

This removal action letter report summarizes the background; discusses the premises for the removal action, and; details the removal activities, including the health and safety monitoring, and waste disposal. Appendix A of this letter report presents a photographic log of removal action activities and Attachment A provides the Analytical Data Package.

Site Background

Tamarack Stamp Mill is located at M-26 and 6th Street, in Osceola Township, Houghton County, Michigan (Figure 1). The Site is bordered by M-26 to the north, 6th Street to the east, Spruce Street to the south, and a playground to the west. Torch Lake is located east of the Site. The Site consisted of several concrete pillars and foundations, walls, and broken roofs that once served as foundation for the railroad and stamp mill. Demolition debris, including asbestos containing material (ACM) and historic remnants were located throughout the Site (Figure 2). When in operations, the Site was used for processing copper. During road construction of highway 26, Michigan Department of Transportation placed excess road construction material next to the pillars and concrete foundations then covered the areas with top soil. The Site is currently owned by Osceola Township.

Premise for Removal Action

A Baseline Environmental Assessment was conducted by the Upper Peninsula Engineers and Architects (UPEA) in October 2001 and a Brownfield Redevelopment Assessment (BFRA) was conducted by the Michigan Department of Environmental Quality (MDEQ) in June 2002. As part of their ongoing assessments, MDEQ collected asbestos samples from the historic remnant piles in May 2013 and concluded that three of the sample results indicated ACM. MDEQ requested U.S. EPA assistance in addressing ACM as it posed a potential threat to nearby residents and users of the adjacent park. In response to this request U.S. EPA and OTIE START performed a Site Assessment on July 5, 2013, July 11, 2013, and September 10, 2013.

The Site Assessment included the collection of bulk samples to determine potential threats posed by Site conditions. Based on the results, six of the twelve samples analyzed for asbestos were found to have ACM. Site assessment samples D1-1, D2-1, D3-1, and D4-2 each showed results of 5-10 percent (%) Chrysotile. Sample P1 was found to have 1-5% Chrysotile, while sampling P4 had 10-15% Chrysotile.





The analytical results from the Site Assessment and the existing Site conditions indicated a threat of release of hazardous substances to the environment and surrounding properties. As outlined in 40 Code of Federal Regulations (CFR) Section 300.415(b) (2), the Tamarack Stamp Mill Site met the criteria for a removal action.

Site Removal Action Activities

1. Threat Abatement Actions Taken

The following paragraphs summarize the removal action.

The U.S. EPA and its ERRS contractor, LATA-Kemron Remediation Services and START contractor OTIE, mobilized to the Site in July 2014 to support U.S. EPA's removal action. The removal included Site mobilization, waste sampling and characterization, hazardous and non-hazardous waste consolidation and disposal, health and safety air monitoring, decontamination, and demobilization.

1.1 Site Mobilization

On July 28, 2014, U.S. EPA, START, and ERRS mobilized to the Site. ERRS mobilized a team of six crew members including the Response Manager (RM), Bill Haynes. ERRS also mobilized office and equipment trailers and rented two Bobcat skid-steer loaders. Prior to mobilization, ERRS prepared a Site-specific Health and Safety Plan (HASP). The RM conducted daily health and safety meetings and discussed health and safety requirements that were to be followed during the removal action.

1.2 Work Area Setup

During the week of July 28, 2014, ERRS cleared vegetation on the south side of the Site; established work zones; installed fencing along the north, east, and south ends of the Site to improve security and restrict access to the Site; and placed signage on the fence directing visitors to the U.S. EPA command post.

1.3 Chronological Narrative of Removal Action

During these removal activities, START conducted health and safety air monitoring for asbestos and particulates. These activities are further discussed in later sections of this report. All debris piles were thoroughly soaked with water using a hydraulic hose. Debris was gathered from inside the foundations

and staged adjacent to the pillars. The interior and exterior areas of the foundations were then washed with water using a hydraulic hose. ERRS donned level C personal protective equipment (PPE) and removed debris piles from the southeast area of the Site along with the debris removed from the pillars using the Bobcat skid-steer loaders and staged the waste for later disposal. Once the debris was segregated and staged, clean off-site backfill material procured from a local vendor was delivered to the Site by B & B Trucking Inc. The backfill was placed in the areas of formerly existing debris piles in the southeast portion of the Site and surrounding the pillars.

Large vegetation debris was consolidated into manageable pieces using a chipper/shredder and staged for disposal. ACM debris collected and staged during the removal action was loaded into a double-lined bed of a dump truck for disposal. On August 7, 2014 a total of 4 cubic yards (Yd³) of friable asbestos material was shipped to K & W Landfill in Ontonagon, Michigan for landfill disposal. ERRS cleaned the work areas and removed the fence around the perimeter of the Site. After the conclusion of the removal activities, START subcontractor and ERRS contractors demobilized from the Site on August 14, 2014.

During the removal action, U.S. EPA worked with the Osceola Township Supervisor and the National Park Service (NPS) to preserve the historical artifacts at the Site to the extent practicable. Milling balls, tools, and drill bits were found during Site activities and transferred to the NPS for preservation. All through the removal action, OSC Kelly has updated U.S. EPA, the State and the City governments through Pollution Reports (PolReps).

1.4 Air Monitoring and Sampling

START prepared an air monitoring and sampling plan to address monitoring requirements for fugitive dust and sampling requirements for asbestos in air. START conducted air monitoring for asbestos and particulate monitoring for fugitive dust during all phases of the removal action. Prior to the initiation of removal activities, START collected background samples to quantify “background” levels of airborne asbestos. Eight background samples were collected from four locations for asbestos and one sample was collected downwind from the removal area for particulates. The action level established in the air monitoring plan for on-site asbestos was 0.1 fibers of asbestos per cubic centimeter (f/cc) and for on-site respirable particulates was 5 milligrams per cubic meter (mg/m³). The action level for perimeter asbestos was 0.05 f/cc and for perimeter respirable particulates was 1.5 mg/m³. Sampling locations are shown in Figure 3.



Daily perimeter monitoring was conducted using a Data Ram 4000 (DR4) to monitor perimeter air quality. The Data Ram equipment monitored particulate matter and was used to measure nuisance/fugitive dust. The DR4 was calibrated daily per manufacturers' instructions by START prior to conducting air monitoring. The DR4 was zeroed out daily prior to Site activities and staged downwind of the removal action area. During the beginning of the removal action, a wind sock was installed on the perimeter of the site to constantly monitor wind direction for conducting air monitoring and sampling. Sampling locations were determined based on the wind direction and were relocated as the wind direction changed during removal activities. START provided real time updates on air quality to the ERRS crew to ensure that appropriate PPE and engineering controls were implemented at all times. During the entirety of this removal action, at no time did particulate matter and fugitive dust levels exceeded applicable removal action levels.

START conducted asbestos sampling at the perimeter of the work area fence-line and the downwind location in order to document ACM levels per U.S. EPA approved sampling and analytical methods. Sampling was conducted daily during the duration of removal activities throughout each day. Daily air samples over an 8-hour period were collected with low flow Gilian Air Pumps using 0.8-micron pore size mixed cellulose ester (MCE) filters enclosed in a 25 mm diameter cassette with a diffuser pad. START subcontractor calibrated the air sampling pumps to flow rates between 2.3 liters per minute (lpm) and 3.0 lpm with the use of an onsite precision rotameter daily prior to Site activities being conducted. Once calibrated, 8 air sampling pumps were co-located and staged around the perimeter of the removal action area and samples were collected daily.

Samples were evaluated in the field by the START subcontractor at the end of each work day. Field analysis is shown in Table 1. Samples exhibiting greater than 0.01 f/cc were sent to International Asbestos Testing Laboratories in Laurel, New Jersey and analyzed by Transmission Electron Microscopy (TEM), NIOSH Method 7402(M), to quantify airborne fiber concentrations and to identify asbestos types. None of the perimeter air samples exceeded the air monitoring plan action levels during the removal action. Air sample results are shown in Table 2.

1.5 Disposal

A total of 4 cubic yards of friable asbestos material accumulated from the removal action was shipped to K & W Landfill in Ontonagon, Michigan on August 7, 2014 for landfilling (Table 3).

TABLE 1
ASBESTOS FIELD ANALYSIS
TAMARACK STAMP MILL REMOVAL SITE
OSCEOLA TOWNSHIP, HOUGHTON COUNTY, MICHIGAN

Date	Sample ID	Sample Type	Sample Location	Volume	Total Fibers	Total Fields	Fiber(s)* Per cc
7/28/2014	TCSM-1	BG	NE / @ intersection of 6th street & Spruce	1072	1	100	0.001
	TCSM-2	BG	N /Between Both sets of Pillars/Parrallell to MI-26	1074	0	100	0.000
	TCSM-3	BG	West / Adjacent to Playground	1072	0	100	0.000
	TCSM-4	BG	South / Downwind east central service road	1034	2	100	0.001
	TCSM-8	BG	#2 South / Downwind east central service road	1066	0	100	0.00
7/29/2014	TCSM-12	AREA	NE / @ intersection of 6th street & Spruce	1092	0	100	0.000
	TCSM-13	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1090	1	100	0.001
	TCSM-14	AREA	West / Adjacent to Playground	1088	0	100	0.000
	TCSM-15	AREA	South / Downwind east central service road	1094	2	100	0.001
7/30/2014	TCSM-22	AREA	NE / @ intersection of 6th street & Spruce	1204	1	100	0.001
	TCSM-23	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1202	0	100	0.000
	TCSM-24	AREA	West / Adjacent to Playground	1198	0	100	0.000
	TCSM-25	AREA	South / Downwind east central service road	1194	1	100	0.001
7/31/2014	TCSM-32	AREA	South / Downwind east central service road	1260	2	100	0.001
	TCSM-33	AREA	NE / @ intersection of 6th street & Spruce	1262	1	100	0.001
	TCSM-34	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1260	0	100	0.000
	TCSM-35	AREA	West / Adjacent to Playground	1258	0	100	0.000
8/1/2014	TCSM-42	AREA	NE / @ intersection of 6th street & Spruce	1270	1	100	0.001
	TCSM-43	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1270	0	100	0.000
	TCSM-44	AREA	West / Adjacent to Playground	1272	0	100	0.000
	TCSM-45	AREA	South / Downwind east central service road	1232	2	100	0.001
8/2/2014	TCSM-52	AREA	NE / @ intersection of 6th street & Spruce	1280	0	100	0.000
	TCSM-53	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1280	1	100	0.001
	TCSM-54	AREA	West / Adjacent to Playground	1280	2	100	0.001
	TCSM-55	AREA	South / Downwind east central service road	1280	4	100	0.001

TABLE 1 (Cont.)
ASBESTOS FIELD ANALYSIS
TAMARACK STAMP MILL REMOVAL SITE
OSCEOLA TOWNSHIP, HOUGHTON COUNTY, MICHIGAN

Date	Sample ID	Sample Type	Sample Location	Volume	Total Fibers	Total Fields	Fiber(s)* Per cc
8/3/2014	TCSM-63	AREA	South @ Sunken West Side Building	1100	1	100	0.001
	TCSM-64	AREA	West (inside park) of sunken structure	1102	1	100	0.001
	TCSM-65	AREA	East of sunken structure on west side of property	1180	0	100	0.000
	TCSM-66	AREA	South / Downwind south central service road	1182	1	100	0.001
8/4/2014	TCSM-73	AREA	NE / @ intersection of 6th street & Spruce	1156	0	100	0.000
	TCSM-74	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1152	0	100	0.000
	TCSM-75	AREA	West / Adjacent to Playground	1150	1	100	0.001
	TCSM-76	AREA	South / Downwind east central service road	1144	2	100	0.001
8/5/2014	TCSM-83	AREA	NE / @ intersection of 6th street & Spruce	1200	0	100	0.000
	TCSM-84	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1200	0	100	0.000
	TCSM-85	AREA	West / Adjacent to Playground	1200	0	100	0.000
	TCSM-86	AREA	South / Downwind east central service road	1200	1	100	0.001
8/6/2014	TCSM-93	AREA	NE / @ intersection of 6th street & Spruce	1204	0	100	0.000
	TCSM-94	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	1204	0	100	0.000
	TCSM-95	AREA	West / Adjacent to Playground	1200	0	100	0.000
	TCSM-96	AREA	South / Downwind east central service road	1192	3	100	0.001
8/7/2014	TCSM-103	AREA	NE / @ intersection of 6th street & Spruce	600	0	100	0.000
	TCSM-104	AREA	N /Between Both sets of Pillars/Parrallell to MI-26	600	0	100	0.000
	TCSM-105	AREA	West / Adjacent to Playground	600	0	100	0.000
	TCSM-106	AREA	South / Downwind east central service road	600	0	100	0.000

Notes:

TCSM-1- sample identification number

Fibers per cc- fibers per cubic centimeter

BG- background sample

* Analysis performed in the field by a State of Michigan accredited asbestos staff using Phase Contrast Microscopy method

TABLE 2
TEM ASBESTOS AIR SAMPLING RESULTS
TAMARACK STAMP MILL REMOVAL SITE
OSCEOLA TOWNSHIP, HOUGHTON COUNTY, MICHIGAN

Date	Sample ID	Sample Location	Result Fibers/cc*	Asbestos Type
7/28/2014	TCSM-08	Southside of property downwind at the perimeter	<0.0028	None Detected
7/29/2014	TCSM-16	Northeast intersection of 6th Street and Spruce Street	<0.0027	None Detected
7/30/2014	TCSM-27	North, between both sets of pillars, parallel to MI-26 highway	<0.0025	None Detected
7/31/2014	TCSM-39	West, adjacent to playground	<0.0024	None Detected
8/1/2014	TCSM-49	South/Downwind East, Central Service Road	<0.0024	None Detected
8/2/2014	TCSM-59	Northeast intersection of 6th Street and Spruce Street	<0.0023	None Detected
8/3/2014	TCSM-68	West (inside park) of SW sunken structure	<0.0027	None Detected
8/4/2014	TCSM-77	Northeast intersection of 6th Street and Spruce Street	<0.0024	None Detected
8/5/2014	TCSM-88	North, between both sets of pillars, parallel to MI-26 highway	<0.0023	None Detected
8/6/2014	TCSM-99	West, adjacent to playground	<0.0023	None Detected
8/7/2014	TCSM-110	South/Downwind East, Central Service Road	<0.0047	None Detected

Notes:

TCSM-08- sample identification number
TEM- Transmission Electron microscopy – NIOSH 7402 (M) Method analysis
Fibers/cc- fibers asbestos per cubic centimeters

* Analysis performed by International Asbestos Testing Laboratories in Laurel, New Jersey

TABLE 3 WASTE DISPOSAL SUMMARY TAMARACK STAMP MILL RV OSCEOLA TOWNSHIP, HOUGHTON COUNTY, MICHIGAN							
SHIPMENT #	WASTE CATEGORY	MEDIUM	QUANTITY	DATE SHIPPED	MANIFEST #	TREATMENT & DISPOSAL METHOD	DISPOSAL FACILITY
1	RQ, NA2212, Asbestos, 9, PGIII	Solid	4 cubic yards	8/7/2014	N/A	Landfill	K & W Landfill 1187 Michigan 38 Ontonagon, Michigan 49953

Notes:

RV- Removal
#- Number

* The transporter of this waste was B & B Trucking, Inc.

Removal Action Summary

The Tamarack Stamp Mill removal was conducted from July 28, 2014 to August 14, 2014.

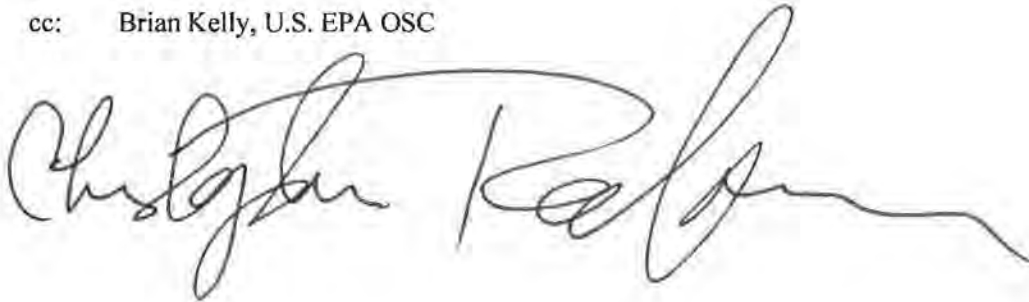
On July 28, 2013, U.S. EPA, ERRS, and START mobilized to the Site and initiated the removal activities. During removal, START provided U.S. EPA with technical support in monitoring on-site activities, providing oversight of the ERRS contractors, and documenting Site information with logbook notes and photographs. U.S. EPA, ERRS, and START conducted removal activities in modified Level D PPE. Air monitoring results indicated no exceedences of established action levels. One dump truck loaded with approximately 4 Yd³ of friable ACM was shipped to K & W Landfill Inc. in Ontonagon, Michigan for landfill disposal. Excavated areas were backfilled with clean imported fill soils and the Site was restored and secured. All crew members demobilized from the Site on August 14, 2014. At the completion of the removal activities, the threat of release of hazardous substances to the surrounding populations and the danger of exposure were abated.

Sincerely,

Christopher Redfearn
START Staff Scientist

Enclosures

cc: Brian Kelly, U.S. EPA OSC

A handwritten signature in dark ink, appearing to read "Christopher Redfearn", with a long horizontal flourish extending to the right.

APPENDIX A PHOTOGRAPHIC LOG



Photograph No.:	1	Photographer:	Christopher Redfearn	Orientation:	Northwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	7/29/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	Fence installed along the perimeter of the Site.				



Photograph No.:	2	Photographer:	Christopher Redfearn	Orientation:	Northeast
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	7/29/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	Exclusion zone staged outside of removal action area.				



Photograph No.:	3	Photographer:	Christopher Redfearn	Orientation:	Southwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	7/29/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ERRS soaking debris piles with water using hydraulic hose.				



Photograph No.:	4	Photographer:	Christopher Redfearn	Orientation:	Northwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	7/30/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ERRS gathering debris around Site using Bobcat skid steer loaders.				



Photograph No.:	5	Photographer:	Christopher Redfearn	Orientation:	Southwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	7/30/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	Gilian air sampling pumps staged along perimeter fence.				



Photograph No.: 6	Photographer: Christopher Redfearn	Orientation: Southwest
TDD Number: TO-01-14-05-1039	Contract: EP-S5-10-10	Date: 7/30/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan	
Subject:	Data Ram staged in the downwind location along perimeter fence.	



Photograph No.:	7	Photographer:	Christopher Redfearn	Orientation:	Southwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/2/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ERRS using hydraulic hose to wash the exterior of concrete foundations.				



Photograph No.:	8	Photographer:	Christopher Redfearn	Orientation:	East
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/2/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	Clean soil being delivered to the Site by B & B Trucking.				



Photograph No.:	9	Photographer:	Christopher Redfearn	Orientation:	North
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/3/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ERRS using Bobcat skid steer loader to backfill removal areas.				



Photograph No.:	10	Photographer:	Christopher Redfearn	Orientation:	North
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/3/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ERRS leveling soil in backfill area.				



Photograph No.:	11	Photographer:	Christopher Redfearn	Orientation:	Northwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/3/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ACM bagged and staged adjacent to concrete foundations pending disposal.				



Photograph No.:	12	Photographer:	Christopher Redfearn	Orientation:	Northwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/7/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	Bagged ACM being loaded onto Bobcat skid steer loader.				



Photograph No.:	13	Photographer:	Christopher Redfearn	Orientation:	Northwest
TDD Number:	TO-01-14-05-1039	Contract:	EP-S5-10-10	Date:	8/7/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan				
Subject:	ERRS loading bagged ACM into bed of disposal truck using the Bobcat skid steer loader.				



Photograph No.: 14	Photographer: Christopher Redfearn	Orientation: South
TDD Number: TO-01-14-05-1039	Contract: EP-S5-10-10	Date: 8/7/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan	
Subject:	ERRS using wood chipper for large vegetation.	



Photograph No.: 15	Photographer: Christopher Redfearn	Orientation: Southwest
TDD Number: TO-01-14-05-1039	Contract: EP-S5-10-10	Date: 8/7/2014
Site Name & Location:	Osceola Township, Houghton County, Michigan	
Subject:	The site post –removal.	

ATTACHMENT A
ANALYTICAL DATA PACKAGE



July 25, 2014

Mr. Brian Kelly
On-Scene Coordinator
Emergency Response Branch
U.S. Environmental Protection Agency, Region 5
9311 Groh Road
Grosse Ile, Michigan 48138

**Subject: Air Monitoring and Contingency Plan
Tamarack Stamp Mill Site - RV
TDD No.: TO-01-14-05-1039
OTIE Contract No.: EP-S5-10-10**

Dear Mr. Kelly:

Oneida Total Integrated Enterprises (OTIE) Superfund Technical Assessment and Response Team (START) is submitting the Air Monitoring and Contingency Plan for the Tamarack Stamp Mill RV Site (the Site) located in Osceola Township, Houghton County, Michigan. This plan specifies air monitoring procedures to be conducted at the Site during the removal action.

START appreciates the opportunity to provide you with this plan. Please contact me at (312) 220-7000 ext. 27 or Raghu Nagam at (312) 220-7005 with any questions or comments regarding this submittal.

Sincerely,

Raghu Nagam

for
Christopher Redfearn
Project Manager

Enclosure

cc: Raghu Nagam, START Program Manager

**AIR MONITORING AND CONTINGENCY PLAN
TAMARACK STAMP MILL RV SITE
OSCEOLA TOWNSHIP, HOUGHTON COUNTY, MI**

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch, Region 5
9311 Groh Road
Grosse Ile, Michigan 48138

TDD No.:	TO-01-14-05-1039
Date Prepared:	July 25, 2014
Contract No.:	EP-S5-10-10
Prepared by:	OTIE
START Project Manager:	Christopher Redfearn
Telephone No.:	(312) 220-7000, Ext.27
EPA On-Scene Coordinator:	Brian Kelly
Telephone No.:	(734) 692-7684

Submitted by:



**29 South LaSalle, Suite 930
Chicago, Illinois 60603**

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1.0 INTRODUCTION

The Michigan Department of Environmental Quality requested assistance from EPA to address abandoned hazardous substances, pollutants, and contaminants at the Tamarack Stamp Mill Site located at M-26 and 6th Street, Osceola Township, Houghton County, Michigan.

EPA performed site assessment activities on July 5, July 11, and September 10, 2013 and documented the presence of friable asbestos containing materials (ACM) mixed with historically significant mining remnants. EPA will perform a time-critical removal action beginning on July 28, 2014. The Tamarack Stamp Mill Removal Action consists of the removal and disposal of ACM open to the environment. The Site is comprised of several historically significant concrete pillars, walls, and broken roofs that once served as foundation for the railroad and stamp mill (See Figure 1, Appendix A). Because of vagrant occupation and the proximity of residential properties and a public park, the ACM may pose a threat to the public.

This Air Monitoring Work Plan (AMWP) is being proposed for implementation during removal activities at the site. The plan was developed to monitor airborne contaminants at removal work areas as well as the Site perimeter. By monitoring air quality at work areas where contaminants are likely to be disturbed and become airborne, and by implementing engineering controls based on real-time monitoring and confirmatory sampling, and by monitoring and sampling air quality at the Site perimeter, the plan design is protective of both worker and public health.

2.0 PROJECT OBJECTIVES

The overall air monitoring objectives on this project are as follows:

- Minimize risk of off-site exposure to contaminants resulting from removal action work performed at the site;
- Provide an early warning of site conditions allowing site managers to proactively manage potential off-site ambient air impacts;
- Create a comprehensive, full-time database of air quality measurements, meteorological conditions, alarm notifications, equipment calibration and daily observations collected during the project.
- Ensure worker safety during removal activities in the work area/interior.

2.1 Air Monitoring Objectives

Air monitoring for asbestos and fugitive dust will be performed at the Site during removal activities. The air monitoring system is designed to accomplish the objectives presented above as well as the following:

- Establish pre-removal baseline levels of asbestos and dust in ambient air prior to initiation of removal activities;
- Monitor and document perimeter and exclusion zone ambient air levels of target compounds (asbestos) during removal activities;
- Provide an early warning system for potential elevated off-site exposures, allowing aggressive responses to exceedences of action levels ensuring that longer-term exposures at the Site are below regulatory levels;
- Evaluate ongoing effectiveness of, and need for additional dust suppression controls and/or alteration of work activities, to reduce airborne asbestos and dust to below acceptable risk levels;
- Use real-time air monitoring results in conjunction with confirmatory laboratory air sample analysis to demonstrate that no human health exposures were caused by the work.
- Establish Data Quality Objectives (DQO) to define the quality of the data gathered in relation to the methods used to collect the data and the data's anticipated end use.

2.2 Data Quality Objectives

Both real-time screening level and confirmatory data will be collected to evaluate contaminant levels in ambient air. The data quality objectives for asbestos sampling is to produce data that are, as reasonably

possible, an accurate representation of the current levels of airborne asbestos fibers which may be released during typical site activities. These data may be used for a variety of purposes, including the development of human health risk assessment and the evaluation of the adequacy of current measures that have been implemented to protect the public from excessive asbestos exposures.

Sampling activities will be conducted before, during, and after onsite soil disturbance activities to determine whether Site activities could result in an inhalation exposure that poses a health hazard for individuals in the vicinity of the Site.

The detection limits (DLs) for perimeter air sampling for asbestos will be 0.01 f/cc by PCM and 0.001 f/cc in the laboratory by PCM using NIOSH 7402 method. Lower DLs will be achieved by adjusting the flow rates to obtain maximum loading.

Screening data will be used to evaluate the ambient air within the breathing zone for particulates. Screening data without definitive confirmation is not considered to be “data of known quality.” The following requirements for “Screening Data (SD)” are applicable:

- Sample documentation in the form of field logbooks and appropriate field data sheets. Chain of custody records are optional for field screening locations.
- All instrument calibration and/or performance check procedures/methods will be summarized and documented in the field/personal or instrument log notebook. The manufacturer’s instructions or SOPs should specify the procedure and frequency for calibration during use.
- Detection limit(s) will be determined and documented, along with the data, where appropriate.

Definitive data is used for all data collection activities that require a high level of accuracy using EPA, National Institute of Occupational Safety and Health (NIOSH), American Society for Testing and Materials (ASTM), and other industry-recognized methods. For the data to be definitive, either total measurement error or analytical error must be determined. The following requirements for “Definitive Data” (DD) are applicable for the Asbestos and Metals analyses:

- Sample documentation in the form of field logbooks, the appropriate field data sheets, and chain of custody forms will be provided.
- All instrument calibration and/or performance check procedures/methods will be summarized and documented in the field/personal or instrument log notebook.
- Detection limit(s) will be determined and documented, along with the data, where appropriate.

- Sample holding times will be documented; this includes documentation of sample collection and analysis dates.
- Initial and continuing instrument calibration data will be provided.
- For air samples, field blanks will be included for each day sampling is performed for each analysis. Lot blanks will be included for each lot of sample media used for each analysis.
- Performance Evaluation (PE) samples are optional.
- Analyte identification will be confirmed on 10% of the samples by analytical methods associated with definitive data.
- Quantitation results for all samples will be provided.
- Analytical or total measurement error must be determined on 100% of the samples.
- Analytical error determination measures the precision of the analytical method.
- At a minimum, two replicate aliquots are taken from a thoroughly homogenized sample or two media blanks, prepared and analyzed in accordance with the method, calculated and compared to method-specific performance criteria.
- Total measurement error is determined from independently collected samples from the same location and analyzed by analytical methods associated with definitive data. Quality control parameters such as the mean, variance, and coefficient of variation is calculated and compared to established measurement criteria.

The number of samples to be collected for this project is presented in Table 1, *Field Sampling Summary - Air*, and Table 2, *QA/QC Analysis and Data Categories Summary - Air*. These tables identify analytical parameters desired; type, volume and number of containers needed; preservation requirements; number of samples to be collected; and associated number and type of QC samples based on the data category.

Air monitoring results will be generated in graphical form at the end of each monitoring day. These graphs will be reviewed each day and will be used in conjunction with daily field reports to generate summary reports. The summary reports will be prepared weekly and will summarize the previous weeks' data, any exceedences, who was notified of the exceedences, and any response actions taken, if appropriate. At the conclusion of the project, an air monitoring summary report will be prepared. The report will include all analytical data generated from the real time monitoring system, confirmatory analytical sampling results, meteorological monitoring, and a summary of any exceedences of action levels, including the response to them. All data will be provided in an Excel spreadsheet and included on a recordable compact disk at the completion of the project.

Real-time screening data: Screening data applies to all field screening methods using portable equipment, such as ambient dust (particulate) monitors. Portable monitors will be calibrated according to manufacturer's specifications. No additional QA/QC will be performed on data generated by field instruments. The real-time data will be used to document conditions occurring on the site during removal activities and determine the need for more aggressive dust suppression activities or alteration of work activities. In addition, the real-time data will be used to demonstrate compliance with the health-protective action levels and will influence the frequency of confirmatory sample analysis.

Confirmatory data: Confirmation sampling data will comprise of real-time on-site analysis data and off-site laboratory analysis data. Evaluation of air particulate filter samples for asbestos by Phase Contrast Microscopy (PCM) method will be performed on-site by a State of Michigan asbestos inspector accredited START all through the duration of the removal action. A representative number of samples, up to a maximum of 10%, will also be sent to an analytical laboratory for asbestos analysis by TEM method. The analyses will be conducted in accordance with the appropriate US EPA air sampling methods and will include QA/QC elements specified by the appropriate US EPA analytical methods. Confirmatory data will be used to demonstrate compliance with the health-protective action levels and will influence the control measures being utilized during site removal activities.

2.3 Selection of Target Compounds

EPA documented friable ACM at the Site. Some removal activities may generate airborne particulate matter (PM). Therefore, this air monitoring plan will address asbestos and PM to be protective of site workers and public health. In addition, heavy metals are typically encountered in demolished building material and in soil associated with industrial facilities. Sampling for heavy metals may be conducted based on field conditions (dusty conditions).

On site worker exposure and Off-site/perimeter data will be compared with the Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) of 0.1 fibers per cubic centimeter (f/cc). Both on site and off site sampling data will be used as a gauge to monitor the effectiveness of the dust suppression activities.

2.4 Warning Levels and Action Levels

To the extent practicable, engineering controls will be used to control, reduce, or eliminate exposure to air contaminants. However, the following warning levels and action levels will apply to air monitoring results, choices of engineering controls, decisions to continue or halt work, and selection of personal protective equipment (PPE) requirements of workers.

PM₁₀ (particulate matter of 10 microns size) monitoring will be used to evaluate fugitive dust exposure. START will monitor for particulate matter using real-time monitors such as Data Rams. The Occupational Safety and Health Administration (OSHA) Permissible Exposure Level (PEL) for respirable nuisance dust is 5 milligrams per cubic meter (mg/m³). The American Conference of Government Industrial Hygienists (ACGIH) recommended a respirable dust Threshold Limit Value (TLV) of 3 mg/m³. The on-site particulate action level would be 5 times its derived background concentration but not to exceed 5 mg/m³ over an 8-hour work period. The perimeter particulate action level would be 2 times its derived background concentration but not to exceed 1.5 mg/m³ (1/2 ACGIH TLV) over an 8-hour work period. If either of these concentrations is exceeded dust suppression methods will be employed. If dust suppression methods are currently in progress while the action level is exceeded, these methods may need to be expanded and/or re-evaluated. The PM₁₀ warning level for the Site is 75% of the action level or 3.75mg/m³ averaged over a 1 hour period. Exceedences of the PM₁₀ action level may result in site workers donning Level C respiratory protection at the site supervisor's discretion. Engineering controls, including wetting work areas, are anticipated to adequately control generation of particulate matter. If the data ram readings over the action levels sustain for at least an hour or more, a downwind particulate sample will be collected for metal analysis.

The EPA Air Action Level for Baseline Residential Asbestos Exposures (target risk level of 1×10^{-4}) in OSWER Directive 9200.0-68 is 0.001 fibers of asbestos per cubic centimeter (f/cc). The action level for asbestos as detected by air filter samples on-site is 0.05 f/cc. The lowest possible method detection level achievable in the field using phase contrast microscopy (PCM) NIOSH 7400 method is 0.01 f/cc. Site workers will don Level C respiratory protection for all asbestos related site work. Exceedences of action levels will result in halting work or using engineering controls to bring results below action levels.

The following table summarizes the selected action levels and warning levels to be used for the real-time monitoring system, and the supplemental confirmatory sampling.

Table 1. Warning and Action Levels

Compound	Warning Level	Action Level
On-site Respirable Particulates (PM ₁₀)	3.75.0mg/m ³	5 X background or 5.0 mg/m ³ whichever is lower
Perimeter Respirable Particulates (PM ₁₀)	1.0 mg/m ³	2 X background or 1. 5 mg/m ³ whichever is lower
Asbestos (on-site)	None	0.1 f/cc by NIOSH 7400 method in the field
Asbestos (perimeter)		0.05 f/cc by NIOSH 7400 method in the field

Notes

µg/m³

micrograms per cubic meter

f/cc

fibers per cubic centimeter

>MDL

Greater than the laboratory method detection limit

3.0 AIR MONITORING STRATEGY

The environmental monitoring required for the site will be conducted using real-time air monitoring equipment for respirable particles (PM10) and by collecting asbestos air samples and performing on-site PCM readings of the asbestos fibers. Field PCM readings will be supplemented with air sample analysis for asbestos using EPA approved sampling and analytical methods such as NIOSH 7402 at a commercial laboratory. Real-time air monitoring is also designed to provide an immediate means to evaluate appropriate measures of control of short-term exposure levels for asbestos, so that acceptable risks for acute and sub-chronic exposures are not exceeded. The data provided by real-time air monitoring may also be used to determine the appropriate control actions. While this data will be useful for such determinations, it may be considered supplementary data to the data required for determining employee time-weighted average exposures as required by specific OSHA regulations. Measuring and controlling the disturbance of, and exposure to, target analytes in work areas results in reduction of risk for off-site contaminant migration, and therefore are also protective of both workers and the surrounding community from removal activities. At the completion of the field work, an air monitoring report will be completed to document the results.

4.0 REAL-TIME AIR MONITORING

Air monitoring stations will be established at the perimeter surrounding the planned removal areas. Spare equipment will be maintained where practical in the event of failure so that downtime of the monitoring network is minimized. Due to instrument limitations, air monitoring and sampling will not be conducted during times of inclement weather.

4.1 Air Monitoring Design

The plan implements established methods to monitor for asbestos and will use a combination of real-time air monitoring and particulate filter sample collection during work hours. Asbestos filter samples will be analyzed on-site during removal activities. When there is any detection of asbestos fibers in the field samples, additional air samples will be collected and sent to the laboratory for confirmatory or more precise determination of asbestos concentrations.

4.2 Asbestos and Respirable Particulate Matter (PM₁₀) Air Monitoring

Respirable dust (PM₁₀) will be measured in real time during work periods where dust may be generated, or for all asbestos related work. Ambient dust levels downwind of the removal action area will be measured with one DR 4 unit. PM₁₀ monitoring will provide measurements of fugitive dust. Asbestos fibers in air will be measured on-site in real-time by collecting samples from the perimeter. Section 5.0 provides more details on air filter sampling for asbestos.

4.2.1 PM₁₀ Monitors

DR 4 monitors are manufactured by Thermo Electron Corporation (Thermo), and are used to continuously monitor and log the real-time concentration and median particle size of airborne dust, smoke, mist and fumes. The DR 4 monitors the concentrations of fine particulates in ambient air through a combination of two wavelength nephelometry concurrent sensing, and aerodynamic size pre-selection. Particle sizes down to 0.05 (micro meters) μm can be detected and measured over a concentration range up to 400 micrograms per meter cubed (mg/m^3).

The data from the DR 4 units can be recorded by digital data loggers using the analog signal outputs of the monitors. User selectable data logging averaging periods of one second to 24 hours can be utilized in a data logging memory capacity of 50,000 data points in up to 99 data groups. All air monitoring units will be operated in accordance with manufacturers' specifications.

4.2.2 Gillian Pump Sampling

Ambient air asbestos sampling will be conducted daily at the perimeter of the work area fence-line, and downwind locations in order to document ambient levels of target contaminants using EPA approved sampling and analytical methods. Analyses will be performed by an accredited off-site analytical laboratory demonstrating proficiency for the specific methods stated in this section. The laboratory will provide the analytical data in an electronic data format for level II data package. In addition to the form one summary pages, this report also includes raw data, Spectral defense, if applicable, run logs, raw data of QC, including CAL and MDL information, also if applicable. Refer to section 6.0 for the occasion and frequency of sampling.

4.3 Asbestos

At a minimum, asbestos samples will be collected continuously while work is occurring, and will be analyzed in the field. Sample locations may include four locations immediately surrounding the work area or four locations in a larger perimeter around the work area. One additional sample will be used as a field blank, based on the discretion of the sampler. These samples will be evaluated daily by the PCM method at the site on a real-time basis.

Asbestos samples will be collected using low flow air sampling pumps such as Gillian Pumps using 0.8-micron pore size MCE filters enclosed in a 25 mm diameter cassette with a diffuser pad. Samples will be analyzed by Phase Contrast Microscopy (PCM), NIOSH Method 7400, to quantify airborne fiber concentrations. Sample pumps will be calibrated to flow rates between 2.3 liters per minute (lpm) and 3.0 lpm with the use of an onsite precision rotameter. As part of the QA/QC protocol, representative samples (up to 10%) will be sent to the lab for asbestos analysis for PCM using NIOSH 7402 method.

4.4 Meteorological System

Meteorological data will be collected from weather authorities such as the National Weather Service in order to determine upwind and downwind sample locations. The meteorological data will consist of wind speed and direction, temperature, and relative humidity. A windsock will also be used to confirm local wind direction.

4.5 Alarm System

The DR 4 instrument will be placed in the downwind location of the removal area. The downwind sampling locations will be chosen based on predicted and locally observed wind conditions for the sampling day. If a warning or action level is exceeded based on PM₁₀ concentrations, site mitigative actions will be implemented.

4.5.1 Alarm Response Actions

In the event of any warning level exceedences, proper responses by on-site personnel will occur. The responses will include; investigating the cause of the exceedences, notifying the site On Scene Coordinator (OSC), or directly remediating the cause of the exceedences, if possible. In the event of warning level exceedences on the DR4 dust monitoring station downwind of the removal action, the air monitoring technician will collect a downwind asbestos sample for on-site analysis. Work activities will be temporarily modified or halted until measured concentrations on DR4 instrument or asbestos sample are less than the warning level. Once concentrations are less than the warning level, normal site work will continue. The air monitoring technician will directly respond to monitoring station parameter alarms (loss of power, loss of communication) and take necessary actions to resolve.

5.0 CONFIRMATORY AIR SAMPLING FOR ASBESTOS

As described earlier, real-time monitoring for particulate matter will serve as a surrogate for potential asbestos exposure while continuous air pumps collect particulate samples on filter media. The filters will be analyzed on-site for asbestos fibers and any detection of asbestos fibers using the PCM method (0.01 f/cc) will require collecting additional air filter samples for laboratory analysis. Representative filters will also be submitted for off-site laboratory analysis as part of the QA/QC protocols. Sample analyses will be performed by an accredited off-site analytical laboratory. The laboratory will provide the analytical data in an eCVP (electronic Comprehensive Validation Package) data format and is equivalent to a Level II data package. In addition to the form one summary pages, this report also includes raw data, Spectral defense, if applicable, run logs, raw data of QC, including CAL and MDL information, also if applicable. Refer to section 6.0 for the occasion and frequency of sampling. The confirmatory sampling methodology for asbestos is as follows.

During air filter sampling, one additional sample will be used as a field blank and will be submitted along with the field samples to the laboratory. The sampling locations will be chosen based on actual and observed wind conditions for the sampling day. Samples will be collected using programmable, constant flow (SKC or GilAir type) air sampling pumps using 0.8-micron pore size Mixed Cellulose Ester (MCE) filters enclosed in a 25 millimeter (mm) diameter cassette with a diffuser pad.

6.0 ASBESTOS SAMPLING PLAN

As presented in previous sections, respirable dust monitoring will act as a surrogate for asbestos on a real-time basis during removal activities. When warning levels are exceeded on the DR4 dust monitor, an asbestos sample will be collected from the downwind location and cross wind location and analyzed on-site for asbestos by PCM. Off-site laboratory confirmatory air sampling for asbestos will occur whenever asbestos is detected in on-site analysis.

6.1 Background (Pre-Removal) Monitoring

Prior to the initiation of removal activities, background sampling will be performed to quantify "background" levels of airborne asbestos. The anticipated background sampling program involves collecting four to six air samples from the north, northeast, south and southwest sides of the Site. The samples will be analyzed on-site by PCM for asbestos analyses via NIOSH Method 7400. One or more samples will also be analyzed in the laboratory by NIOSH Method 7402 for PCM determination.

6.2 Routine Monitoring

During on-going removal activities, asbestos air samples will be collected daily from a minimum of four areas of the perimeter for on-site PCM analysis. Areas of concern include homes on the North, Northeast, and South side of the Site. An area air sample will also be collected at least once from the Southwest side of the Site, near the public park. On-site analysis will be performed to quantify airborne levels of asbestos.

6.3 Alarm Condition Monitoring

During on-going site removal activities, if sustained alarm conditions are present based on dust monitor action levels, on-site asbestos analysis of air samples will be conducted immediately to evaluate if dust exceedances correlate with the detection of asbestos fibers by PCM method. If no asbestos fibers are detected in the field during dust monitor exceedances, removal activities will continue as planned. In case asbestos fibers are detected in field analysis during dust monitor exceedances, mitigative actions will be implemented and asbestos samples will be collected within an hour and analyzed on-site for asbestos. If these results show the presence of asbestos, removal activities will be temporarily halted and site conditions such as site activities, wind direction, potential off-site impacts, etc., will be evaluated. After modifications to work activities are addressed, removal activities will resume and asbestos sampling will continue on an hourly or daily basis based on the results. The confirmatory sampling will continue for the duration of the day to document the levels and/or the effectiveness of mitigative actions such as dust suppression actions.

6.4 **Sample Analyses**

Asbestos samples will be collected with a Gillian Pump equipped with a 0.8-micron, 25mm MCE filter for performing on-site asbestos analysis using NIOSH method 7400. Off-site laboratory analysis by PCM will be conducted using NIOSH 7402 method. Sample number, collection, holding times, calibration procedures and handling will be performed in accordance with the requirements of the appropriate method.

6.5 **Equipment Calibration**

Equipment calibration will be performed in accordance with the manufacturer's instructions. Field checks using the appropriate reference standards will be made on-site at the minimum frequency of once per shift. The dust monitors will be zero checked once per shift (pre-sampling) and calibration will be performed according to the manufacturer's instructions for each instrument. A daily log of all instrument readings, as well as all field reference checks and calibration information will be maintained.

If monitoring or sampling equipment is determined not to be in proper working order, it will be removed from service, replaced with other equipment and sent to the appropriate manufacturer or supplier for service and calibration. In the event of frequent equipment malfunction, additional spare monitoring equipment will be maintained on the Site and available for use as needed to minimize air monitoring system downtime.

7.0 AIRBORNE EXPOSURE MITIGATION METHODS

In order to ensure dust suppression the following actions are to be undertaken:

- During excavation and soil pile removals, the project supervisor will carefully watch for evidence of visible dust moving to off-site locations. The Data Ram will be shifted to the downwind direction and its action levels will be monitored. If action levels are exceeded, intrusive and soil removal activities will be halted until application of water to the soil reduces dust levels to an acceptable amount.
- The wind speeds should exceed 10 mph work for the work activities to be halted
- Ensure that sufficient water is applied to the area prior to disturbance to prevent visible emissions from crossing project boundaries
- Keep areas to be graded or excavated adequately wetted to prevent visible emissions from crossing project boundaries
- Keep storage piles adequately wetted, treated with chemical dust suppressant, or covered when material is not being added or removed
- Storage piles must be stabilized when inactive for more than 7 days by adequately wetting, establishing surface crusting, chemical dust suppressant, covering with tarps or vegetative cover, installation of wind barriers around three sides or open areas, or other measure as effective.
- Equipment must be washed down before moving from property onto paved roadway
- Visible track-out on paved public road must be cleaned using wet sweeping or HEPA filter equipped vacuum device by end of work shift.
- Post project stabilization of disturbed surfaces using vegetative cover, 3" of non-asbestos-containing material, paving, or other measure deemed sufficient to prevent 10 mph winds from causing visible emissions

7.1 Wind Speed Work Stoppage

The application of a wind speed work stoppage requirement is designed to control fugitive emissions due to increased air velocity. In the event of high wind speeds, work will be stopped at the site until wind speeds are reduced to a speed that will not generate visible emissions from the site. The Michigan State solid waste regulations indicate that wind speeds which will trigger work stoppage requirements are between 10 and 15 miles per hour. For the purposes of this site, work will be stopped when wind speeds reach a sustained 10 miles per hour, or any wind speed at which particulates are observed by site personnel to be entrained in the air stream. If site-specific weather creates conditions that may result in

fugitive emissions, work stoppage may occur at wind speeds less than specified above based on decisions of site personnel.

The OSC will make the decision as to when it is appropriate to restart.

7.2 Street Cleaning and Maintenance of Roadways

Streets and roadways will be cleaned by equipment that will produce no visible emissions of dust, if practicable. Mud and dirt carry-out onto paved surfaces will be prevented (e.g., using gravel entry ways, washing vehicle wheels, etc.). Any mud and dirt carry-out onto paved surfaces will be wetted and cleaned up daily. All unpaved roads and other disturbed surfaces on the site will be watered as necessary to prevent off-site transport of visible fugitive particulate emissions.

7.3 Wetting/Dust Suppression

Water to wet the work area will be by applying water directly from a fire hydrant or hose. This will assure proper distribution of wetting agents during application. The anticipated schedule for the application of wetting agents and water to the soil will be determined by environmental and site conditions. If a precipitation event occurs, site management personnel may adjust the application schedule of wetting agents and water. Any modifications, and the necessary justification for the modification, will be recorded in a project logbook maintained by the Remediation Contractor.

Wetting of all work areas, where active soil disturbance will occur that day, will begin prior to the start of the disturbance activities. Wetting will be conducted as appropriate, based on the visual observations of the site construction manager.

Maintenance wetting will occur at the close of each workday in preparation of the following day's work zones. If maintenance wetting from the previous workday appears adequate (in other words, preliminary movement of machinery to a work zone will not yield emissions), and passes inspection, additional initial wetting will not be required, as determined by the site construction manager using a shovel to dig a series of small holes and visually ensuring the penetration is adequate. Adequate wetting shall occur to prevent the possible emission of material during the movement of equipment to another location. Care will be taken to assure that the application of water does not produce emissions from the ground surface and that there is not excessive over-watering. Wetting will occur immediately prior to each soil disturbance activity. This wetting is to assure that the surface conditions remain adequately wet between the initial wetting period and the actual soil disturbance. This wetting activity will occur immediately prior to the removal of each lift, as necessary, dependent upon infiltration/penetration rate and depth from the previous application.

During the actual soil disturbance activity, water will be applied to the site of the disturbance, as appropriate, to suppress any visible emission.

The ERRS response manager will oversee the wetting of work zones to assure that sufficient wetting is occurring. Additional moisture will be misted over the work areas as the excavation progresses, and as necessary to suppress visible emissions. Should oversight personnel discover that visible emissions are being generated by the excavation activities, personnel will be instructed to use additional wetting at that location.

8.0 DOCUMENTATION

Documents and records that will be generated during this project include:

- HASP
- QAPP
- Laboratory, site log books
- Site map
- Sample labels
- Chain of Custody (COC) forms
- Custody Seals
- Air Sampling Work Sheets
- Instrument printouts
- Data reduction records
- Data assessment forms
- Final Trip Report
- Laboratory analytical reports
- Data Validation Records

A Final Report will provide a description of the project, field procedures, laboratory procedures, difficulties encountered and will include validated final laboratory reports (with copies of chain of custody records) as appendices. All documentation will be recorded in accordance with standard operating procedures.

9.0 SAMPLE PACKING, SHIPPING, AND DOCUMENTATION

The asbestos samples will be sent under chain of custody to the laboratory for analysis. Scribe will be used for sample management as well as generation of sample labels and chain of custody (COC) records. COC records will be used to document the collection of all air samples. All COC records will receive a peer review in the field prior to shipment of the samples in accordance SOPs. At least two custody seals will be placed across the canister shipping containers to ensure sample integrity.

9.1 Cooler Preparation

In preparation for sample shipment:

- Plastic coolers, or similar, will be used for each sample shipment;
- Coolers shall be inspected prior to shipment for cleanliness;
- All cooler drain plugs will be sealed with tape;
- All previous shipping labels will be removed.

9.2 Packing Samples in Coolers

Each sample will be placed in an individual paper envelope

9.3 Closing and Shipping of Coolers

Sample documentation will be enclosed in sealed plastic bags taped to the underside of the cooler lid.

Coolers will be secured with packing tape and custody seals as described below:

- Cooler lids will be taped shut with strapping tape, encircling the cooler several times;
- Chain of custody seals will be placed on two sides of the lid after closing the lid (one in front and one on the side);
- “This Side Up” arrows will be placed on the sides of the cooler; and
- Coolers will then be shipped to the laboratory by overnight courier as soon as possible. Daily shipments are required to obtain 24 hour turn around required for the N-Forcer site.

10.0 REFERENCES

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2. Oneida Total Integrated Enterprises (OTIE) Superfund Technical Assessment and Response Team (OTIE-START). Tamarack Stamp Mill Site Assessment Report. October 13, 2013.
3. OSHA. 1994. Occupational Exposure to Asbestos. Federal Register 59(153):40978-82.
4. OSHA. 1997. U.S. Department of Labor. Occupational Safety and Health Administration. Code of Federal Regulations. 29 CFR 1910.1000.
5. OSHA. 1998. U.S. Department of Labor. Occupational Safety and Health Administration. Code of Federal Regulations. 29 CFR 1910.1001.
6. USEPA. 1990. Contingency Plans at Superfund Sites Using Air Monitoring. Air/Superfund National Technical Guidance Study Series. U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards Research. Triangle Park, NC. EPA-450/1-90-005. September 1990.
7. U.S. EPA/ERT- Air Monitoring and Contingency Plan, N-Forcer Asbestos Site, April 2005

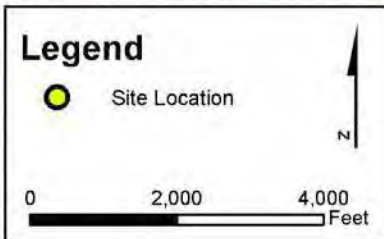
APPENDIX A:

FIGURES AND TABLES



USGS 7.5 MINUTE SOURCE QUAD MAP (MICHIGAN): LAURIUM

Disclaimer: This map is intended for visual orientation use only. In no way is this map to be used for precise locational use.



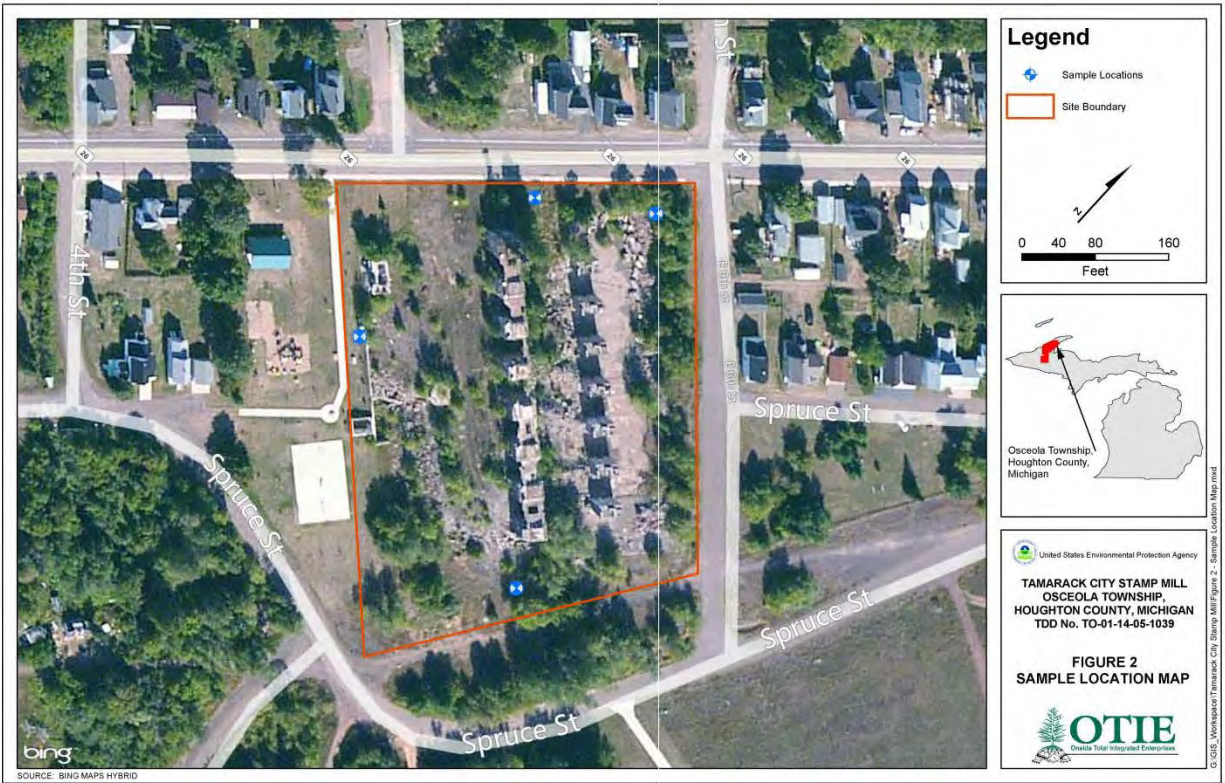


Table 2
Field Sampling Summary - Air
Tamarack Stamp Mill RV
Hubbell, MI

Analytical Parameter	Sampling Media	Suggested Holding Times	Flow Rate	Volume Min - Max	Subtotal Number Samples
PCM 7402 or TEM Asbestos ISO 10312 (Area/Perimeter/Fence line/Residential)	0.45 or 0.8 µm 25 mm MCE Filter	30 Days	2-4 L/min	1200-2400 L	10
PCM Asbestos NIOSH 7400 (Personnel & perimeter sampling)	0.45 or 0.8 µm 25 mm MCE Filter	1 - 30 Days	1-5 L/min (personnel) ~1-5 L/min (perimeter)	1200 L (personnel) 1200 (perimeter)	100

Φm = micrometer

L = liter

L/min = liters per minute

N/A = not applicable

ISO = International Organization of Standardization

TEM = Transmission Electron Microscopy

PCM = Phase Contrast Microscopy

NIOSH = National Institute of Occupational Safety and Health

mm = millimeter

MCE = mixed cellulose ester

Table 3
QA/QC Analysis and Data Categories Summary
Tamarack City Stamp Mill RV
Hubbell, MI

Analytical Parameter	Analytical Method	Estimated Limit of Detection ¹	Lot Blanks ²	Field Blanks ³	Collocated Samples ⁴	Trip Blanks ⁵	Breakthrough	PE Samples	Data Category
PCM/TEM Asbestos ISO 10312 (Perimeter)	PCM by 7402 or TEM Asbestos ISO 10312	<i>0.0001 f/cc</i>	1 per lot used	1 per day sampled	1 per sampling event	N/A	N/A	0	DD
PCM Asbestos NIOSH 7400	PCM Asbestos NIOSH 7400	<i>0.001 f/cc</i>	1 per lot used	1 per day sampled	1 per sampling event	N/A	N/A	N/A	DD

DD= Definitive Data

1. To be determined by the person arranging the analysis. Should be equal to or less than the action level.
2. Required for all data categories at a minimum rate of 10 percent of the total sample or one per sampling event per lot.
3. Mandatory for Definitive Data at a minimum rate of 5 percent of the total sample or one per sampling event. Certain methods may require a greater frequency.
4. Required for all data categories at a minimum rate of 5 percent of the total sample or one per sampling event.
5. Optional for SD/DC and mandatory for DD at a minimum rate of 5 percent of the total sample or one per sampling event.

f/cc = fibers per cubic centimeter

mg/m³ = milligrams per cubic meter

N/A = not applicable

ISO = International Organization of Standardization

TEM = Transmission Electron Microscopy

NIOSH = National Institute of Occupational Safety and Health

PE = Performance Evaluation

QC = Quality Control

ATTACHMENT 2

CERTIFICATE OF ANALYSIS

Client: Oneida Total Integrated Entpris

29 S. Lasalle Street, Ste#930

Chicago IL 60603

Report Date: 8/8/2014

Report Number: 342189

Project: Tamarack City Stamp Mill

Project No.: TDD#TO-01-14-05-1

PCM AIR SAMPLE ANALYSIS SUMMARY

Lab No.	Client No.	Description / Location	Volume (Liters)	Density (Fibers/mm ²)	Concentration (Fibers/cc)
5395383	TCSM-77	NE/@IntersectionOf6thSt&Spruce 8/4/14	1156	2.65	<0.0024
5395384	TCSM-88	N/BtwnBothSetsOfPillars/ParallelToMI-26 8/5/14	1200	2.65	<0.0023
5395385	TCSM-99	West/AdjacentToPlayground 8/6/14	1200	2.65	<0.0023
5395386	TCSM-110	South/DownwindEastCentralServiceRoad 8/7/14	602	2.65	<0.0047
5395387	TCSM-111	Lot Blank	0	1.33	NA
5395388	TCSM-112	Field Blank	0	1.33	NA

Accreditation:

AIHA Registry Program, LLC

AIHA-LAP, LLC No. 100188

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Analytical Method: Phase Contrast Microscopy - NIOSH 7400 Method Revision #4, Issue 2, August 15, 1994

Comments:

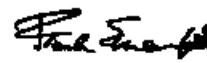
A VOID concentration means that the sample has been overloaded with particulate matter and could not be reliably analyzed. Method requires submittal of blanks. Reporting Limit based upon 7 f/mm². These results are not blank corrected. IATL assumes that appropriate sampling methods were used and that the data upon which these results are based, has been accurately supplied by the client. This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government. Current annual Coefficient of Variation (CV) values from low to high fiber ranges are 0.25, 0.29, & 0.28 as required by NIOSH 7400.

Date Received: 8/8/2014

Date Analyzed: 8/8/2014

Analyst: B. Reich

Approved By:

Frank E. Ehrenfeld, III
Laboratory Director

FINAL RESULTS
Airborne Asbestos Analysis
TEM AHERA & NIOSH 7402

Client: OTIE / EDI Batch #: 342190
29 S. Lasalle Street, Suite #930 Project: Tamarack City Stamp Mill
Chicago, IL 60603 Project No.: TDD# TO-01-14-05-1039
 Client No.: oti535 Turn-Around Time: 5 Day

Summary Data - NIOSH 7402

Client Sample ID #	IATL Sample ID #	Volume (L)	¹ Comments	AHERA		NIOSH 7402 (mod.)		PCM Result	OVA Result
				² Results s/mm ²	³ Results s/cc	⁴ Results f/mm ²	⁵ Results f/cc	Results f/cc	⁶ Results f/cc
TCSM-77	5395383	1156	None Detected	< 7.69	< 0.003	< 7.69	< 0.003	< 0.002	< 0.002
TCSM-88	5395384	1200	None Detected	< 7.69	< 0.003	< 7.69	< 0.003	< 0.002	< 0.002
TCSM-99	5395385	1200	None Detected	< 7.69	< 0.003	< 7.69	< 0.003	< 0.002	< 0.002
TCSM-110	5395386	602	None Detected	< 7.69	< 0.005	< 7.69	< 0.005	< 0.005	< 0.004
TCSM-111	5395387	0	None Detected	< 7.69	< NA	< 7.69	NA	NA	
TCSM-112	5395388	0	None Detected	< 7.69	< NA	< 7.69	NA	NA	

Notes from the Results Section Above: (1) Asbestos may be listed even if only non-PCME fibers were detected. (2) Total AHERA-countable asbestos structures in relation to area of sample analyzed. (3) Total AHERA-countable asbestos structures as a function of the volume of air sampled. (4) Total uncorrected NIOSH-countable asbestos fibers in relation to area of sample analyzed. (5) Total uncorrected NIOSH-countable asbestos fibers as a function of the volume of air sampled. (6) Fraction of Optically-Visible Asbestos (OVA) fibers are the total asbestos fibers which meet the requirements of PCM-Equivalency.

Notes for Data Table Below: (1) This number represents the number of fibers and fields counted during NIOSH 7400 analysis. (2) This value represents the result calculated from NIOSH 7400 analysis using Phase Contrast Microscopy (PCM). (3) If "NA" or "VOID" is entered, sample was not analyzed. Refer to more detailed comments typed at the bottom of this report page. (4) This value represents the TOTAL count of fibers detected using Transmission Electron Microscopy (TEM). The value includes both regulated asbestos and non-regulated fibers which meet NIOSH 7402 counting rules. (5) This value represents the number of EPA regulated asbestos mineral fibers which meet the sizing rules in NIOSH 7400. This value is divided into the Total Fibers (see note 4) to represent the Optically-Visible Fraction. (6) This value is achieved by multiplying the original PCM fiber count and the Optically-Visible Fraction.

Ancillary Data Summary

IATL Sample #	PCM Data ₁		PCM Result ₂ (f/cc)	IATL - Qualifier ₃	TEM Total Fibers ₄	TEM PCME Fibers ₅	Adjusted PCM Fibers ₆	Optically Visible Fraction
	Fibers	Fields						
5395383	2	100	< 0.0024		0	0	0.00	0.000
5395384	2	100	< 0.0023		0	0	0.00	0.000
5395385	2	100	< 0.0023		0	0	0.00	0.000
5395386	2	100	< 0.0047		0	0	0.00	0.000
5395387	1	100	NA		0	0	0.00	0.000
5395388	1	100	NA		0	0	0.00	0.000

Results contained within this report are intended to represent potential exposure data as sampled. NIOSH Method 7402 results are used to determine asbestos fibers in the optically visible range and is intended to complement the results obtained by phase contrast microscopy (Method 7400). These results should not be used for clearance purposes, when AHERA sampling and analytical protocol is warranted.

Client Name:	OTIE / EDI	Analysis Date:	IATL Sample #: 5395383
Client Project #:	TDD# TO-01-14-05-1039	08/14/14	Client Sample #: TCSM-77
Sample Type:	NIOSH		IATL Grid Box #: 8269
QC Submittal			Grid Archive ID #: q2

Electron Microscope ID:	Filter Dia. (mm ²): 25	Magnification: 20,000X
iii JEOL JEM-1230, EM18440033	Effective Area (mm ²): 385	
EVEX	Filter Type: MCE	Accelerating Voltage: 100KeV
	Filter Pore Size (µm): 0.8	

Grid Opening: 0.115 mm	Volume of Air Sampled: 1156 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 9	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0026 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < 0.0026 s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0026 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0026 f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole **	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
q2 d1		nsd								
d2		nsd								
d3		nsd								
d4		nsd								
d5		nsd								
d6		nsd								
d7		nsd								
d8		nsd								
d9		nsd								
d10		nsd								
Totals:	NSD		0	0			0	0	0	

3AED, and EDXA for each suspect asbestos fiber
 otile DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

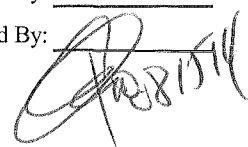
SEE REVERSE: FIBER ORIENTATION MAP

Comments:

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: RGS

Reviewed By:



Client Name:	OTIE / EDI	Analysis Date:	08/14/14	IATL Sample #:	5395384
Client Project #:	TDD# TO-01-14-05-1039			Client Sample #:	TCSM-88
Sample Type:	NIOSH			IATL Grid Box #:	8269
QC Submittal				Grid Archive ID #:	q6

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
iii JEOL JEM-1230 EM18440033	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.8		

Grid Opening: 0.115 mm	Volume of Air Sampled: 1200 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 9	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0025 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < 0.0025 s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0025 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0025 f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
q6	a2	nsd								
	b2	nsd								
	c2	nsd								
	d2	nsd								
	e2	nsd								
	f2	nsd								
	g2	nsd								
	h2	nsd								
	i2	nsd								
	j2	nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 stle DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality:	
Dissolution	good
Carbon Film	fair
Loading	<1%

Comments: _____

Analyzed By: RGS
 Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/14/14	IATL Sample #:	5395385
Client Project #:	TDD# TO-01-14-05-1039			Client Sample #:	TCSM-99
Sample Type:	NIOSH			IATL Grid Box #:	8269
QC Submittal				Grid Archive ID #:	q10

Electron Microscope ID:	iii	JEOL JEM-1230 EM18440033	Filter Dia. (mm²):	25	Magnification:	20,000X
		EVEX	Effective Area (mm²):	385	Accelerating Voltage:	100KeV
			Filter Type:	MCE		
			Filter Pore Size (µm):	0.8		

Grid Opening:	0.115	mm	Volume of Air Sampled:	1200	Liters
Grid opening Area:	0.013	mm ²	Analytical Sensitivity:	7.7	f/mm ²
Grid Openings Read / (Required):	10	9	Minimum Detection Limit:	0.0025	f/cc (0.003)
Total Area Analyzed:	0.13	mm ²			

Total Asbestos Occurrences:	NSD	Non-Asbestos Structures:	NSD
(AHERA Structures):	NSD		
(NIOSH/PCME Fibers):	NSD		
AHERA Density (<5µm):	< 7.7	s/mm ²	Non-Asbestos: < 7.7 f/mm ²
AHERA Conc. (<5µm):	< 0.0025	s/cc	Non-Asbestos: < 0.0025 f/cc
(NIOSH/PCME) Asbestos Density:	< 7.7	f/mm ²	
(NIOSH/PCME) Asbestos Conc.:	< 0.0025	f/cc	

Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
q10	d1	nsd								
	d2	nsd								
	d3	nsd								
	d4	nsd								
	d5	nsd								
	d6	nsd								
	d7	nsd								
	d8	nsd								
	d9	nsd								
	d10	nsd								
Totals:	NSD		0	0			0	0	0	

3AED, and EDXA for each suspect asbestos fiber
 xile DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	2%

Comments: _____

Analyzed By: RGS

Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/14/14	IATL Sample #:	5395386
Client Project #:	TDD# TO-01-14-05-1039			Client Sample #:	TCSM-110
Sample Type:	NIOSH			IATL Grid Box #:	8269
QC Submittal				Grid Archive ID #:	r3

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
iii JEOL JEM-1230, EM18440033	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.8		

Grid Opening: 0.115 mm	Volume of Air Sampled: 602 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 15	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0049 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < 0.0049 s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0049 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0049 f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
r3 d1		nsd								
d2		nsd								
d3		nsd								
d4		nsd								
d5		nsd								
d6		nsd								
d7		nsd								
d8		nsd								
d9		nsd								
d10		nsd								
Totals:	NSD		0	0			0	0	0	

3AED, and EDXA for each suspect asbestos fiber
 stile DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	2%

Comments: _____

Analyzed By: RGS
 Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/14/14	IATL Sample #:	5395387
Client Project #:	TDD# TO-01-14-05-1039			Client Sample #:	TCSM-111
Sample Type:	NIOSH			IATL Grid Box #:	8269
QC Submittal				Grid Archive ID #:	r7

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
iii JEOL JEM-1230 EM18440033	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.8		

Grid Opening: 0.115 mm	Volume of Air Sampled: 0 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 15	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: NA f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < NA s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < NA f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < NA f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
r7 g1		nsd								
g2		nsd								
g3		nsd								
g4		nsd								
g5		nsd								
g6		nsd								
g7		nsd								
g8		nsd								
g9		nsd								
g10		nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 xtile DP reflections (002, 004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 characterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments: _____

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: RGS

Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/14/14	IATL Sample #:	5395388
Client Project #:	TDD# TO-01-14-05-1039			Client Sample #:	TCSM-112
Sample Type:	NIOSH			IATL Grid Box #:	8269
QC Submittal				Grid Archive ID #:	s2

Electron Microscope ID:	Filter Dia. (mm²):	25	Magnification:	20,000X
iii JEOL JEM-1230, EM18440033	Effective Area (mm²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.8		

Grid Opening: 0.115 mm	Volume of Air Sampled: 0 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 15	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: NA f/cc (0.003)

Total Asbestos Occurrences: NSD	Non-Asbestos Structures: NSD
(AHERA Structures): NSD	
(NIOSH/PCME Fibers): NSD	
AHERA Density (<5µm): < 7.7 s/mm ²	Non-Asbestos: < 7.7 f/mm ²
AHERA Conc. (<5µm): < NA s/cc	Non-Asbestos: < NA f/cc
(NIOSH/PCME) Asbestos Density: < 7.7 f/mm ²	
(NIOSH/PCME) Asbestos Conc: < NA f/cc	

Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
s2 d1		nsd								
d2		nsd								
d3		nsd								
d4		nsd								
d5		nsd								
d6		nsd								
d7		nsd								
d8		nsd								
d9		nsd								
d10		nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 stle DP reflections (002 ,004, 110, 130, 220, 200) .
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Comments: _____

Analyzed By: RGS

Reviewed By: _____

Chain of Custody

Contact Information

Client Company: OTIE / EDI
Office Address: 29 S. Lasalle Street, Suite #930
City, State, Zip: Chicago, IL, 60603
Fax Number: 312-220-7004
Email Address: RNagam@otie.com

Project Number: TDD # TO-01-14-05-1039
Project Name: Tamarack City Stamp Mill
Primary Contact: Raghu Nagam
Office Phone: 312-220-7000
Cell Phone: (312) 217-7003 cell

Matrix:

Air ☒ Water ☐ Soil ☐ Paint ☐ Bulk ☐ Surface Dust / Wipe ☐ Other ☐

Analysis Method:

☐ PCM: NIOSH 7400
☐ PCM: OSHA
☐ PCM: TWA

☐ Total Dust: NIOSH 0500
☐ Total Dust: NIOSH 0600

☐ AAS: Lead in Air
☐ AAS: Lead in Water
☐ AAS: Lead in Paint
☐ AAS: Lead Dust/Wipe₁
☐ AAS: Lead in Soil
☐ AAS: TCLP
☐ AAS: Metals [Cd, Zn, Cr-circle]

PLM Use Bulk Asbestos Sample Log

☐ PLM: Bulk Asbestos EPA 600
☐ PLM: Point Counting 198.1
☐ PLM: NOB via 198.6 (PLM only)
☐ If <1% by PLM, to TEM via 198.4.2

IAQ Use Mold Sample Log

☐ IAQ: I Bioaersol Fungal Spore Trap₃
☐ IAQ: II Bioaersol Fungal Spore
☐ IAQ: Tape, Bulk, Misc. Qualitative₃
☐ IAQ: Tape, Bulk, Misc. Quantitative₃
☐ IAQ: Other Culturable ID₂

☐ TEM: AHERA
☒ TEM: NIOSH 7402
☐ TEM: ISO 10312
☐ TEM: ISO 13794
☐ TEM: Wipe ASTM 6480
☐ TEM: Microvac ASTM D5755
☐ TEM: Microvac ASTM D5756
☐ TEM: NOB 198.4
☐ TEM: Bulk Analysis
☐ TEM: Potable Water
☐ TEM: Non-Potable Water
☐ TEM: Other
☐ Soil: Call for Available Methods

1- Requires ASTM acceptable material 2- Call to confirm TAT 3- Non-culturable 4- With Non-fungal Microscopic Exam

Special Instructions: FULL 7402 METHOD

Turnaround Time

Preliminary Results Requested Date: _____ ☐ Verbal ☒ Email ☐ Fax

Specific date / time
☐ 10 Day ☒ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Shipping Method

☒ FedEx ☐ UPS ☐ USPS ☐ Other

Chain of Custody

Relinquished (Name/Organization): Paul Kybartas (EDI/OTIE)
Received (Name / iATL): *[Signature]*
Sample Login (Name / iATL): *[Signature]*
Analyst (Name(s) / iATL): *[Signature]*
QA/QC Review (Name / iATL): *[Signature]*
Archived / Released: QA/QC InterLAB Use *[Signature]*

Date: 8-07-14
Date: *[Signature]*
Date: *[Signature]*
Date: *[Signature]*
Date: *[Signature]*

RECEIVED
Time: *[Signature]*
Time: *[Signature]*
Time: *[Signature]*
Time: *[Signature]*
Time: *[Signature]*



9000 Commerce Parkway, Suite B • Mount Laurel, NJ 08054
 Phone: 877-428-4285/856-231-9449 • Fax: 856-231-9818

Sample Log

-Bulk Asbestos -

Client: **OTIE**

Project: **TDD# TO-01-14-05-1039**

Sampling Date/Time: Please See Sample Location/Description For Dates of Sample Collection

Bulk Asbestos Sample Log				
Client Sample #	iATL #	Location/Description		Notes
TCSM-77	14-5395383	Sample Collection date: 8-04-14 // NE / @ Intersection of 6th street & Spruce		578 Minutes / 1156 liters
TCSM-88	14-5395384	Sample Collection date: 8-05-14-14// N / Between Both sets of Pillars/Parallel to MI-29		600 Minutes / 1200 liters
TCSM-99	14-5395385	Sample Collection date: 8-06-14 // West / Adjacent to Playground		600 Minutes / 1200 liters
TCSM-110	14-5395386	Sample Collection Date: 8-07-14 // South / Downwind east central service road		301 Minutes / 602 liters
TCSM-111	14-5395387	Lot Blank		0 Minutes/ 0 Liters
TCSM-112	14-5395388	Field Blank		0 Minutes/ 0 Liters

Phase Contrast Microscopy - NIOSH 7400

Date: 8/8/14

Project: Tamarack City Stamp Mill

Project #: TDD#TO-01-14-05-1

Batch #: 342189

FAX:

Analyst: B. Reich

Client #: OTI535

Turn Around Time: 5 Day

These preliminary results are issued by IATL to expedite procedures by the client based upon the above data. IATL assumes that appropriate sampling methods were used and the data upon which these results are based has been accurately supplied by the client. These results may not have been blank corrected nor reviewed by the Laboratory Director. Final Certificate of Analysis will follow these preliminary results and is to be considered the official results. All EPA, HUD, and NJDEP conditions apply. Effective Filter Area: 385 mm². Field of View 0.00754 mm²

CERTIFICATE OF ANALYSIS

Client:	Oneida Total Integrated Entpris	Report Date:	7/31/2014
	29 S. Lasalle Street, Ste#930	Report Number:	341427
	Chicago IL 60603	Project:	TCSM @ Mi-26 & 6th St.
		Project No.:	1870.001

PCM AIR SAMPLE ANALYSIS SUMMARY

<u>Lab No.</u>	<u>Client No.</u>	<u>Description / Location</u>	<u>Volume (Liters)</u>	<u>Density (Fibers/mm²)</u>	<u>Concentration (Fibers/cc)</u>
5386306	TCSM-08	South Side Of Property Downwind @ Perimeter, 7-28-14	1062	5.31	<0.0026
5386307	TCSM-11	Blank	0	1.33	NA

Accreditation:

AIHA Registry Program, LLC

AIHA-LAP, LLC No. 100188

*This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government**This report shall not be reproduced except in full, without written approval of the laboratory.***Analytical Method:** Phase Contrast Microscopy - NIOSH 7400 Method Revision #4, Issue 2, August 15, 1994

Comments:

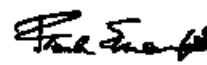
A VOID concentration means that the sample has been overloaded with particulate matter and could not be reliably analyzed. Method requires submittal of blanks. Reporting Limit based upon 7 f/mm². These results are not blank corrected. IATL assumes that appropriate sampling methods were used and that the data upon which these results are based, has been accurately supplied by the client. This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA or any agency of the U.S. government. Current annual Coefficient of Variation (CV) values from low to high fiber ranges are 0.25, 0.29, & 0.28 as required by NIOSH 7400.

Date Received: 7/30/2014

Date Analyzed: 7/31/2014

Analyst: B. Reich

Approved By:

Frank E. Ehrenfeld, III
Laboratory Director

FINAL RESULTS
Airborne Asbestos Analysis
TEM AHERA & NIOSH 7402

Client: OTIE / EDI
29 S. Lasalle Street, Suite #930
Chicago, IL 60603
Client No.: oti535

Batch #: 341824
Project: Tamarack City Stamp Mill
Project No.: TDD # TO-01-14-05-1039
Turn-Around Time: 5 Day

Summary Data - NIOSH 7402

Client Sample ID #	IATL Sample ID #	Volume (L)	¹ Comments	AHERA		NIOSH 7402 (mod.)		PCM Result	OVA Result
				² Results s/mm ²	³ Results s/cc	⁴ Results f/mm ²	⁵ Results f/cc	Results f/cc	⁶ Results f/cc
TCSM-16	5390859	1092	None Detected	< 7.69	< 0.003	< 7.69	< 0.003	< 0.003	< 0.002
TCSM-27	5390860	1202	None Detected	< 7.69	< 0.003	< 7.69	< 0.003	< 0.002	< 0.002
TCSM-39	5390861	1222	None Detected	< 7.69	< 0.002	< 7.69	< 0.002	< 0.002	< 0.002
TCSM-49	5390862	1240	None Detected	< 7.69	< 0.002	< 7.69	< 0.002	< 0.002	< 0.002
TCSM-59	5390863	1284	None Detected	< 7.69	< 0.002	< 7.69	< 0.002	< 0.002	< 0.002
TCSM-60	5390864	0	None Detected	< 7.69	< NA	< 7.69	NA	NA	
TCSM-62	5390865	0	None Detected	< 7.69	< NA	< 7.69	NA	NA	
TCSM-68	5390866	1102	None Detected	< 7.69	< 0.003	< 7.69	< 0.003	< 0.003	< 0.002

Notes from the Results Section Above: (1) Asbestos may be listed even if only non-PCME fibers were detected. (2) Total AHERA-countable asbestos structures in relation to area of sample analyzed. (3) Total AHERA-countable asbestos structures as a function of the volume of air sampled. (4) Total uncorrected NIOSH-countable asbestos fibers in relation to area of sample analyzed. (5) Total uncorrected NIOSH-countable asbestos fibers as a function of the volume of air sampled. (6) Fraction of Optically-Visible Asbestos (OVA) fibers are the total asbestos fibers which meet the requirements of PCM-Equivalency.

Notes for Data Table Below: (1) This number represents the number of fibers and fields counted during NIOSH 7400 analysis. (2) This value represents the result calculated from NIOSH 7400 analysis using Phase Contrast Microscopy (PCM). (3) If "NA" or "VOID" is entered, sample was not analyzed. Refer to more detailed comments typed at the bottom of this report page. (4) This value represents the TOTAL count of fibers detected using Transmission Electron Microscopy (TEM). The value includes both regulated asbestos and non-regulated fibers which meet NIOSH 7402 counting rules. (5) This value represents the number of EPA regulated asbestos mineral fibers which meet the sizing rules in NIOSH 7400. This value is divided into the Total Fibers (see note 4) to represent the Optically-Visible Fraction. (6) This value is achieved by multiplying the original PCM fiber count and the Optically-Visible Fraction.

Ancillary Data Summary

IATL Sample #	PCM Data ₁		PCM Result ₂ (f/cc)	IATL - Qualifier ₃	TEM Total Fibers ₄	TEM PCME Fibers ₅	Adjusted PCM Fibers ₆	Optically Visible Fraction
	Fibers	Fields						
5390859	2	100	< 0.0026		0	0	0.00	0.000
5390860	2	100	< 0.0023		0	0	0.00	0.000
5390861	2	100	< 0.0023		0	0	0.00	0.000
5390862	2	100	< 0.0023		0	0	0.00	0.000
5390863	2	100	< 0.0022		0	0	0.00	0.000
5390864	1	100	NA		0	0	0.00	0.000
5390865	1	100	NA		0	0	0.00	0.000
5390866	2	100	< 0.0025		0	0	0.00	0.000

Results contained within this report are intended to represent potential exposure data as sampled. NIOSH Method 7402 results are used to determine asbestos fibers in the optically visible range and is intended to complement the results obtained by phase contrast microscopy (Method 7400). These results should not be used for clearance purposes, when AHERA sampling and analytical protocol is warranted.

Client Name:	OTIE / EDI	Analysis Date:	IATL Sample #:	5390859
Client Project #:	TDD # TO-01-14-05-1039	08/06/14	Client Sample #:	TCSM-16
Sample Type:	NIOSH		IATL Grid Box #:	8265
QC Submittal			Grid Archive ID #:	1315

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening: 0.115 mm	Volume of Air Sampled: 1092 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 10	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0027 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < 0.0027 s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0027 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0027 f/cc
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Analysis Data

Asbestos ONLY										Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole **	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)	
13 g6		nsd									
g7		nsd									
g8		nsd									
g9		nsd									
g10		nsd									
15 f10		nsd									
g10		nsd									
h10		nsd									
i10		nsd									
j10		nsd									
Totals:	NSD		0	0			0	0	0		

3AED, and EDXA for each suspect asbestos fiber
 xtile DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 characterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments: _____

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: _____ RGS

Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/06/14	IATL Sample #:	5390860
Client Project #:	TDD # TO-01-14-05-1039			Client Sample #:	TCSM-27
Sample Type:	NIOSH			IATL Grid Box #:	8265
QC Submittal				Grid Archive ID #:	1719

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening: 0.115 mm	Volume of Air Sampled: 1202 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 9	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0025 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < 0.0025 s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0025 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0025 f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
17	c6	nsd								
	c7	nsd								
	c8	nsd								
	c9	nsd								
	c10	nsd								
19	g6	nsd								
	g7	nsd								
	g8	nsd								
	g9	nsd								
	g10	nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 stle DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 characterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments: _____

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: RGS
 Reviewed By: _____

Client Name:	OTIE / EDI
Client Project #:	TDD # TO-01-14-05-1039
Sample Type:	NIOSH
QC Submittal	

Analysis Date:
08/06/14

IATL Sample #:	5390861
Client Sample #:	TCSM-39
IATL Grid Box #:	8265
Grid Archive ID #:	m2

Electron Microscope ID:		Filter Dia. (mm ²):	<u>25</u>	Magnification:	20,000X
ii	<u>Hitachi H600AB, 542-47-7</u>	Effective Area (mm ²):	<u>385</u>		
	EVEX	Filter Type:	<u>MCE</u>	Accelerating Voltage:	100KeV
		Filter Pore Size (µm):	0.45		

Grid Opening:	<u>0.115</u>	mm	Volume of Air Sampled:	<u>1222</u>	Liters
Grid opening Area:	<u>0.013</u>	mm ²			
Grid Openings Read / (Required):	<u>10</u>	9	Analytical Sensitivity:	<u>7.7</u>	f/mm ²
Total Area Analyzed:	<u>0.13</u>	mm ²	Minimum Detection Limit:	<u>0.0024</u>	f/cc (0.003)

Total Asbestos Occurrences:	<u>NSD</u>
(AHERA Structures):	<u>NSD</u>
(NIOSH/PCME Fibers):	NSD

Non-Asbestos Structures: NSD

AHERA Density (<5μm): < 7.7 s/mm

Non-Asbestos: < 7.7 f/mm²

AHERA Conc. (<5µm): < 0.0024 s/cc

Non-Asbestos: < 0.0024 f/cc

(NIOSH/PCME) Asbestos Density:	< 7.7	f/mm
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(NIOSH/PCME) Asbestos Conc.:	< 0.0024	f/cc
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Analysis Data

		Asbestos ONLY							Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length > 5.0 µm	³ Diameter > 0.25 µm	Aspect (x :1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
m2 g6		nsd								
g7		nsd								
g8		nsd								
g9		nsd								
g10		nsd								
m4 h6		nsd								
h7		nsd								
h8		nsd								
h9		nsd								
h10		nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 (002, 004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 Characterize by EDS
 Length and 3 fiber diameter (μm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments:

Prep Quality:

Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: RGS

Reviewed By:

Client Name:	OTIE / EDI	Analysis Date:	IATL Sample #:	5390862
Client Project #:	TDD # TO-01-14-05-1039	08/06/14	Client Sample #:	TCSM-49
Sample Type:	NIOSH		IATL Grid Box #:	8265
QC Submittal			Grid Archive ID #:	m6

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening: 0.115 mm	Volume of Air Sampled: 1240 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 8	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0024 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 a/mm ² AHERA Conc. (<5µm): < 0.0024 a/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0024 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0024 f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
m6	g6	nsd								
	g7	nsd								
	g8	nsd								
	g9	nsd								
	g10	nsd								
m8	b6	nsd								
	b7	nsd								
	b8	nsd								
	b9	nsd								
	b10	nsd								
Totals:	NSD		0	0			0	0	0	

3AED, and EDXA for each suspect asbestos fiber
 tile DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 characterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments: _____

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	5%

Analyzed By: RGS

Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/06/14	IATL Sample #:	5390863
Client Project #:	TDD # TO-01-14-05-1039			Client Sample #:	TCSM-59
Sample Type:	NIOSH			IATL Grid Box #:	8265
QC Submittal				Grid Archive ID #:	m10

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening: 0.115 mm	Volume of Air Sampled: 1284 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 8	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: 0.0023 f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 f/mm ² AHERA Conc. (<5µm): < 0.0023 f/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < 0.0023 f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < 0.0023 f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
m10	c6	nsd								
	c7	nsd								
	c8	nsd								
	c9	nsd								
	c10	nsd								
n1	c6	nsd								
	c7	nsd								
	c8	nsd								
	c9	nsd								
	c10	nsd								
Totals:	NSD		0	0			0	0	0	

3AED, and EDXA for each suspect asbestos fiber
 stle DP reflections (002,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	2%

Comments: _____

Analyzed By: RGS
 Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	IATL Sample #:
Client Project #:	TDD # TO-01-14-05-1039	08/06/14	Client Sample #:
Sample Type:	NIOSH		IATL Grid Box #:
QC Submittal			Grid Archive ID #:

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening: 0.115 mm	Volume of Air Sampled: 0 Liters
Grid opening Area: 0.013 mm ²	
Grid Openings Read / (Required): 10 15	Analytical Sensitivity: 7.7 f/mm ²
Total Area Analyzed: 0.13 mm ²	Minimum Detection Limit: NA f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 f/mm ² AHERA Conc. (<5µm): < NA f/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < NA f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < NA f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
n3	e6	nsd								
	e7	nsd								
	e8	nsd								
	e9	nsd								
	e10	nsd								
n5	g6	nsd								
	g7	nsd								
	g8	nsd								
	g9	nsd								
	g10	nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 stle DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments: _____

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: RGS

Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	IATL Sample #:	5390865
Client Project #:	TDD # TO-01-14-05-1039	08/06/14	Client Sample #:	TCSM-62
Sample Type:	NIOSH		IATL Grid Box #:	8265
QC Submittal			Grid Archive ID #:	n7

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening:	0.115	mm	Volume of Air Sampled:	0	Liters
Grid opening Area:	0.013	mm ²			
Grid Openings Read / (Required):	10	15	Analytical Sensitivity:	7.7	f/mm ²
Total Area Analyzed:	0.13	mm ²	Minimum Detection Limit:	NA	f/cc (0.003)

Total Asbestos Occurrences: NSD (AHERA Structures): NSD (NIOSH/PCME Fibers): NSD AHERA Density (<5µm): < 7.7 s/mm ² AHERA Conc. (<5µm): < NA s/cc (NIOSH/PCME) Asbestos Density: < 7.7 f/mm ² (NIOSH/PCME) Asbestos Conc.: < NA f/cc	Non-Asbestos Structures: NSD Non-Asbestos: < 7.7 f/mm ² Non-Asbestos: < NA f/cc
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Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
n7	h6	nsd								
	h7	nsd								
	h8	nsd								
	h9	nsd								
	h10	nsd								
n9	i6	nsd								
	i7	nsd								
	i8	nsd								
	i9	nsd								
	i10	nsd								
Totals:	NSD		0	0			0	0	0	

3AED, and EDXA for each suspect asbestos fiber
 tile DP reflections (002, 004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 characterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Comments: _____

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Analyzed By: RGS

Reviewed By: _____

Client Name:	OTIE / EDI	Analysis Date:	08/06/14	IATL Sample #:	5390866
Client Project #:	TDD # TO-01-14-05-1039			Client Sample #:	TCSM-68
Sample Type:	NIOSH			IATL Grid Box #:	8265
QC Submittal				Grid Archive ID #:	o2

Electron Microscope ID:	Filter Dia. (mm ²):	25	Magnification:	20,000X
ii Hitachi H600AB, 542-47-7	Effective Area (mm ²):	385		
EVEX	Filter Type:	MCE	Accelerating Voltage:	100KeV
	Filter Pore Size (µm):	0.45		

Grid Opening:	0.115	mm	Volume of Air Sampled:	1102	Liters
Grid opening Area:	0.013	mm ²			
Grid Openings Read / (Required):	10	9	Analytical Sensitivity:	7.7	f/mm ²
Total Area Analyzed:	0.13	mm ²	Minimum Detection Limit:	0.0027	f/cc (0.003)

Total Asbestos Occurrences:	NSD	Non-Asbestos Structures:	NSD
(AHERA Structures):	NSD		
(NIOSH/PCME Fibers):	NSD		
AHERA Density (<5µm):	< 7.7	s/mm ²	Non-Asbestos: < 7.7
AHERA Conc. (<5µm):	< 0.0027	g/cc	Non-Asbestos: < 0.0027
(NIOSH/PCME) Asbestos Density:	< 7.7	f/mm ²	
(NIOSH/PCME) Asbestos Conc.:	< 0.0027	f/cc	

Analysis Data

Asbestos ONLY									Non-Asbestos ONLY	
Grid Opening ID	Tallies	Structure F B M C	¹ Length ≤ 5.0	² Length 5.0 µm	³ Diameter > 0.25 µm	Aspect (x:1)	Chrysotile *	Amphibole**	Non-Asbestos (in PCME range only) ***	Micrograph / EDS ID (or comments)
o2 e5		nsd								
e6		nsd								
e8		nsd								
e9		nsd								
e10		nsd								
o4 a6		nsd								
a7		nsd								
a8		nsd								
d6		nsd								
e6		nsd								
Totals:	NSD		0	0			0	0	0	

SAED, and EDXA for each suspect asbestos fiber
 stle DP reflections (002 ,004, 110, 130, 220, 200)
 obtained Y/N). Print-out EDS and attach.
 haracterize by EDS
 length and 3 fiber diameter (µm)

SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality:	
Dissolution	good
Carbon Film	good
Loading	<1%

Comments: _____

Analyzed By: RGS

Reviewed By: _____

Chain of Custody

Contact Information

Client Company: OTIE / EDI
Office Address: 29 S. Lasalle Street, Suite #930
City, State, Zip: Chicago, IL, 60603
Fax Number: 312-220-7004
Email Address: RNagam@otie.com

Project Number: TDD # TO-01-14-05-1039
Project Name: Tamarack City Stamp Mill
Primary Contact: Raghu Nagam
Office Phone: 312-220-7000
Cell Phone: (312) 217-7003 cell

Matrix:

Air ☒
Water ☐

Soil ☐
Paint ☐

Bulk ☐
Surface Dust / Wipe ☐

Other ☐

Analysis Method:

☐ PCM: NIOSH 7400
☐ PCM: OSHA
☐ PCM: TWA

☐ Total Dust: NIOSH 0500
☐ Total Dust: NIOSH 0600

☐ AAS: Lead in Air
☐ AAS: Lead in Water
☐ AAS: Lead in Paint
☐ AAS: Lead Dust/Wipe₁
☐ AAS: Lead in Soil
☐ AAS: TCLP
☐ AAS: Metals [Cd, Zn, Cr-circle]

PLM Use Bulk Asbestos Sample Log

☐ PLM: Bulk Asbestos EPA 600
☐ PLM: Point Counting 198.1
☐ PLM: NOB via 198.6 (PLM only)
☐ If <1% by PLM, to TEM via 198.4 2

IAQ Use Mold Sample Log

☐ IAQ: I Bioaersol Fungal Spore Trap₃
☐ IAQ: II Bioaersol Fungal Spore
☐ IAQ: Tape, Bulk, Misc. Qualitative₃
☐ IAQ: Tape, Bulk, Misc. Quantitative₃
☐ IAQ: Other Culturable ID₂

☐ TEM: AHERA
☒ TEM: NIOSH 7402
☐ TEM: ISO 10312
☐ TEM: ISO 13794
☐ TEM: Wipe ASTM 6480
☐ TEM: Microvac ASTM D5755
☐ TEM: Microvac ASTM D5756
☐ TEM: NOB 198.4
☐ TEM: Bulk Analysis
☐ TEM: Potable Water
☐ TEM: Non-Potable Water
☐ TEM: Other
☐ Soil: Call for Available Methods

1- Requires ASTM acceptable material 2- Call to confirm TAT 3- Non-culturable 4- With Non-fungal Microscopic Exam

Special Instructions: FULL 7402 METHOD

Turnaround Time

Preliminary Results Requested Date: _____

☐ Verbal ☒ Email ☐ Fax

Specific date / time
☐ 10 Day ☒ 5 Day ☐ 3 Day ☐ 2 Day ☐ 1 Day* ☐ 12 Hour** ☐ 6 Hour** ☐ RUSH**

* End of next business day unless otherwise specified. ** Matrix Dependent. ***Please notify the lab before shipping***

Shipping Method

☒ FedEx

☐ UPS

☐ USPS

☐ Other

Chain of Custody

Relinquished (Name/Organization): Paul Kybartas (EDI/OTIE)

Received (Name / iATL):

Sample Login (Name / iATL):

Analyst (Name(s) / iATL):

QA/QC Review (Name / iATL):

Archived / Released: QA/QC InterLAB Use:

Date: 8-04-14

Date:

Date:

Date:

Date:

Date:

Time:

Time:

Time:

Time:

Time:

Time:

Sample Log

—Bulk Asbestos—

Client: **OTIE**

Project: **TDD# TO-01-14-05-1039**

Sampling Date/Time: Please See Sample Location/Description For Dates of Sample Collection

Bulk Asbestos Sample Log			
Client Sample #	iATL #	Location/Description	Notes
TCSM-16	5390859	Sample Collection date: 7-29-14 // NE / @ intersection of 6th street & Spruce	546 Minutes / 1092 liters
TCSM-27	5390860	Sample Collection date: 7-30-14/N / Between Both sets of Pillars/Parallel to MI-26	601 Minutes / 1202 liters
TCSM-39	5390861	Sample Collection date: 7-31-14 // West / Adjacent to Playground	611 Minutes / 1222 liters
TCSM-49	5390862	Sample Collection Date: 8-01-14 // South / Downwind east central service road	620 Minutes / 1240 liters
TCSM-59	5390863	Sample Collection Date: 8-02-14 // NE / @ intersection of 6th street & Spruce	642 Minutes / 1284 liters
TCSM-60	5390864	Lot Blank	0 Minutes/ 0 Liters
TCSM-62	5390865	Field Blank	0 Minutes/ 0 Liters
TCSM-68	5390866	Sample Collection Date: 8-03-14 // West // (inside park) of SW sunken structure	551 Minutes / 1102 liters