=Surface Water Ecological Screening Levels
- 5=Surface Water Rule 57 HNV Drink
- 6=Surface Water Rule 57 HCV Drink
- 7=Surface Water Rule 57 WV

DEQ

Prepared by:
Michigan Department of Environmental Quality

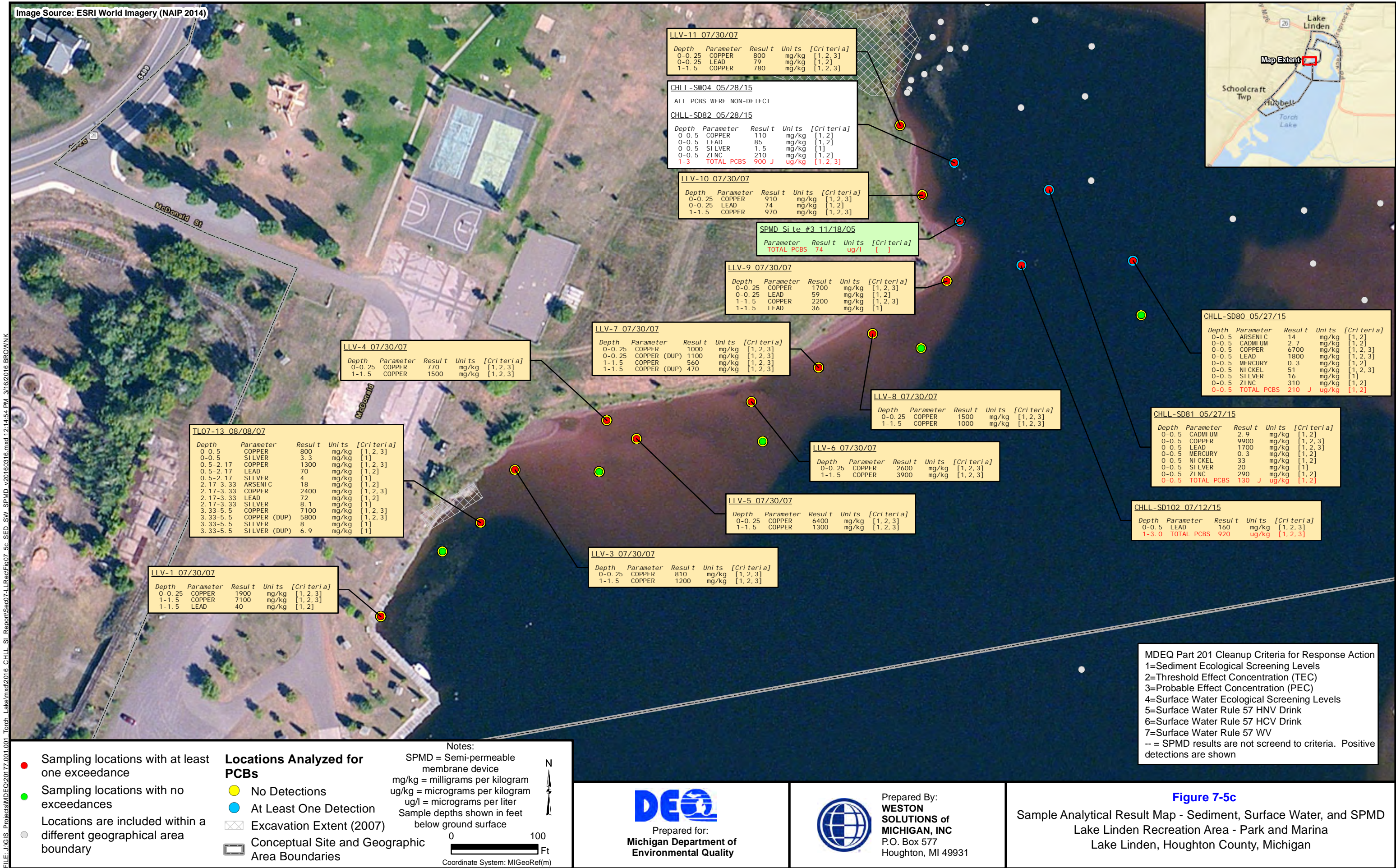
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P.O. Box 577
Houghton, MI 49931

Figure 7-5b

Sample Analytical Result Map - Sediment and Surface Water
Lake Linden Recreation Area - 2007 Lake Linden ER Footprint
Lake Linden, Houghton County, Michigan

Image Source: ESRI World Imagery (NAIP 2014)

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**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

8. DETAILED FINDINGS REPORT – LAKE LINDEN PROCESSING AREA

This Section summarizes the findings derived from implementation of the sampling and analysis plan (SAP) in the Lake Linden Processing Area. The narrative follows the investigative approach outlined in **Section 3**, while providing specific details about the study area and the potential human health and ecological risks associated with mining era operations in the study area.

8.1 SITE INSPECTION AND INVESTIGATION RESULTS

The implementation of the site inspection and investigation activities were intended to provide critical lines of evidence that link the findings of the archival research to the current environmental conditions in and around Torch Lake. The following subsections present the findings of the inspection and investigation activities and provide correlation of mining era operations and their potential impacts on the nearshore environment of Torch Lake.

8.1.1 Site Inspection

The site inspection at the Lake Linden Processing Area included the locating and inventory of structures and similar surficial artifacts associated with the mining era industrial operations. The study area was also inspected for potential physical and health hazards which were documented, photographed, and located with a global positioning system (GPS) unit. The inventoried hazards, if identified, were then qualitatively assessed for potential human health and environmental risks to determine if analytical sampling was warranted during the targeted inspection phase of the work.

8.1.1.1 Reconnaissance

On 6 October 2014, 13 May 2015, 30 June 2015, and 1 July 2015 a field team comprised of Weston Solutions of Michigan, Inc. (WESTON®) and Michigan Department of Environmental Quality (MDEQ) personnel performed reconnaissance activities in the Lake Linden Processing Area where written access was granted to the MDEQ. In the cases where access was not requested based on historic operational and investigative findings, property conditions were evaluated from a neighboring property or public right of way where access was permitted.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

The properties were visually inspected and observations were recorded on field logs. The following provides a summary of the relevant findings associated with the reconnaissance activities.

Lake Linden Processing Area – Reconnaissance Summary	
Potential Chemical or Physical Hazards	Recorded Observations
Suspect Asbestos Containing Material (SACM)	SACM were observed during the inspection. Roofing material, fibrous, paper-like cardboard material, thermal system insulating (TSI) materials, cementitious fragments, transite, and tar coated rope like material were noted at the Calumet Stamp Mill property. Transite, roofing material, and TSI materials were noted at the Calumet and Hecla (C&H) Power Plant property.
Residual Process Materials	No residual process materials were observed during the inspection; however substantial mining era foundations and structures were observed on several parcels.
Potentially Abandoned Containers	Abandoned containers, generally consisting of steel intact and dilapidated drums suspected to be associated with mining era operations were observed at the Calumet Stamp Mill and C&H Power Plant properties.
Soil Staining/Stressed Vegetation	No barren or stressed areas of the ground surface were documented on the inspected properties, but mining era artifacts and foundations were observed. Although specific areas of stained soil were not observed, the majority of the Calumet Stamp Mill property and portions of the C&H Power Plant property are sparsely to non-vegetated. The majority of the C&H Power Plant property has been capped as part of completed remedial activities.
Potential Polychlorinated Biphenyl (PCB) or Mercury Containing Equipment	No potential PCB or mercury containing equipment was observed on the properties.
Other:	Household waste, including building materials, insulating materials, and similar wastes were observed on the Calumet Stamp Mill and C&H Power Plant properties. Some of these materials are suspected to be comprised of mining era debris and building materials.

In general, no significant hazards were identified in the Lake Linden Processing Area during the reconnaissance activities. Field logs documenting reconnaissance observations are included in **Appendix D** of the Site Investigation (SI) Report.

8.1.1.2 Targeted Inspection

The qualitative assessment of the reconnaissance findings in the Lake Linden Processing Area warranted the performance of targeted inspection activities on the both the Calumet Stamp Mill and C&H Power Plant properties. Between 30 June and 1 July 2015 a WESTON field team conducted targeted inspection activities at the Calumet Stamp Mill and C&H Power Plant

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

properties that included the collection of bulk material and surface soil samples. The following subsections summarize the findings of these sampling efforts.

8.1.1.2.1 Bulk Material Sampling

Based on the SACM hazards noted during the reconnaissance activities a limited asbestos survey was conducted as part of the SI to identify suspect potentially friable asbestos containing materials (ACMs) located on the Calumet Stamp Mill and C&H Power Plant properties. The asbestos survey was limited to SACMs in open areas of the property, including the outside of buildings, within debris piles, and atop the foundations and floors of demolished mining era structures. The sampling approach used when conducting a traditional asbestos survey is based upon the building's functional spaces and homogeneous areas of intact building materials. These regulatory criteria determine the quantity and location of bulk samples to be collected. Since the asbestos survey at the Calumet Stamp Mill and C&H Power Plant properties was limited to non-intact debris, the traditional asbestos sampling approach could not be directly applied. Although the SACMs were not intact, the quantity of bulk samples collected per similar types of building materials were consistent with the sampling requirements defined in 40 Code of Federal Regulations (CFR) 763.83 "Sampling".

Between 30 June and 1 July 2015 a total of 51 bulk samples were collected from 26 different SACMs. ACM identified on properties within the Lake Linden Processing Area are summarized as follows:

- Highly weathered TSI material (CHLL-ASBBLK39) susceptible to degradation, located in a trench in the floor of the Calumet Stamp Mill ruins;
- Blue-gray layered transite-like material (CHLL-ASBBLK41) that is damaged and friable, in trenches in the floor and on the surface of the Calumet Stamp Mill ruins;
- Grayish white transite fragments (CHLL-ASBBLK43 and CHLL-ASBBLK44) that are damaged and friable, in trenches in the floor, on the surface, and along the east side of the Calumet Stamp Mill ruins;
- Gray corrugated pipe wrap (CHLL-ASBBLK48) that is damaged and friable, in debris along the east side of the Calumet Stamp Mill ruins;

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

- Dense gray mineral-like insulating board (CHLL-ASBBLK51) that is weathered and damaged, on the surface and in debris along the east side of the Calumet Stamp Mill ruins;
- White fibrous insulating material (CHLL-ASBBLK64) that is clumpy, located in the vicinity of an empty drum and a fuel storage tank near a wooded low lying area of the C&H Power Plant property; and,
- White fibrous insulating material, fibrous rope-like material, black asphaltic roofing material, and grayish white transite fragments (CHLL-ASBBLK59, CHLL-ASBBLK60, CHLL-ASBBLK61, CHLL-ASBBLK62, and CHLL-ASBBLK63) that are damaged and friable, in an uncapped area of mixed debris and drums east of the capped portion of the C&H Power Plant property.

The samples were analyzed in accordance with U.S. Environmental Protection Agency (EPA) Method 600/R-93/116, “Method for the Determination of Asbestos in Bulk Building Materials” using Polarized Light Microscopy (PLM). This laboratory analytical method identifies the presence and estimated concentration of asbestos fibers in sampled building materials.

The location of soil and bulk asbestos sampling locations collected during the targeted inspection activities are depicted on [Figure 8-1](#). A detailed summary of bulk asbestos sample analytical results collected from the Lake Linden Processing Area during the targeted inspection are provided in [Table 8-1](#). Bulk asbestos sample analytical results are depicted on [Figure 8-2](#).

8.1.1.2.2 Soil

In addition to the collection of bulk material samples, two surface soil samples from the C&H Power Plant property were also collected during the targeted inspection activities. On 19 August 2015 a WESTON sampling team collected samples from the following locations to assess whether soils adjacent to identified drums and drum carcasses contained contaminants of concern (COCs) in the Lake Linden Processing Area:

- Surface soil samples (CHLL-SS16 and CHLL-17) were collected adjacent to observed drums/drum carcasses in an uncapped portion of the C&H Power Plant property near the Torch Lake shoreline.

The soil sampling locations collected during the targeted inspection activities are depicted on [Figure 8-1](#). Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

A detailed summary of soil results collected from the Lake Linden Processing Area during the SI are provided in [Table 8-2](#).

8.1.2 Site Investigation

The SI at the Lake Linden Processing Area was developed based on a variety of data and information as outlined in **Section 3**. In addition to the historical accounts and documentation, current land use and potential exposure pathways were also taken into consideration when selecting the sampling locations specific to the Lake Linden Processing Area. The following subsections present the outcomes of investigative activities completed in the area by summarizing the laboratory analytical results and characterizing their impacts on the environmental media in which they were detected.

8.1.2.1 Terrestrial Investigation

Planned intrusive investigation activities in the Lake Linden Processing Area were generally guided by the findings of historical research and field observations. From a historical standpoint, the area housed one of the largest complexes in C&H's operations. These operations included the Calumet and Hecla stamp mills, the C&H Power Plant, pump houses, and reclamation and leaching facilities. Contaminants of concern (COCs) in near surface soils were relatively well understood on the C&H Power Plant property based on efforts completed by the EPA and their identified responsible party (RP). These efforts, did not fully characterize subsurface contaminants in soil and groundwater, specifically as they relate to PCBs. Further, the adjacent property to the north, the Calumet Stamp Mill property, was part of the same industrial complex, but focus on remediation related to the C&H Power Plant limited investigation at the Calumet Stamp Mill. As a result, the proposed investigative activities in the SAP and SAP Addendum were focused on filling potential data gaps where potential human health and ecological risks may be present due to the presence of undocumented COCs in soil and groundwater. The following subsections present a summary of the field observations and analytical results derived from the terrestrial sampling activities.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA****8.1.2.1.1 Field Observations – Soil and Groundwater**

Borings in the Lake Linden Processing Area were advanced to depths between 1 and 26 feet (ft) below the ground surface (bgs). Boring locations are depicted on [Figure 8-1](#). Soil observations documented on field logs indicate that the subsurface is primarily comprised of a fine to course grained sands, ranging from light brown to dark gray to reddish brown in color. A subset of boring locations contained intervals of fill, silty sand, and clay. The upper most layers in the borings at the C&H Power House consisted of a cap, primarily of clay with some sand.

During groundwater sampling, temporary well points were generally established in 5-ft intervals between 10 ft and 26 ft bgs. Saturated soil conditions were variable, generally encountered between depths of 5 and 8 ft bgs at the Calumet Stamp Mill and depths of 12 and 17 ft bgs at the C&H Power House. Temporary well points were advanced to 17 ft bgs, the floor of the former C&H Power House building; however, saturation was not encountered therefore a groundwater sample was not collected. Groundwater quality parameters, including temperature, conductivity, dissolved oxygen (DO) and pH, measured at the time of sample collection were generally considered normal. DO measurements were greater than 40% in six of the sample locations with a maximum concentration of 112.50%. Elevated DO concentrations are typically indicative of low bio-activity, indicating that oxygen is not being consumed by aerobic organisms in the subsurface. These conditions may persist in the study area due to the presence of stamp sands deposits along the shoreline of Torch Lake. Alternatively, the presence of other volatile chemicals in soil or groundwater and inconsistencies in sample collection could also cause interference within the instrument, causing inaccurate or false measurements. Additional evaluation would be required to determine if these results are indicators of variability in sample collection or the presence of chemical interference.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA****8.1.2.1.2 Soil Sampling Results**

Terrestrial investigation activities were completed in the Lake Linden Processing Area during three mobilizations. Investigative work was completed on 15 June 2014, 13 May 2015, and 18 August 2015. Between the three mobilizations, a total of 24 soil samples and one duplicate soil sample were collected from 11 boring locations and four surface soil locations. Soil sampling locations are depicted on **Figure 8-1**. Investigative methodologies and soil sampling techniques were conducted using the procedures outlined in **Section 3**.

All of the samples were analyzed for PCBs and subset of the samples were analyzed for volatile organic compounds (VOCs), semi-VOCs (SVOCs), cyanide, asbestos, and inorganic constituents. The selection of analytical parameters was based upon potential environmental impacts associated with the historical operation of a mining era laboratory on the property as well as known contaminants on the C&H Power Plant and Calumet Stamp Mill properties.

The surficial and subsurface soil analytical results for the Lake Linden Processing Area contained inorganic COCs and cyanide at concentrations above applicable regulatory criteria. An SVOC was detected in one surface soil sample at a concentration above the applicable regulatory criteria. Asbestos was detected in one surface soil sample via PLM Method 600/R-93/116. The asbestos concentration was non-detect in the same sample when subjected to PLM – California Air Resource Board (CARB) 435 method analysis. VOCs and Total PCBs were not detected in any of the samples collected from the Lake Linden Processing Area.

A detailed summary of soil analytical results collected from the Lake Linden Processing Area are provided in **Table 8-2**. X-ray fluorescence (XRF) soil screening results and soil analytical results from the Lake Linden Processing Area are depicted on **Figure 8-3** and **Figure 8-4**, respectively.

8.1.2.1.3 Groundwater Sampling Results

During the installation of soil borings in the Lake Linden Processing Area 10 temporary groundwater sampling locations were established to characterize groundwater in the area. The temporary sampling locations were installed and sampled using the methodologies presented in **Section 3**. A total of 10 groundwater samples were collected from the temporary sampling

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

locations. The screened intervals in the groundwater sampling locations ranged from between 10 ft and 15 ft bgs to 21 ft and 26 ft bgs. Temporary groundwater sampling locations are depicted on **Figure 8-1**.

All groundwater samples were analyzed for PCBs, VOCs, and SVOCs, and a subset for inorganic constituents. The analytical results for the Lake Linden Processing Area groundwater did not contain any COCs at concentrations above applicable regulatory criteria. PCBs and SVOCs were detected in basement pits of the C&H Power Plant historically; however, those areas were reportedly remediated by the RP under the direction of the EPA. A detailed summary of groundwater analytical results collected from the Lake Linden Processing Area are provided in **Table 8-3**. Groundwater and the historic pit sample analytical results from the Lake Linden Processing Area are depicted on **Figure 8-5**. Soil boring logs are included in **Appendix G** of the SI Report.

8.1.2.2 Offshore Investigation

Similar to the terrestrial investigation, the proposed offshore investigation activities for the Lake Linden Processing Area were also guided by several factors. First, historical analytical data was evaluated to determine if adequate characterization data was available in the study area to assess the overall sediment and surface water quality in the nearshore environment.

In addition, underwater surveillance of the area, as described in **Section 3**, was used to locate and assess potential offshore waste deposits. Substantial submerged structures were observed offshore of the stamp mill adjacent to the power plant property. These structures were determined to be rubble, steel girders, cable, and similar debris not indicative of large offshore waste or container disposal area.

Lastly, field observations, both terrestrial and offshore, were used to position sampling locations. As a result, the offshore investigative work was generally completed to fill data gaps in historical data along the shoreline of the Lake Linden Processing Area. Surface water samples were not collected from the Lake Linden Processing Area during the SI. The following subsections present a summary of the analytical results derived from the offshore sampling activities.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA****8.1.2.2.1 Sediment Sampling Results**

Offshore investigation activities were completed in the Lake Linden Processing Area during three mobilizations. Investigative work was completed over a period of several days between 9 and 15 July 2014, 28 May and 2 June 2015, and on 23 August 2015. A total of 21 sediment samples and two duplicate sediment samples were collected from nine sampling locations. Sediment sampling locations are depicted on [Figure 8-1](#). Investigative methodologies and sediment sampling techniques were conducted using the procedures outlined in [Section 3](#).

Sediment sampling locations included nine surficial sediment samples, ranging from 0 to 6 inches (in.) in depth. The investigation also included the collection of 12 deeper sediment samples ranging from 1 ft to 4.75 ft in depth. All samples were analyzed for PCBs. Two sediment samples collected from location CHLL-SD-53 and two samples from CHLL-SD-83 were also analyzed for SVOCs, cyanide, and inorganic constituents.

The sediment analytical results for the Lake Linden Processing Area contained multiple inorganic COCs and cyanide at concentrations that exceeded applicable regulatory criteria. Total PCBs and SVOCs were not detected in any of the samples collected from the Lake Linden Processing Area during the SI. PCBs and SVOCs were detected in basement samples of the C&H Power Plant historically; however, those areas were reportedly remediated by the RP under the direction of the EPA.

A detailed summary of sediment analytical results collected from the Lake Linden Processing Area are provided in [Table 8-4](#). Sediment and the historic pit sample analytical results from the Lake Linden Processing Area are depicted on [Figure 8-6](#). Sediment core logs are included in [Appendix H](#) of the SI Report.

8.2 NATURE AND EXTENT OF CONTAMINATION

Utilizing the established regulatory criteria presented in [Section 4](#) for various land use categories and exposure pathways, the laboratory analytical results summarized in the preceding section for the Lake Linden Processing Area were reviewed and compared to the following regulatory criteria as applicable for the sampled environmental media:

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

- MDEQ Cleanup Criteria Requirements for Response Activity;
- EPA Ecological Screening Levels (ESLs); and,
- Sediment Quality Guidelines, Threshold Effect Concentrations (TECs) and Probable Effect Concentrations (PECs), MacDonald, et al, 2000.

8.2.1 Comprehensive Exposure Assessment

The comparison was completed to determine which ecological and human exposure pathways, risks, and conditions are relevant in the Lake Linden Processing Area. Although not inclusive of relevant pathways where regulatory criteria were not exceeded, the following exposure pathways were determined to be relevant in the Lake Linden Processing Area:

- Risks posed by hazardous substances inside buildings or former building substrates.
- Risks posed by hazardous substances that are covered or capped with soil and or a vegetative cover.
- Risks posed by hazardous substances in soil and the potential for the substances to be inhaled if they are emitted as particulates and dispersed in ambient air in in both residential and nonresidential settings.
- Risks posed by hazardous substances in soil and the potential for the substances to leach to groundwater that could vent to surface water.
- Risks posed by hazardous substances in soil and the potential for direct contact with these soils in both residential and nonresidential settings.
- Risks posed by hazardous substances in sediments that have the potential to have toxic effects on aquatic biota and/or enter the food chain.

As discussed in **Section 4.2.5**, the MDEQ drinking water/surface water pathway criteria exceedances for metals were excluded from the soil and groundwater evaluation. The rationale for this exclusion is twofold:

- The Project investigation and anticipated response actions are being undertaken pursuant to Part 201 of Michigan's Natural Resources and Environmental Protection Act (NREPA), being Public Act (PA) 451 of 1994, as amended. The concentrations of metals in excess of the MDEQ drinking water/surface water pathway criteria are ubiquitous in the study area and are predominantly the result of the presence of stamp sands. Stamp sands are not defined as a hazardous substance nor are subject to regulation under Part 201 unless the

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

property otherwise contains hazardous substances in excess of concentrations that satisfy the cleanup criteria for unrestricted residential use; and,

- The study area is part of OU2 for which the EPA Record of Decision (ROD) remedy called for No Action. The EPA's ROD Operable Unit (OU) 2 includes groundwater, surface water, submerged tailings and sediments in Torch Lake, Portage Lake, the Portage Canal, and other area water bodies. Note that EPA's No Action determination relies on the following to mitigate the effects of stamp sand to the extent practicable:
 - The reduction of stamp sand loading to surface water bodies expected as a result of the remedial action taken at OU 1 and OU 3.
 - Ongoing natural sedimentation and detoxification.
 - Institutional programs and practices controlling potential future exposure to site-affected drinking water which were intended to be administered at the county and state level.
 - The long-term monitoring and the five year review process monitoring requirements of the remedy selected for OU 1 and OU 3 under the 1992 ROD.

Note that metals criteria for other relevant pathways, and cyanide and organic contaminants for all pathways were included in the evaluation.

8.2.1.1 Building Materials and Containers

During the targeted inspection activities completed in the Lake Linden Processing Area, seven different ACMs were identified in samples collected from damaged and friable building materials. In addition, representative surface soil samples adjacent to drums/drum carcasses were also analyzed to evaluate potential human health and environmental risks posed by these abandoned containers.

The following tables provide an aggregate summary of the sample locations with respect to the total number of samples and how they compare to applicable regulatory criteria. The tables are based solely on the total number of samples, inclusive of historical samples, collected from the Lake Linden Processing Area. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion. Surface soil samples collected from near abandoned containers were compared to applicable soil criteria, while bulk asbestos samples

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

were compared to applicable National Emissions Standard for Hazardous Air Pollutants (NESHAP) standards.

Building Materials, Containers, and Wastes Analytical Result Summary	Analytical Summary			National Emissions Standard for Hazardous Air Pollutants			
	Total Number of Samples	Detected Analytes	Total Exceedances	Friable Asbestos Material	Category I Nonfriable ACM	Category II Nonfriable ACM	Asbestos-Containing Waste Materials
Asbestos (Bulk)	51	22	22	21	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				Asbestos			

8.2.1.2 Soil Exposure Pathway Assessment

Soil analytical results from the Lake Linden Processing Area included COC concentrations in soil that were at or above concentrations that trigger a “facility” designation as defined in Section 20101(1) (s) of the NREPA.

The following tables provide an aggregate summary of the soil sample locations with respect to the total number of samples and how they compare to the applicable MDEQ’s Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios. The tables are based solely on the total number of samples, inclusive of historical samples, collected from the Lake Linden Processing Area. They list only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

Soil Analytical Result Summary Table	Cleanup Criteria Requirements for Response Activity – Residential											
	Analytical Summary			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
	Total Number of Samples	Detected Analytes	Total Exceedances	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Inorganics	17	305	14	0	0	0	0	0	0	0	11	0
Cyanide	16	4	4	0	4	0	0	0	0	0	0	0
VOCs	11	24	0	0	0	0	0	0	0	0	0	0
SVOCs	17	61	1	0	1	0	0	0	0	0	0	0
Asbestos	12	4	1	0	0	0	0	0	0	1	0	0
Total PCBs	29	2	0	0	0	0	0	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more samples				Arsenic, Cyanide, Lead, Phenanthrene, Asbestos								

Soil Analytical Result Summary Table	Cleanup Criteria Requirements for Response Activity – Nonresidential											
	Analytical Summary			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
	Total Number of Samples	Detected Analytes	Total Exceedances	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Inorganics	17	305	7	0	0	0	0	0	0	0	6	0
Cyanide	16	4	4	0	4	0	0	0	0	0	0	0
VOCs	11	24	0	0	0	0	0	0	0	0	0	0
SVOCs	17	61	1	0	1	0	0	0	0	0	0	0
Asbestos	12	4	1	0	0	0	0	0	0	1	0	0
Total PCBs	29	2	0	0	0	0	0	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				Arsenic, Cyanide, Lead, Phenanthrene, Asbestos								

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Groundwater analytical results from the Lake Linden Processing Area did not include COC concentrations in groundwater that were at or above concentrations that trigger a facility designation as defined in Section 20101(1) (s) of the NREPA.

Similar to the preceding soil tables, the following table provides summary of the aforementioned sample locations with respect to the total number of samples and how they compare to the applicable MDEQ's Cleanup Criteria for Response Activity under both Residential and Nonresidential exposure scenarios.

Groundwater Analytical Result Summary Table	Analytical Summary			Cleanup Criteria Requirements for Response Activity – Residential and Nonresidential						
	Total Number of Samples	Total Number of Detected Analytes	Total Exceedances	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Levels
Inorganics	4	47	0	0	0	0	0	0	0	0
Cyanide	0	0	0	0	0	0	0	0	0	0
VOCs	10	0	0	0	0	0	0	0	0	0
SVOCs	10	0	0	0	0	0	0	0	0	0
Total PCBs	10	0	0	0	0	0	0	0	0	0
Other – General Chemistry	0	0	0	0	0	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				None						

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA****8.2.1.4 Sediment Exposure Pathway Assessment**

Sediment analytical results from the Lake Linden Processing Area included COC concentrations that were at or above concentrations that pose potential risks to sediment dwelling species, and consequently the food chain. The following table provides a summary of the sample locations located in the Lake Linden Processing Area. The table lists only the number of samples for a specific analytical suite that contained one or more exceedance of a given criterion.

Sediment Analytical Result Summary	Analytical Summary			EPA, Region 5, Resource Conservation and Recovery Act	Consensus Based Sediment Quality Guidelines	
	Total Number of Samples	Detected Analytes	Total Exceedances	Ecological Screening Levels	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)
Inorganics	15	161	57	15	15	15
Cyanide	4	1	1	1	0	0
VOCs	0	0	0	0	0	0
SVOCs	4	0	0	0	0	0
Total PCBs	39	0	0	0	0	0
COCs exceeding applicable regulatory criteria in one or more sample				Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc, Cyanide		

8.2.2 Extent of Contamination

The comparison of analytical results to applicable regulatory criteria indicates that potential human health and ecological risks are present in soil, groundwater, and sediment in the Lake Linden Processing Area. Recalling that the goals and objectives of the SI, the following subsections describe the extent of contamination in environmental media in the study area.

8.2.2.1 Building Materials and Containers

Analytical results for various building materials indicated ACM are present in the Lake Linden Processing Area. These materials are distributed across the Calumet Stamp Mill and uncapped portions of the C&H Power Plant properties and are subject to migration via wind and water

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erosion. Asbestos concentrations in seven bulk material samples contained asbestos fibers at concentrations greater than 1 percent (%). The damaged and friable nature of these materials poses a potential risk to human health as it relates to the inhalation pathway.

Surface soil samples collected near dilapidated drums/drum carcasses that were sampled on the C&H Power Plant property contained arsenic that exceeded Direct Contact Criteria (DCC) in both of the residential and nonresidential exposure scenarios, and cyanide that exceeded Groundwater Surface Water Interface Protection Criteria (GSIPC).

Identified ACMs in the Lake Linden Processing Area present a health risk, particularly as it relates to the potential for these materials to degrade and migrate via wind and water erosion. The distribution of ACM in the study area is widespread and poses exposure risks via the inhalation pathway. COCs identified in surface soils adjacent to abandoned containers pose similar exposure risks to the dermal contact and surface water pathway.

The identified risks summarized in the preceding paragraphs, pose potential threats to human and ecological receptors and are a significant factor when evaluating the extent of contamination in the Lake Linden Processing Area.

8.2.2.2 Soil Extent of Contamination

Soil analytical results exceeded the GSIPC for SVOCs and cyanide, and DCC in both of the residential and nonresidential exposure scenarios for inorganic contaminants. Similarly, historical surface soil screening results also included measured inorganic contaminant concentrations that exceeded DCC and Particulate Soil Inhalation Criteria (PSIC) in both residential and non-residential exposure scenarios.

All samples were collected from surface and subsurface soil intervals generally located within 50 ft to 1,000 ft of the shoreline of Torch Lake. The samples were collected from private properties, some of which may be accessed by the public. In addition, these properties are located adjacent to public properties located in the Lake Linden Recreation Area.

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The detection of phenanthrene in one surface soil sample may be attributable to activities on the property that resulted in a surface spill of fuel. It should be noted that subsurface soil and groundwater samples collected from the property did not contain phenanthrene; however, a temporary groundwater sampling locations downgradient of the property contained benzene at concentrations that exceeded applicable regulatory criteria.

Soils with elevated levels of inorganic COCs are ubiquitous in the area, which becomes a limiting factor when evaluating potential exposure pathways. In the case of the Lake Linden Processing Area, elevated concentrations of inorganic contaminants include exposure risks related to inhalation and dermal contact pathways, which must be taken under consideration when evaluating land use, public access, and the extent of contamination in surface and near surface soils.

The remaining exposure risks are generally related to the leaching of contaminants to groundwater and their potential impacts on surface water. These risks pose a long-term threat to the overall environmental health of the watershed, the widespread distribution of inorganic COCs throughout the region limit determinations related to the extent of contamination in the Lake Linden Processing Area. Nevertheless, risks posed to groundwater and surface water are significant and are a factor when considering the public use of these resources in the Lake Linden Processing Area.

8.2.2.3 Groundwater Extent of Contamination

Groundwater analytical results did not exceed any applicable regulatory criteria in samples collected during the SI. The groundwater samples were collected from a zone roughly 600 ft to 1,000 ft to the shoreline of Torch Lake at depths of approximately 10 ft to 26 ft below the ground surface.

Concentrations of Total PCBs in a historic sample collected from water within a basement pit of the C&H Power Plant exceeded DWC and Groundwater/Surface Water Criteria (GSIC). Similarly, SVOC concentrations in samples collected from water contained in the basement of the C&H Power Plant also exceeded DWC, GSIC, and Water Solubility Criteria.

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However, remedial actions completed at the C&H Power Plant reportedly resulted in the recovery and treatment of accumulated groundwater in the building basement. The building was razed, basement contents removed, and the building footprint was backfilled and graded and potential PCB and SVOC source material was reportedly removed from the building as a component of the remedial action at the property. The investigation and remediation of contaminated groundwater beneath the property was not included in the RP activities; however, the SI results do not indicate that PCB-contaminated groundwater is present downgradient of the former C&H Power Plant.

8.2.2.4 Sediment Extent of Contamination

Sediment analytical results exceeded ESLs, TECs, and PECs for inorganic contaminants and SVOCs. Surficial and deep sediment samples were collected from throughout the area. One analytical result for cyanide exceeded ESLs. In addition, concentrations of Total PCBs in one sample collected from sediment on the floor of the basement in the C&H Power Plant exceeded TECs and PECs.

Similar to the preceding discussion related to groundwater, remedial actions completed at the C&H Power Plant reportedly resulted in the recovery and treatment of accumulated sediment and sludges from the floor of the building basement. As such, it is presumed that SVOC and PCB contaminated sludges in the building basement were remediated as a component of the remedial action at the property.

Similar to the preceding subsections, inorganic COCs are prevalent in the area and the related exceedances, although potentially detrimental to aquatic biota, remain a consistent finding in sediment samples collected from Torch Lake. No concentrations of Total PCBs exceeding applicable regulatory criteria were identified in any of the offshore sediment samples collected from the Lake Linden Processing Area.

The potential risks associated with inorganic constituents, though prevalent in the region, should be considered when evaluating the extent of surface water and sediment contamination in the Lake Linden Processing Area.

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LAKE LINDEN PROCESSING AREA****8.2.2.5 Surface Water Extent of Contamination**

Although no surface water samples were collected from the Lake Linden Processing Area, it is presumed that inorganic COCs are present at concentrations that exceed applicable regulatory criteria. This assumption is supported by surface water analytical results from adjacent study areas. The potential risks associated with inorganic constituents, though prevalent in the region, should be considered when evaluating the extent of surface water contamination in the Lake Linden Processing Area.

8.3 CONCLUSIONS AND RECOMMENDATIONS

The analytical results and interpretation summarized in the preceding subsections document potential human health and ecological risks that are present in the Lake Linden Processing Area. The following subsections provide a synopsis of these findings and a recommended path forward for mitigating these risks in the Lake Linden Processing Area.

8.3.1 Conclusions

Environmental impacts in the Lake Linden Processing Area are generally characterized by detections of organic and inorganic contaminants in soil and sediment; repercussions of mining era operations in the region. Although, specific sources of these contaminants may not be fully understood, historical research related to the operations, closing, and eventual abandonment/scraping of mining company operations provided substantive evidence for assessing specific operational areas and selecting target analytes anticipated to be present within the study area. The findings of these investigative activities are summarized as follows:

- Analytical results for various building materials indicate ACM are present in the study area. These materials are distributed across the Calumet Stamp Mill and the uncapped portion of the C&H Power Plant properties, and are subject to migration via wind and water erosion. Asbestos concentrations in seven bulk material samples contained asbestos fibers at concentrations greater than 1 %. The damaged and friable nature of these materials poses a potential risk to human health as it relates to the inhalation pathway.
- Surface soil analytical results from samples collected adjacent to dilapidated drums/drum carcasses at the C&H Power Plant property contained inorganic contaminants that exceeded DCC in both of the residential and nonresidential exposure scenarios, and GISPC for cyanide.

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- Soil analytical results exceeded DCC in both of the residential and nonresidential exposure scenarios for inorganic contaminants. In addition, one sample analyzed for SVOCs exceeded GSIPC and one sample analyzed for asbestos exceeded applicable criteria.
- Surface soil screening results also included measured inorganic contaminant concentrations that exceeded DCC and PSIC in both residential and non-residential exposure scenarios.
- Sediment analytical results exceeded ESLs, TECs, and PECs for inorganic contaminants and SVOCs. One analytical result for cyanide exceeded ESLs.

The analytical results summarized above provide sufficient analytical data and lines of evidence to conclude that the study area is a facility as defined in Section 20101(1) (s) of the NREPA. The following table provides a summary of the affected environmental media, applicable regulatory criteria, and potential receptors within the Lake Linden Processing Area.

Lake Linden Processing Area – Media, Criteria, Potential Receptor Summary															
Media	Soil			Groundwater			Air		Sediment	Surface Water		Building Materials, Asbestos, and Abandoned Containers			
Criteria	Drinking Water Protection	Groundwater Surface Water Interface	Direct Contact	Drinking Water Protection	Groundwater Surface Water Interface	Flammability and Explosivity	Volatilization	Particulate Inhalation	Ecological	Ecological	Human Health	Particulate Inhalation	Flammability and Explosivity	Environmental	Human Health
Potential Receptor															
Residential Human		✓	✓					✓							
Nonresidential Human		✓	✓					✓							
Water Column Organism									✓						
Benthic Organism									✓						
COCs exceeding applicable regulatory criteria in one or more sample				Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Silver, Zinc, Asbestos, Phenanthrene											

In addition to the evaluation of analytical results collected from the study area, the following provides a summary of findings derived from the assessment of the Lake Linden Processing Area with respect to the goals and objectives for the Project:

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- Significant in-lake and terrestrial sources of contamination are present in the form of inorganic, SVOCs, and cyanide COCs, and asbestos in the study area. PCBs were not detected in soil, groundwater, or sediment samples in the study area. Total PCBs exceeding applicable regulatory criteria were previously identified in the sludges and groundwater of the C&H Power Plant basement, prior to EPA and their RP undertaking remedial activities;
- No in-lake or terrestrial uncharacterized waste deposits were identified in the study area. Underwater surveillance along the shoreline documented steel, concrete, and similar rubble along the shoreline, but abandoned containers and obvious waste deposits were not visually identified;
- Bulk disposal areas, including capped mining era and asbestos containing wastes on the C&H Power Plant property, are known to be present in the study area. Benzene was detected in groundwater at concentrations exceeding applicable regulatory criteria on the adjacent Marina property that is downgradient of the Lake Linden Processing Area, suggesting that a potential source of contamination may be present in the vicinity of the sample location; and,
- Industrial ruins, including foundations and building floors associated with the Calumet Stamp Mill and reclamation complex are present at the ground surface have been incorporated into facilities at the Houghton County Historical Museum. ACM and mining area containers were identified during site reconnaissance and targeted inspection activities.

8.3.2 Recommendations

The conclusions outlined in the preceding subsection establish that the Lake Linden Processing Area is a Part 201 Facility. Section 20107a of Part 201 of NREPA describes the duties of owners or operators of a Facility, regardless of their liability, including: prevent unacceptable exposures, prevent exacerbation, and take reasonable precautions against the foreseeable actions of third parties. Some exceptions may apply; in any case, owners and operators of contaminated properties should become familiar with Section 20107a and the associated Rules.

A partial soil and vegetative cap and recording of institutional controls on the C&H Power Plant property by Honeywell Specialty Materials, Inc, has been conducted in efforts to address these environmental issues. This effort, however, does not address the presence of ACM, abandoned containers, and surface soils present outside of the capped area.

The presence of ACM and surface soil contamination at the Calumet Stamp Mill property merits immediate response actions to control potential exposure. Once these immediate response actions have been implemented, long-term remedial objectives can be evaluated.

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The performance of a risk assessment on select properties or groups of properties, based on current and anticipated future land-use will help identify remedial goals for properties where potential human health and ecological hazards have been identified. Assessment based on current and future land-use contributes to the beneficial and safe re-use and potential redevelopment of any given property by clarifying applicability of regulatory statutes, as traditional property zoning (residential versus nonresidential) is generally undefined in the study area.

MDEQ should continue to provide new study data to the Remediation and Redevelopment Division Superfund Section (RRD SFS), which is responsible for monitoring EPA's remedy for the terrestrial and lake portion of the Torch Lake Superfund Site. RRD SFS should evaluate whether any remedy modifications are necessary. The EPA and RRD SFS should verify that administrative controls for areas that have been previously remediated by the EPA have been employed to ensure that the selected remedy is performing as designed and those institutional controls, where required, have been recorded and are being enforced.

Additionally, MDEQ should continue to provide pertinent data to the Michigan Department of Health and Human Services (MDHHS) where evaluation of specific potential public health risks is warranted.

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LAKE LINDEN PROCESSING AREA**

SECTION 8

**DETAILED FINDINGS REPORT – LAKE LINDEN PROCESSING AREA
TABLES**

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA****TABLE 8-1****Sample Analytical Summary - Bulk Asbestos
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site**

Sample Location	Field Sample ID	Sample Date	Asbestos	Note
CHLL-ASBBLK38A	CHLL-ASBBLK38A-063015	6/30/2015	ND	
CHLL-ASBBLK38B	CHLL-ASBBLK38B-063015	6/30/2015	ND	
CHLL-ASBBLK38C	CHLL-ASBBLK38C-063015	6/30/2015	ND	
CHLL-ASBBLK39A	CHLL-ASBBLK39A-063015	6/30/2015	60 %	chrysotile
CHLL-ASBBLK39B	CHLL-ASBBLK39B-063015	6/30/2015	70 %	chrysotile
CHLL-ASBBLK39C	CHLL-ASBBLK39C-063015	6/30/2015	70 %	chrysotile
CHLL-ASBBLK40A	CHLL-ASBBLK40A-063015	6/30/2015	ND	
CHLL-ASBBLK41A	CHLL-ASBBLK41A-063015	6/30/2015	90 %	chrysotile
CHLL-ASBBLK41B	CHLL-ASBBLK41B-063015	6/30/2015	90 %	chrysotile
CHLL-ASBBLK41C	CHLL-ASBBLK41C-063015	6/30/2015	90 %	chrysotile
CHLL-ASBBLK42A	CHLL-ASBBLK42A-063015	6/30/2015	ND	
CHLL-ASBBLK42B	CHLL-ASBBLK42B-063015	6/30/2015	ND	
CHLL-ASBBLK42C	CHLL-ASBBLK42C-063015	6/30/2015	ND	
CHLL-ASBBLK43A	CHLL-ASBBLK43A-063015	6/30/2015	30 %	chrysotile
CHLL-ASBBLK43B	CHLL-ASBBLK43B-063015	6/30/2015	30 %	chrysotile
CHLL-ASBBLK43C	CHLL-ASBBLK43C-063015	6/30/2015	30 %	chrysotile
CHLL-ASBBLK44A	CHLL-ASBBLK44A-063015	6/30/2015	30 %	chrysotile
CHLL-ASBBLK45A	CHLL-ASBBLK45A-063015	6/30/2015	ND	
CHLL-ASBBLK45B	CHLL-ASBBLK45B-063015	6/30/2015	ND	
CHLL-ASBBLK46A	CHLL-ASBBLK46A-063015	6/30/2015	ND	
CHLL-ASBBLK46B	CHLL-ASBBLK46B-063015	6/30/2015	ND	
CHLL-ASBBLK46C	CHLL-ASBBLK46C-063015	6/30/2015	ND	
CHLL-ASBBLK47A	CHLL-ASBBLK47A-063015	6/30/2015	ND	
CHLL-ASBBLK47B	CHLL-ASBBLK47B-063015	6/30/2015	ND	
CHLL-ASBBLK47C	CHLL-ASBBLK47C-063015	6/30/2015	ND	
CHLL-ASBBLK48A	CHLL-ASBBLK48A-063015	6/30/2015	20 %	chrysotile
CHLL-ASBBLK48B	CHLL-ASBBLK48B-063015	6/30/2015	ND	
CHLL-ASBBLK49A	CHLL-ASBBLK49A-063015	6/30/2015	ND	
CHLL-ASBBLK50A	CHLL-ASBBLK50A-063015	6/30/2015	ND	
CHLL-ASBBLK50B	CHLL-ASBBLK50B-063015	6/30/2015	ND	
CHLL-ASBBLK50C	CHLL-ASBBLK50C-063015	6/30/2015	ND	
CHLL-ASBBLK51A	CHLL-ASBBLK51A-063015	6/30/2015	15 %	chrysotile
CHLL-ASBBLK51B	CHLL-ASBBLK51B-063015	6/30/2015	15 %	chrysotile
CHLL-ASBBLK51C	CHLL-ASBBLK51C-063015	6/30/2015	15 %	chrysotile
CHLL-ASBBLK52A	CHLL-ASBBLK52A-063015	6/30/2015	ND	
CHLL-ASBBLK52B	CHLL-ASBBLK52B-063015	6/30/2015	ND	
CHLL-ASBBLK52C	CHLL-ASBBLK52C-063015	6/30/2015	ND	
CHLL-ASBBLK52D	CHLL-ASBBLK52D-063015	6/30/2015	ND	
CHLL-ASBBLK53A	CHLL-ASBBLK53A-063015	6/30/2015	ND	
CHLL-ASBBLK53B	CHLL-ASBBLK53B-063015	6/30/2015	ND	
CHLL-ASBBLK53C	CHLL-ASBBLK53C-063015	6/30/2015	ND	
CHLL-ASBBLK54A	CHLL-ASBBLK54A-063015	6/30/2015	ND	
CHLL-ASBBLK55A	CHLL-ASBBLK55A-063015	6/30/2015	2 %	chrysotile
CHLL-ASBBLK56A	CHLL-ASBBLK56A-063015	6/30/2015	ND	
CHLL-ASBBLK57A	CHLL-ASBBLK57A-063015	6/30/2015	ND	
CHLL-ASBBLK59A	CHLL-ASBBLK59A-070115	7/1/2015	60 %	chrysotile
CHLL-ASBBLK60A	CHLL-ASBBLK60A-070115	7/1/2015	75 %	chrysotile
CHLL-ASBBLK61A	CHLL-ASBBLK61A-070115	7/1/2015	40 %	chrysotile
CHLL-ASBBLK62A	CHLL-ASBBLK62A-070115	7/1/2015	2 %	chrysotile
CHLL-ASBBLK63A	CHLL-ASBBLK63A-070115	7/1/2015	40 %	chrysotile
CHLL-ASBBLK64A	CHLL-ASBBLK64A-070115	7/1/2015	15 %	amosite
	CHLL-ASBBLK64A-070115	7/1/2015	40 %	chrysotile

ND = Not detected

Results greater than the National Emissions Standard for Hazardous Air Pollutants (NESHAP) and MDEQ Particulate Soil Inhalation Criteria of 1% are highlighted yellow

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

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LAKE LINDEN PROCESSING AREA

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CalumetB-16	CHLL-SB23		CHLL-SB24	
Field Sample ID									Calument XRF 16	CHLL - SB - 23 - 4'-4.5'	CHLL - SB - 23 - 4.5'-13'	CHLL - SB - 24 - 3.5'-4'	CHLL - SB - 24 - 4'-15'
Sample Date:									9/7/2007	8/18/2015	8/18/2015	8/18/2015	8/18/2015
Sample Interval (bgs):									0 - 0 in	4 - 4.5 ft	4.5 - 13 ft	3.5 - 4 ft	4 - 15 ft
Sample Description:										FILL, SAND, Light brown to 4 ft; CLAY, Reddish brown	FILL, SAND, Light brown to 4 ft; CLAY, Reddish brown to 4.75 ft; SAND, Reddish brown, Fine to medium to 5 ft; SAND Dark gray, Medium to coarse to 11 ft; SAND, Reddish brown, Fine to medium	SAND, medium, dark gray	SAND, fine, light brown; SAND, medium to coarse, reddish brown to dark gray
Inorganics - Metals (mg/kg)													
ALUMINUM	7429-90-5	6,900 (B)	NA	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	13000 J	--	--	8900	--
ANTIMONY	7440-36-0	4.3	1.2 (X)	13,000	180	4.3	5,900	670	--	--	--	0.7	--
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	36	--	--	7.8	--
BARIUM	7440-39-3	1,300 (G)	130	330,000	37,000	1,300	150,000	130,000	--	--	--	43	--
BERYLLIUM	7440-41-7	51	4.6 (G)	1,300	410	51	590	1,600	1.6 J	--	--	0.7	--
CADMIUM	7440-43-9	6.0	1.6 (G,X)	1,700	550	6.0	2,200	2,100	--	--	--	<0.2 U	--
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--
CHROMIUM	7440-47-3	1,000,000 (D,H)	1,200,000 (G,H,X)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	28	--	--	15	--
COBALT	7440-48-4	0.8	2.0	13,000	2,600	2.0	5,900	9,000	18	--	--	8.6	--
COPPER	7440-50-8	5,800	32 (G)	130,000	20,000	5,800	59,000	73,000	10000	--	--	2200	--
IRON	7439-89-6	12,000 (B)	NA	ID	160,000	12,000 (B)	ID	580,000	--	--	--	12000	--
LEAD	7439-92-1	700	1,900 (G,X)	100,000	400	700	44,000	900 (DD)	1100	--	--	22	--
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	9.7	--	--	4.9	--
MAGNESIUM	7439-95-4	8,000	NA	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	--	--	--	5500	--
MANGANESE	7439-96-5	440 (B)	440 (B,G,X)	3,300	25,000	440 (B)	1,500	90,000	740	--	--	170	--
MERCURY	7439-97-6	1.7 (Z)	0.13 (B, Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.23	--	--	0.07	--
NICKEL	7440-02-0	100	29 (G)	13,000	40,000	100	16,000	150,000	49	--	--	26	--
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--
SELENIUM	7782-49-2	4.0	0.41 (B)	130,000	2,600	4.0	59,000	9,600	--	--	--	0.6	--
SILVER	7440-22-4	4.5	1.0 (M); 0.027	6,700	2,500	13	2,900	9,000	2.4	--	--	0.9	--
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--
VANADIUM	7440-62-2	72	430	ID	750 (DD)	990	ID	5,500 (DD)	--	--	--	--	--
ZINC	7440-66-6	2,400	62 (G)	ID	170,000	5,000	ID	630,000	420 J	--	--	32	--
Inorganics - Cyanide (mg/kg)													
CYANIDE	57-12-5	4.0 (P,R)	0.1 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	--	--	--	<0.11 U	--
Organics - PCBs (ug/kg)													
AROCLOR-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	<57 UJ	<240 UJ	<120 UJ	<220 UJ	<110 UJ
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<57 UJ	<240 UJ	<120 UJ	<220 UJ	<110 UJ
TOTAL PCBs	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	ND	ND	ND	ND

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CalumetB-16	CHLL-SB23		CHLL-SB24	
Field Sample ID									Calument XRF 16	CHLL - SB - 23 - 4'-4.5'	CHLL - SB - 23 - 4.5'-13'	CHLL - SB - 24 - 3.5'-4'	CHLL - SB - 24 - 4'-15'
Sample Date:									9/7/2007	8/18/2015	8/18/2015	8/18/2015	8/18/2015
Sample Interval (bgs):									0 - 0 in	4 - 4.5 ft	4.5 - 13 ft	3.5 - 4 ft	4 - 15 ft
Sample Description:										FILL, SAND, Light brown to 4 ft; CLAY, Reddish brown	FILL, SAND, Light brown to 4 ft; CLAY, Reddish brown to 4.75 ft; SAND, Reddish brown, Fine to medium to 5 ft; SAND Dark gray, Medium to coarse to 11 ft; SAND, Reddish brown, Fine to medium	SAND, medium, dark gray	SAND, fine, light brown; SAND, medium to coarse, reddish brown to dark gray
Organics - SVOCs (ug/kg)													
ACENAPHTHENE	83-32-9	300,000	8,700	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	--	--	--	--	--
ACENAPHTHYLENE	208-96-8	5,900	ID	2.3E+09	1,600,000	17,000	1E+09	5,200,000	--	--	--	--	--
ANTHRACENE	120-12-7	41,000	ID	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	--	--	--	--	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	--	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	--	--	--	--	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	--	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	--	--	--	--	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	--	--	--	--	--
CARBAZOLE	86-74-8	9,400	1,100	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	--	--	--	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	--	--	--	--	--
DIBENZOFURAN	132-64-9	ID	1,700	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--
FLUORANTHENE	206-44-0	730,000	5,500	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	--	--	--	--	--
FLUORENE	86-73-7	390,000	5,300	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	--	--	--	--	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	--
PHENANTHRENE	85-01-8	56,000	2,100	6,700,000	1,600,000	160,000	2,900,000	5,200,000	--	--	--	--	--
PYRENE	129-00-0	480,000	ID	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	--	--	--	--	--
Organics - VOCs (ug/kg)													
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--
1,2,4-TRIMETHYLBENZENE (I)	95-63-6	2,100	570	8.2E+10	3.2E+07 (C)	2,100	3.6E+10	1E+08 (C)	--	--	--	--	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	57,000	4,200	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	--
BENZENE (I)	71-43-2	100	240 (X)	3.8E+08	180,000	100	4.7E+08	840,000 (C)	--	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--
TOLUENE (I)	108-88-3	16,000	5,400	2.7E+10	5E+07 (C)	16,000	1.2E+10	1.6E+08 (C)	--	--	--	--	--
XYLENE - TOTAL (I)		5,600	820	2.9E+11	4.1E+08 (C)	5600	1.3E+11	1E+09	--	--	--	--	--
Asbestos (%)													
ASBESTOS	ASB	NLL	NLL	1.0 (BB)	ID	NLL	1.0 (BB)	ID	--	--	--	--	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SB25			CHLL-SB51		CHLL-SB142	
Field Sample ID									CHLL - SB - 25 - 5'-5.5'	CHLL - SB - 25 - 5.5'-11'	CHLL - SB - 25 - 5.5'-11' DUP	CHLL-SB 51 0"-6"	CHLL-SB 51 6"-5'	CHLL-SB-142-0-6"	CHLL-SB-142-6"-8'
Sample Date:									8/18/2015	8/18/2015	8/18/2015	6/15/2014	6/15/2014	5/13/2015	5/13/2015
Sample Interval (bgs):									5 - 5.5 ft	5.5 - 11 ft	5.5 - 11 ft	0 - 0.5 ft	0.5 - 5 ft	0 - 0.5 ft	0.5 - 8 ft
Sample Description:									SAND, medium to course grained, dark gray	SAND, medium to course grained 5 ft to 10 ft; SAND fine to medium grained 10 ft to 11 ft	Field Duplicate	TOPSOIL, Sandy, Fine grained, Gray	SAND, Fine grained, Dark gray	TOPSOIL	SAND, Fine grained to 1.5 ft, Gray; FILL, Gravel and Wood to 2.5 ft; SAND, Brown, Medium to fine grained
Inorganics - Metals (mg/kg)															
ALUMINUM	7429-90-5	6,900 (B)	NA	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	2900	--	--	7000	3800	--	--
ANTIMONY	7440-36-0	4.3	1.2 (X)	13,000	180	4.3	5,900	670	0.4	--	--	0.3	2.6	--	--
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	5.6	--	--	8.1	2.7	--	--
BARIUM	7440-39-3	1,300 (G)	130	330,000	37,000	1,300	150,000	130,000	87	--	--	76	37	--	--
BERYLLIUM	7440-41-7	51	4.6 (G)	1,300	410	51	590	1,600	0.5	--	--	0.7	0.3	--	--
CADMIUM	7440-43-9	6.0	1.6 (G,X)	1,700	550	6.0	2,200	2,100	<0.2 U	--	--	0.2	<0.2 U	--	--
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
CHROMIUM	7440-47-3	1,000,000 (D,H)	1,200,000 (G,H,X)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	8.4	--	--	15	8.1	--	--
COBALT	7440-48-4	0.8	2.0	13,000	2,600	2.0	5,900	9,000	3.2	--	--	5.9	3.3	--	--
COPPER	7440-50-8	5,800	32 (G)	130,000	20,000	5,800	59,000	73,000	220	--	--	1300	140	--	--
IRON	7439-89-6	12,000 (B)	NA	ID	160,000	12,000 (B)	ID	580,000	18000	--	--	13000	7900	--	--
LEAD	7439-92-1	700	1,900 (G,X)	100,000	400	700	44,000	900 (DD)	21	--	--	140	1700	--	--
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	3.2	--	--	--	--	--	--
MAGNESIUM	7439-95-4	8,000	NA	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	380	--	--	--	--	--	--
MANGANESE	7439-96-5	440 (B)	440 (B,G,X)	3,300	25,000	440 (B)	1,500	90,000	42	--	--	280	170	--	--
MERCURY	7439-97-6	1.7 (Z)	0.13 (B, Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	<0.06 U	--	--	0.2	0.3	--	--
NICKEL	7440-02-0	100	29 (G)	13,000	40,000	100	16,000	150,000	7.5	--	--	17	8.4	--	--
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
SELENIUM	7782-49-2	4.0	0.41 (B)	130,000	2,600	4.0	59,000	9,600	0.9	--	--	0.3	<0.2 U	--	--
SILVER	7440-22-4	4.5	1.0 (M); 0.027	6,700	2,500	13	2,900	9,000	0.2	--	--	0.7	0.2	--	--
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
VANADIUM	7440-62-2	72	430	ID	750 (DD)	990	ID	5,500 (DD)	--	--	--	--	--	--	--
ZINC	7440-66-6	2,400	62 (G)	ID	170,000	5,000	ID	630,000	13	--	--	70	19	--	--
Inorganics - Cyanide (mg/kg)															
CYANIDE	57-12-5	4.0 (P,R)	0.1 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.12 U	--	--	<0.11 U	<0.11 U	--	--
Organics - PCBs (ug/kg)															
AROCOR-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	<120 UJ	<120 UJ	<130 UJ	<110 U	<110 U	<130 U	<120 U
AROCOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<120 UJ	<120 UJ	<130 UJ	<110 U	<110 U	<130 U	<120 U
TOTAL PCBs	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	ND	ND	ND	ND	ND	ND

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SB25			CHLL-SB51		CHLL-SB142	
Field Sample ID									CHLL - SB - 25 - 5'-5.5'	CHLL - SB - 25 - 5.5'-11'	CHLL - SB - 25 - 5.5'-11' DUP	CHLL-SB 51 0"-6"	CHLL-SB 51 6"-5'	CHLL-SB-142-0-6"	CHLL-SB-142-6"-8'
Sample Date:									8/18/2015	8/18/2015	8/18/2015	6/15/2014	6/15/2014	5/13/2015	5/13/2015
Sample Interval (bgs):									5 - 5.5 ft	5.5 - 11 ft	5.5 - 11 ft	0 - 0.5 ft	0.5 - 5 ft	0 - 0.5 ft	0.5 - 8 ft
Sample Description:									SAND, medium to course grained, dark gray	SAND, medium to course grained 5 ft to 10 ft; SAND fine to medium grained 10 ft to 11 ft	Field Duplicate	TOPSOIL, Sandy, Fine grained, Gray	SAND, Fine grained, Dark gray	TOPSOIL	SAND, Fine grained to 1.5 ft, Gray; FILL, Gravel and Wood to 2.5 ft; SAND, Brown, Medium to fine grained
Organics - SVOCs (ug/kg)															
ACENAPHTHENE	83-32-9	300,000	8,700	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	--	--	--	<230 U	<220 U	--	<230 U
ACENAPHTHYLENE	208-96-8	5,900	ID	2.3E+09	1,600,000	17,000	1E+09	5,200,000	--	--	--	<230 U	<220 U	--	<230 U
ANTHRACENE	120-12-7	41,000	ID	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	--	--	--	<230 U	<220 U	--	<230 U
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	230	<220 U	--	<230 U
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	--	--	--	<450 U	<440 U	--	<470 U
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	--	--	460	<440 U	--	<470 U
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	--	--	--	<450 U	<440 U	--	<470 U
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	--	--	--	<450 U	<440 U	--	<470 U
CARBAZOLE	86-74-8	9,400	1,100	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	--	--	--	310	<220 U	--	<230 U
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	--	--	--	<450 U	<440 U	--	<470 U
DIBENZOFURAN	132-64-9	ID	1,700	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	730,000	5,500	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	--	--	--	400	<220 U	--	<230 U
FLUORENE	86-73-7	390,000	5,300	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	--	--	--	<230 U	<220 U	--	<230 U
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	--	--	--	<450 U	<440 U	--	<470 U
NAPHTHALENE (SVOC)	91-20-3S	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	<230 U	<220 U	--	<230 UJ
PHENANTHRENE	85-01-8	56,000	2,100	6,700,000	1,600,000	160,000	2,900,000	5,200,000	--	--	--	<230 U	<220 U	--	<230 U
PYRENE	129-00-0	480,000	ID	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	--	--	--	360	<220 U	--	<230 U
Organics - VOCs (ug/kg)															
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<62 U	--	<66 UJ
1,2,4-TRIMETHYLBENZENE (I)	95-63-6	2,100	570	8.2E+10	3.2E+07 (C)	2,100	3.6E+10	1E+08 (C)	--	--	--	--	<62 U	--	<66 UJ
2-METHYLNAPHTHALENE (VOC)	91-57-6V	57,000	4,200	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	--	--	--	<310 U	--	<330 UJ
BENZENE (I)	71-43-2	100	240 (X)	3.8E+08	180,000	100	4.7E+08	840,000 (C)	--	--	--	--	<62 U	--	<66 UJ
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<120 U	--	<130 UJ
NAPHTHALENE (VOC)	91-20-3V	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	--	--	--	<310 U	--	<330 UJ
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	<62 U	--	<66 UJ
TOLUENE (I)	108-88-3	16,000	5,400	2.7E+10	5E+07 (C)	16,000	1.2E+10	1.6E+08 (C)	--	--	--	--	<62 U	--	<66 UJ
XYLENE - TOTAL (I)		5,600	820	2.9E+11	4.1E+08 (C)	5600	1.3E+11	1E+09	--	--	--	--	ND	--	ND
Asbestos (%)															
ASBESTOS	ASB	NLL	NLL	1.0 (BB)	ID	NLL	1.0 (BB)	ID	--	--	--	ND	--	ND	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SB143		CHLL-SB144		CHLL-SB145	CHLL-SB159	
Field Sample ID									CHLL-SB-143-0-6"	CHLL-SB-143-6"-5'	CHLL-SB-144-0-6"	CHLL-SB-144-6"-5'	CHLL-SB-145-0-6"	CHLL - SB - 159 - 3"-9"	CHLL - SB - 159 - 3"-12'
Sample Date:									5/13/2015	5/13/2015	5/13/2015	5/13/2015	5/13/2015	8/18/2015	8/18/2015
Sample Interval (bgs):									0 - 0.5 ft	0.5 - 5 ft	0 - 0.5 ft	0.5 - 5 ft	0 - 0.5 ft	0.25 - 0.75 ft	0.75 - 12 ft
Sample Description:									TOPSOIL	SAND, Gray, Fine grained to 1.5 ft; SAND, Brown, Medium to fine grained	SAND, Gray, Fine grained	SAND, Gray, Fine grained to 1 ft; SAND, Brown, Medium to fine grained to 5 ft; SAND, Reddish brown, Medium grained	Surface Soil	CLAY CAP and FILL SAND	FILL, SAND, Dark gray, Medium to 3.5 ft; SAND, Reddish brown, Fine to medium to 11 ft; CLAY, Reddish brown to 11.5 ft; SAND, Reddish brown, Fine to medium
Inorganics - Metals (mg/kg)															
ALUMINUM	7429-90-5	6,900 (B)	NA	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	--	--	--	--	--	6100	2800
ANTIMONY	7440-36-0	4.3	1.2 (X)	13,000	180	4.3	5,900	670	--	--	--	--	--	1.1	2.1
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	--	--	--	--	--	4.8	2.2
BARIUM	7440-39-3	1,300 (G)	130	330,000	37,000	1,300	150,000	130,000	--	--	--	--	--	56	26
BERYLLIUM	7440-41-7	51	4.6 (G)	1,300	410	51	590	1,600	--	--	--	--	--	0.5	0.3
CADMIUM	7440-43-9	6.0	1.6 (G,X)	1,700	550	6.0	2,200	2,100	--	--	--	--	--	0.3	<0.2 U
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
CHROMIUM	7440-47-3	1,000,000 (D,H)	1,200,000 (G,H,X)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	--	--	--	--	--	11	6.3
COBALT	7440-48-4	0.8	2.0	13,000	2,600	2.0	5,900	9,000	--	--	--	--	--	6.0	3.4
COPPER	7440-50-8	5,800	32 (G)	130,000	20,000	5,800	59,000	73,000	--	--	--	--	--	7600	4000
IRON	7439-89-6	12,000 (B)	NA	ID	160,000	12,000 (B)	ID	580,000	--	--	--	--	--	15000	7600
LEAD	7439-92-1	700	1,900 (G,X)	100,000	400	700	44,000	900 (DD)	--	--	--	--	--	80	430
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	--	--	--	--	--	6.9	4.9
MAGNESIUM	7439-95-4	8,000	NA	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	--	--	--	--	--	3800	1900
MANGANESE	7439-96-5	440 (B)	440 (B,G,X)	3,300	25,000	440 (B)	1,500	90,000	--	--	--	--	--	260	120
MERCURY	7439-97-6	1.7 (Z)	0.13 (B, Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	--	--	--	--	--	0.1	<0.05 U
NICKEL	7440-02-0	100	29 (G)	13,000	40,000	100	16,000	150,000	--	--	--	--	--	18	10
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
SELENIUM	7782-49-2	4.0	0.41 (B)	130,000	2,600	4.0	59,000	9,600	--	--	--	--	--	0.4	<0.2 U
SILVER	7440-22-4	4.5	1.0 (M); 0.027	6,700	2,500	13	2,900	9,000	--	--	--	--	--	1.7	0.8
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
VANADIUM	7440-62-2	72	430	ID	750 (DD)	990	ID	5,500 (DD)	--	--	--	--	--	--	--
ZINC	7440-66-6	2,400	62 (G)	ID	170,000	5,000	ID	630,000	--	--	--	--	--	84	25
Inorganics - Cyanide (mg/kg)															
CYANIDE	57-12-5	4.0 (P,R)	0.1 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	--	--	--	--	--	<0.11 U	<0.11 U
Organics - PCBs (ug/kg)															
AROCLOR-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	<120 U	<120 U	<120 U	<120 U	<140 U	<110 UJ	<110 U
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<120 U	<120 U	<120 U	<120 U	<140 U	<110 UJ	<110 U
TOTAL PCBs	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	ND	ND	ND	ND	ND	ND

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SB143		CHLL-SB144		CHLL-SB145	CHLL-SB159	
Field Sample ID									CHLL-SB-143-0-6"	CHLL-SB-143-6"-5'	CHLL-SB-144-0-6"	CHLL-SB-144-6"-5'	CHLL-SB-145-0-6"	CHLL - SB - 159 - 3"-9"	CHLL - SB - 159 - 3"-12'
Sample Date:									5/13/2015	5/13/2015	5/13/2015	5/13/2015	5/13/2015	8/18/2015	8/18/2015
Sample Interval (bgs):									0 - 0.5 ft	0.5 - 5 ft	0 - 0.5 ft	0.5 - 5 ft	0 - 0.5 ft	0.25 - 0.75 ft	0.75 - 12 ft
Sample Description:									TOPSOIL	SAND, Gray, Fine grained to 1.5 ft; SAND, Brown, Medium to fine grained	SAND, Gray, Fine grained	SAND, Gray, Fine grained to 1 ft; SAND, Brown, Medium to fine grained to 5 ft; SAND, Reddish brown, Medium grained	Surface Soil	CLAY CAP and FILL SAND	FILL, SAND, Dark gray, Medium to 3.5 ft; SAND, Reddish brown, Fine to medium to 11 ft; CLAY, Reddish brown to 11.5 ft; SAND, Reddish brown, Fine to medium
Organics - SVOCs (ug/kg)															
ACENAPHTHENE	83-32-9	300,000	8,700	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	--	<250 U	--	<240 U	--	<1100 U	<210 U
ACENAPHTHYLENE	208-96-8	5,900	ID	2.3E+09	1,600,000	17,000	1E+09	5,200,000	--	<250 U	--	<240 U	--	<1100 U	<210 U
ANTHRACENE	120-12-7	41,000	ID	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	--	<250 U	--	<240 U	--	<1100 U	<210 U
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	<250 U	--	<240 U	--	<1100 U	<210 U
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	--	<500 U	--	<480 U	--	<2200 U	<430 U
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	<500 U	--	<480 U	--	<2200 U	<430 U
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	--	<500 U	--	<480 U	--	<2200 U	<430 U
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	--	<500 U	--	<480 U	--	<2200 U	<430 U
CARBAZOLE	86-74-8	9,400	1,100	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	--	<250 U	--	<240 U	--	<1100 U	<210 U
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	--	<500 U	--	<480 U	--	<2200 U	<430 U
DIBENZOFURAN	132-64-9	ID	1,700	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	730,000	5,500	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	--	<250 U	--	<240 U	--	<1100 U	<210 U
FLUORENE	86-73-7	390,000	5,300	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	--	<250 U	--	<240 U	--	<1100 U	<210 U
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	--	<500 U	--	<480 U	--	<2200 U	<430 U
NAPHTHALENE (SVOC)	91-20-3S	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	<250 UJ	--	<240 UJ	--	<1100 U	<210 U
PHENANTHRENE	85-01-8	56,000	2,100	6,700,000	1,600,000	160,000	2,900,000	5,200,000	--	<250 U	--	<240 U	--	<1100 U	<210 U
PYRENE	129-00-0	480,000	ID	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	--	<250 U	--	<240 U	--	<1100 U	<210 U
Organics - VOCs (ug/kg)															
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	<74 UJ	--	<69 UJ	--	<59 U	<75 U
1,2,4-TRIMETHYLBENZENE (I)	95-63-6	2,100	570	8.2E+10	3.2E+07 (C)	2,100	3.6E+10	1E+08 (C)	--	<74 UJ	--	<69 UJ	--	<59 U	<75 U
2-METHYLNAPHTHALENE (VOC)	91-57-6V	57,000	4,200	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	<370 UJ	--	<350 UJ	--	<300 U	<370 U
BENZENE (I)	71-43-2	100	240 (X)	3.8E+08	180,000	100	4.7E+08	840,000 (C)	--	<74 UJ	--	<69 UJ	--	<59 U	<75 U
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	<150 UJ	--	<140 UJ	--	<120 U	<150 U
NAPHTHALENE (VOC)	91-20-3V	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	<370 UJ	--	<350 UJ	--	<300 U	<370 U
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	<74 UJ	--	<69 UJ	--	<59 U	<75 U
TOLUENE (I)	108-88-3	16,000	5,400	2.7E+10	5E+07 (C)	16,000	1.2E+10	1.6E+08 (C)	--	<74 UJ	--	<69 UJ	--	<59 U	<75 U
XYLENE - TOTAL (I)		5,600	820	2.9E+11	4.1E+08 (C)	5600	1.3E+11	1E+09	--	ND	--	ND	--	ND	ND
Asbestos (%)															
ASBESTOS	ASB	NLL	NLL	1.0 (BB)	ID	NLL	1.0 (BB)	ID	ND	--	ND	--	ND	0.75 - CHRYSOTILE	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SB160		CHLL-SB161		CHLL-SS10	CHLL-SS11	CHLL-SS12
Field Sample ID									CHLL - SB - 160 - 9"-15"	CHLL - SB - 160 - 15"-12'	CHLL - SB - 161 - 3'-3.5'	CHLL - SB - 161 - 3.5'-9'	240-52869-1	240-52869-2	CHLL-SS12-0-6"
Sample Date:									8/18/2015	8/18/2015	8/18/2015	8/18/2015	7/1/2015	7/1/2015	7/1/2015
Sample Interval (bgs):									0.75 - 1.25 ft	1.25 - 12 ft	3 - 3.5 ft	3.5 - 9 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sample Description:									FILL, SAND, Dark gray, Medium	FILL, SAND, Dark gray, Medium to 6 ft; CLAY, Reddish brown to 6.5 ft; SAND, Reddish brown, Fine to medium	CLAY CAP to 3 ft; SAND, Dark gray, Medium to coarse	SAND, Dark gray, Medium to coarse	SAND AND GRAVEL, Brownish black	SAND AND GRAVEL, Brownish black	SAND AND GRAVEL, Brownish black
Inorganics - Metals (mg/kg)															
ALUMINUM	7429-90-5	6,900 (B)	NA	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	8800	5800	5800	5000	--	--	--
ANTIMONY	7440-36-0	4.3	1.2 (X)	13,000	180	4.3	5,900	670	0.6	<0.3 U	0.4	0.3	--	--	--
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	3.6	0.9	6.7	5.7	--	--	--
BARIUM	7440-39-3	1,300 (G)	130	330,000	37,000	1,300	150,000	130,000	41	18	57	30 J	--	--	--
BERYLLIUM	7440-41-7	51	4.6 (G)	1,300	410	51	590	1,600	0.5	0.3	0.8	0.7	--	--	--
CADMIUM	7440-43-9	6.0	1.6 (G,X)	1,700	550	6.0	2,200	2,100	<0.2 U	<0.2 U	<0.2 U	<0.2 U	--	--	--
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
CHROMIUM	7440-47-3	1,000,000 (D,H)	1,200,000 (G,H,X)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	15	6.2	14	13	--	--	--
COBALT	7440-48-4	0.8	2.0	13,000	2,600	2.0	5,900	9,000	8.0	3.1	7.4	6.4	--	--	--
COPPER	7440-50-8	5,800	32 (G)	130,000	20,000	5,800	59,000	73,000	1500	7000	4600	4100	--	--	--
IRON	7439-89-6	12,000 (B)	NA	ID	160,000	12,000 (B)	ID	580,000	16000	6700	13000	11000	--	--	--
LEAD	7439-92-1	700	1,900 (G,X)	100,000	400	700	44,000	900 (DD)	47	5.5	27	14	--	--	--
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	7.0	6.1	7.3	7.0	--	--	--
MAGNESIUM	7439-95-4	8,000	NA	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	6500	1500	5800	5400	--	--	--
MANGANESE	7439-96-5	440 (B)	440 (B,G,X)	3,300	25,000	440 (B)	1,500	90,000	220	78	170	170	--	--	--
MERCURY	7439-97-6	1.7 (Z)	0.13 (B, Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	0.07	<0.06 U	<0.06 U	0.06	--	--	--
NICKEL	7440-02-0	100	29 (G)	13,000	40,000	100	16,000	150,000	24	7.3	19	17	--	--	--
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
SELENIUM	7782-49-2	4.0	0.41 (B)	130,000	2,600	4.0	59,000	9,600	0.2	<0.2 U	0.5	0.4	--	--	--
SILVER	7440-22-4	4.5	1.0 (M); 0.027	6,700	2,500	13	2,900	9,000	0.6	0.9	4.6	3.2 J	--	--	--
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--
VANADIUM	7440-62-2	72	430	ID	750 (DD)	990	ID	5,500 (DD)	--	--	--	--	--	--	--
ZINC	7440-66-6	2,400	62 (G)	ID	170,000	5,000	ID	630,000	45	13	120	77	--	--	--
Inorganics - Cyanide (mg/kg)															
CYANIDE	57-12-5	4.0 (P,R)	0.1 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	<0.11 U	<0.11 U	<0.11 U	<0.11 U	--	--	--
Organics - PCBs (ug/kg)															
AROCLOR-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	<220 U	<110 U	<110 UJ	<110 UJ	--	--	--
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	<220 U	<110 U	<110 UJ	<110 UJ	--	--	--
TOTAL PCBs	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	ND	ND	ND	ND	--	--	--

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SB160		CHLL-SB161		CHLL-SS10	CHLL-SS11	CHLL-SS12
Field Sample ID									CHLL - SB - 160 - 9"-15"	CHLL - SB - 160 - 15"-12'	CHLL - SB - 161 - 3'-3.5'	CHLL - SB - 161 - 3.5'-9'	240-52869-1	240-52869-2	CHLL-SS12-0-6"
Sample Date:									8/18/2015	8/18/2015	8/18/2015	8/18/2015	7/1/2015	7/1/2015	7/1/2015
Sample Interval (bgs):									0.75 - 1.25 ft	1.25 - 12 ft	3 - 3.5 ft	3.5 - 9 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft
Sample Description:									FILL, SAND, Dark gray, Medium	FILL, SAND, Dark gray, Medium to 6 ft; CLAY, Reddish brown to 6.5 ft; SAND, Reddish brown, Fine to medium	CLAY CAP to 3 ft; SAND, Dark gray, Medium to coarse	SAND, Dark gray, Medium to coarse	SAND AND GRAVEL, Brownish black	SAND AND GRAVEL, Brownish black	SAND AND GRAVEL, Brownish black
Organics - SVOCs (ug/kg)															
ACENAPHTHENE	83-32-9	300,000	8,700	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	<220 U	<220 U	<220 U	<230 U	--	--	--
ACENAPHTHYLENE	208-96-8	5,900	ID	2.3E+09	1,600,000	17,000	1E+09	5,200,000	<220 U	<220 U	<220 U	<230 U	--	--	--
ANTHRACENE	120-12-7	41,000	ID	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	<220 U	<220 U	<220 U	<230 U	--	--	--
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<220 U	<220 U	<220 U	<230 U	--	--	--
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	<430 U	<440 U	<450 U	<460 U	--	--	--
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	<430 U	<440 U	<450 U	<460 U	--	--	--
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	<430 U	<440 U	<450 U	<460 U	--	--	--
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	<430 U	<440 U	<450 U	<460 U	--	--	--
CARBAZOLE	86-74-8	9,400	1,100	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	--	--	--	--
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	<220 U	<220 U	<220 U	<230 U	--	--	--
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	<430 U	<440 U	<450 U	<460 U	--	--	--
DIBENZOFURAN	132-64-9	ID	1,700	6,700,000	ID	ID	2,900,000	ID	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	730,000	5,500	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	<220 U	<220 U	<220 U	<230 U	--	--	--
FLUORENE	86-73-7	390,000	5,300	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	<220 U	<220 U	<220 U	<230 U	--	--	--
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	<430 U	<440 U	<450 U	<460 U	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	<220 UJ	<220 U	<220 U	<230 U	--	--	--
PHENANTHRENE	85-01-8	56,000	2,100	6,700,000	1,600,000	160,000	2,900,000	5,200,000	<220 U	<220 U	<220 U	<230 U	--	--	--
PYRENE	129-00-0	480,000	ID	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	<220 U	<220 U	<220 U	<230 U	--	--	--
Organics - VOCs (ug/kg)															
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	59 J	<60 U	<66 U	--	--	--	--
1,2,4-TRIMETHYLBENZENE (I)	95-63-6	2,100	570	8.2E+10	3.2E+07 (C)	2,100	3.6E+10	1E+08 (C)	160 J	<60 U	110	--	--	--	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	57,000	4,200	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	290 J	<300 U	<330 U	--	--	--	--
BENZENE (I)	71-43-2	100	240 (X)	3.8E+08	180,000	100	4.7E+08	840,000 (C)	<57 UJ	<60 U	<66 U	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	300 J	<120 U	190	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	280 J	<300 U	<330 U	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	190 J	<60 U	150	--	--	--	--
TOLUENE (I)	108-88-3	16,000	5,400	2.7E+10	5E+07 (C)	16,000	1.2E+10	1.6E+08 (C)	300 J	88	190	--	--	--	--
XYLENE - TOTAL (I)		5,600	820	2.9E+11	4.1E+08 (C)	5600	1.3E+11	1E+09	490 J	ND	340	--	--	--	--
Asbestos (%)															
ASBESTOS	ASB	NLL	NLL	1.0 (BB)	ID	NLL	1.0 (BB)	ID	ND	--	0.25 - CHRYSHOTILE	--	ND	ND	< 1 - AMOSITE 2 - CHRYSHOTILE (PLM Method)

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SS13	CHLL-SS16	CHLL-SS17	SS-10	SS-11	SS-12	
Field Sample ID									240-52869-3	CHLL-SS16- 0"-6"	CHLL-SS17- 0"-6"	SS-10	SS-11	SS-12	SS-12D
Sample Date:									7/1/2015	8/19/2015	8/19/2015	10/12/2011	10/12/2011	10/12/2011	10/12/2011
Sample Interval (bgs):									0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 8 in	0 - 8 in	0 - 8 in	0 - 8 in
Sample Description:									SANDY LOAM, Black, Organics, Wet	SANDY LOAM, Black, Organics, Wet	SANDY LOAM, Black, Organics, Wet	--	--	--	Field Duplicate
Inorganics - Metals (mg/kg)															
ALUMINIUM	7429-90-5	6,900 (B)	NA	ID	50,000 (DD)	6,900 (B)	ID	370,000 (DD)	--	8000	8600	5390 J	4580 J	24300 J	26900 J
ANTIMONY	7440-36-0	4.3	1.2 (X)	13,000	180	4.3	5,900	670	--	2.6	3.8	0.64 J	0.86 J	7.8	11
ARSENIC	7440-38-2	4.6	4.6	720	7.6	4.6	910	37	--	62	69	14.1	18.9	307	312
BARIUM	7440-39-3	1,300 (G)	130	330,000	37,000	1,300	150,000	130,000	--	540	310	113 J	74 J	566 J	537 J
BERYLLIUM	7440-41-7	51	4.6 (G)	1,300	410	51	590	1,600	--	0.6	0.7	0.76	0.67	2.3	2.3
CADMIUM	7440-43-9	6.0	1.6 (G,X)	1,700	550	6.0	2,200	2,100	--	0.9	2.2	1.2	1.2	12	11.1
CALCIUM	7440-70-2	NA	NA	NA	NA	NA	NA	NA	--	--	--	3380 J	2740 J	32000 J	33700 J
CHROMIUM	7440-47-3	1,000,000 (D,H)	1,200,000 (G,H,X)	330,000 (H)	790,000 (H)	1,000,000 (D,H)	150,000 (H)	1,000,000 (D,H)	--	13	34	15.2	16.2	416	463
COBALT	7440-48-4	0.8	2.0	13,000	2,600	2.0	5,900	9,000	--	4.7	8.2	6.3	6.0	14.7	15.2
COPPER	7440-50-8	5,800	32 (G)	130,000	20,000	5,800	59,000	73,000	--	4900	550	1590 J	3440 J	7010 J	7540 J
IRON	7439-89-6	12,000 (B)	NA	ID	160,000	12,000 (B)	ID	580,000	--	15000	47000	13900 J	12900 J	93400 J	92600 J
LEAD	7439-92-1	700	1,900 (G,X)	100,000	400	700	44,000	900 (DD)	--	290	370	322	171	838	1130
LITHIUM	7439-93-2	9.8 (B)	9.8 (B)	2,300,000	4,200 (DD)	9.8 (B)	1,000,000	31,000 (DD)	--	54	38	--	--	--	--
MAGNESIUM	7439-95-4	8,000	NA	6,700,000	1,000,000 (D)	22,000	2,900,000	1,000,000 (D)	--	4500	3200	3580	3630	7980	8590
MANGANESE	7439-96-5	440 (B)	440 (B,G,X)	3,300	25,000	440 (B)	1,500	90,000	--	370	260	308 J	241 J	656 J	645 J
MERCURY	7439-97-6	1.7 (Z)	0.13 (B, Z)	20000 (Z)	160 (Z)	1.7 (Z)	8800 (Z)	580 (Z)	--	1.2	0.7	0.25 J-	0.17 J-	0.13 J-	0.14 J-
NICKEL	7440-02-0	100	29 (G)	13,000	40,000	100	16,000	150,000	--	21	31	18.2	20.9	31.6	35.6
POTASSIUM	7440-09-7	NA	NA	NA	NA	NA	NA	NA	--	--	--	<500 U	<500 U	5820	5440
SELENIUM	7782-49-2	4.0	0.41 (B)	130,000	2,600	4.0	59,000	9,600	--	2.9	1.9	0.48 J	0.81 J	<3.5 U	<3.5 U
SILVER	7440-22-4	4.5	1.0 (M); 0.027	6,700	2,500	13	2,900	9,000	--	5.3	4.7	0.76 J	1	14.9	18
SODIUM	7440-23-5	NA	NA	NA	NA	NA	NA	NA	--	--	--	282 J	240 J	7250	7570
VANADIUM	7440-62-2	72	430	ID	750 (DD)	990	ID	5,500 (DD)	--	--	--	24.9 J	22.3 J	140 J	134 J
ZINC	7440-66-6	2,400	62 (G)	ID	170,000	5,000	ID	630,000	--	210	67	92.9 J	126 J	583 J	664 J
Inorganics - Cyanide (mg/kg)															
CYANIDE	57-12-5	4.0 (P,R)	0.1 (P,R)	250 (P,R)	12 (P,R)	4.0 (P,R)	250 (P,R)	250 (P,R)	--	0.8	0.46	0.2 J	0.51 J	<0.5 U	<0.5 U
Organics - PCBs (ug/kg)															
AROCLOR-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	--	<110 U	<110 U	<38 U	<38 U	94 J	100 J
AROCLOR-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	--	<110 U	<110 U	<38 U	<38 U	82 J	88 J
TOTAL PCBs	TPCB	NLL	NLL	5,200,000 (J)	1,000 (J,T)	NLL	6,500,000 (J)	1,000 (J,T)	--	ND	ND	ND	ND	176	188

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Residential Particulate Soil Inhalation Criteria	Residential Direct Contact Criteria	Nonresidential Drinking Water Protection Criteria	Nonresidential Particulate Soil Inhalation Criteria	Nonresidential Direct Contact Criteria	CHLL-SS13	CHLL-SS16	CHLL-SS17	SS-10	SS-11	SS-12	
Field Sample ID									240-52869-3	CHLL-SS16- 0"-6"	CHLL-SS17- 0"-6"	SS-10	SS-11	SS-12	SS-12D
Sample Date:									7/1/2015	8/19/2015	8/19/2015	10/12/2011	10/12/2011	10/12/2011	10/12/2011
Sample Interval (bgs):									0 - 0.5 ft	0 - 0.5 ft	0 - 0.5 ft	0 - 8 in	0 - 8 in	0 - 8 in	0 - 8 in
Sample Description:									SANDY LOAM, Black, Organics, Wet	SANDY LOAM, Black, Organics, Wet	SANDY LOAM, Black, Organics, Wet	--	--	--	Field Duplicate
Organics - SVOCs (ug/kg)															
ACENAPHTHENE	83-32-9	300,000	8,700	1.4E+10	4.1E+07	880,000	6.2E+09	1.3E+08	--	<1100 U	<2200 U	<170 U	190 J	92 J	100 J
ACENAPHTHYLENE	208-96-8	5,900	ID	2.3E+09	1,600,000	17,000	1E+09	5,200,000	--	<1100 U	<2200 U	<170 U	170 J	<170 U	<170 U
ANTHRACENE	120-12-7	41,000	ID	6.7E+10	2.3E+08	41,000	2.9E+10	7.3E+08	--	<1100 U	<2200 U	<170 U	480	260	320 J
BENZO(A)ANTHRACENE	56-55-3	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	<1100 U	<2200 U	130 J	1000 J	1000	1000 J
BENZO(A)PYRENE	50-32-8	NLL	NLL	1,500,000 (Q)	2,000 (Q)	NLL	1,900,000 (Q)	8,000 (Q)	--	<2200 U	<4400 U	150 J	1200 J	900	930
BENZO(B)FLUORANTHENE	205-99-2	NLL	NLL	ID	20,000 (Q)	NLL	ID	80,000 (Q)	--	<2200 U	<4400 U	170 J	1600 J	940	1100
BENZO(G,H,I)PERYLENE	191-24-2	NLL	NLL	8E+08 (Q)	2,500,000 (Q)	NLL	3.5E+08 (Q)	7,000,000 (Q)	--	<2200 U	<4400 U	140 J	1200 J	720	650
BENZO(K)FLUORANTHENE	207-08-9	NLL	NLL	ID	200,000 (Q)	NLL	ID	800,000 (Q)	--	<2200 U	<4400 U	140 J	1100 J	980	780
CARBAZOLE	86-74-8	9,400	1,100	6.2E+07	530,000	39,000	7.8E+07	2,400,000	--	--	--	<170 U	290	150 J	170 J
CHRYSENE	218-01-9	NLL	NLL	ID	2,000,000 (Q)	NLL	ID	8,000,000 (Q)	--	<1100 U	<2200 U	180 J	1300 J	1100	1100 J
DIBENZO(A,H)ANTHRACENE	53-70-3	NLL	NLL	ID	2,000 (Q)	NLL	ID	8,000 (Q)	--	<2200 U	<4400 U	<170 U	380 J	290	270
DIBENZOFURAN	132-64-9	ID	1,700	6,700,000	ID	ID	2,900,000	ID	--	--	--	<170 U	150 J	<170 U	<170 U
FLUORANTHENE	206-44-0	730,000	5,500	9.3E+09	4.6E+07	730,000	4.1E+09	1.3E+08	--	<1100 U	<2200 U	240	2800 J	2800 J	2100 J
FLUORENE	86-73-7	390,000	5,300	9.3E+09	2.7E+07	890,000	4.1E+09	8.7E+07	--	<1100 U	<2200 U	<170 U	210	<170 U	<170 U
INDENO(1,2,3-CD)PYRENE	193-39-5	NLL	NLL	ID	20,000	NLL	ID	80,000	--	<2200 U	<4400 U	110 J	1100 J	650	620
NAPHTHALENE (SVOC)	91-20-3S	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	<1100 U	<2200 U	<170 U	99 J	<170 U	<170 U
PHENANTHRENE	85-01-8	56,000	2,100	6,700,000	1,600,000	160,000	2,900,000	5,200,000	--	<1100 U	<2200 U	160 J	2300	1400	1400 J
PYRENE	129-00-0	480,000	ID	6.7E+09	2.9E+07	480,000	2.9E+09	8.4E+07	--	<1100 U	<2200 U	260	2300 J	1800	1800 J
Organics - VOCs (ug/kg)															
1,2,3-TRIMETHYLBENZENE	526-73-8	NA	NA	NA	NA	NA	NA	NA	--	<65 U	<69 U	--	--	--	--
1,2,4-TRIMETHYLBENZENE (I)	95-63-6	2,100	570	8.2E+10	3.2E+07 (C)	2,100	3.6E+10	1E+08 (C)	--	97	85	--	--	--	--
2-METHYLNAPHTHALENE (VOC)	91-57-6V	57,000	4,200	6.7E+08	8,100,000	170,000	2.9E+08	2.6E+07	--	<320 U	<340 U	--	--	--	--
BENZENE (I)	71-43-2	100	240 (X)	3.8E+08	180,000	100	4.7E+08	840,000 (C)	--	76	<69 U	--	--	--	--
M,P-XYLENE	1330-20-7	NA	NA	NA	NA	NA	NA	NA	--	180	<140 U	--	--	--	--
NAPHTHALENE (VOC)	91-20-3V	35,000	730	2E+08	1.6E+07	100,000	8.8E+07	5.2E+07	--	<320 U	<340 U	--	--	--	--
O-XYLENE	95-47-6	NA	NA	NA	NA	NA	NA	NA	--	120	95	--	--	--	--
TOLUENE (I)	108-88-3	16,000	5,400	2.7E+10	5E+07 (C)	16,000	1.2E+10	1.6E+08 (C)	--	250	100	--	--	--	--
XYLENE - TOTAL (I)		5,600	820	2.9E+11	4.1E+08 (C)	5600	1.3E+11	1E+09	--	300	95	--	--	--	--
Asbestos (%)															
ASBESTOS	ASB	NLL	NLL	1.0 (BB)	ID	NLL	1.0 (BB)	ID	ND	--	--	--	--	--	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-2
Sample Analytical Summary - Soil
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

Soil Table Footnotes:

- MDEQ Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a.Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013.

- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected. ND indicates that one or more analyte of that goup was tested and not detected and a -- indicates not analyzed.

- Bold values are concentrations detected above the laboratory reporting limit.

- Shaded values indicate analyte concentration exceed applicable criteria. Color presented is the criteria with the highest value that was exceeded:

Residential Drinking Water Protection Criteria
Groundwater Surface Water Interface Protection Criteria
Residential Particulate Soil Inhalation Criteria
Residential Direct Contact Criteria
Nonresidential Drinking Water Protection Criteria
Nonresidential Particulate Soil Inhalation Criteria
Nonresidential Direct Contact Criteria

-- = Not analyzed/Not Reported

bgs = Below ground surface

ft = Feet

in = Inches

mg/kg = Milligrams per kilogram.

PCBs = Polychlorinated biphenyls

SVOC = Semi-volatile organic compound

ug/kg = Micrograms per kilogram

VOC = Volatile organic compound

Criteria Footnotes

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

NLV = Hazardous substance is not likely to volatilize under most conditions.

(B) = Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscopy.

(C) = The criterion developed under R 299.20 to R 299.26 exceeds the chemical- specific soil saturation screening level (Csat). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific Csat or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(DD) = Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO3/L, use 400 mg CaCO3/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environmental Quality (DEQ) internet web site.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protectio

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria.

Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

Laboratory Footnotes

J = Estimated result

ND = Not detected

U = Analyte analyzed for but not detected above the reported sample reporting limit.

TABLE 8-3
Sample Analytical Summary - Groundwater
Powerplant Property - Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

Station Name	CAS Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level	3RD BAY (REMIATED IN 2014)	3RD BAY (REMIATED IN 2014)	CENTRAL PIT (REMIATED IN 2014)	CENTRAL PIT #2 (REMIATED IN 2014)	CHLL-GW12	CHLL-GW13
Field Sample ID									3RD BAY SEDS WATER	3RD BAY WATER	CENTRAL PIT WATER	CENTRAL PIT #2 (DECANTED)	CHLL-GW12-18'-23'	CHLL-GW13-17'-22'
Sample Date									10/14/2008	10/14/2008	10/14/2008	10/14/2008	8/18/2015	8/18/2015
Sample Interval (bgs)									0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	18 - 23 ft	17 - 22 ft
Sample Description									--	--	--	--	--	--
Inorganics - Metals (ug/l)														
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NLV	NLV	NA	ID	--	--	--	--	--	--
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NLV	NLV	NA	ID	--	--	--	--	--	--
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NLV	NLV	NA	ID	--	--	--	--	--	--
BERYLLIUM	7440-41-7	4.0 (A)	4.0 (A)	0.36 (G)	NLV	NLV	NA	ID	--	--	--	--	--	--
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NLV	NLV	NA	ID	--	--	--	--	--	--
COBALT	7440-48-4	40	100	100	NLV	NLV	NA	ID	--	--	--	--	--	--
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NLV	NLV	NA	ID	--	--	--	--	--	--
IRON	7439-89-6	300 (E)	300 (E)	NA	NLV	NLV	NA	ID	--	--	--	--	--	--
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NLV	NLV	NA	ID	--	--	--	--	--	--
LITHIUM	7439-93-2	170	350	440	NLV	NLV	NA	ID	--	--	--	--	--	--
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NLV	NLV	NA	ID	--	--	--	--	--	--
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NLV	NLV	NA	ID	--	--	--	--	--	--
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NLV	NLV	NA	ID	--	--	--	--	--	--
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NLV	NLV	NA	ID	--	--	--	--	--	--
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NLV	NLV	NA	ID	--	--	--	--	--	--
Organics - PCBs (ug/l)														
AROCLOR-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	32	<0.1 U	<0.1 U	<0.33 U	<0.10 U	<0.10 U
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	45 (J,S,T)	45 (J,S,T)	44.7 (J,T)	ID	32	ND	ND	ND	ND	ND
Organics - SVOCs (ug/l)														
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	6.0 (A)	6.0 (A)	25	NLV	NLV	340	NA	1000	<5 U	21	16	--	--
CHOLESTANE	Cholestane	NA	NA	NA	NA	NA	NA	NA	--	--	--	46	--	--
DOCOSANE	Docosane	NA	NA	NA	NA	NA	NA	NA	--	--	--	16	--	--
EICOSANE	Eicosane	NA	NA	NA	NA	NA	NA	NA	--	--	--	16	--	--
FLUORANTHENE	206-44-0	210 (S)	210 (S)	1.6	210 (S)	210 (S)	206	ID	<40 U	<1 U	<1 U	3.6	<1.0 U	<1.0 U
HEPTADECANE	Heptadecane	NA	NA	NA	NA	NA	NA	NA	--	--	--	51	--	--
HEPTYL-PENTADECANE	Heptyl-pentadec	NA	NA	NA	NA	NA	NA	NA	--	--	--	15	--	--
HEXACOSANE	Hexacosane	NA	NA	NA	NA	NA	NA	NA	--	--	--	21	--	--
HEXADECANE	Hexadecane	NA	NA	NA	NA	NA	NA	NA	54	--	--	--	--	--
METHYL-TRIDECANE	Methyl-tridecan	NA	NA	NA	NA	NA	NA	NA	--	--	--	16	--	--
TETRAMETHYL-PENTADECANE	Tetramethyl-pen	NA	NA	NA	NA	NA	NA	NA	--	--	--	26	--	--
Organics - VOCs (ug/l)														
		NA	NA	NA	NA	NA	NA	NA	--	ND	ND	--	ND	ND
Field Measurements														
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	0.71	0.61
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	76	39.1
pH	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	6.93	6.66
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	20.1	16.2

Note: Analytical and Criteria Footnotes are included on the last page of the table.

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-3
Sample Analytical Summary - Groundwater
Powerplant Property - Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level	CHLL-GW14	CHLL-GW36	CHLL-GW64	CHLL-GW65	CHLL-GW66	CHLL-GW71	CHLL-GW72	CHLL-GW73
Field Sample ID									CHLL-GW14-17'-22'	CHLL-GW 36 12'-17'	CHLL-GW-64-13'-18'	CHLL-GW-65-10'-15'	CHLL-GW-66-10'-15'	CHLL-GW71-17'-22'	CHLL-GW72-21'-26'	CHLL-GW73-13'-18'
Sample Date									8/18/2015	6/15/2014	5/13/2015	5/13/2015	5/13/2015	8/18/2015	8/18/2015	8/18/2015
Sample Interval (bgs)									17 - 22 ft	12 - 17 ft	13 - 18 ft	10 - 15 ft	10 - 15 ft	17 - 22 ft	21 - 26 ft	13 - 18 ft
Sample Description									--	--	--	--	--	--	--	--
Inorganics - Metals (ug/l)																
ALUMINUM	7429-90-5	50 (V)	50 (V)	NA	NLV	NLV	NA	ID	--	730	--	--	--	21000	30000	400
ARSENIC	7440-38-2	10 (A)	10 (A)	10	NLV	NLV	NA	ID	--	1.3	--	--	--	2.9	3.4	<1.0 U
BARIUM	7440-39-3	2,000 (A)	2,000 (A)	200 (G)	NLV	NLV	NA	ID	--	80	--	--	--	440	440	270
BERYLLIUM	7440-41-7	4.0 (A)	4.0 (A)	0.36 (G)	NLV	NLV	NA	ID	--	<1.0 U	--	--	--	<1.0 U	1.3	<1.0 U
CHROMIUM	7440-47-3	100 (A,H)	100 (A,H)	40 (G,H,X)	NLV	NLV	NA	ID	--	2.2	--	--	--	95	140	2.0
COBALT	7440-48-4	40	100	100	NLV	NLV	NA	ID	--	<5.0 U	--	--	--	15	20	<5.0 U
COPPER	7440-50-8	1,000 (E)	1,000 (E)	4.7 (G)	NLV	NLV	NA	ID	--	4.6	--	--	--	77	140	56
IRON	7439-89-6	300 (E)	300 (E)	NA	NLV	NLV	NA	ID	--	2600	--	--	--	22000	33000	12000
LEAD	7439-92-1	4.0 (L)	4.0 (L)	11 (G,X)	NLV	NLV	NA	ID	--	4.8	--	--	--	6.3	5.1	<1.0 U
LITHIUM	7439-93-2	170	350	440	NLV	NLV	NA	ID	--	--	--	--	--	17	26	<10 U
MAGNESIUM	7439-95-4	400,000	1,100,000	NA	NLV	NLV	NA	ID	--	--	--	--	--	25000	23000	18000
MANGANESE	7439-96-5	50 (E)	50 (E)	1,000 (G,X)	NLV	NLV	NA	ID	--	350	--	--	--	2700	780	700
NICKEL	7440-02-0	100 (A)	100 (A)	28 (G)	NLV	NLV	NA	ID	--	20	--	--	--	42	62	5.1
SELENIUM	7782-49-2	50 (A)	50 (A)	5	NLV	NLV	NA	ID	--	<1.0 U	--	--	--	1.7 J	<1.0 U	<1.0 U
ZINC	7440-66-6	2,400	5,000 (E)	63 (G)	NLV	NLV	NA	ID	--	94	--	--	--	56	140	13
Organics - PCBs (ug/l)																
AROCLO-1262	37324-23-5	NA	NA	NA	NA	NA	NA	NA	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U
TOTAL PCBs	TPCB	0.5 (A,J,T)	0.5 (A,J,T)	0.2 (J,M,T)	45 (J,S,T)	45 (J,S,T)	44.7 (J,T)	ID	ND	ND	ND	ND	ND	ND	ND	ND
Organics - SVOCs (ug/l)																
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	6.0 (A)	6.0 (A)	25	NLV	NLV	340	NA	--	--	--	--	--	--	--	--
CHOLESTANE	Cholestane	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
DOCOSANE	Docosane	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
EICOSANE	Eicosane	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	210 (S)	210 (S)	1.6	210 (S)	210 (S)	206	ID	<1.0 U	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
HEPTADECANE	Heptadecane	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
HEPTYL-PENTADECANE	Heptyl-pentadec	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
HEXACOSANE	Hexacosane	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
HEXADECANE	Hexadecane	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
METHYL-TRIDECANE	Methyl-tridecan	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
TETRAMETHYL-PENTADECANE	Tetramethyl-pen	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
Organics - VOCs (ug/l)																
		NA	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
Field Measurements																
Conductivity (mS/cm)	NA	NA	NA	NA	NA	NA	NA	NA	1.07	0.18	0.293	0.341	0.304	--	0.473	0.96
DO (%)	NA	NA	NA	NA	NA	NA	NA	NA	--	112.5	94.0	87.8	9.00	--	48.8	58.8
pH	NA	NA	NA	NA	NA	NA	NA	NA	6.99	7.45	7.49	7.24	7.2	--	6.46	6.64
Temperature (°C)	NA	NA	NA	NA	NA	NA	NA	NA	22.2	11.1	7.4	8.4	7.6	--	22.5	17.0

Note: Analytical and Criteria Footnotes are included on the last page of the table.

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-3
Sample Analytical Summary - Groundwater
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Groundwater Table Footnotes:

MDEQ Part 201 residential and non-residential generic cleanup criteria and screening levels criteria were originally promulgated December 21, 2002 within the Administrative Rules for Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. This table reflects revisions to the criteria pursuant to the December 2010 Part 201 amendments and new criteria consistent with the provisions of R299.5706a.Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Release Date: December 30, 2013.

Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected. ND indicates that one or more analyte of that goup was tested and not detected and a – indicates not analyzed.

Bold values are concentrations detected above the reporting limit.

Shaded values indicate analyte concentration exceed applicable criteria. Color presented is the criteria below with the highest value that was exceeded:

Residential Drinking Water Criteria
Nonresidential Drinking Water Criteria
Groundwater Surface Water Interface Criteria
Residential Groundwater Volatilization to Indoor Air Inhalation Criteria
Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria
Water Solubility
Flammability and Explosivity Screening Level

-- = Not analyzed/Not reported

bgs = Below ground surface

DO = Dissolved oxygen

ft = Feet

in = Inches

PCBs = Polychlorinated biphenyls

SVOC = Semi-volatile organic compound

ug/l = Micrograms per liter

VOC = Volatile organic compound

°C = Degrees Celsius

mS/cm = MilliSiemens per centimeter

% = Percent

Groundwater Table Footnotes:

ID = Insufficient data to develop criterion.

NA = A criterion or value is not available

NLL = Hazardous substance is not likely to leach under most soil conditions.

NLV = Hazardous substance is not likely to volatilize under most conditions.

(A) Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(BB) = The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscopy.

(D) = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) = Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in a table available on the Department of Environmental Quality (DEQ) internet web site. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information)

(G) = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO3/L, use 400 mg CaCO3/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote. A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environmental Quality (DEQ) internet web site.

(H) = Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil clea

(HH) = The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

(I) = Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(L) = Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase. Acceptable combinations of site-specific soil and drinking water concentrations are presented in a table available on the Department of Environmental Quality (DEQ) internet web site (See R 299.49 Footnotes for generic cleanup criteria tables for additional information).

(M) = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(N) = The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/L. Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 ug/kg.

(P) = Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) = Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) = Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(S) = Criterion defaults to the hazardous substance-specific water solubility limit.

(T) = Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the published table if TSCA standards are not applicable.

(V) = Criterion is the aesthetic drinking water value as required by Section 20120(a)(5) of the NREPA. Concentrations up to 200 ug/L may be acceptable, and still allow for drinking water use, as part of a site-specific cleanup under Section 20120a(2) and 20120b of the NREPA.

(X) = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. (See R 299.49 Footnotes for generic cleanup criteria tables for additional information.)

(Z) = Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

Laboratory Footnotes:

ND = Not detected

J = Estimated result

U = Analyte analyzed for but not detected above the reported sample reporting limit.

TABLE 8-4
Sample Analytical Summary - Sediment
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	EPA Region 5 Ecological Screening Level	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	3RD BAY (REMEDIATED IN 2014)	CHLL-SD25			CHLL-SD26			CHLL-SD28		CHLL-SD29	
Field Sample ID					3RD BAY SEDS	CHLL-SD-25-0"-6"	CHLL-SD-25-1'-3'	CHLL-SD 25-3'-4'	CHLL-SD-26 0"-6"	CHLL-SD-26 1'-3'	CHLL-SD-26 3'-4.75'	CHLL-SD28-0"-6"	CHLL-SD28-1'-2'	CHLL-SD29-0"-6"	CHLL-SD29-1'-2.3'
Sample Date					10/14/2008	7/11/2014	7/11/2014	7/11/2014	5/28/2015	5/28/2015	5/28/2015	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Sample Interval (bgs)					0 - 6 in	0 - 0.5 ft	1 - 3 ft	3 - 4 ft	0 - 0.5 ft	1 - 3 ft	3 - 4.75 ft	0 - 0.5 ft	1 - 2 ft	0 - 0.5 ft	1 - 2.3 ft
Sample Description					Sample collected from the basement of the power plant building	SILT, Dark brown	SAND, Silty, Fine grained, Reddish brown	SAND, Silty, Fine grained, Reddish brown	SILT, Dark brown	SILT, Reddish brown, Clayey	SILT, Reddish brown, Clayey	SILT, Clayey, Dark Brown	SAND, Silty, Poorly sorted, Reddish brown	SAND, Silty, Fine grained, Reddish brown	SAND, Silty, Fine grained, Reddish brown
Inorganics - Metals (mg/kg)															
ALUMINUM	7429-90-5	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
ARSENIC	7440-38-2	9.79	9.79	33.0	--	--	--	--	--	--	--	--	--	--	--
BARIUM	7440-39-3	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
BERYLLIUM	7440-41-7	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
CADMIUM	7440-43-9	0.99	0.99	4.98	--	--	--	--	--	--	--	--	--	--	--
CHROMIUM	7440-47-3	43.4	43.4	111	--	--	--	--	--	--	--	--	--	--	--
COBALT	7440-48-4	50	NA	NA	--	--	--	--	--	--	--	--	--	--	--
COPPER	7440-50-8	31.6	31.6	149	--	--	--	--	--	--	--	--	--	--	--
IRON	7439-89-6	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
LEAD	7439-92-1	35.8	35.8	128	--	--	--	--	--	--	--	--	--	--	--
LITHIUM	7439-93-2	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
MAGNESIUM	7439-95-4	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
MANGANESE	7439-96-5	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
MERCURY	7439-97-6	0.174	0.18	1.06	--	--	--	--	--	--	--	--	--	--	--
NICKEL	7440-02-0	22.7	22.7	48.6	--	--	--	--	--	--	--	--	--	--	--
SELENIUM	7782-49-2	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
SILVER	7440-22-4	0.5	NA	NA	--	--	--	--	--	--	--	--	--	--	--
ZINC	7440-66-6	121	121	459	--	--	--	--	--	--	--	--	--	--	--
Inorganics - Cyanide (mg/kg)															
CYANIDE	57-12-5	0.0001	NA	NA	--	--	--	--	--	--	--	--	--	--	--
Organics - PCBs (ug/kg)															
AROCLOR-1262	37324-23-5	NA	NA	NA	17000	<460 U	<290 U	<290 U	<510 U	<310 U	<300 U	<360 U	<250 U	<260 U	<270 U
TOTAL PCBs	TPCB	59.8	59.8	676	17000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Organics - SVOCs (ug/kg)															
1-METHYL-NAPHTHALENE	1-Methyl-naphth	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-65	20.2	NA	NA	<17000 U	--	--	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	150000	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER1	Dimethyl-napht1	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER2	Dimethyl-napht2	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER3	Dimethyl-napht3	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-OCTANE	Dimethyl-octane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-UNDECANE	Dimethyl-undeca	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
DOCOSANE	Docosane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
EICOSANE	Eicosane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	423	423	2,230	<6900 U	--	--	--	--	--	--	--	--	--	--
HENEICOSANE	Heneicosane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
HEPTADECANE	Heptadecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
METHYLETHYL-NAPHTHALENE	Methylethyl-nap	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
METHYL-TRIDECAENE	Methyl-tridecan	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-35	176	176	561	<6900 U	--	--	--	--	--	--	--	--	--	--
NONADECANE	Nonadecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
OCTADECANE	Octadecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
PHENANTHRENE	85-01-8	204	204	1,170	<6900 U	--	--	--	--	--	--	--	--	--	--
PROPYL-TRIDECAENE	Propyl-tridecan	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
PYRENE	129-00-0	195	195	1,520	<6900 U	--	--	--	--	--	--	--	--	--	--
TETRAMETHYL-BENZENE	Tetramethyl-ben	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
TETRAMETHYL-HEXADECANE	Tetramethyl-hex	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
TETRAMETHYL-PENTADECANE	Tetramethyl-pen	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
TRIMETHYL-NAPHTHALENE	Trimethyl-napht	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--
UNDECANE	Undecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

TABLE 8-4
Sample Analytical Summary - Sediment
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	EPA Region 5 Ecological Screening Level	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	CHLL-SD30			CHLL-SD53		CHLL-SD83				CHLL-SD84		
Field Sample ID					CHLL-SD-30-0"-6"	CHLL-SD-30-1'-3'	CHLL-SD-30-1'-3' DUP	CHLL-SD53 0-6"	CHLL-SD53 1-2.3'	CHLL-SD-83 0"-6"	CHLL-SD-83 1'-3'	CHLL-SD-83 1'-3' DUP	CHLL-SD-83 3'-4.5'	CHLL-SD-84-0-6"	CHLL-SD-84-1-3'	CHLL-SD-84-3-3.5'
Sample Date					7/9/2014	7/9/2014	7/9/2014	7/15/2014	7/15/2014	5/28/2015	5/28/2015	5/28/2015	5/28/2015	6/2/2015	6/2/2015	6/2/2015
Sample Interval (bgs)					0 - 0.5 ft	1 - 3 ft	1 - 3 ft	0 - 0.5 ft	1 - 2.3 ft	0 - 0.5 ft	1 - 3 ft	1 - 3 ft	3 - 4.5 ft	0 - 0.5 ft	1 - 3 ft	3 - 3.5 ft
Sample Description					SILT, Clayey, Dark Brown	SILT, Reddish brown; SAND, Clayey, Silty, Poorly sorted	Field Duplicate	SAND, Silty, Fine grained, Dark brown	SAND, Silty, Fine grained, Dark brown; Gray staining between 0.5 ft and 2.3 ft	SILT, Dark Brown	SILT, Reddish brown, Clayey to 2.1 ft; SILT, Reddish-Brown, sandy, few pieces of slag to 2.5 ft; SILT, Reddish brown, Clayey	Field Duplicate	SAND, Light brown to rusty brown, Poorly sorted	SILT, Reddish brown	SAND, Reddish brown, fine grained, silty to 1.2 ft; SAND, Reddish brown, poorly sorted	SAND, Reddish brown, poorly sorted
Inorganics - Metals (mg/kg)																
ALUMINUM	7429-90-5	NA	NA	NA	--	--	--	4700	6300	--	18000	--	2800	--	--	--
ARSENIC	7440-38-2	9.79	9.79	33.0	--	--	--	12	17	--	7.3	--	1.4	--	--	--
BARIUM	7440-39-3	NA	NA	NA	--	--	--	62	96	--	35	--	10	--	--	--
BERYLLIUM	7440-41-7	NA	NA	NA	--	--	--	0.4	0.5	--	0.8	--	0.4	--	--	--
CADMIUM	7440-43-9	0.99	0.99	4.98	--	--	--	<0.2 U	0.3	--	<0.2 U	--	<0.2 U	--	--	--
CHROMIUM	7440-47-3	43.4	43.4	111	--	--	--	11	16	--	45	--	9.6	--	--	--
COBALT	7440-48-4	50	NA	NA	--	--	--	5.7	8.7	--	25	--	4.4	--	--	--
COPPER	7440-50-8	31.6	31.6	149	--	--	--	500	2400	--	3800	--	9500	--	--	--
IRON	7439-89-6	NA	NA	NA	--	--	--	19000	30000	--	25000	--	8100	--	--	--
LEAD	7439-92-1	35.8	35.8	128	--	--	--	19	36	--	12	--	4.0	--	--	--
LITHIUM	7439-93-2	NA	NA	NA	--	--	--	--	--	--	9.3	--	4.7	--	--	--
MAGNESIUM	7439-95-4	NA	NA	NA	--	--	--	--	--	--	20000	--	4300	--	--	--
MANGANESE	7439-96-5	NA	NA	NA	--	NA	--	130	120	--	480	--	91	--	--	--
MERCURY	7439-97-6	0.174	0.18	1.06	--	--	--	<0.1 U	0.1	--	0.1	--	0.09	--	--	--
NICKEL	7440-02-0	22.7	22.7	48.6	--	--	--	14	21	--	67	--	10	--	--	--
SELENIUM	7782-49-2	NA	NA	NA	--	--	--	0.3	0.7	--	<0.2 U	--	<0.2 U	--	--	--
SILVER	7440-22-4	0.5	NA	NA	--	--	--	0.4	0.7	--	8.1	--	12	--	--	--
ZINC	7440-66-6	121	121	459	--	--	--	38	62	--	120	--	43	--	--	--
Inorganics - Cyanide (mg/kg)																
CYANIDE	57-12-5	0.0001	NA	NA	--	--	--	0.23	<0.23 U	--	<0.15 U	--	<0.63 U	--	--	--
Organics - PCBs (ug/kg)																
AROCLOR-1262	37324-23-5	NA	NA	NA	<360 U	<310 U	<300 U	<190 U	<470 U	<610 U	<310 U	<300 U	<250 U	<360 U	<260 U	<220 U
TOTAL PCBs	TPCB	59.8	59.8	676	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Organics - SVOCs (ug/kg)																
1-METHYL-NAPHTHALENE	1-Methyl-naphth	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-65	20.2	NA	NA	--	--	--	<2400 U	<2900 U	--	<1900 U	--	<1600 U	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER1	Dimethyl-napht1	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER2	Dimethyl-napht2	NA	NA	NA	--	NA	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER3	Dimethyl-napht3	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-OCTANE	Dimethyl-octane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
DIMETHYL-UNDECANE	Dimethyl-undeca	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
DOCOSANE	Docosane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
EICOSANE	Eicosane	NA	NA	NA	--	NA	--	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	423	423	2,230	--	--	--	<960 U	<1200 U	--	<760 U	--	<630 U	--	--	--
HENEICOSANE	Heneicosane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
HEPTADECANE	Heptadecane	NA	NA	NA	--	NA	--	--	--	--	--	--	--	--	--	--
METHYLETHYL-NAPHTHALENE	Methylethyl-nap	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
METHYL-TRIDECANE	Methyl-tridecan	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	176	176	561	--	--	--	<960 U	<1200 U	--	<760 U	--	<630 U	--	--	--
NONADECANE	Nonadecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
OCTADECANE	Octadecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
PHENANTHRENE	85-01-8	204	204	1,170	--	--	--	<960 U	<1200 U	--	<760 U	--	<630 U	--	--	--
PROPYL-TRIDECANE	Propyl-tridecan	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
PYRENE	129-00-0	195	195	1,520	--	--	--	<960 U	<1200 U	--	<760 U	--	<630 U	--	--	--
TETRAMETHYL-BENZENE	Tetramethyl-ben	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
TETRAMETHYL-HEXADECANE	Tetramethyl-hex	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
TETRAMETHYL-PENTADECANE	Tetramethyl-pen	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
TRIMETHYL-NAPHTHALENE	Trimethyl-napht	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
UNDECANE	Undecane	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-4
Sample Analytical Summary - Sediment
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	EPA Region 5 Ecological Screening Level	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	CHLL-SD96	SEDS #1 CENTRAL PIT (REMEDIATED IN 2014)	SEDS #2 CENTRAL BAY (REMEDIATED IN 2014)	TL07-15			TL07-16		TL07-28	TL07-29	TL07-30	TL07-31
Field Sample ID					CHLL - SD - 96 - 0"-3"	SEDS #1 CENTRAL PIT	SEDS #2 CENTRAL BAY	TL07-15 0-6	TL07-15 6-36	TL07-15 6-36 D	TL07-16 0-6	TL07-16 6-25	TL07-28	TL07-29	TL07-30	TL07-31
Sample Date					8/23/2015	10/14/2008	10/14/2008	8/8/2007	8/8/2007	8/8/2007	8/8/2007	8/8/2007	8/9/2007	8/9/2007	8/9/2007	8/9/2007
Sample Interval (bgs)					0 - 0.25 ft	0 - 6 in	0 - 6 in	0 - 6 in	6 - 36 in	6 - 36 in	0 - 6 in	6 - 25 in	0 - 2 in	0 - 2 in	0 - 2 in	0 - 2 in
Sample Description					Surface Sediment	Sample collected from the basement of the power plant building	Sample collected from the basement of the power plant building	--	--	Field Duplicate	--	--	--	--	--	--
Inorganics - Metals (mg/kg)																
ALUMINIUM	7429-90-5	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
ARSENIC	7440-38-2	9.79	9.79	33.0	--	--	--	13	13	14	16	9.1	31	34	28	17
BARIIUM	7440-39-3	NA	NA	NA	--	--	--	120	96	96	65	61	190	160	150	150
BERYLLIUM	7440-41-7	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
CADMIUM	7440-43-9	0.99	0.99	4.98	--	--	--	<0.2 U	<0.2 U	<0.2 U	0.31	<0.2 U	0.89	1.1	0.78	0.62
CHROMIUM	7440-47-3	43.4	43.4	111	--	--	--	15	14	15	37	27	42	48	37	32
COBALT	7440-48-4	50	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
COPPER	7440-50-8	31.6	31.6	149	--	--	--	810	1000	1200	2100	7100	1700	2000	1900	1500
IRON	7439-89-6	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
LEAD	7439-92-1	35.8	35.8	128	--	--	--	23	19	21	47	26	90	140	94	66
LITHIUM	7439-93-2	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
MAGNESIUM	7439-95-4	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
MANGANESE	7439-96-5	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
MERCURY	7439-97-6	0.174	0.18	1.06	--	--	--	0.15	0.15	0.15	0.22	0.16	0.47	0.2	0.4	0.32
NICKEL	7440-02-0	22.7	22.7	48.6	--	--	--	--	--	--	--	--	--	--	--	--
SELENIUM	7782-49-2	NA	NA	NA	--	--	--	0.64	0.54	0.38	0.37	0.25	0.85	0.75	0.3	0.3
SILVER	7440-22-4	0.5	NA	NA	--	--	--	0.52	0.58	0.65	3.4	9.3	4.5	5.7	4.0	3.0
ZINC	7440-66-6	121	121	459	--	--	--	52	62	71	120	100	170	200	160	130
Inorganics - Cyanide (mg/kg)																
CYANIDE	57-12-5	0.0001	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Organics - PCBs (ug/kg)																
AROCLOR-1262	37324-23-5	NA	NA	NA	<260 U	<160 U	<1800 U	<290 U	<250 U	<260 U	<200 U	<150 U	<580 U	<480 U	<460 U	<420 U
TOTAL PCBs	TPCB	59.8	59.8	676	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Organics - SVOCs (ug/kg)																
1-METHYL-NAPHTHALENE	1-Methyl-naphth	NA	NA	NA	--	1500	--	--	--	--	--	--	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-65	20.2	NA	NA	--	1700	<18000 U	--	--	--	--	--	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	--	<780 U	<18000 U	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER1	Dimethyl-napht1	NA	NA	NA	--	1800	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER2	Dimethyl-napht2	NA	NA	NA	--	1100	--	--	--	--	--	--	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER3	Dimethyl-napht3	NA	NA	NA	--	650	--	--	--	--	--	--	--	--	--	--
DIMETHYL-OCTANE	Dimethyl-octane	NA	NA	NA	--	2000	--	--	--	--	--	--	--	--	--	--
DIMETHYL-UNDECANE	Dimethyl-undeca	NA	NA	NA	--	1800	11000	--	--	--	--	--	--	--	--	--
DOCOSANE	Docosane	NA	NA	NA	--	600	--	--	--	--	--	--	--	--	--	--
EICOSANE	Eicosane	NA	NA	NA	--	--	16000	--	--	--	--	--	--	--	--	--
FLUORANTHENE	206-44-0	423	423	2,230	--	<310 U	5700	--	--	--	--	--	--	--	--	--
HENEICOSANE	Heneicosane	NA	NA	NA	--	--	16000	--	--	--	--	--	--	--	--	--
HEPTADECANE	Heptadecane	NA	NA	NA	--	--	11000	--	--	--	--	--	--	--	--	--
METHYLETHYL-NAPHTHALENE	Methylethyl-nap	NA	NA	NA	--	710	--	--	--	--	--	--	--	--	--	--
METHYL-TRIDECANE	Methyl-tridecan	NA	NA	NA	--	820	--	--	--	--	--	--	--	--	--	--
NAPHTHALENE (SVOC)	91-20-35	176	176	561	--	350	<7300 U	--	--	--	--	--	--	--	--	--
NONADECANE	Nonadecane	NA	NA	NA	--	--	8100	--	--	--	--	--	--	--	--	--
OCTADECANE	Octadecane	NA	NA	NA	--	--	15000	--	--	--	--	--	--	--	--	--
PHENANTHRENE	85-01-8	204	204	1,170	--	190	<7300 U	--	--	--	--	--	--	--	--	--
PROPYL-TRIDECANE	Propyl-tridecan	NA	NA	NA	--	2600	--	--	--	--	--	--	--	--	--	--
PYRENE	129-00-0	195	195	1,520	--	<310 U	5600	--	--	--	--	--	--	--	--	--
TETRAMETHYL-BENZENE	Tetramethyl-ben	NA	NA	NA	--	910	--	--	--	--	--	--	--	--	--	--
TETRAMETHYL-HEXADECANE	Tetramethyl-hex	NA	NA	NA	--	2200	22000	--	--	--	--	--	--	--	--	--
TETRAMETHYL-PENTADECANE	Tetramethyl-pen	NA	NA	NA	--	3200	22000	--	--	--	--	--	--	--	--	--
TRIMETHYL-NAPHTHALENE	Trimethyl-napht	NA	NA	NA	--	1200	--	--	--	--	--	--	--	--	--	--
UNDECANE	Undecane	NA	NA	NA	--	1900	--	--	--	--	--	--	--	--	--	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-4
Sample Analytical Summary - Sediment
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Station Name	CAS Number	EPA Region 5 Ecological Screening Level	Threshold Effect Concentration (TEC)	Probable Effect Concentration (PEC)	TL07-32	TL07-33	TL08-013	TL08-079
Field Sample ID					TL07-32	TL07-33	TL08-013	TL08-079
Sample Date					8/9/2007	8/9/2007	8/27/2008	8/28/2008
Sample Interval (bgs)					0 - 2 in	0 - 2 in	0 - 0 ft	0 - 0 ft
Sample Description					--	--	--	--
Inorganics - Metals (mg/kg)								
ALUMINUM	7429-90-5	NA	NA	NA	--	--	--	--
ARSENIC	7440-38-2	9.79	9.79	33.0	8.9	4.0	--	--
BARIUM	7440-39-3	NA	NA	NA	93	68	--	--
BERYLLIUM	7440-41-7	NA	NA	NA	--	--	--	--
CADMIUM	7440-43-9	0.99	0.99	4.98	0.27	<0.2 U	--	--
CHROMIUM	7440-47-3	43.4	43.4	111	18	11	--	--
COBALT	7440-48-4	50	NA	NA	--	--	--	--
COPPER	7440-50-8	31.6	31.6	149	650	270	--	--
IRON	7439-89-6	NA	NA	NA	--	--	--	--
LEAD	7439-92-1	35.8	35.8	128	31	16	--	--
LITHIUM	7439-93-2	NA	NA	NA	--	--	--	--
MAGNESIUM	7439-95-4	NA	NA	NA	--	--	--	--
MANGANESE	7439-96-5	NA	NA	NA	--	--	--	--
MERCURY	7439-97-6	0.174	0.18	1.06	0.15	<0.05 U	--	--
NICKEL	7440-02-0	22.7	22.7	48.6	--	--	--	--
SELENIUM	7782-49-2	NA	NA	NA	0.3	<0.2 U	--	--
SILVER	7440-22-4	0.5	NA	NA	1.1	0.41	--	--
ZINC	7440-66-6	121	121	459	75	43	--	--
Inorganics - Cyanide (mg/kg)								
CYANIDE	57-12-5	0.0001	NA	NA	--	--	--	--
Organics - PCBs (ug/kg)								
AROCOR-1262	37324-23-5	NA	NA	NA	<280 U	<190 U	--	--
TOTAL PCBs	TPCB	59.8	59.8	676	ND	ND	<120 UJ	<130 UJ
Organics - SVOCs (ug/kg)								
1-METHYL-NAPHTHALENE	1-Methyl-naphth	NA	NA	NA	--	--	--	--
2-METHYLNAPHTHALENE (SVOC)	91-57-6S	20.2	NA	NA	--	--	--	--
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	182	NA	NA	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER1	Dimethyl-napht1	NA	NA	NA	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER2	Dimethyl-napht2	NA	NA	NA	--	--	--	--
DIMETHYL-NAPHTHALENE ISOMER3	Dimethyl-napht3	NA	NA	NA	--	--	--	--
DIMETHYL-OCTANE	Dimethyl-octane	NA	NA	NA	--	--	--	--
DIMETHYL-UNDECANE	Dimethyl-undeca	NA	NA	NA	--	--	--	--
DOCOSANE	Docosane	NA	NA	NA	--	--	--	--
EICOSANE	Eicosane	NA	NA	NA	--	--	--	--
FLUORANTHENE	206-44-0	423	423	2,230	--	--	--	--
HENEICOSANE	Heneicosane	NA	NA	NA	--	--	--	--
HEPTADECANE	Heptadecane	NA	NA	NA	--	--	--	--
METHYLETHYL-NAPHTHALENE	Methylethyl-nap	NA	NA	NA	--	--	--	--
METHYL-TRIDECANE	Methyl-tridecan	NA	NA	NA	--	--	--	--
NAPHTHALENE (SVOC)	91-20-3S	176	176	561	--	--	--	--
NONADECANE	Nonadecane	NA	NA	NA	--	--	--	--
OCTADECANE	Octadecane	NA	NA	NA	--	--	--	--
PHENANTHRENE	85-01-8	204	204	1,170	--	--	--	--
PROPYL-TRIDECANE	Propyl-tridecan	NA	NA	NA	--	--	--	--
PYRENE	129-00-0	195	195	1,520	--	--	--	--
TETRAMETHYL-BENZENE	Tetramethyl-ben	NA	NA	NA	--	--	--	--
TETRAMETHYL-HEXADECANE	Tetramethyl-hex	NA	NA	NA	--	--	--	--
TETRAMETHYL-PENTADECANE	Tetramethyl-pen	NA	NA	NA	--	--	--	--
TRIMETHYL-NAPHTHALENE	Trimethyl-napht	NA	NA	NA	--	--	--	--
UNDECANE	Undecane	NA	NA	NA	--	--	--	--

Note: Analytical and Criteria Footnotes are included on the last page of the table.

DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA

TABLE 8-4
Sample Analytical Summary - Sediment
Lake Linden Processing Area
Abandoned Mining Wastes - Torch Lake Non-Superfund Site

Sediment Table Footnotes:

- ESLs, TECs, and PECs are adapted from Appendix A and Appendix B of Michigan Department of Environmental Quality - Remediation and Redevelopment Division Operational Memorandum No. 4 Attachment 3, Interim Final August 2, 2006
- Only detected analytes are listed - Gray rows indicate requested analyses. If no analytes are listed below a gray row then all analytes of that group were either not analyzed or not detected. ND indicates that one or more analyte of that group was tested and not detected and a -- indicates not analyzed.
- **Bold** values are concentrations detected above the reporting limit.
- **Shaded values indicate analyte concentration exceed applicable criteria. Color presented is the criteria with the highest value that was exceeded:**

EPA Region 5 RCRA ESLs dated August 22, 2003
TECs from MacDonald <i>et al.</i> 2000
PECs from MacDonald <i>et al.</i> 2000

- = Not analyzed/Not Reported
- bgs = Below ground surface
- ESL = Ecological Screening Level
- ft = Feet
- in = Inches
- mg/kg = Milligrams per kilogram.
- PCBs = Polychlorinated biphenyls
- PEC = Probable Effect Concentration
- RCRA = Resource Conservation and Recovery Act
- SVOC = Semi-volatile organic compound
- TEC = Threshold Effect Concentration
- ug/kg = Micrograms per kilogram
- VOC = Volatile organic compound

Criteria Footnotes:

NA = A criterion or value is not available

Laboratory Footnotes:





- J = Estimated result
- ND = Analyte analyzed for but not detected above the reported sample reporting limit.
- U = Analyte analyzed for but not detected above the reported sample reporting limit.

**DETAILED FINDINGS REPORT
LAKE LINDEN PROCESSING AREA**

SECTION 8

**DETAILED FINDINGS REPORT – LAKE LINDEN PROCESSING AREA
FIGURES**



-  Bulk Asbestos
-  Soil
-  Groundwater
-  Sediment

0 225 Ft
Coordinate System: MGeoRef(m)



Figure 8-1
Sampling Location Map
Lake Linden Processing Area
Lake Linden, Houghton County, Michigan





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