TRIP REPORT
FOR THE PORTRAIT HOMES, INC SUBDIVISION
SURFACE AND SUBSURFACE SOIL ASSESSMENT
POWHATAN MINING COMPANY SITE
WOODLAWN, MARYLAND

Prepared for

U.S. Environmental Protection Agency Region III
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TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION....1

2.0 BACKGROUND....1

2.1 SITE LOCATION....2

2.2 SITE DESCRIPTION....2

2.3 PREVIOUS INVESTIGATIONS....3

2.3.1 Greenhorne & O'Mara, Inc "Asbestos Evaluation and Sampling"....3
2.3.2 U.S. Environmental Protection Agency Investigation....6

3.0 SITE ACTIVITIES....12

3.1 Sample Collection....12

3.1.1 GeoProbe® Soil Sampling....13

4.0 ANALYTICAL RESULTS....14

4.1 SOIL SAMPLING RESULTS....14

REFERENCES....37

LIST OF FIGURES

Figure 1 Site Location 4
Figure 2 Site Layout 5
Figure 3 Previous Soil Sample Locations 11
Figure 4 Weston Soil Sample Locations 17
Figure 5 Soil Sample Results 33
Figure 6 Cross Section Locations 34
Figure 7 Cross Sections A and B 35
Figure 8 Cross sections C and D 36

LIST OF TABLES

Table 2.1 G&O Sample Locations 6
Table 2.2 Tetra Tech Sample Locations 9
Table 2.3 Tetra Tech GeoProbe® Observations 9
Table 4.1 Weston Sample Locations 18
Table 4.2 Weston GeoProbe® Boring Observations 20
Table 4.3 Soil Sample Results 31

ATTACHMENTS

Attachment

A. "Final Interim Aerial Photographic analysis Powhatan Mining Company" Environmental Research, Inc., January 2010
B. "Geophysical Survey – 6722 Windsor Mill Rd.– Gwynn Oak, MD" TPI Environmental, November 2010
C. GeoProbe ® Technology Description
D. Analytical Result

1.0 INTRODUCTION

Under Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-10-05, Technical Direction Document (TDD) No. WS01-10-09-002, U.S. Environmental Protection Agency (EPA) Region 3 tasked Weston Solutions, Inc., (Weston) to collect off-site surface and subsurface soil samples for asbestos analyses on the Portrait Homes, Inc. Subdivision Property (PHS). The property is located adjacent to the Powhatan Mining Company Site (Site), a former asbestos processing facility, located in Woodlawn, Baltimore County, Maryland, 21207.

The purpose of this sampling event was to fill data gaps from previous sampling events where limited or no sample data was available for the subsurface conditions, specifically for asbestos content, of the PHS. Weston conducted sampling activities in October 2010. Asbestos includes the classes of minerals belonging to the serpentine class, chrysotile, and that belonging to the amphibole class, which included amosite, crocidolite, tremolite, anthophyllite and actinolite. Under EPA's National Emissions Standards for Hazardous Air Pollutants (NESHAPs), asbestos containing material (ACM) means any material containing more than 1 percent asbestos as determined using the Polarized Light Microscopy (PLM) analytical method specified in appendix E, subpart E, 40 CFR part 763, section 1. State of Maryland laws pertaining to asbestos can be found in Title 26, Subtitle 11, Chapter 21 of the Annotated Code of Maryland regulations (COMAR). The application of these and other State, Federal and local laws to situations involving disturbed or excavated soil containing asbestos can sometimes be confusing and are often evaluated on a case-by-case basis.

This trip report provides background information and describes previous investigations of PHS in Section 2.0, presents site activities in Section 3.0, and summarizes analytical results in Section 4.0. References cited in this report are listed after the text.

2.0 BACKGROUND

This section describes the location of activities and discusses previous investigations at the PHS property.

2.1 SITE LOCATION

The Powhatan Mining Company Site (Site) is located at 2006 Emmanuel Court in Woodlawn, Baltimore County, Maryland. The approximate coordinates of the center of the Site are 39.3251 degrees north and 76.3593 degrees west. The Site is bordered by residential properties to the west and south along Wells Manor Road and Kincheloe Avenue, respectively. Undeveloped portions of the PHS are located adjacent to the Site to the east, across from Emmanuel Court. A drainage retention area separates the Site from the church property. The run-off from the Site generally flows to the south towards the residential properties along Kincheloe Avenue. The Site Location Map is provided in Figure 1: “Site Location”.

2.2 SITE DESCRIPTION

The Site is the location of a former asbestos processing facility operated by the Powhatan Mining Company in Woodlawn, Baltimore County, Maryland. The facility was in operation from approximately 1920 to 1980 primarily processing anthophyllite asbestos. It is not known if and to what extent other asbestos types were processed (the U.S. Geological Survey likely could assist in determining this if necessary by reviewing historic company correspondence). The facility operated as a multi-story factory building with a loading area on the northeast end and a processing area at the southwest end. The loading area consists of three garage bays that, until EPA’s involvement, were used by the current owner for storage and a workshop.

The Site is bordered on the east by the PHS. It consists of a parcel of land with two houses and nine empty lots. In 2006 or 2007 the parcel was cleared and roughly graded in preparation for the building of eleven homes. Only two homes were constructed. Two large soil piles were left on the parcel when construction activities ceased. One soil stock pile is located on the eastern side of Emmanuel Court across from the Site (the northern pile). The second soil stock pile is located south of the Emmanuel Court cul-de-sac adjacent to the eastern side of the Site (the southern pile). A storm water retention basin is located on the southeastern corner of the PHS adjacent to several residential yards. The site location and surrounding area is shown in Figure 1: "Site Location” and Figure 2: “Site Layout”, respectively.

Historical aerial photographs obtained by EPA identify the southern portion of the PHA as being scarred and disturbed, likely by activities associated with the former Powhatan Mining Company. Photographs dated September 1957, May 1964, and February 1966 clearly show landscape scarring features (see Attachment A).

2.3 PREVIOUS INVESTIGATIONS

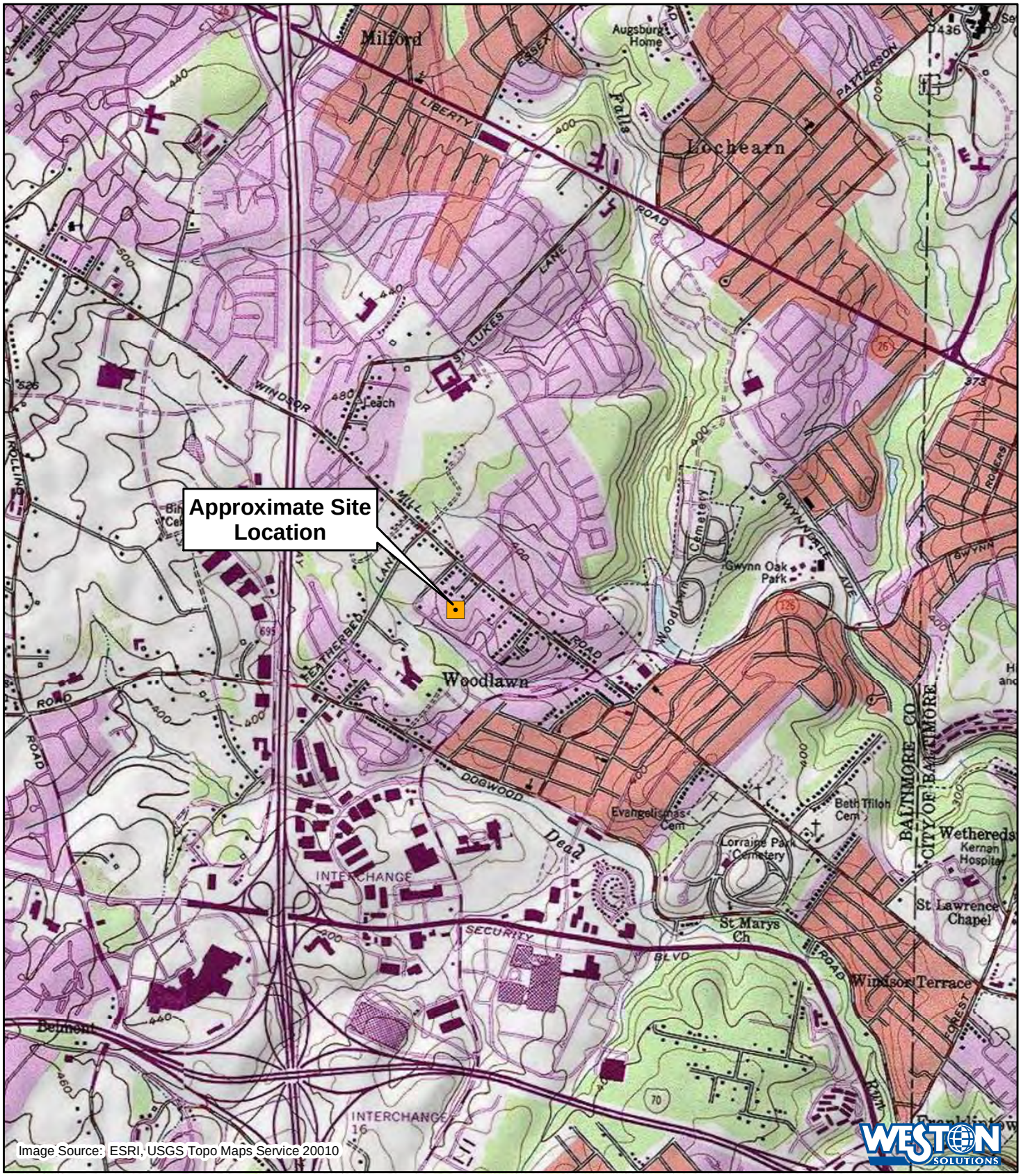
2.3.1 Greenhorne & O'Mara, Inc "Asbestos Evaluation and Sampling"

In early 2009, Greenhorne & O'Mara, Inc. (G&O) was tasked by Chesapeake GeoSciences, Inc. to complete an asbestos evaluation and sampling event at the former Powhatan asbestos facility and undeveloped sections of the PHS. This report was provided to the Maryland Department of the Environment (MDE). G&O completed an initial evaluation in April 2009, which included bulk sampling. A subsurface evaluation and sampling event was performed in June 2009, in which G&O dug six backhoe excavations (aka test pits) for the purpose of sample collection. Three of the test pits were located on the PHS. Historic aerial photographs were obtained to help guide the selection of excavation locations. G&O submitted a report titled "Asbestos Evaluation and Sampling" to Chesapeake GeoSciences, Inc in July 2009 (G&O 2009) summarizing the two sampling events. This section focuses on the subsurface sampling conducted on the PHS as part of the overall "Asbestos Evaluation and Sampling" report.

In June 2009, a total of six (6) surface and subsurface soil and rock ore samples were collected from excavated locations on the PHS. MDE staff attended the subsurface sampling event conducted by G&O. Soil samples were analyzed utilizing Polarized Light Microscopy (PLM) by EPA 600/R-93/116 – Visual Estimate method.

G&O test pit No. 1 was located approximately twenty (20) feet east of the boundary of the processing facility property in the southern fill pile of the PHS along Emmanuel Court. The sampling location was on the northwestern end nearest to the mill. Three samples were collected from this test pit, one soil sample and two rock ore samples. The July 2009 report states that no evidence of asbestos was observed in G&O test pit No. 1.

Figure 1 Site Location



Legend

Approximate Site Location

N
W E
S

0 2,000 Feet

Figure 1
Site Location Map
Powhatan Mining Company Site
Woodlawn, Baltimore County, Maryland

File: \\fsfed01\tig\EPA_Region_III\Powhatan_Mining\MXD\site_loc.mxd, 24-Aug-10 09:42, curtisf

Figure 2 Site Layout

Legend

- Approximate Powhatan Mining Company Site Property Boundary
- Portrait Properties Subdivision Investigation Area
- Northern Soil Stock Pile
- Southern Soil Stock Pile
- Storm Water Retention Basin

Image Source:
Digital Globe, 11-01-09

N

Coordinate System:
WGS 84

0 75
Feet

Powhatan Mining Company
Baltimore, Maryland

Figure 2
Site Layout

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

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G&O test pit No. 2 was located approximately one hundred (100) feet east of the mill property in the northern fill pile on the PHS. One (1) sample was collected from the surface before the excavation was started. Three (3) rock ore samples were collected from various depths within G&O test pit No. 2. A thin layer of suspect off-white material was included as one of the samples from G&O test pit No. 2 (G&O 2009).

G&O test pit No. 6 was located south-southeast of test pit No. 1 and south of the southern fill pile in a location between the pile and residential backyards along Kincheloe Avenue. Two (2) samples were collected from the G&O test pit No. 6, a rock ore sample and an off-white material suspected of being tailings or waste rock ore from asbestos milling operations.

Asbestos was identified in both samples collected from G&O test pit No. 6. The rock ore and off-white sample results indicated the materials contained 100% and 5% of anthophyllite asbestos respectively. The sample results from the soil sample collected from G&O test pit No. 1 and the off-white material sample collected from G&O test pit No. 2 indicated the samples contained a trace amount of anthophyllite asbestos. All other sample results from this sampling event did not detect the presence of asbestos.

Table 2.1 "G&O sample locations" includes the approximate latitude and longitude of the sample locations collected by G&O on the PHS. The locations of the sampling locations are depicted in Figure 3: "Previous Soil Sample Locations".

Table 2.1 G&O Sample Locations

Sample	Latitude	Longitude
G&O TP 1	~39.324854	~ -76.735838
G&O TP 2	~39.324692	~ -76.735795
G&O TP 6	~39.324857	~ -76.735340

2.3.2 U.S. Environmental Protection Agency Investigation

Beginning in August 2009, The EPA tasked Tetra Tech to complete the following sampling and asbestos analyses activities at the Site: on- and off-site ambient air sampling, activity-based air sampling at residential properties near the Site, air sampling inside the former asbestos facility,

and visual observation and sampling of surface and subsurface soils on undeveloped areas of the PHS. Tetra Tech summarized sampling events conducted in December 2009 and March 2010 in a report titled "Draft Trip Report for the Powhatan Mining Company Site" which was submitted to the EPA on June 21, 2010. This section summarizes the sampling and assessment activities conducted on the PHS that were presented in that report.

As part of the March 2010 assessment, Tetra Tech advanced 22 soil borings into a large portion of the PHS using Geoprobe direct-push technology (see Attachment C for a description of Geoprobe technology). Borings were advanced into the soil piles and, when performed on level grade, generally extended from 5 to 10 feet below the ground surface. Each soil boring was visually screened for the presence of suspect asbestos waste.

Because the EPA On Scene Coordinator (OSC) had not instructed Tetra Tech to perform a detailed sampling and analyses effort, only three grab samples and four composite samples were collected for asbestos analyses. The three grab samples were subsurface samples each collected from the toe of the soil pile nearest the old facility. They were collected from approximately 5 feet into the piles. The four composite samples were "five-point" composites; two were surface samples obtained from different locations on the surface of each of the two soil mounds and two were subsurface samples collected from each pile at different locations from 4 to 10 feet inside the pile. All surface and subsurface soil samples were analyzed using both PLM California Air Resource Board (CARB) Level A and Transmission Electron Microscopy (TEM) CARB Level B analytical methods. This latter analytical method is a very sensitive technique for identifying asbestos fibers, is currently undergoing peer review and is not routinely utilized by EPA when conducting asbestos analyses for soil. However, the results are presented here for complete disclosure. EPA generally relies on PLM CARB Level A analyses for making site cleanup decisions.

During the March 2010 sampling event, asbestos was not detected in all seven samples, both grab and composite, collected by Tetra Tech utilizing PLM CARB analyses at a reporting limit of 0.25%. However, using the more sensitive TEM analyses, asbestos was detected in two of the subsurface grab samples collected from the southern pile. The results indicated anthophyllite and chrysotile asbestos were present in concentrations ranging from 1.4% – 1.6 %.

Table 2.3 “Tetra Tech Geoprobe Observations” includes the approximate latitude and longitude of the sample locations collected by Tetra Tech on the PHS. The GeoProbe® and sampling locations are depicted in Figure 3, “Previous Soil Sample Locations”

Table 2.2 Tetra Tech Sample Locations

Sample	Latitude	Longitude
PP-SS-01	Composite samples from multiple locations	
PP-SS-02		
PP-SB-001		
PP-SB-002		
PP-SB-12	~39.324811	~ -76.735779
PP-SB-13	~39.324763	~ -76.735789
PP-SB-15D	~39.324656	~ -76.735844

Table 2.3 Tetra Tech GeoProbe® Observations

Boring ID	Depth of Boring (Feet BGS)	Boring Location	Observations	Sample ID
PP1	10	Ground Surface	No Asbestos-Like Material Observed	No Sample Collected
PP2	10	Ground Surface	No Asbestos-Like Material Observed	No Sample Collected
PP3	10	Ground Surface	No Notation Assume No Asbestos-Like Material Observed	No Sample Collected
PP4	10	5 ft. into pile and 5 ft. below grade	No Notation Assume No Asbestos-Like Material Observed	PP-SB-001 (Composite)
PP5	10	Soil Pile	No Notation Assume No Asbestos-Like Material Observed	No Sample Collected

Boring ID	Depth of Boring (Feet BGS)	Boring Location	Observations	Sample ID
PP6	10	5 ft. into pile and 5 ft. below grade	No Notation Assume No Asbestos-Like Material Observed	PP-SB-01 (Composite)
PP7	10	Soil Pile	No Notation Assume No Asbestos-Like Material Observed	PP-SB-001 (Composite)
PP8	10	Surface	Two Refusal Areas at 2 ft BGS	No Sample Collected
PP9	15	Surface	White Waste at 5-7 ft. BGS	No Sample Collected
PP10	10	Surface	White Waste at 5-7 ft. BGS	No Sample Collected
PP11	3.5	Pile	Three Refusal Areas at 3.5 ft. BGS	PP-SB-02 (Composite)
PP12	15	Pile to Below Grade	White Waste at 4-5 ft. BGS	PP-SB-12 (Grab)
PP13	10	Surface	White Waste at 4-5 ft. BGS	PP-SB-13 (Grab)
PP14	10	Surface	White Waste at 6.5 ft. BGS	No Sample Collected
PP15	10	Surface	Ribbon of White	PP-SB-15D (7 ft. BGS)

Notes:

BGS = Below Ground Surface

Figure 3 Previous Soil Sample Locations

Legend

Site Boundary Lines

- Powhatan Mining Company Site Boundary
- Portrait Properties Subdivision Investigation Area

Soil Sampling Locations

G&O for MDE Samples (June 2009)
- Test Pit

Tetra Tech Composite Sampling Locations (March 2010)
- PP-SB-001
- PP-SB-002
- PP-SS-001
- PP-SS-002

Tetra Tech Samples
- Grab Sampling Location
- Soil Boring Location

Image Source: Digital Globe, 11-01-09

Coordinate System: WGS 84

0 75

Feet

Powhatan Mining Company
Baltimore, Maryland

Figure 3
Previous Sample Locations

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

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3.0 SITE ACTIVITIES

In October 2010, the OSC tasked Weston to perform a follow-up GeoProbe® and test pit investigation of the undeveloped PHS in order to provide a more detailed picture of subsurface conditions. Weston documented and photographed site activities in accordance with Weston Standard Operating Procedure (SOP) No. 024, "Recording of Notes in Field Logbook" (Weston 2008b). This section discusses soil sampling and related activities during this event.

3.1 SAMPLE COLLECTION

All samples for analysis, including QC samples, were given a unique sample number. The project samples can be identified using the following format:

- POW-[Date]-[Sample Type]-[Station ID]-[Sample Depth]
- POW – Abbreviation of Powhatan Mining Company site
- Date – The date the sample was collected indicated as MMDDYY.
- Sample Type – specialized abbreviation that tells what kind of sample was collected:
    - "EB" – Equipment Blank (QC sample)
    - "FB" – Field Blank (QC sample)
    - "SS" – Surface Soil Samples
    - "SB" – Subsurface Soil Sample
- Station ID – unique four digit identifier used to identify the sampling location.
- Sample Depth – A four digit numerical identifier indicating the range of sample depth collected is recorded in feet below ground surface (bgs). The first two digits indicate starting sample depth and last two digits indicate the ending sample depth.

Examples of the sample identifications for the Site are as follows:

- POW-102610-SB-0005-1720: Powhatan Mining Company site sample collected on October 26, 2010 consisting of a subsurface soil sample from sampling location 0005 at a depth of 17 to 20 feet bgs.

- POW-102610-EB-0001: Powhatan Mining Company site sample collected on collected on October 26, 2010 consisting of an equipment blank sample from sampling location 0001.

3.1.1 GeoProbe® Soil Sampling

Surface and subsurface soil samples were collected from the undeveloped PHS. Samples were collected to determine if asbestos was detected in soils and to quantify the concentrations present. Sample locations were selected to fill data gaps from previous sampling events conducted by MDE and Tetra Tech.

Prior to collection of subsurface soil samples, Weston subcontracted TPI Environmental to complete a utility mark up. A copy of the Geophysical Survey report is included as Attachment C to this Trip Report.

Subsurface soil samples were collected via a GeoProbe® rig utilizing acetate sleeve liners. Subsurface borings were advanced to 4 to 30 feet below ground surface (bgs) depending on depth to original grade (most borings were drilled through the soil piles). The borings were observed for the presence of asbestos-like material, which included fluffy grey/white fibrous materials and rock ore. The subsurface soil samples were collected as a composite sample from a single boring at multiple depths. Composite samples consisted of soil collected from three (3) to five (5) samples from a continuous depth range in a single boring. Samples were primarily collected from locations that appeared to contain asbestos-like material. If no asbestos-like material was observed, a composite sample was collected from the boring at an interval of approximately 1 foot above to 2 feet below the original ground surface. GeoProbe® activities were conducted in accordance with US EPA ERT SOP No. 2050 *"Operation of the MD70 ASV*

Posi-Track/540B GeoProbe®" which is included as an attachment to this Trip Report. Subsurface soil samples were collected in accordance with Weston SOP No. 304 *"Subsurface Soil Sampling"* which is included as an attachment to this Trip Report.

Soil samples were collected in accordance with Weston SOP No. 005, "Soil Sampling" (Weston 2009). All sampling equipment consisted of dedicated sampling equipment, including acetate liners, plastic trowels, and aluminum mixing pans, were disposed of following each use. Sampling locations were recorded in the field using a Trimble Pro XCR geographical positioning system (GPS).

Sample handling, packaging, and shipment procedures were performed in accordance with Weston SOP 103 *"Chain-of-Custody Documentation."* Samples were recorded on a chain-of-custody form.

A total of eighteen (18) samples were collected from fifteen (15) borings that were advanced on the PHS. Sample depths ranged from one (1) to twenty eight (28) feet bgs. Sample locations are included in Table 4.1 Weston Sample Locations.

4.0 ANALYTICAL RESULTS

This section summarizes the results of all of the sampling activities conducted by Weston, Tetra Tech, and G&O for MDE. Several different asbestos analytical methods will be referred to in this section. If a reader unfamiliar with asbestos analyses wishes to gain a greater understanding of the methods, he/she may want to review the references presented at the end of this document. Several of the references attempt to provide an explanation geared toward those relatively new to asbestos sampling and analyses (marked with an asterisk). Unfortunately, it is a challenge to adequately and simply describe asbestos analytical procedures even to those routinely involved in environmental sampling activities.

4.1 SOIL SAMPLING RESULTS

A total of thirty eight (38) soil samples have been collected and analyzed in the PHS. G&O collected two (2) surface and seven (7) subsurface soil samples from the PHS. Tetra Tech collected two (2) surface and five (5) subsurface soil samples and Weston collected twenty two

(22) subsurface soil samples from the PHS. The sample results and sample depths intervals for all three investigations are presented in Table 4.3 "Soil Sample Results" and are depicted in Figure 5: "Soil Sample Results".

G&O collected two (2) surface and seven (7) subsurface soil samples during the June 2009 investigation on the PHS. Soil samples collected by G&O were analyzed at AMA Analytical Services, Inc. in Lanham, Maryland approved under the National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program. The G&O samples were analyzed for asbestos using method EPA/600/R-93/116. Results from the samples collected by G&O ranged from none detected to 100% anthophyllite asbestos. The rock ore sample, indentified as G&O sample 6-1, collected from the surface of Test Pit No. 6 was identified as having 100% anthophyllite asbestos.

Tetra Tech collected two (2) surface soil samples and five (5) subsurface soil samples during the March 2010 investigation at PHS. Soil samples collected by Tetra Tech during the March 2010 investigation at the PHS were analyzed at EMSL Analytical, Inc. located in Westmont, New Jersey. EMSL Analytical, Inc's Westmont, New Jersey laboratory is approved under NIST National Voluntary Laboratory Accreditation Program. Soil samples were analyzed for asbestos using both PLM and TEM methods, specifically, California Air Resources Board (CARB) 435 Level A PLM analysis and CARB 435 Level B TEM analysis. PLM analytical results for <u>all</u> samples collected by Tetra Tech, both surface and subsurface, did not reveal the presence of asbestos. Results for the subsurface samples analyzed by the more sensitive TEM method ranged from non-detect to 1.6 % anthophyllite/chrysotile asbestos (all surface samples were non-detect for asbestos by TEM.) Only the southern pile subsurface samples revealed asbestos detections, specifically 1.4% anthophyllite and 1.6% chrysotile by TEM.

As previously mentioned, TEM is a more sensitive procedure. It identifies fibers much shorter and thinner than detected by PLM analyses and the fibers in soil identified by TEM, when PLM results are non-detect, generally are considered to be of less concern from a health risk perspective. In addition, because the fiber detections were only found in soil below the ground surface, and the fibers cannot be released to the air if left undisturbed, they pose minimal risk under the current, undeveloped land use scenario. The analytical results from the Tetra Tech

investigation are summarized in Table 4.3 “Soil Sample Results” and are depicted in Figure 5: “Soil Sample Results”.

Note: Based on the historical aerial photographs clearly suggesting that the southern portion of the PHS was subject to ground disturbing activities during the 1950 and 60s, this area was expected to show elevated asbestos levels. The data collected confirms this prediction. The northern area of the PHS shows no significant past disturbances on the aerial photographs. The difficulty lies in delineating the boundary between contaminated and uncontaminated land. The soil piles referred to in the report were created within the last few years during clearing and grading for the PHS development. EPA was informed that this soil originated from one or both areas excavated to form two retention/drainage basins for the PHS and adjacent church property. Both of these areas would appear to have been minimally affected by past Powhatan Company operations based on the available historic aerial photos. The data collected suggests that the bulk of the soil mounds do not contain asbestos-contaminated soil but some mixing of soils may have occurred. The PHS developer and development contractors could provide more accurate information on the source of the soil and how it was distributed during grading and digging activities.

Figure 4 Weston Soil Sample Locations

Legend

Site Boundary Lines

- Powhatan Mining Company Site Boundary
- Portrait Properties Subdivision Investigation Area

Soil Sampling Locations

Weston Samples (October 2010)

- Geoprobe Location
- Test Pit Location

Image Source:
Digital Globe, 11-01-09

N

Coordinate System:
WGS 84

0 75

Feet

Powhatan Mining Company
Baltimore, Maryland

Figure 4
Weston Soil Sample Locations

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

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Weston collected twenty two (22) subsurface soil samples from the PHS during the October 2010 investigation. Samples collected by Weston were analyzed at the EMSL Analytical, Inc. laboratory (since relocated from Westmont, New Jersey to Cinnaminson, New Jersey). Soil samples collected by Weston were analyzed using method CARB 435 Level B PLM analysis. One (1) sample (TP-001) consisted of a fibrous mat like material was analyzed by PLM using EPA Method 600/R-93/116. (Note: EMSL designations Level A and B merely signify reporting limits for asbestos of 0.25% and 0.1% respectively.)

Table 4.1 Weston Sample Locations

Sample	Latitude	Longitude
SB-0001	39.32499967	-76.73504486
SB-0002	39.32491470	-76.73514772
SB-0003	39.32484281	-76.73524577
SB-0004	39.32476929	-76.73581108
SB-0005	39.32478767	-76.73584701
SB-0006	39.32481327	-76.73587786
SB-0007	39.32477280	-76.73540867
SB-0008	39.32473489	-76.73551314
SB-0009	39.32473489	-76.73551314
SB-0010	39.32493296	-76.73489265
SB-0011	39.32499143	-76.73485403
SB-0012	39.32506459	-76.73477220
SB-0013	39.32462329	-76.73570084
SB-0014	39.32451384	-76.73577434
SB-0015	39.32457246	-76.73582679
TP-001	39.32473627	-76.73593408
TP-002	39.32472037	-76.73589750
TP-003	39.32463489	-76.73575472
TP-004	39.32460149	-76.73576389

The transparent, acetate sleeves from the GeoProbe® borings were observed for asbestos-like materials, primarily identified as grey/white fibrous material or fibrous rock ore. Asbestos-like material was observed in eight (8) of the borings. The asbestos-like material was observed as a distinct layer in some borings, while it was mixed within the soil in other borings. Photographs of the acetate sleeves from the borings and observations of asbestos-like materials in the borings are summarized in Table 4.2 “Weston GeoProbe® Boring Observations”.

Table 4.2 Weston GeoProbe® Boring Observations

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
SB-0001	No Asbestos-Like Material Observed		
SB-0002	No Asbestos-Like Material Observed		

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	**Ending**	
SB-0003	No Asbestos-Like Material Observed The white material in the photograph appeared to be crushed stone and non-fibrous		
SB-0004	16	17	

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
SB-0005	17	18	
SB-0006	25	26	

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
SB-0007	6	7	
SB-0008	6	7	

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
SB-0009	9	10	
SB-0010	No Asbestos-Like Material Observed		

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	**Ending**	
SB-0011	No Asbestos-Like Material Observed		
SB-0012	No Asbestos-Like Material Observed		

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
SB-0013	2	3	
SB-0014	No Asbestos-Like Material Observed		

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
SB-0015	0.5	2.5	
TP-001	1.5	3	

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
TP-002	1.5	3	
TP-003	1.5	2.5	

Sample Location	Observed Asbestos-Like Material (ft. BGS)		Photograph
	Beginning	Ending	
TP-004	1	2	

Note: GeoProbe® cores in the photographs are arranged so the acetate sleeve from the deepest interval is in the foreground of the photograph and the top of the acetate sleeve is located on the left of the photograph.

The highest percentage of asbestos in samples collected by Weston was in sample TP-001, the fibrous mat like material which contained 80% of chrysotile asbestos. Sample SB-0008 had the highest percentage of anthophyllite asbestos which was 15%. Chrysotile asbestos was identified in four (4) samples and percentages ranged from 1.4% to 80% asbestos. Anthophyllite asbestos was identified in eighteen (18) samples and percentages ranged from less than 0.1 to 15% asbestos. Two other test pits, TP-002 and TP-004, were not sampled but the material unearthed closely resembled the grey/white fibrous material that appeared in TP-001 and TP-003 where results were up to 12% anthophyllite. Based on the data collected and the historical aerial photographs, it is apparent that this section of the PHS (Development Lots 1 and 2 and likely Lots 3 and 4) contains the largest quantity of buried asbestos material. A copy of the laboratory

analytical data is included as Attachment B of this report. Sample location, intervals, and results are shown in Table 4.3 “Soil Sample Results” and depicted in Figure 5: “Soil Sample Results”.

A cross section depicting the sample results from the GeoProbe® borings is depicted in Figure 6: “Cross Section Locations” Figure 7: “Cross Sections A and B” and Figure 8: “Cross Sections C and D”. Figure 6: “Cross Section Locations” shows the locations of the GeoProbe® borings that were used to develop the cross section figures. Figure 7: “Cross Section A and B” shows the cross sectional diagram for cross sections A’-A and B’-B. Figure 8: “Cross Section C and D” shows the cross sectional diagram for cross section C’-C and D’-D.

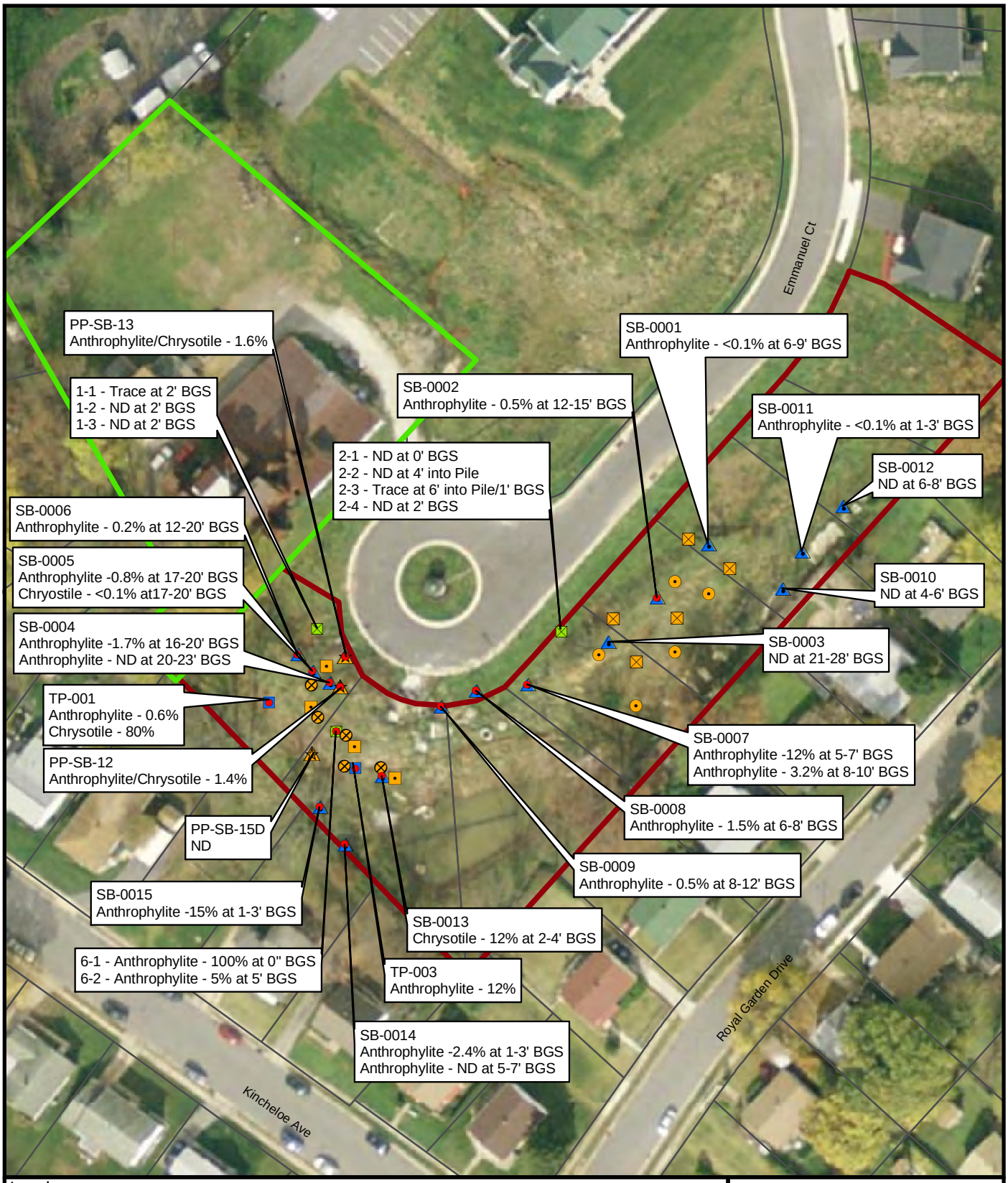
Table 4.3 Soil Sample Results

Sample Location	Collected By	Sample Results		Sample Interval (ft. BGS)	
		Asbestos (%)	Asbestos (Type)	Beginning	Ending
SB-0001	Weston	<0.1	Anthophyllite	6	9
SB-0002	Weston	0.5	Anthophyllite	12	15
SB-0003	Weston	None Detected	NA	21	28
SB-0004	Weston	1.7	Anthophyllite	16	20
		None Detected	NA	20	23
SB-0005	Weston	0.8	Anthophyllite	17	20
SB-0005	Weston	<0.1	Chrysotile		
SB-0006	Weston	0.2	Anthophyllite	18	20
SB-0007	Weston	12	Anthophyllite	5	7
		3.2	Anthophyllite	8	10
SB-0008	Weston	15	Anthophyllite	6	8
SB-0009	Weston	0.5	Anthophyllite	8	12
SB-0010	Weston	None Detected	NA	4	6
SB-0011	Weston	<0.1	Anthophyllite	1	3
SB-0012	Weston	None Detected	NA	6	8
SB-0013	Weston	12	Chrysotile	2	4
SB-0014	Weston	2.4	Anthophyllite	1	3
		None Detected	NA	5	7
SB-0015	Weston	15	Anthophyllite	1	3
TP-001	Weston	0.6	Anthophyllite	0	4
		80	Chrysotile	2	2
TP-003	Weston	12	Anthophyllite	1	3
PP-SS-01	Tetra Tech	None Detected	NA	Surface	Surface
PP-SS-02	Tetra Tech	None Detected	NA	Surface	Surface
PP-SB-001	Tetra Tech	<0.1	Anthophyllite	~4 ft. (in pile)	~10 ft. (in pile)
PP-SB-002	Tetra Tech	None Detected	NA	~4 ft. (in pile)	~10 ft. (in pile)
PP-SB-12	Tetra Tech	1.4	Anthophyllite/ Chrysotile	5	5
PP-SB-13	Tetra Tech	1.6	Anthophyllite/ Chrysotile	5	5
PP-SB-15D	Tetra Tech	None Detected	NA	5	5
1-1	G&O (MDE)	Trace	NA	2	2
1-2	G&O (MDE)	None Detected	NA	2	2
1-3	G&O	None Detected	NA	2	2

Sample Location	Collected By	Sample Results		Sample Interval (ft. BGS)	
		Asbestos (%)	Asbestos (Type)	Beginning	Ending
	(MDE)				
2-1	G&O (MDE)	None Detected	NA	0	1
2-2	G&O (MDE)	None Detected	NA	4	4
2-3	G&O (MDE)	Trace	NA	6	6
2-4	G&O (MDE)	None Detected	NA	2	2
6-1	G&O (MDE)	100	Anthophyllite	0	1
6-2	G&O (MDE)	5	Anthophyllite	5	5

NA – Not Applicable

Figure 5 Soil Sample Results



Legend

Site Boundary Lines

- Powhatan Mining Company Site Boundary
- Portrait Properties Subdivision Investigation Area

Note:
BGS = Below Ground Surface

Image Source:
Digital Globe, 11-01-09

Soil Sampling Locations

Weston Samples
- Geoprobe Location
- Test Pit Location

G&O for MDE Samples
- Test Pit

Tetra Tech Composite Sampling Locations
- PP-SB-001 (<0.1%)
- PP-SB-002 (ND)
- PP-SS-001(ND)
- PP-SS-002 (ND)

Tetra Tech Samples
- Grab Sampling Location
- Soil Boring Location
- Sample Results Greater than 0.1

N

Coordinate System:
WGS 84

0 75
Feet

Powhatan Mining Company
Baltimore, Maryland

Figure 5
Soil Sample Results

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

WESTON SOLUTIONS

File: \\fsfed01\tig\EPA_Region_III\Powhatan_Mining\MXD\Portrait_properties_sampling Result.mxd, 01-Apr-11 11:54, ricksc

Figure 6 Cross Section Locations

Legend

Weston Samples

- Geoprobe Location
- Test Pit Location
- Cross Sections
- Approximate Property Boundary
- Portrait Properties Subdivision Investigation Area

Image Source:
Digital Globe, 11-01-09

N

Coordinate System:
WGS 84

0 75

Feet

Powhatan Mining Company
Baltimore, Maryland

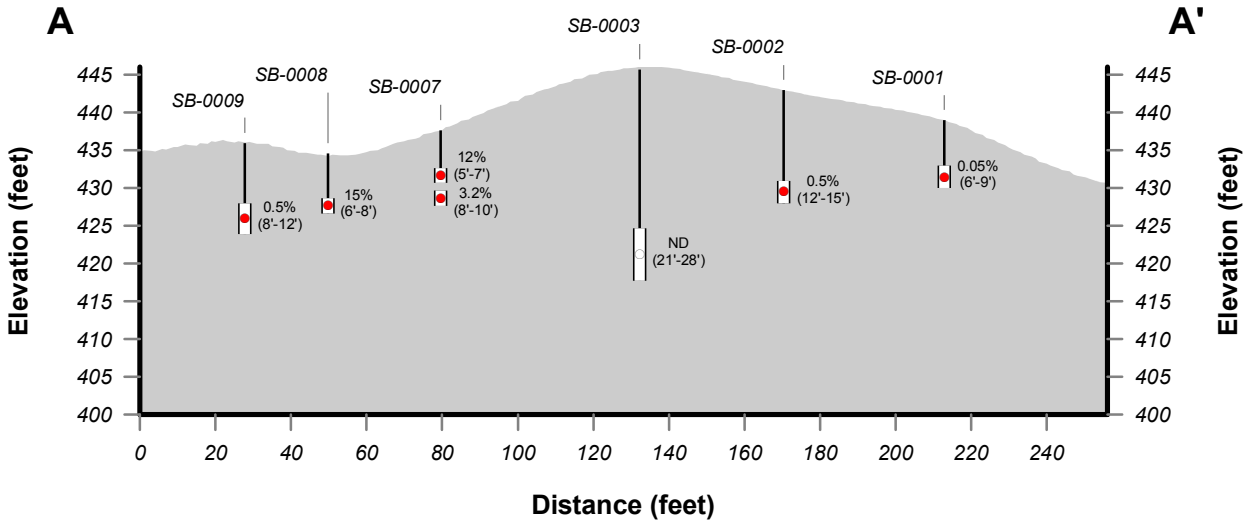
Figure 6
Cross Section Locations

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

WESTON SOLUTIONS

File: \\fsfed01\tig\EPA_Region_III\Powhatan_Mining\MXD\cross_section_location.mxd, 18-Feb-11 09:48, ricksc

Figure 7 Cross Sections A and B



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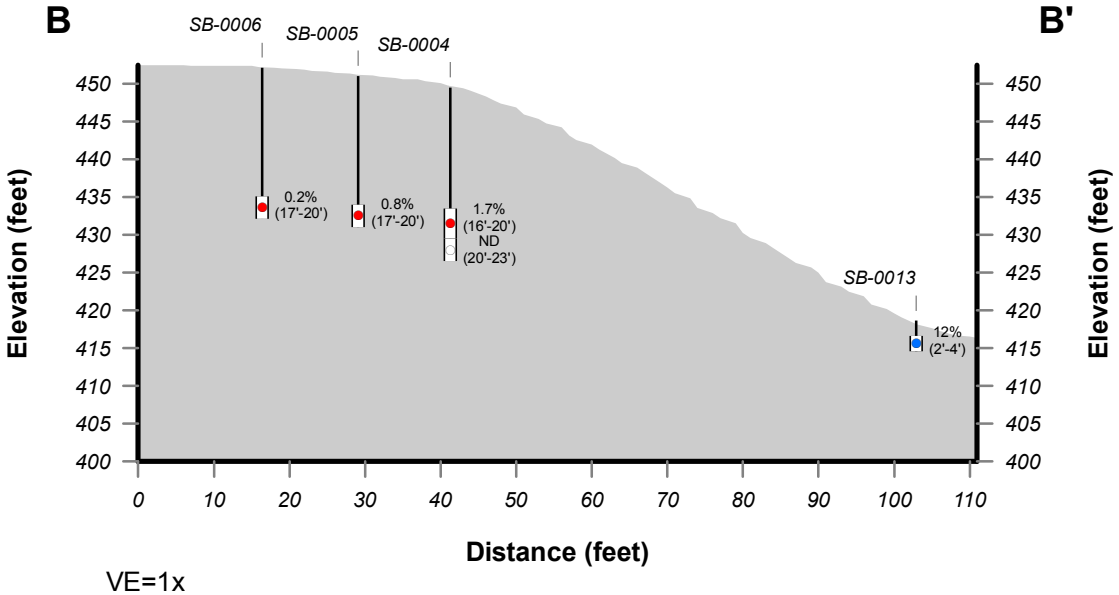


VE=1x

Legend

Subsurface

Geoprobe Location

Sample Interval

Asbestos Type

- Anthophylite
- Chrysotile
- None

Notes:

1. VE = Vertical Exaggeration
2. ND = not detected
3. Values posted at samples are % asbestos followed by sample depth in feet.

Powhatan Mining Company
Baltimore, Maryland

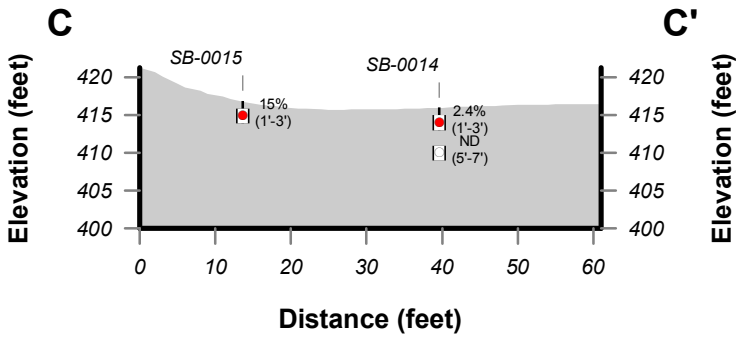
Figure 7
Cross Sections A and B

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

WESTON SOLUTIONS

File: \\Fsfed01\TIG\EPA_Region_III\Powhatan_Mining\MXD\GP_xsecs_CandD.mxd, 21-Dec-10 12:26, STROBRID

Figure 8 Cross sections C and D



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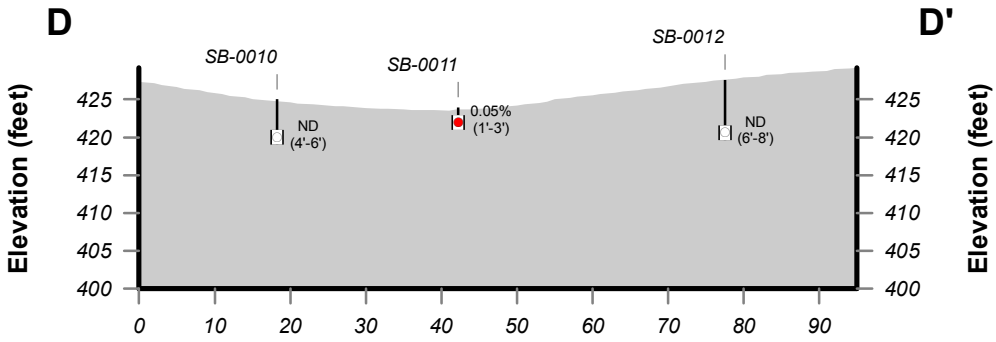

VE=1x

Legend

Subsurface

Geoprobe Location

Sample Interval

Asbestos Type

- Anthophylite
- Chrysotile
- None

Notes:

1. VE = Vertical Exaggeration
2. ND = not detected
3. Values posted at samples are % asbestos followed by sample depth in feet.

Powhatan Mining Company
Baltimore, Maryland

Figure 8
Cross sections C and D

TDD#: WS01-10-08-001
Contract: EP-S3-10-05

WESTON SOLUTIONS

File: \\Fsfed01\TIG\EPA_Region_III\Powhatan_Mining\MXD\GP_xsecs_CandD.mxd, 21-Dec-10 12:26, STROBRID

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ATTACHMENT A

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01/08/10

U.S. Environmental Protection Agency
P.O. Box 93478
Las Vegas, NV 89193-3478

ATTENTION: John Lin

Subject: Final Interim Report Delivery of "Powhatan Mining Company Site, MD", ESD-LV Project 21003601S.

Dear Mr. Lin:

Attached is one (1) copy of the above-mentioned product.

This completes delivery of all interim products for work assignment # 21003601S. If you have any questions, please contact me at (702) 897-3232.

Sincerely,

L. Mata
Remote Sensing Support Services
Contract

cc: Larry Mata
W.A. RS036010

TS-PIC-21003601S
JANUARY 2010

INTERIM
AERIAL PHOTOGRAPHIC ANALYSIS
POWHATAN MINING COMPANY

Woodlawn, Maryland

by

George J. Mika and Glen M. Hickerson
Environmental Research, Inc.
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Linden, Virginia 22642

for
Environmental Services
Lockheed Martin Services
Las Vegas, Nevada 89119

Contract No. EP-D-05-088

Work Assignment Manager

John Lin
Landscape Ecology Branch
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Las Vegas, Nevada 89193-3478

ENVIRONMENTAL SCIENCES DIVISION
NATIONAL EXPOSURE RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
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NOTICE

As an interim product, this document has not undergone a technical and quality control/assurance review and has not been approved for publication by personnel of the U.S. Environmental Protection Agency, Office of Research and Development, Environmental Sciences Division, Landscape Ecology Branch at Las Vegas, Nevada. It is for internal Agency use and distribution only.

ABSTRACT

This report presents the results of a historical aerial photographic analysis of the Powhatan Mining Company site in Woodlawn, Maryland (Site/Spill ID# A3NA) that was conducted to provide operational remote sensing support to field investigations of the U.S. Environmental Protection Agency (EPA) Region 3 under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The analysis documents landscape morphology, patterns of waste disposal, and other observable activities and conditions of environmental significance at this Superfund hazardous waste site.

The Powhatan Mining Company site is located in Baltimore County, Maryland and comprises approximately 1.5 hectares (3.2 acres). The former asbestos processing facility at the site was reportedly constructed in 1920 and operated until the late 1970s/early 1980s.

Ten dates of aerial photographs, covering the period from 1938 through 1979, were acquired and analyzed for this report and photographs from nine of these dates were reproduced for inclusion in this report. Environmentally significant features noted on site consisted primarily of mounded and scattered light-toned material.

The EPA Environmental Sciences Division, Landscape Ecology Branch in Las Vegas, Nevada, prepared this report for the EPA Region 3 in Philadelphia, Pennsylvania and the EPA Office of Superfund Remediation Technology Innovation in Washington, D.C.

CONTENTS

	Page
Abstract	iii
Introduction	1
Methodology	7
Photographic Analysis	10
April 11, 1938	12
April 25, 1943	14
December 1, 1947	16
August 26, 1952	16
September 27, 1957	18
May 16, 1964	20
February 21, 1966	22
October 12, 1971	24
June 15, 1979	26
Glossary	28
References	30
Fold-out Legend	32

FIGURES

Number		
1	Study Area Location Map, Baltimore County, Maryland, 1972	2
2	Local Study Area Location Map, Baltimore West, MD, 1974	3
3	Powhatan Mining Company, Woodlawn, Maryland, April 11, 1938	28
4	Powhatan Mining Company, Woodlawn, Maryland, April 25, 1943	13
5	Powhatan Mining Company, Woodlawn, Maryland, December 1, 1947	15
6	Powhatan Mining Company, Woodlawn, Maryland, August 26, 1952	15
7	Powhatan Mining Company, Woodlawn, Maryland, September 27, 1957	17
8	Powhatan Mining Company, Woodlawn, Maryland, May 16, 1964	19
9	Powhatan Mining Company, Woodlawn, Maryland, February 21, 1966	21
10	Powhatan Mining Company, Woodlawn, Maryland, October 12, 1971	23
11	Powhatan Mining Company, Woodlawn, Maryland, June 15, 1979	25

INTRODUCTION

This report presents the results of a historical aerial photographic analysis of the Powhatan Mining Company site in Woodlawn, Maryland (Site/Spill ID# A3NA) that was conducted to provide operational remote sensing support to field investigations of the U.S. Environmental Protection Agency (EPA) Region 3 under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The analysis was conducted to document landscape morphology, patterns of waste disposal, and other observable activities and conditions of environmental significance at this Superfund hazardous waste site.

Figure 1 illustrates the approximate location of the Powhatan Mining Company site within the State of Maryland (USGS, 1972), and Figure 2 depicts the local study area of the site on an overlay to a color-copy mosaic of two United States Geological Survey (USGS) topographic maps (USGS 1974). Ten dates of aerial photographs, covering the period from 1938 through 1979, were acquired and analyzed for this report and photographs from nine of these dates were reproduced for inclusion in this report.

In 1938, the Powhatan Mining Company site was bounded to the north by low-density single unit housing, and on the remaining sides by agricultural land. By 1979, tract housing had been constructed to the south and west of the site, while the land use to the north and east of the site remained relatively unchanged from 1938. The site comprises approximately 1.3 hectares (3.2 acres).

The former on-site asbestos processing facility was reportedly constructed in 1920 and operated until the late 1970s/early 1980s. The primary environmentally significant feature noted on site was mounded light-toned material, with lesser amounts of scattered light-toned material also present. On the 1938 aerial photographs, small amounts of probable light-toned material were noted to the west of the production facility. By 1943, two mounds of light-toned material were seen to the north of the production facility. These mounds were merged by 1952 and appeared to contain the majority of the on-site light-toned material for the remainder of the study period. In 1957 rows of light-toned material were seen in the southern portion of the site and in subsequent years (1964 and 1966) light-toned mounded material was seen in this vicinity. By 1971 light-toned material was no longer visible in the southern portion of the site, which had been fenced off and was vegetated. By 1979 the mounded light-toned material noted north of the production facility since 1938 was no longer evident.

A Glossary, defining features or conditions identified in this report, follows the Photographic Analysis section. Sources for all maps, aerial photographs, and collateral data used in this report are listed in the References section. A list of all aerial photographs that were identified and evaluated for potential application to this study can be obtained by contacting the EPA Work Assignment Manager.

The EPA Environmental Sciences Division, Landscape Ecology Branch in Las

Vegas, Nevada, prepared this report for the EPA Region 3 in Philadelphia, Pennsylvania and the EPA Office of Superfund Remediation Technology Innovation in Washington, D.C.

METHODOLOGY

This report was prepared using a standard methodology that includes the following steps:

- data identification and acquisition
- photographic analysis and interpretation
- graphics and text preparation

These steps are described in this section. Subsections also address details related to specific kinds of analyses that may be required to identify environmental features such as surface drainage and wetlands. All operational steps and processes used to perform this work (including data identification and acquisition, photographic analysis and interpretation, and graphics and text preparation) adhere to strict QA/QC guidelines and standard operating procedures (SOPs). These guidelines and procedures are documented in the Master Quality Assurance Project Plan (QAPP) for the Remote Sensing Support Services Contract, EP-D-05-088 (LMS, 2006).

Data identification and acquisition included a search of government and commercial sources of historical aerial photographs to identify and obtain photographs with optimal spatial and temporal resolution and image quality for the study area. In addition, U.S. Geological Survey (USGS) topographic maps were obtained to show the study area location and to provide geographic and topographic context.

To conduct this analysis, the photographic analyst obtained diapositives (transparencies) of historical aerial photographs showing the study area. Diapositives are most often used for analysis instead of prints because the diapositives have superior photographic resolution. Diapositives show minute details of significant environmental features that may not be discernible on paper prints.

A photographic analyst uses a stereoscope to view adjacent, overlapping pairs of diapositives on a backlit light table. In most cases, the stereoscope is capable of various magnifications up to 60 power. Stereoscopic viewing involves using the principle of parallax (observing a feature from slightly different positions) to observe a three-dimensional representation of the area of interest. The stereoscope enhances the photo interpretation process by allowing the analyst to observe vertical as well as horizontal spatial relationships of natural and cultural features.

The process of photographic analysis involves the visual examination and comparison of many components of the photographic image. These components include shadow, tone, color, texture, shape, size, pattern, and landscape context of individual elements of a photograph. The photographic analyst identifies objects, features, and "signatures" associated with specific environmental conditions or events. The term "signature" refers to a combination of components or characteristics that indicate a specific object, condition, or pattern of environmental significance. The academic and

professional training, photo interpretation experience gained through repetitive observations of similar features or activities, and deductive logic of the analyst as well as background information from collateral sources (e.g., site maps, geologic reports, and soil surveys) are critical factors employed in the photographic analysis.

The photographic analyst records the results of the analysis by using a standard set of annotations and terminology to identify objects and features observed in the diapositives. Significant findings are annotated on overlays attached to the photographs in the report and are discussed in the accompanying text. Annotations that are self-explanatory may not be discussed in the text. The annotations are defined in the Fold-out Legend at the end of the report and in the text when first used.

Objects and features are identified in the graphics and text according to the photographic analyst's degree of confidence in the evidence. A distinction is made between certain, probable, and possible identifications. When the photographic analyst believes the identification is unmistakable, no qualifier is used. Probable is used when a limited number of discernible characteristics allow the photographic analyst to be reasonably certain of a feature's identification. Possible is used when only a few characteristics are discernible and the photographic analyst can only infer a feature's identification.

The prints presented in this report have been reproduced, either by photographic or computer methods, from the original film. Reproductions are made from the original film and may be either contact (the same size) prints or enlargements, depending on the scale of the original film. Any computer-produced prints used in this report are generated from scans of the film at approximately 1,300 dots per inch (dpi) and are printed at 600 dpi. Although the reproductions allow effective display of the interpretive annotations, they may have less photographic resolution than the original film. Therefore, some of the objects and features identified in the original image and described in the text may not be clearly discernible on the prints in this report.

Study area boundaries shown in this report were determined from aerial photographs or collateral data and do not denote legal property lines or ownership.

PHOTOGRAPHIC ANALYSIS

The Powhatan Mining Company site is situated approximately 128 meters (420 feet) above sea level on a knoll from which surface drainage flows south and west into an unnamed tributary of Gwynns Falls (USGS, 1974).

April 11, 1938 (FIGURE 3)

The Powhatan Mining Company site is accessed via a driveway leading from Windsor Mill Road. A production facility (PF) is located near the center of the site and an ancillary building (B) to its northwest. Three areas of probable (PROB) light-toned (LT) material (M) are visible to the west of these buildings. The southern portion of the site is in agricultural (AG) use. In the northeastern portion of the site, two buildings are seen which may be part of an adjacent farm and not utilized by the Powhatan Mining Company.

To the east of the site, a house (H) is visible adjacent to the access road. This house will continue to be annotated though not further discussed in this report. Agricultural land is noted to the east of the site, as well as to the south and west.

April 25, 1943 (FIGURE 4)

In the northern portion of the Powhatan Mining Company site, two areas of light-toned mounded material (MM) are seen. Four additional smaller areas of light-toned material are noted in the vicinity of the production facility and adjacent to the ancillary building. To the northeast, one of the two buildings noted in 1938 (Figure 3) has been removed (BR). To the south, adjacent to the access road, two possible (POSS) trailers (TRL) are visible.

The southern portion of the site remains in agricultural use.

Beginning at the edge of the western boundary of the site, a medium-toned (MT) flow pattern (FP) extends south to the unnamed tributary of Gwynns Falls. Light-toned material is noted outside the site boundary, adjacent to the flow pattern.

December 1, 1947 (Figure 5)

In the northern portion of the Powhatan Mining Company site, the two areas of light-toned mounded material noted in 1943 (Figure 4) remain. Dark-toned material (DK) and/or vegetation (VEG) is visible on the western end of the larger mound while material has been removed from the smaller mound. Light-toned material is seen adjacent to the southwestern end of the production facility.

To the east of the production facility, a possible trailer and an area of light-toned mounded material are noted.

The southern portion of the site remains in agricultural use.

Outside the western boundary of the site a flow pattern is noted as in 1943.

August 26, 1952 (FIGURE 6)

In the northern portion of the Powhatan Mining Company site, the two areas of light-toned mounded material noted since 1943 (Figure 4) appear to have been merged into one. Approximately half of this mounded material is covered in vegetation. Portions of the unvegetated light-toned mounded material may be new since 1947 (Figure 5) or be existing material that has been moved. Additional light-toned material is seen to the south, west and northwest of the production facility, which has been enlarged since 1943.

To the east of the production facility, four vehicles (VEH) and/or probable trailers are noted. To the south of the production facility two possible trailers are visible.

The southern portion of the site remains in agricultural use.

Outside the western boundary of the site a flow pattern is noted as in 1943 and 1947 (Figure 5) and to the south an area of light-toned material is seen.

September 27, 1957 (FIGURE 7)

In the northern portion of the Powhatan Mining Company site, additional light-toned material has been added to the area of light-toned mounded material noted since 1943 (Figure 4). Portions of the light-toned mounded material remain vegetated. Vehicles are visible adjacent to the buildings located southeast and southwest of the light-toned mounded material.

To the east of the production facility a trailer and possible trailer are seen and to the south a possible trailer is visible.

To the southwest of the production facility a row of small mounds of light-toned material and two possible horizontal tanks (HT) are seen.

In the southern portion of the site a ground scar (GS), likely the result of vehicular traffic or grading, and six strips of light-toned material are noted. It could not be discerned from the aerial photographs whether this light-toned material was deposited or exposed by grading.

To the south of the site former agricultural land has been developed for residences (not annotated).

May 16, 1964 (FIGURE 8)

In the northern portion of the Powhatan Mining Company site no significant change is noted in the area of light-toned mounded material noted since 1943 (Figure 4). A dump truck (DT) and a tractor-trailer (TTL) are seen to the southeast of this mounded material.

To the east of the production facility a light-toned linear object and possible light-toned material are visible. Light-toned material is noted adjacent to the southeastern side of the production facility.

In the southern portion of the site three areas of light-toned mounded material are seen within an area of ground scarring.

February 21, 1966 (FIGURE 9)

In the northern portion of the Powhatan Mining Company site a fence has been constructed extending southward from the area of light-toned mounded material noted since 1943 (Figure 4). No other significant change is noted regarding this mounded material that remains partially vegetated. A vehicle and light-toned material are visible in the vicinity of the building located to the southeast.

To the east of the production facility two areas of light-toned material and a light-toned object (O) or material are visible. A dump truck is noted adjacent to the southeastern corner of the production facility. To the south of the production facility three possible drums and two areas of light-toned material are seen.

In the southern portion of the site four areas of light-toned mounded material are noted. Light-toned material is visible adjacent to the southwestern boundary of the site on an embankment (not annotated).

To the southwest of the site Kincheloe Avenue has been extended and residences have been constructed adjacent to it.

October 12, 1971 (FIGURE 10)

In the northern portion of the Powhatan Mining Company site the fence along the southern edge of the area of light-toned mounded material noted since 1943 (Figure 4) has been extended to the east. The eastern end of the light-toned mounded material has been graded (GR). Two vehicles and a rectangular light-toned object are visible in the vicinity of the building located to the southeast.

To the southeast of the production facility a probable trailer and a grouping of three large rectangular storage containers (SC) or structures (S) are seen. To the south a light-toned linear (LIN) object and a new building (NB) are visible. This new building will continue to be annotated though not further discussed in this report. To the northwest light-toned material is noted adjacent to the western end of the ancillary building.

In the south-central portion of the site a fence has been constructed bisecting the site from east to west. The southern portion of the site has become entirely vegetated.

June 15, 1979 (FIGURE 11)

In the northern portion of the Powhatan Mining Company site two areas of ground scarring, an area of ground scarring and/or light-toned material, and vegetation are seen where an area of light-toned mounded material has been noted since 1943 (Figure 4). It was not apparent on these aerial photographs where the light-toned mounded material had been moved. A rectangular light-toned object, likely the same one noted in 1971 (Figure 10) is visible to the southeast.

To the southeast of the production facility two large rectangular storage containers or structures are seen where three were noted in 1971. To the south a light-toned object or material is visible. A possible trailer is visible adjacent to the southern side of the production facility.

GLOSSARY

Dark-, Medium-, or Light-Toned - Tones of features in question are compared with the darkest and lightest tones of gray (if using B&W photography) on the print.

Drum(s) (D) - Metal cylinders used for the storage, transportation, or disposal of materials.

Dump Truck (DT) - A truck whose contents can be emptied without handling; the front end of the platform can be pneumatically raised so that the load is discharged by gravity.

Graded Area (GR) - An area where the surface of the ground has been leveled or altered by a vehicle pulling or pushing a wide blade.

Ground Scar (GS) - An area of bare soil, apparently the result of human activity.

Mounded Material (MM) - Piles of raw or waste materials on or in the vicinity of the site.

Production Facility (PF) - The building or group of buildings where an industrial or manufacturing process occurs.

Site-The land or water area where any facility or activity is physically located or conducted, including land used in connection with the facility or activity.

Storage Container(s) (SC) - A reusable noncollapsible container of any configuration designed to provide protection for items against impact and climatic conditions.

Structure (S) - Something that is constructed, but cannot be further identified.

Tanks - Vertical tanks (VT) and horizontal tanks (HT). A large receptacle, container, or structure for holding liquid or gas.

Trailer(s) (TRL) - 1. A large van or wagon drawn by an automobile, truck, or tractor, used especially in hauling freight by road. 2. A non-motorized vehicle or structure attached to, or carried by, a motorized vehicle and used as a mobile home or place of business, usually equipped with furniture, kitchen facilities, etc.

REFERENCES

MAPS

Source1	Figure	Name	Scale	Date
USGS	1	State of Maryland	1:2,500,000	1972
USGS	2	Ellicott City, MD	1:24,000	1974
USGS	2	West Baltimore, MD	1:24,000	1974

COLLATERAL INFORMATION

EPA. 2009. Statement of Work for the Powhatan Mining Company, Woodlawn MD site with collateral data supplied by EPA Region 3 as attached to EPIC Remote Sensing Services Request Form, 09-14-09, 10 pp.

LMS (Lockheed Martin Services). 2005. Master Quality Assurance Project Plan. Prepared for EPA Environmental Sciences Division. Contract EP-D-05-088. Las Vegas, Nevada.

AERIAL PHOTOGRAPHS

Photo Source[1]	Figure[2]	Date of Acquisition	Original Scale	Film Type[3]	Mission I.D.	Source Frame #	EPA EPIC Frame #
NARA	3	04-11-38	1:20,000	BW	AJO	3:31,32	
NARA	4	04-25-43	1:20,000	BW	DCO	7:43,44	
NARA	5	12-01-47	1:20,400	BW	M560	23,24	
NARA	-	02-10-52	1:25,500	BW	3TRG	50,51	
NARA	6	08-26-52	1:20,000	BW	AJO	6K:87-89	
FSA	7	09-27-57	1:20,000	BW	AJO	6T:105,106	
FSA	8	05-16-64	1:20,000	BW	AJO	2DD:51,52	
USGS	9	02-01-66	1:24,000	BW	VBLA	1:134,135	
FSA	10	10-12-71	1:20,000	BW	AJO	6MM:116,117	
FSA	11	06-15-79	1:40,000	BW	24005	179:47,48	

[1]FSA Farm Service Agency, U.S. Department of Agriculture, Salt Lake City, Utah.
NARA National Archives and Records Administration, College Park, MD.
USGS U.S. Geological Survey, U.S. Department of the Interior. Sioux Falls, South Dakota.
[2](-) Photographs with no figure number were analyzed, but not reproduced for this report.
[3]BW Black-and-white

N

UNITED STATES
(USGS, 1972)

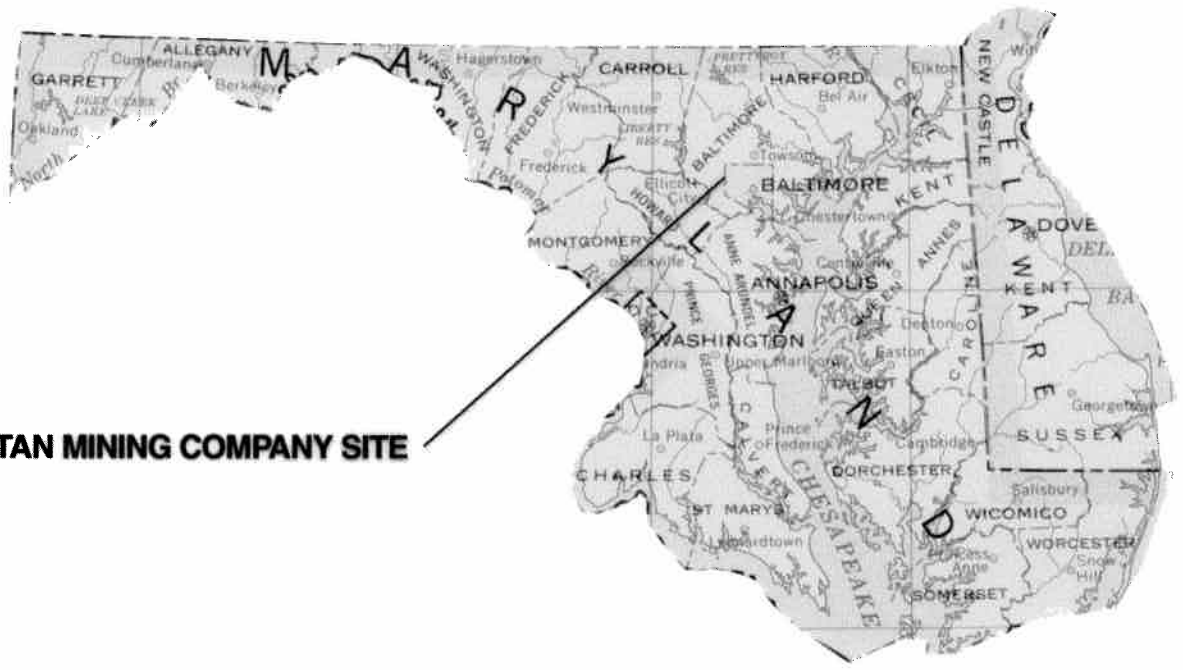


FIGURE 1
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

STUDY AREA LOCATION MAP
BALTIMORE COUNTY, MARYLAND

APPROX. SCALE 1:2,500,000

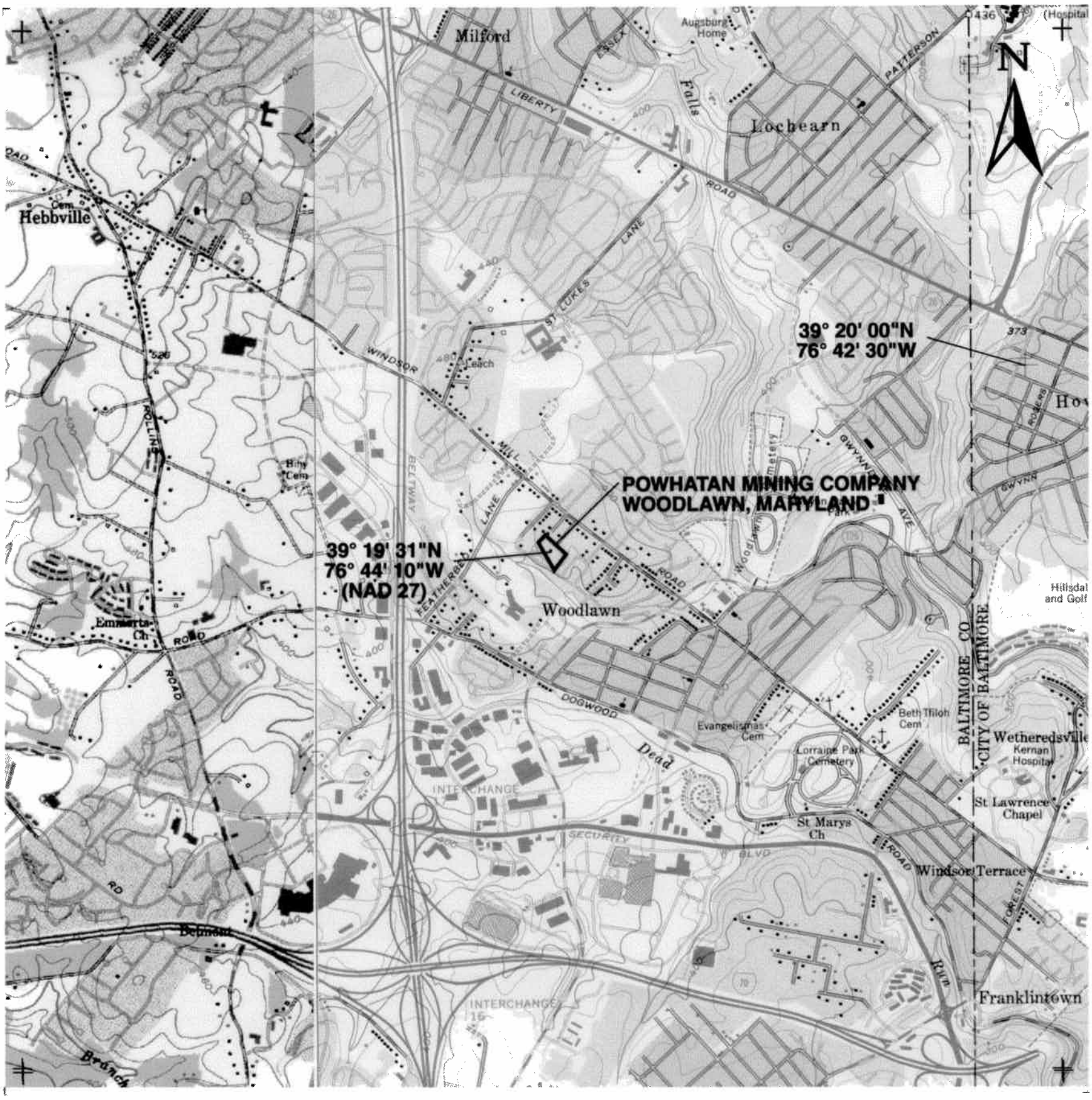


FIGURE 2
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

LOCAL STUDY AREA LOCATION MAP
BALTIMORE WEST & ELLICOTT CITY, MD
USGS QUADRANGLES, 1974

APPROX. SCALE 1:24,000

FIGURE 3
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

APRIL 11, 1938

APPROX. SCALE 1:2,020

FIGURE 4
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

APRIL 25, 1943

APPROX. SCALE 1:2,020

FIGURE 5
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

DECEMBER 1, 1947

APPROX. SCALE 1:2,020

FIGURE 6
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

AUGUST 26, 1952

APPROX. SCALE 1:2,140

FIGURE 7
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

SEPTEMBER 27, 1957

APPROX. SCALE 1:2,020

FIGURE 8
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

MAY 16, 1964

APPROX. SCALE 1:2,020

FIGURE 9
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

FEBRUARY 21, 1966

APPROX. SCALE 1:2,020

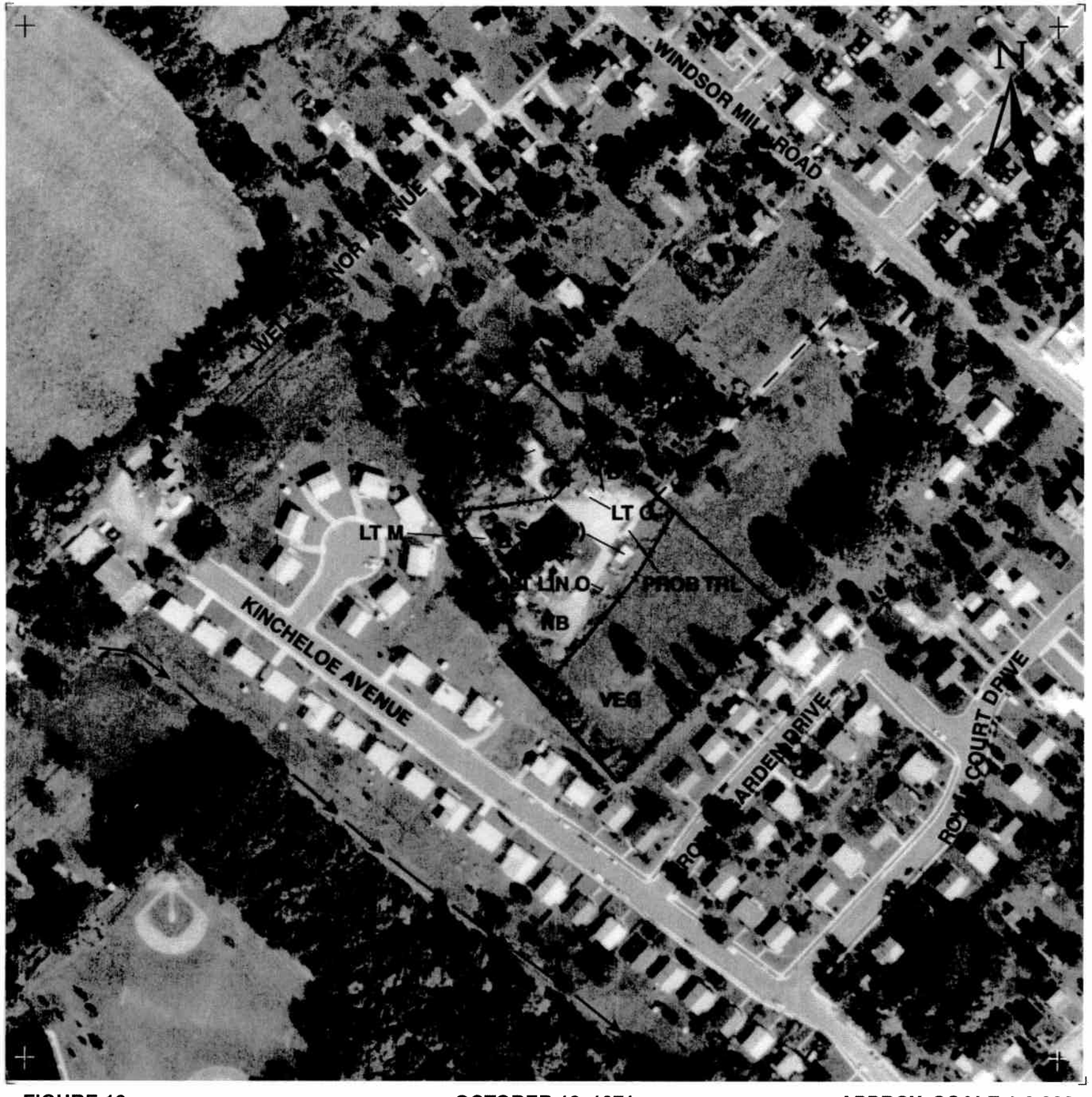


FIGURE 10
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

OCTOBER 12, 1971

APPROX. SCALE 1:2,020

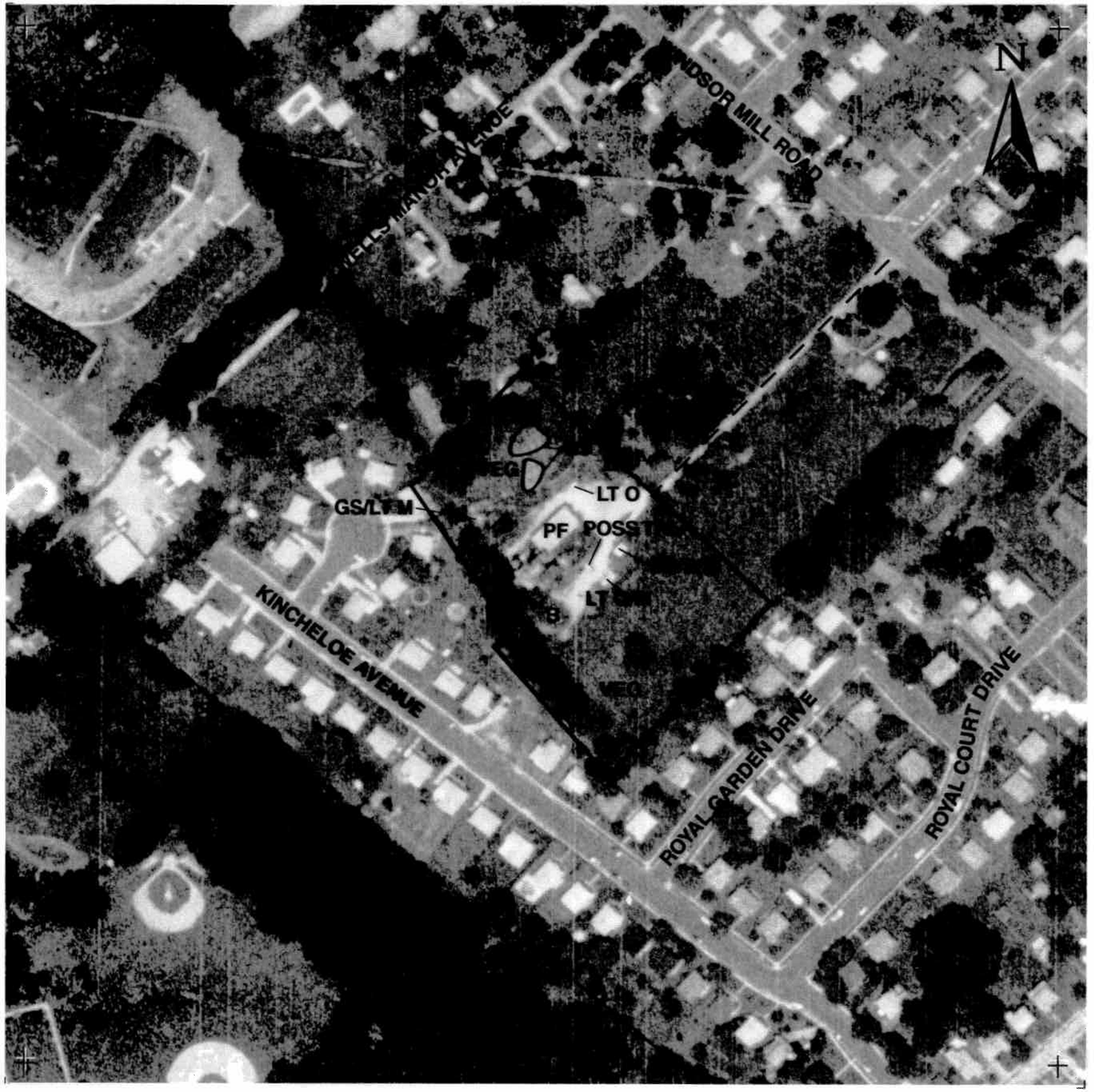


FIGURE 11
POWHATAN MINING COMPANY
WOODLAWN, MARYLAND

JUNE 15, 1979

APPROX. SCALE 1:2,020

ATTACHMENT B

November 4, 2010

Christopher Baer
Weston Solutions, Inc.
1400 Weston Way
West Chester, PA 19380

Project: Geophysical Survey – 6722 Windsor Mill Rd.– Gwynn Oak, MD

Dear Chris;

The following is a brief letter report detailing the results of the geophysical survey performed at the above referenced site. Site maps and/or pertinent ground penetrating radar (GPR) transects are contained in the report and Appendix A. It would be helpful to review Appendix A and the site maps when reading this report. TPI's standard practice is to indicate the results of the geophysical survey by marking all identified utility lines, tanks, and GPR anomalies etc. with chalk, paint or flags. It should be noted that this report is a means of transferring data and results of data interpretation, which was performed during the time allotted for the fieldwork

Project Scope and Visual Site Inspection

TPI Environmental, Inc. (TPI) was contracted by Weston Solutions, Inc. (client) to clear soil borings and locate private utilities in the immediate vicinity of the borings. The site consists of an incomplete neighborhood development at the above address and as indicated on Figure 1. Upon arrival to the site on October 25, 2010, TPI performed a site walk to review one call utility mark outs and evidence of other on-site utilities in the vicinity of the borings. During the site walk the following areas of interest were noted;

- Utilities not marked and to be investigated during the survey include; water, private electric, gas, telephone, storm sewer, and the sanitary sewer.

Methodology

Geophysical surveys are typically accomplished by employing the following techniques; GPR, Fisher TW6 electromagnetic metal detection (TW6 EM), a Geonics EM61-MK2 Time – Domain Electromagnetic Detector unit (EM61), radio frequency line locating (RF), and magnetics. Known utilities are typically traced with the RF unit, GPR, and the TW6 EM unit depending on the size, matrix and conductive properties of the line. The EM61 is a high power, high sensitivity metal detector capable of detecting both ferrous and non-ferrous metal. The TW6 EM unit sounds an audible alarm in the presence of a large mass of metal such as an UST. A description and discussion of these geophysical methods as well as TPI's standard procedures for performing geophysical surveys is found in Appendix A. In general, "blind surveys" are typically performed by initially scanning the site with a TW6 EM unit and/or an EM61 unit and noting areas of relatively high EM response. Then locations with high EM response are further investigated with GPR. EM units are typically not effective and practical in areas underlain with

reinforced concrete and/or the presence of ubiquitous metallic objects.

Geophysical Survey Results

The geophysical survey at this site was accomplished with the TW6 EM, RF and GPR units. Known utilities were traced and confirmed with the GPR and RF units then the borings were scanned and cleared with the TW6 and GPR units. Results of the geophysical survey were marked on the ground with paint and a map of the geophysical survey result as well as pertinent GPR images are contained in this report. Results of the geophysical survey are as follows;

- Fifteen soil boring locations were scanned, moved as needed, and marked with white paint and flags.

TPI completes non-intrusive geophysical surveys using equipment and techniques representing best available technology. TPI does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen and varying site-specific conditions such as metal-reinforced concrete. In practical terms, TPI serves to reduce the risk of encountering subsurface utilities during excavation operations or greatly increase the chance of locating man made subsurface objects depending on the goal of the project. The results of this investigation should only be used as a tool and should not be considered a guarantee regarding the presence or absence of USTs or piping.

If you should require additional information or have any questions, please do not hesitate to contact me at the above phone number or email me at ffendler@tpienv.com.

Sincerely,

Frank Fendler
Frank Fendler, M.S, P.G.
President

Michael Robbins
Michael Robbins, M.S.
Geologist

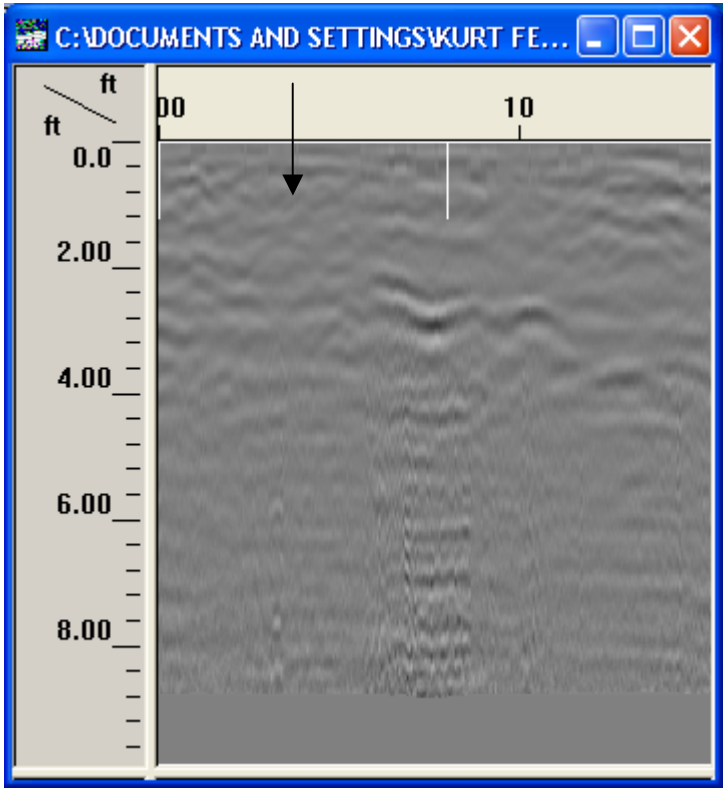
TPI environmental	6722 Windsor Mill Rd, Gwynn Oak, MD		Figure 1
	Client: Weston	Date: 10-20-10	Geophysical Survey Results

Appendix A

Geophysical Survey Data & Results

PO Box 518
New Hope, PA 18938
888-204-3266-Phone
tpi@tpienv.com
www.tpienv.com

GPR Transect 170
East Across SB 2



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tpi@tpienv.com
www.tpienv.com

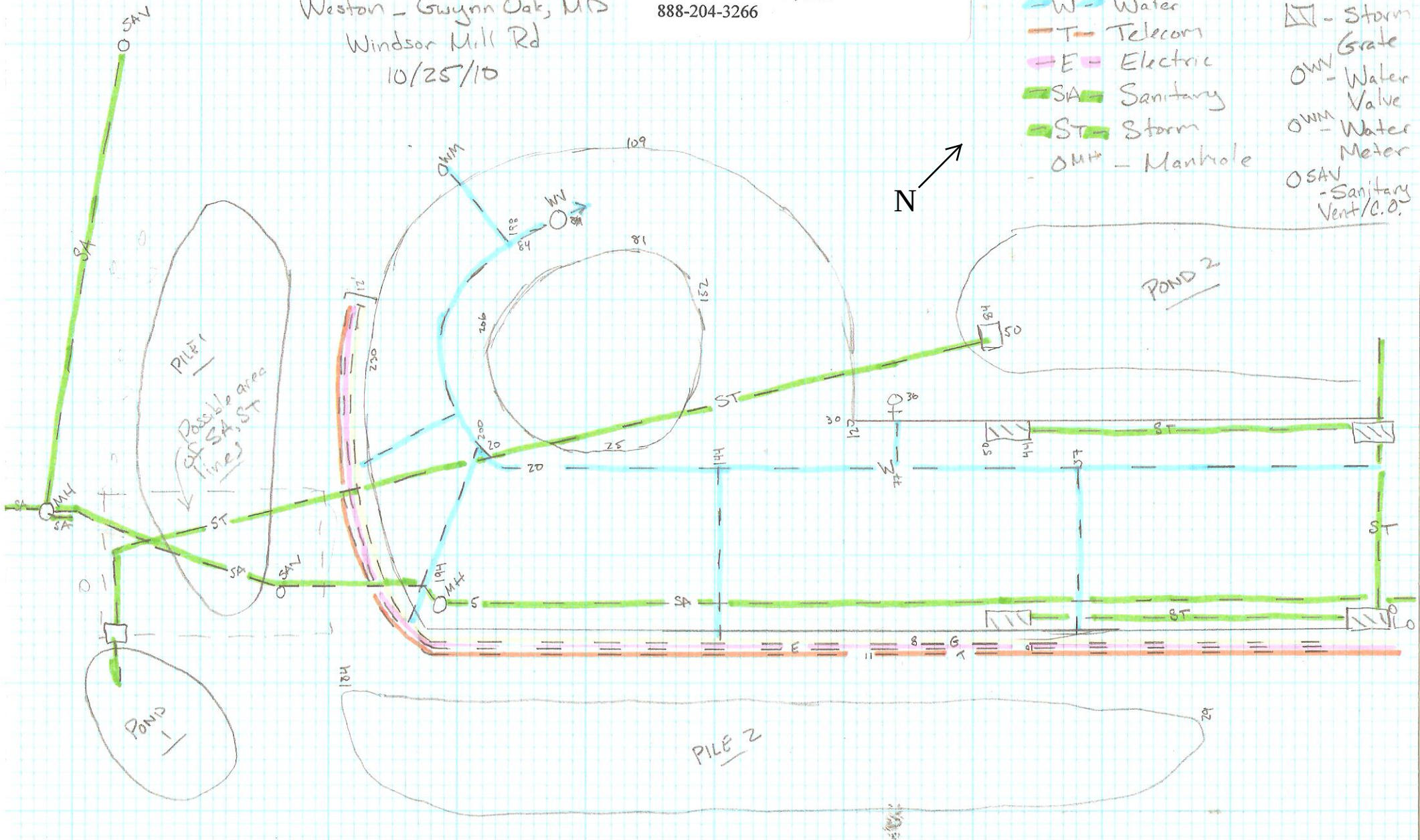
Field Notes

TPI Environmental, Inc.
888-204-3266

Weston - Gwynn Oak, MD
Windsor Mill Rd
10/25/10

LEGEND
- G - Gas
- W - Water
- T - Telecom
- E - Electric
- SA - Sanitary
- ST - Storm
- MH - Manhole

- Hydrant
- Storm Grate
- WV - Water Valve
- WM - Water Meter
- SAV - Sanitary Vent/C.O.

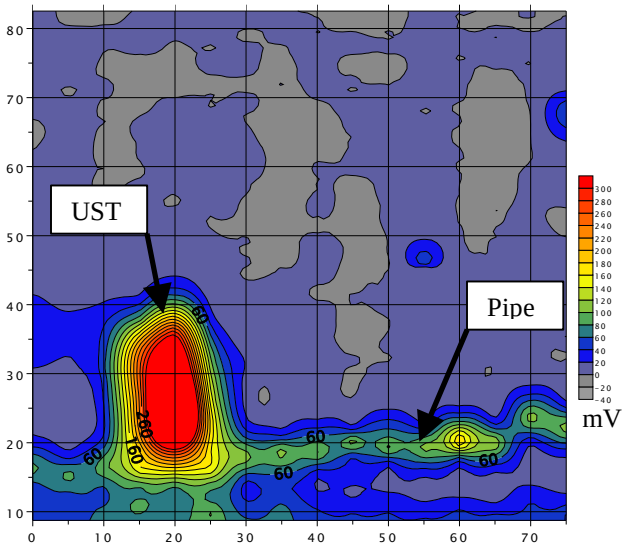


Attachment A
TPI's Geophysical Survey Equipment & Methods

Geonics EM61-MK2

The EM61 is a high resolution time-domain metal detector which is used to detect ferrous and non-ferrous metallic objects. It consists of a powerful transmitter that generates a pulsed primary magnetic field, which induces eddy currents in nearby metallic objects. The decay of these currents is measured by two receiver coils mounted on the coil assembly. The responses are recorded and displayed by an integrated computer based digital data logger with real time numberical and graphic display. Two ports on the logger allows simultaneous collection of EM and GPS data. For further processing and interpretation data can be transferred to a laptop computer in the field and a color contoured map of the EM61 reponse is prepared (see below).

EM61 Color Contoured Map



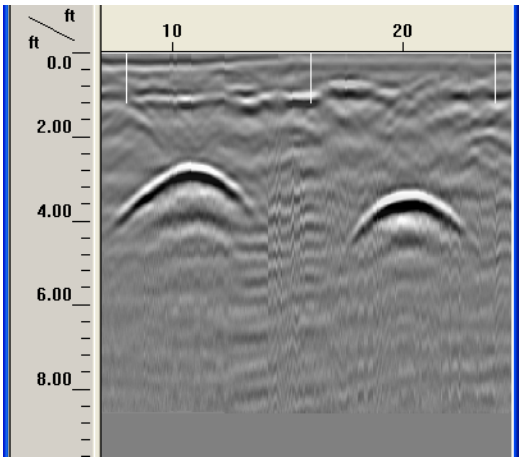
The EM61-MK2 detects a single 55 gallon drum at a depth of over 10-feet beneath the instrument, yet it is relatively insentsitive to interference from nearby surface metal such as fences, buildings, cars, etc. By making the measurement at a relatively long time after termination of the primary pulse, the response is practically independent of the electrical conductivity fo the ground.

Due to it unique coil arrangements, the response curve is a single well defined positive peak greatly facilitating quick and accurate location of the target, the depth of which can usually be estimated from the width of the response and/or from relative response from each of the two receiver coils.

GPR

This method is one of the most powerful and cost effective methods of locating man made objects and stratigraphic layers in the subsurface. It is an active method that transmits electromagnetic pulses into the ground, the radar pulses are reflected from materials or layers of differing dielectric and electrical conductive properties. The GPR computer measures the elapsed time in billionths of a second (nanoseconds) from when the pulses are sent and when they are received back at the surface that can then be converted to depth. Results of the radar scan are displayed as a continuous cross section of the subsurface on the computer screen in real time. Metallic materials such as tanks, pipes conduits, rebar etc. have vastly different dielectric properties then soils so there reflections are striking and relatively easy to identify. Pipes and tanks constructed of PVC, concrete, and terracotta also produce distinct reflections, however, these reflections are typically not as striking as metallic materials. A typical radar image of two metallic underground storage tanks is found below.

GPR Image Of Two Metallic USTs



GPR surveys are conducted with the most advanced GPR equipment currently available

PO Box 518
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Attachment A
TPI's Geophysical Survey Equipment & Methods

including a Geophysical Survey Systems (GSSI) SIR-3000 subsurface radar unit with a 400 MHz antenna. The 400 MHz antenna has a depth range of approximately 20-feet and other antennas may be employed with the system depending on specific site conditions and objectives of the survey. The GPR transect data may be saved on the internal hard drive and transferred to a PC for storage, printing, and post processing. GSSI is the world leader in the development of GPR systems and was the first company to commercialize GPR in 1970. GPR hardware and software has improved dramatically over the last several years allowing for relatively rapid and economical GPR surveys. With 3-dimensional capabilities, the latest GPR software takes data processing a step farther then the former 2-dimensional viewing method. Three-dimensional visualization helps you to see the whole picture, giving you a powerful tool to interpret complex utility layouts and identify subtle linear features that may have otherwise been missed.

GPR surveys are typically conducted by searching for GPR hyperbolas indicative of subsurface pipes or tanks signatures in the vicinity of known entities. Theses signatures are marked on the ground and areas progressively further from the known entity are scanned and marked. This process is continued until the GPR operator performed enough scans to determine and mark the subsurface pipe, tank or anomaly. During this process the GPR data is typically not saved due to the immense size of the data files. After this phase of the GPR survey is completed, representative GPR transects or grids are performed and saved for the report and post processing. Some of the factors that may negatively affect GPR results include clay soils, rebar in concrete, high moisture content, depth of the target, and the integrity, size, and material of the target.

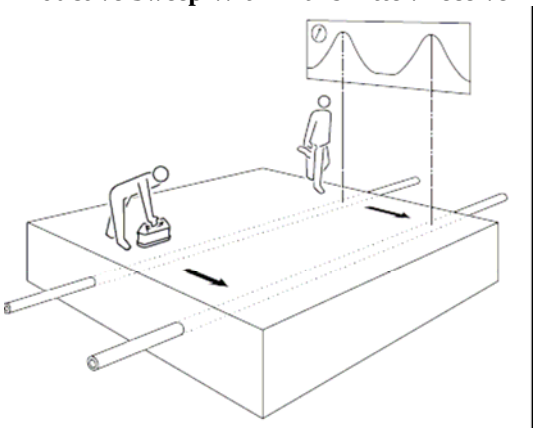
TW-6 EM Unit

TPI routinely employs a Fisher TW-6 electromagnetic metal detector when performing GPR surveys. The TW-6 creates an electromagnetic field with a transmitting coil and measures the strength of that field with a receiving coil. As the TW-6 passes over electrically conductive materials such as metal tanks or drums the field is distorted and the instrument produces an audible alarm based on the degree of the distortion. The TW-6 can detect conductive materials the size of drums or small tanks to depths of 10-feet. The instrument is actually a relatively poor metal detector which makes it ideal for locating large conductive materials such as metal drums, medium to large metal pipes, reinforced concrete pipes, and metal tanks. A more sensitive metal detector would produce "false positives" on small pieces of metal that are typically found in fill and throughout developed sites. If the survey area is underlain by reinforced concrete or cars and other large surficial metallic features are within 10-feet, the TW-6 will not be useful.

Line Locating

Line locating is performed with a Radiodetection RD400 PXL-2 line locator with a 433 HCTX-2 transmitter. The transmitter emits a specific radio or electromagnetic signal which is indirectly induced or directly conducted onto the metallic line. The transmitter is capable of producing frequencies of 512 Hz, 8 kHz, or 33 kHz and the receiver is configured for the specific transmitted frequency. The induced signal is coupled with the line by either using an induction clamp which surrounds an exposed line or placing the transmitter above a buried line and transmitting the signal to it. The receiver may also be used in a passive locate mode (power) to identify the presence of current carrying lines. Nonmetallic lines may also be located by snaking a sonde down accessible lines with push rods. A sonde is a small transmitter that emits a specific electromagnetic frequency which can be detected by the receiver at depths of 12 to 16-feet.

Inductive Sweep With Transmitter/Receiver



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888-204-3266-Fax

ATTACHMENT C

The Geoprobe® direct push drilling method is used to collect soil analytical samples and lithologic data from the soil column where bedrock is not anticipated to be encountered. Continuous soil samples are collected from each soil boring using a Geoprobe® macrosampler. The macrosampler is a 2-inch diameter, 4-foot long, steel cylinder that is fitted with a 4-foot long, inner acetate liner that holds the soil sample. The macrosampler is advanced into the soil column by the truck- or track-mounted Geoprobe® drilling rig, which operates via hydraulic power to directly push the macrosampler below surface in 4 foot increments. The following is a summary of the procedures used to collect a soil sample with a Geoprobe® rig:

- Insert a clean dedicated acetate liner into a clean macrosampler.
- Advance the macrosampler 4 ft with a hydraulic hammer.
- Remove the macrosampler from the borehole and unscrew the shoe from the tip of the macrosampler.
- Pull the acetate liner from the macrosampler.
- Place the acetate liner on a surface covered with clean visqueen (plastic).
- Slice open the acetate liner with a utility knife.

Soil samples are collected directly from the acetate liner and placed into labeled, clean, laboratory-prepared sample containers. Soil samples should be collected from the intervals which showed signs of white or gray fibrous material.

Image of a small track mounted GeoProbe® direct push rig that was used during the assessment.

ATTACHMENT D

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Greenhorne & O'Mara	**Job Name:**	Powhatan Mill	**Chain Of Custody:**	181482
Address:	6110 Frost Place	**Job Location:**	Woodlawn, MD	**Date Analyzed:**	4/10/2009
	Laurel, Maryland 20707	**Job Number:**	Not Provided	**Person Submitting:**	Charlie McEleney
		P.O. Number:	Not Provided		

Attention: Ross Voorhees

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0934763	1-PM-040209	5	--	--	--	5	--	--	TR	--	--	95	Black	Homogeneous	SW	The Other Asbestos is Anthophylite
0934764	2-PM-040209	20	--	--	--	20	--	--	--	--	--	80	Beige	Homogeneous	SW	The Other Asbestos is Anthophylite
0934765	3-PM-040209	5	--	--	--	5	--	--	TR	--	--	95	Gray	Homogeneous	SW	The Other Asbestos is Anthophylite
0934766	4-PM-040209	20	--	--	--	20	--	--	--	--	--	80	Beige	Homogeneous	SW	The Other Asbestos is Anthophylite
0934767	5-PM-040209	7	5	--	--	2	--	--	--	--	--	93	Gray	Homogeneous	SW	The Other Asbestos is Anthophylite
0934768	6-PM-040209	98	--	--	--	98	--	--	--	--	--	2	White	Homogeneous	SW	The Other Asbestos is Anthophylite
0934769	7-PM-040209	25	--	--	--	25	--	--	TR	--	5	70	Tan	Homogeneous	SW	The Other Asbestos is Anthophylite
0934770	8-PM-040209	5	--	--	--	5	--	--	5	TR	--	90	Brown	Homogeneous	SW	The Other Asbestos is Anthophylite
0934771	9-PM-040209	25	--	--	--	25	--	--	TR	TR	5	70	Brown	Homogeneous	SW	The Other Asbestos is Anthophylite
0934772	10-PM-040209	25	--	--	--	25	--	--	--	--	5	70	Brown	Homogeneous	SW	The Other Asbestos is Anthophylite

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP® 101143-0

Client:	Greenhorne & O'Mara	**Job Name:**	Powhatan Mill	**Chain Of Custody:**	181482
Address:	6110 Frost Place	**Job Location:**	Woodlawn, MD	**Date Analyzed:**	4/10/2009
	Laurel, Maryland 20707	**Job Number:**	Not Provided	**Person Submitting:**	Charlie McEleney
		P.O. Number:	Not Provided		
Attention:	Ross Voorhees				

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0934773	11-PM-040209	25	--	--	--	25	--	--	TR	--	5	70	Brown	Homogeneous	SW	The Other Asbestos is Anthophylite
0934774	12-PM-040209	25	--	--	--	25	--	--	TR	--	5	70	Brown	Homogeneous	SW	The Other Asbestos is Anthophylite
0934775	13-PM-040209	15	--	--	--	15	--	--	--	--	5	80	Off-White	Homogeneous	SW	The Other Asbestos is Anthophylite
0934776	14-PM-040209	10	--	--	--	10	--	--	TR	TR	--	90	Black	Homogeneous	SW	The Other Asbestos is Anthophylite

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

Surat Watson

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

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Focused on Results
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643
www.amalab.com

CHAIN OF CUSTODY

email to: rvoorhees@g-and-a.com

(Please Refer To This Number For Inquires) 181482

1 of 2

Mailing/Billing Information:

1. Client Name: Greenhorne & O'Mara Inc
2. Address 1: 6110 Frost Place
3. Address 2: Laurel MD 20707
4. Address 3:
5. Phone #(301) 982-2800 Fax #:

Submittal Information:

1. Job Name: Powhatan Mill
2. Job Location: Woodlawn, MD
3. Job #: P.O. #:
4. Contact Person: Ross Voorhees @ phone #
5. Submitted by: Charlie McElveny Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
- ❑ Immediate Date Due:
- ❑ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ❑ Immediate
- ❑ Next Day
- ❑ 2 Day
- ❑ 3 Day
- ☒ ~~5 Day~~ +
- Date Due: 4/10/09
- ❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
- ❑ Include COC/Field Data Sheets with Report
- ❑ Email: ~~ross~~ rvoorhees@g-and-a.com
- ❑ Fax:
- ❑ Verbals:

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
PC MCE Porosity in a 25mm 37mm
- ❑ NIOSH 7400 (QTY)
- ❑ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
PC MCE Porosity in a 25mm 37mm
- ❑ AHERA (QTY)
- ❑ NIOSH 7402 (QTY)
- ❑ Other (specify) (QTY)

PLM Bulk
- ☒ ~~EPA 600~~ – Visual Estimate 14 (QTY)
- ❑ EPA Point Count (QTY)
- ❑ NY State Friable 198.1 (QTY)
- ❑ Grav. Reduction ELAP 198.6 (QTY)
- ❑ Other (specify) (QTY)

TEM Bulk
- ❑ ELAP 198.4/Chatfield (QTY)
- ❑ NY State PLM/TEM (QTY)
- ❑ Residual Ash (QTY)

TEM Dust
- ❑ Qual. (pres/abs) Vacuum/Dust (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 (QTY)
- ❑ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ❑ Qual. (pres/abs) (QTY)
- ❑ ELAP 198.2/EPA 100.2 (QTY)
- ❑ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Lead Analysis
- ❑ Paint Chip (QTY)
- ❑ Dust Wipe (wipe type) (QTY)
- ❑ Air (QTY)
- ❑ Soil/Solid (QTY)
- ❑ TCLP (QTY)
- ❑ Drinking Water (QTY)
- ❑ Waste Water (QTY)
- ❑ Dust Wipe Furnace (wipe type) (QTY)

Mold - Direct Microscopic Analysis
- ❑ Collection Apparatus for Spore Traps:
- ❑ Spore-Trap (QTY) ❑ Bulk (QTY)
- ❑ Surface Swab (QTY) ❑ Surface Vacuum Dust (QTY)
- ❑ Surface Tape (QTY) ❑ Other (Specify) (QTY)

SAMPLE INFORMATION				ANALYSIS					MATRIX						CLIENT CONTACT
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	(LABORATORY STAFF ONLY)
1-PM-040209	Surface Soil	4/2/09															Date/Time: Contact: By:
2-PM-040209	Debris																
3-PM-040209	Residue																
4-PM-040209	Debris																
5-PM-040209	Debris																Date/Time: Contact: By:
6-PM-040209	Rock ore																
7-PM-040209	Debris																
8-PM-040209	DUST																
9-PM-040209	DUST																Date/Time: Contact: By:
10-PM-040209	Debris																
11-PM-040209	Debris																
12-PM-040209	Air Debris																

LABORATORY STAFF ONLY:

1. Date/Time RCVD: 4/3/09 @ 1130 Via: MC By (Print): David Hudson Sign:
2. Date/Time Analyzed: 4/10/09 @ By (Print): Surat Watson Sign:
3. Results Reported To: Ross Voorhees Via: Email Date: 4/10/09 Time: Initial:

AMA Analytical Services, Inc.
Focused on Results
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643
www.amalab.com

CHAIN OF CUSTODY

email to: rvoorhees@g-and-o.com

(Please Refer To This Number For Inquires) 181481~~2~~ 2 of 2

Mailing/Billing Information:

1. Client Name: Gregalunas & O'Mara Inc.
2. Address 1: 6110 Frost Place
3. Address 2: Laurel, MD 20707
4. Address 3:
5. Phone #: (301) 982-2800 Fax #:

Submittal Information:

1. Job Name: Powhatan Mill
2. Job Location: Woodlawn, MD
3. Job #: P.O. #:
4. Contact Person: Ross Voorhees @ phone # (301) 982-2852
5. Submitted by: Charlie McElroy Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)
❑ Immediate Date Due:
❑ 24 Hours Time Due:
Comments:

NORMAL BUSINESS HOURS
❑ Immediate ❑ 3 Day
❑ Next Day ☒ 5 Day +
❑ 2 Day Date Due:
❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
❑ Include COC/Field Data Sheets with Report
❑ Email: rvoorhees@g-and-o.com
❑ Fax:
❑ Verbals:

Asbestos Analysis

PCM Air – Please Indicate Filter Type:
PC MCE Porosity in a 25mm 37mm
❑ NIOSH 7400 (QTY)
❑ Fiberglass (QTY)

TEM Air – Please Indicate Filter Type:
PC MCE Porosity in a 25mm 37mm
❑ AHERA (QTY)
❑ NIOSH 7402 (QTY)
❑ Other (specify) (QTY)

PLM Bulk
❑ EPA 600 – Visual Estimate (QTY)
❑ EPA Point Count (QTY)
❑ NY State Friable 198.1 (QTY)
❑ Grav. Reduction ELAP 198.6 (QTY)
❑ Other (specify) (QTY)

TEM Bulk
❑ ELAP 198.4/Chatfield (QTY)
❑ NY State PLM/TEM (QTY)
❑ Residual Ash (QTY)

TEM Dust
❑ Qual. (pres/abs) Vacuum/Dust (QTY)
❑ Quan. (s/area) Vacuum D5755-95 (QTY)
❑ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
❑ Qual. (pres/abs) (QTY)
❑ ELAP 198.2/EPA 100.2 (QTY)
❑ EPA 100.1 (QTY)

❑ All samples received in good condition unless otherwise noted.
(TEM Water samples °C)

Lead Analysis
❑ Paint Chip (QTY)
❑ Dust Wipe (wipe type) (QTY)
❑ Air (QTY)
❑ Soil/Solid (QTY)
❑ TCLP (QTY)
❑ Drinking Water (QTY)
❑ Waste Water (QTY)
❑ Dust Wipe Furnace (wipe type) (QTY)

Mold - Direct Microscopic Analysis
❑ Collection Apparatus for Spore Traps:
❑ Spore-Trap (QTY) ❑ Bulk (QTY)
❑ Surface Swab (QTY) ❑ Surface Vacuum Dust (QTY)
❑ Surface Tape (QTY) ❑ Other (Specify) (QTY)

SAMPLE INFORMATION / **ANALYSIS** / **MATRIX**

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
13-PM-040209		4/2/09														
14-PM-040209		"														

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

LABORATORY STAFF ONLY:

1. Date/Time RCVD: / / @ Via: By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported By: Via: Date: / / Time: Initials:

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Greenhorne & O'Mara	**Job Name:**	Powhatan	**Chain Of Custody:**	191752
Address:	6110 Frost Place	**Job Location:**	Baltimore Co	**Date Analyzed:**	7/10/2009
	Laurel, Maryland 20707	**Job Number:**	110580	**Person Submitting:**	Ross Voorhess
		P.O. Number:	Not Provided		

Attention: Ross Voorhess

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0951582	1-1	TR	--	--	--	TR	--	--	--	--	--	100	Multi	Homogeneous	CK	Other Asbestos Type is Anthophyllite.
0951583	1-2	NAD	--	--	--	--	--	--	--	--	--	100	Multi	Homogeneous	CK	
0951584	1-3	NAD	--	--	--	--	--	--	--	--	--	100	Black	Homogeneous	CK	
0951585	2-1	NAD	--	--	--	--	--	--	--	--	--	100	Beige	Homogeneous	CK	
0951586	2-2	NAD	--	--	--	--	--	--	--	--	--	100	Black	Homogeneous	CK	
0951587	2-3	TR	--	--	--	TR	--	--	--	--	--	100	Multi	Homogeneous	CK	Other Asbestos Type is Anthophyllite.
0951588	2-4	NAD	--	--	--	--	--	--	--	--	--	100	Multi	Homogeneous	CK	
0951589	3-1	NAD	--	--	--	--	--	--	--	--	--	100	Brown	Homogeneous	CK	
0951590	4-1	NAD	--	--	--	--	--	--	--	--	--	100	Black	Homogeneous	CK	
0951591	5-1 White	2	--	--	--	2	--	--	--	--	--	98	Beige	Homogeneous	CK	Other Asbestos Type is Anthophyllite.
0951592	5-1 Black	NAD	--	--	--	--	--	--	--	--	--	100	Black	Homogeneous	CK	
0951593	6-1	100	--	--	--	100	--	--	--	--	--	--	Off-White	Homogeneous	CK	Other Asbestos Type is Anthophyllite.

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that itis not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	Greenhorne & O'Mara	**Job Name:**	Powhatan	**Chain Of Custody:**	191752
Address:	6110 Frost Place	**Job Location:**	Baltimore Co	**Date Analyzed:**	7/10/2009
	Laurel, Maryland 20707	**Job Number:**	110580	**Person Submitting:**	Ross Voorhess
		P.O. Number:	Not Provided		

Attention: Ross Voorhess

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Color	Homogeneity	Analyst ID	Comments
0951594	6-2	5	--	--	--	5	--	--	--	--	--	95	Brown	Homogeneous	CK	Other Asbestos Type is Anthophyllite.

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

Crystal Kellam

This report applies only to the sample, or samples, investigated and is not necessarily indicative of the quality or condition of apparently identical or similar products. As a mutual protection to clients, the public, and these Laboratories, this report is submitted and accepted for the exclusive use of the client to whom it is addressed and upon the condition that it is not to be used, in whole or in part, in any advertising or publicity matter without prior written authorization from us. Sample types, locations, and collection protocols are based upon the information provided by the persons submitting them and, unless collected by personnel of these Laboratories, we expressly disclaim any knowledge and liability for the accuracy and completeness of this information. Residual sample material will be discarded in accordance with the appropriate regulatory guidelines, unless otherwise requested by the client. NVLAP accreditation applies only to polarized light microscopy of bulk samples and transmission electron microscopy of AHERA air samples. This report must not be used to claim, and does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. All rights reserved. AMA Analytical Services, Inc.

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) **191752**

Mailing/Billing Information:

1. Client Name: Greenhorne + O'Mara
2. Address 1: 6110 Frost Place
3. Address 2: Laurel, MD 20707
4. Address 3:
5. Phone #: FAX #:

Submittal Information:

1. Job Name: Pow + Ham
2. Job Location: Baltimore Co
3. Job #: 110590 P.O. #: 443-995-1074
4. Contact Person: Ross Voorhees @ phone #
5. Submitted by: Signature:

Reporting Information (Results will be provided as soon as technically feasible):

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day 10	❑ Include COC/Field Data Sheets with Report
❑ 24 Hours Time Due:	☒ 5 Day + 7-8-09	❑ Email: RVoorhees @ G-and-O.com
Comments	❑ Next Day ❑ 2 Day	❑ Fax:
	Date Due: ❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	❑ Verbals: G

Asbestos Analysis

PCM Air -- Please Indicate Filter Type:
- ❑ NIOSH 7400 (QTY)
- ❑ Fiberglass (QTY)

TEM Air -- Please Indicate Filter Type:
- ❑ AHERA (QTY)
- ❑ NIOSH 7402 (QTY)
- ❑ Other (specify) (QTY)

PLM Bulk
- ☒ EPA 600 Visual Estimate 12 (QTY)
- ❑ EPA Point Count (QTY)
- ❑ NY State Friable 198.1 (QTY)
- ❑ Grav. Reduction ELAP 198.6 (QTY)
- ❑ Other (specify) (QTY)

MISC
- ❑ Vermiculite
- ☒ Asbestos Soil PLM 12 Quals: PLM__ Quals: PLM-TEM__ Quals: PLM-PCM__ Quals:

TEM Bulk
- ❑ ELAP 198.4/Chatfield (QTY)
- ❑ NY State PLM/TEM (QTY)
- ❑ Residual Ash (QTY)

TEM Dust
- ❑ Qual. (pres/abs) Vacuum/Dust (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 (QTY)
- ❑ Quan. (s/area) Dust D6480-99 (QTY)

TEM Water
- ❑ Qual. (pres/abs) (QTY)
- ❑ ELAP 198.2/EPA 100.2 (QTY)
- ❑ EPA 100.1 (QTY)

❑ All samples received in good condition unless otherwise noted. (TEM Water samples "C)

Metals Analysis
- ❑ Pb Paint Chip (QTY)
- ❑ Pb Dust Wipe (wipe type) (QTY)
- ❑ Pb Air (QTY)
- ❑ Pb Soil/Solid (QTY)
- ❑ Pb TCLP (QTY)
- ❑ Drinking Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Waste Water ❑ Pb (QTY) ❑ Cu (QTY) ❑ As (QTY)
- ❑ Pb Furnace (Media) (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ❑ Spore-Trap (QTY)
- ❑ Surface Swab (QTY)
- ❑ Surface Tape (QTY)
- ❑ Other (Specify) (QTY)
- ❑ Surface Vacuum Dust (QTY)
- ❑ Culturable ID Genus (Media) (QTY)
- ❑ Culturable ID Species (Media) (QTY)

SAMPLE INFORMATION					ANALYSIS						MATRIX							CLIENT CONTACT
CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	(LABORATORY STAFF ONLY)
1-1							✓										Date/Time: Contact: By:
1-2							✓										Please bag all positive *
1-3							✓										materials for Colin
2-1							✓										Date/Time: Contact: By:
2-2							✓										References
2-3							✓										
2-4							✓										
3-1							✓										
4-1							✓										Date/Time: 7/14 1150 Contact: RV By: KOA
5-1							✓										see attached
6-1							✓										
6-2							✓										

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 6 / 30 / 09 @ 8.10 Via: DO By (Print): Surat Watson Sign:
2. Date/Time Analyzed: 7 / 10 / 09 @ By (Print): Crystal Kellam Sign:
3. Results Reported To: R. Voorhees Via: Phone 7/10/09 Date: 7 / 10 Time: Initials:
4. Comments: E-mail 7/13/09

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-001	Lab Sample Number	040930263-0001	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	17
Air Volume (L)	4630	Analysis Date	12/29/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 17, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-002	Lab Sample Number	040930263-0002	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	18
Air Volume (L)	4300	Analysis Date	12/29/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-003	Lab Sample Number	040930263-0003	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	3860	Analysis Date	12/29/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 20, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-004	Lab Sample Number	040930263-0004	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	17
Air Volume (L)	4475	Analysis Date	12/29/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 17, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-005	Lab Sample Number	040930263-0005	Effective filter area (mm²)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm²)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	17
Air Volume (L)	4420	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 17, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm²)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm²) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-006	Lab Sample Number	040930263-0006	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	28
Air Volume (L)	2820	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 28, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-007	Lab Sample Number	040930263-0007	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	17
Air Volume (L)	4400	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	4.0E-04
Stopping Rule(s):	GO = 17, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-008	Lab Sample Number	040930263-0008	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	18
Air Volume (L)	4240	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-009	Lab Sample Number	040930263-0009	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	62
Air Volume (L)	1200	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	4.0E-04
Stopping Rule(s):	GO = 62, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-010	Lab Sample Number	040930263-0010	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	18
Air Volume (L)	4220	Analysis Date	1/5/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-010	Lab Sample Number	040930263-0010	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lab QC	Sample Status	Analyzed	# GOs counted	18
Air Volume (L)	4220	Analysis Date	1/5/2010		
QA Sample Type	RD	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-011	Lab Sample Number	040930263-0011	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	19
Air Volume (L)	4220	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.7E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

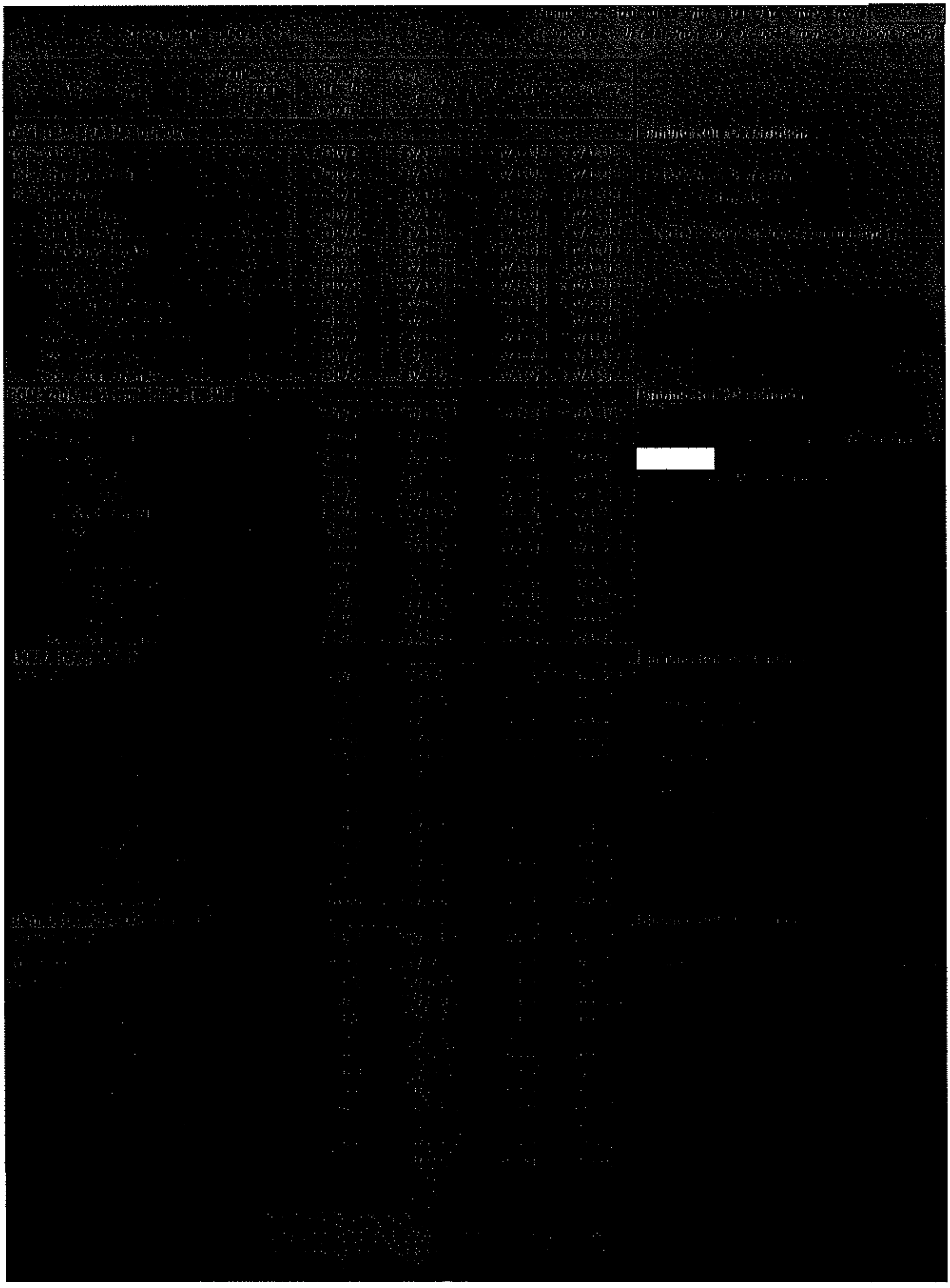
(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM

ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC1-012	Lab Sample Number	040930263-0012	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Damaged	# GOs counted	0
Air Volume (L)	4060	Analysis Date	1/0/1900		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	
Stopping Rule(s):	GO = , Structures = 50, Sensitivity = 4.00E-04				



Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-001	Lab Sample Number	040930263-0013	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	19
Air Volume (L)	4090	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 19, Structures = 100, Sensitivity = 4.00E-04				

Desired Confidence Interval (%): 95

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version B-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-002	Lab Sample Number	040930263-0014	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	3850	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 20, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-003	Lab Sample Number	040930263-0015	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	3720	Analysis Date	12/30/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	4.0E-04
Stopping Rule(s):	GO = 20, Structures = 100, Sensitivity = 4.00E-04				

Desired Confidence Interval (%): 95

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-004	Lab Sample Number	040930263-0016	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	16
Air Volume (L)	4770	Analysis Date	12/29/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 16, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-005	Lab Sample Number	040930263-0017	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	16
Air Volume (L)	4630	Analysis Date	12/29/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	4.0E-04
Stopping Rule(s):	GO = 16, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.5E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-007	Lab Sample Number	040930265-0001	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	4190	Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.5E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval	
Total TEM-EPASM Structures					**Binning Rule Description:**
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	Apply to fibers (F) only:
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	L ≥ 0.5um, AR ≥ 3
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	No restrictions for other structure types.
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
PCM Equivalent Structures (PCME)					**Binning Rule Description:**
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	Apply to all structures where Total column > 0:
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	L > 5um, W ≥ 0.25um, AR ≥ 3
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
AHERA (d) Structures					**Binning Rule Description:**
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	Apply to fibers (F) only:
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	L ≥ 0.5um, AR ≥ 5
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	No restrictions for other structure types.
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	Most "secondary" structures (structures
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	that are part of a primary complex structure)
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	are excluded.
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Berman Crump (2003) Structures					**Binning Rule Description:**
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	Apply to all structures where Total column > 0:
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	L > 10um, W ≤ 0.4um
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03	

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-008	Lab Sample Number	040930265-0002	Effective filter area (mm²)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm²)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	4190	Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.5E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm²)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm²) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-008	Lab Sample Number	040930265-0002	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lab QC	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	4190	Analysis Date	1/8/2010		
QA Sample Type	RP	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.5E-04
Stopping Rule(s):	GO = 18, Structures = 50, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-009	Lab Sample Number	040930265-0003	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	64
Air Volume (L)	1200	Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.9E-04
Stopping Rule(s):	GO = 62, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-010	Lab Sample Number	040930265-0004	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	4220	Analysis Date	1/7/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.5E-04
Stopping Rule(s):	GO = 18, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-011	Lab Sample Number	040930265-0005	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	4390	Analysis Date	1/7/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.4E-04
Stopping Rule(s):	GO = 17, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-CC2-012	Lab Sample Number	040930265-0006	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	20
Air Volume (L)	4530	Analysis Date	1/7/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.3E-04
Stopping Rule(s):	GO = 17, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.2E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-FB-01	Lab Sample Number	040930265-0007	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Blank	Sample Status	Analyzed	# GOs counted	10
Air Volume (L)		Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	blank
Stopping Rule(s):	GO = 10, Structures = 10, Sensitivity = 0.00E+00				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-LB-01	Lab Sample Number	040930265-0011	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	N/A	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lot Blank	Sample Status	Analyzed	# GOs counted	10
		Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (--)	blank
Stopping Rule(s):	GO = 10, Structures = 10, Sensitivity = 0.00E+00				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	0	Lab Sample Number	040930250	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	N/A	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lab QC	Sample Status	Analyzed	# GOs counted	10
		Analysis Date	12/30/2009		
QA Sample Type	LB	Method SOP	TEM ISO 10312	Sensitivity (--)	blank
Stopping Rule(s):	GO = 10, Structures = 10, Sensitivity = 0.00E+00				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM

ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	0	Lab Sample Number	040930263	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	N/A	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lab QC	Sample Status	Analyzed	# GOs counted	10
		Analysis Date	12/29/2009		
QA Sample Type	LB	Method SOP	TEM ISO 10312	Sensitivity (--)	blank
Stopping Rule(s):	GO = 10, Structures = 10, Sensitivity = 0.00E+00				

Number of Structures with Fatal Data Entry Errors: 0

(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only

(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)

(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)

(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM

ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	0	Lab Sample Number	040930265	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	N/A	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lab QC	Sample Status	Analyzed	# GOs counted	10
		Analysis Date	1/6/2010		
QA Sample Type	LB	Method SOP	TEM ISO 10312	Sensitivity (--)	blank
Stopping Rule(s):	GO = 10, Structures = 10, Sensitivity = 0.00E+00				

Number of Structures with Fatal Data Entry Errors: 0

Desired Confidence Interval (%): 95

(Structures with fatal errors are excluded from calculations below)

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)		95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	blank	blank - blank
Total Chrysotile (CH)	0	0.0E+00	blank	blank - blank
Total Amphibole	0	0.0E+00	blank	blank - blank
actinolite (AC)	0	0.0E+00	blank	blank - blank
amosite (AM)	0	0.0E+00	blank	blank - blank
anthophyllite (AN)	0	0.0E+00	blank	blank - blank
crocidolite (CR)	0	0.0E+00	blank	blank - blank
tremolite (TR)	0	0.0E+00	blank	blank - blank
Libby amphibole (LA)	0	0.0E+00	blank	blank - blank
other amphibole (OA)	0	0.0E+00	blank	blank - blank
other mineral class (OM)	0	0.0E+00	blank	blank - blank
Solid Soln: Amosite	0	0.0E+00	blank	blank - blank
Solid Soln: Trem-Act	0	0.0E+00	blank	blank - blank

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only

(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)

(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)

(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-ABS-001	Lab Sample Number	040930250-0001	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	25
Air Volume (L)	1230	Analysis Date	12/30/2009 - 12/31/2009		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	9.6E-04
Stopping Rule(s):	GO = 25, Structures = 100, Sensitivity = 1.00E-03				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval	
Total TEM-EPASM Structures					**Binning Rule Description:**
Total Asbestos	4	1.2E+01	3.9E-03	1.0E-03 - 9.9E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	Apply to fibers (F) only:
Total Amphibole	4	1.2E+01	3.9E-03	1.0E-03 - 9.9E-03	L ≥ 0.5um, AR ≥ 3
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	No restrictions for other structure types.
anthophyllite (AN)	4	1.2E+01	3.9E-03	1.0E-03 - 9.9E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
PCM Equivalent Structures (PCME)					**Binning Rule Description:**
Total Asbestos	4	1.2E+01	3.9E-03	1.0E-03 - 9.9E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	Apply to all structures where Total column > 0:
Total Amphibole	4	1.2E+01	3.9E-03	1.0E-03 - 9.9E-03	
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	L > 5um, W ≥ 0.25um, AR ≥ 3
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
anthophyllite (AN)	4	1.2E+01	3.9E-03	1.0E-03 - 9.9E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
AHERA (d) Structures					**Binning Rule Description:**
Total Asbestos	3	9.2E+00	2.9E-03	6.0E-04 - 8.4E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	Apply to fibers (F) only:
Total Amphibole	3	9.2E+00	2.9E-03	6.0E-04 - 8.4E-03	L ≥ 0.5um, AR ≥ 5
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	No restrictions for other structure types.
anthophyllite (AN)	3	9.2E+00	2.9E-03	6.0E-04 - 8.4E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	Most "secondary" structures (structures
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	that are part of a primary complex structure)
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	are excluded.
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Berman Crump (2003) Structures					**Binning Rule Description:**
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	Apply to all structures where Total column > 0:
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	L > 10um, W ≤ 0.4um
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03	

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-ABS-002	Lab Sample Number	040930250-0002	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	31
Air Volume (L)	960	Analysis Date	12/31/2009 - 1/2/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	1.0E-03
Stopping Rule(s):	GO = 31, Structures = 100, Sensitivity = 1.00E-03				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	8	2.0E+01	8.0E-03	3.4E-03 - 1.6E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Total Amphibole	8	2.0E+01	8.0E-03	3.4E-03 - 1.6E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
anthophyllite (AN)	7	1.7E+01	7.0E-03	2.8E-03 - 1.4E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
tremolite (TR)	1	2.5E+00	1.0E-03	2.5E-05 - 5.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	8	2.0E+01	8.0E-03	3.4E-03 - 1.6E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Total Amphibole	8	2.0E+01	8.0E-03	3.4E-03 - 1.6E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
anthophyllite (AN)	7	1.7E+01	7.0E-03	2.8E-03 - 1.4E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
tremolite (TR)	1	2.5E+00	1.0E-03	2.5E-05 - 5.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
AHERA (d) Structures				
Total Asbestos	8	2.0E+01	8.0E-03	3.4E-03 - 1.6E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Total Amphibole	8	2.0E+01	8.0E-03	3.4E-03 - 1.6E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
anthophyllite (AN)	7	1.7E+01	7.0E-03	2.8E-03 - 1.4E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
tremolite (TR)	1	2.5E+00	1.0E-03	2.5E-05 - 5.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Berman Crump (2003) Structures				
Total Asbestos	1	2.5E+00	1.0E-03	2.5E-05 - 5.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Total Amphibole	1	2.5E+00	1.0E-03	2.5E-05 - 5.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
tremolite (TR)	1	2.5E+00	1.0E-03	2.5E-05 - 5.5E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.7E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-ABS-003	Lab Sample Number	040930250-0003	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	50
Air Volume (L)	600	Analysis Date	1/4/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	9.9E-04
Stopping Rule(s):	GO = 50, Structures = 100, Sensitivity = 1.00E-03				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	8	1.2E+01	7.9E-03	3.4E-03 - 1.6E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Total Amphibole	8	1.2E+01	7.9E-03	3.4E-03 - 1.6E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
anthophyllite (AN)	6	9.2E+00	5.9E-03	2.2E-03 - 1.3E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
tremolite (TR)	2	3.1E+00	2.0E-03	2.4E-04 - 7.1E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	7	1.1E+01	6.9E-03	2.8E-03 - 1.4E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Total Amphibole	7	1.1E+01	6.9E-03	2.8E-03 - 1.4E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
anthophyllite (AN)	5	7.7E+00	4.9E-03	1.6E-03 - 1.2E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
tremolite (TR)	2	3.1E+00	2.0E-03	2.4E-04 - 7.1E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
AHERA (d) Structures				
Total Asbestos	8	1.2E+01	7.9E-03	3.4E-03 - 1.6E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Total Amphibole	8	1.2E+01	7.9E-03	3.4E-03 - 1.6E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
anthophyllite (AN)	6	9.2E+00	5.9E-03	2.2E-03 - 1.3E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
tremolite (TR)	2	3.1E+00	2.0E-03	2.4E-04 - 7.1E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Berman Crump (2003) Structures				
Total Asbestos	1	1.5E+00	9.9E-04	2.5E-05 - 5.5E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Total Amphibole	1	1.5E+00	9.9E-04	2.5E-05 - 5.5E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
anthophyllite (AN)	1	1.5E+00	9.9E-04	2.5E-05 - 5.5E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 3.6E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

EMSL ANALYTICAL, INC.
107 HADDON AVENUE
WESTMONT, NJ 08108
PHONE: (800) 220-3675
FAX: (856) 858-4960

January 22, 2010

Chris Burns
Environmental Scientist
Tetra Tech EMI
7 Creek Parkway
Suite 700
Boothwyn, PA 19061
570-417-1280
christopher.burns@ttemi.com

Re: **Narrative, Powhatan Site, ASTM D2216 Moisture Content 360903928 3 samples**

Dear Chris:

On December 22, 2009 EMSL Analytical, Inc. in Westmont, NJ received 3 soil samples via overnight carrier from Tetra Tech EMI, Boothwyn, PA for asbestos content analysis via ASTM D2216. These samples are associated with the Powhatan Mine Site. Samples were received under Chain of Custody. All analysis was performed in Westmont, NJ.

Percent Moisture Content ASTM D2216

Three samples were prepared following ASTM D2216. Samples were initially weighed and then placed in pre-weighed trays and put in a 110 ± 5 degrees C drying oven for 24 hours. The post drying weight was then calculated, and the samples were dried again for 1 hour. If the mass change between the weights was less than 0.1 %, moisture content was then determined. If not, then samples were dried in 1 hour increments until the change in weights was less than 0.1 %. Percent moisture content for all samples was calculated and reported.

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ 08108
Phone: (856) 858-4800

Materials Science Division

Attn.: *Christopher Burns*
Tetra Tech EMI
7 Creek Parkway Suite 700
Boothwyn, PA 19061

Phone: 570-417-1280 Fax: 610-485-8587

EMSL Case No.: 360903928
Sample(s) Received: 12/22/2009
Date of Analysis: 01/07/2010
Date Printed: 01/7/2010
Reported By: E. Mirica

- Laboratory Report -

Moisture Content

For

Project: Powhatan Mine Site/EP-S3-05-02-EPA, Start 3, Region 3
Project #103X9022026.0908003/ASTMD 2216-05

Analyzed by: *Eugenia Mirica, Ph.D.*
Senior Materials Scientist
January 7, 2010
Date

QA/QC : *John Newton*
Laboratory Manager
January 7, 2010
Date

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ 08108
Phone: (856) 858-4800

Attn.: Christopher Burns
Tetra Tech EMI
7 Creek Parkway Suite 700
Boothwyn, PA 19061

Phone: 570-417-1280 Fax: 610-485-8587

EMSL Case No.: 360903928
Sample(s) Received: 12/22/2009
Date of Analysis: 01/07/2010
Date Printed: 01/7/2010
Reported By: E. Mirica

Procurement of Samples and Analytical Overview:

The samples for analysis (three samples, soil) arrived at EMSL Analytical's corporate laboratory in Westmont, NJ on December 22, 2009. The package arrived in satisfactory condition with no evidence of damage to the contents. The samples were submitted for the purpose of the moisture content. The samples reported herein have been analyzed using the following equipment and methodologies.

Methods & Equipment:	ASTM D2216 Drying Oven, 110 ± 5°C Balance (0.01g sensitivity)

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ 08108
Phone: (856) 858-4800

Attn.: Christopher Burns
Tetra Tech EMI
7 Creek Parkway Suite 700
Boothwyn, PA 19061

Phone: 570-417-1280 Fax: 610-485-8587

EMSL Case No.: 360903928
Sample(s) Received: 12/22/2009
Date of Analysis: 01/07/2010
Date Printed: 01/7/2010
Reported By: E. Mirica

Results and Discussion:

Sample ID	Matrix/Location	Moisture Content %
PM-SM-001	Subsurface soil/PM-SM-001	30.7
PM-SM-002	Subsurface soil/PM-SM-002	18.9
PM-SM-003	Subsurface soil/PM-SM-003	43.1

The results are obtained using the methods and sampling procedures as described in the report or as stated in the published standard methods, and are only guaranteed to the accuracy and precision consistent with the used methods and sampling procedures. Any change in methods and sampling procedure may generate substantially different results. EMSL Analytical, Inc. assumes no responsibility or liability for the manner in which the results are used or interpreted.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-AA-001	Lab Sample Number	040930265-0012	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	34
Air Volume (L)	2320	Analysis Date	1/11/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 32, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-AA-002	Lab Sample Number	040930265-0013	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	34
Air Volume (L)	2320	Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 32, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-AA-002	Lab Sample Number	040930265-0013	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Lab QC	Sample Status	Analyzed	# GOs counted	34
Air Volume (L)	2320	Analysis Date	1/6/2010		
QA Sample Type	RD	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 32, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-AA-003	Lab Sample Number	040930265-0014	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	34
Air Volume (L)	2320	Analysis Date	1/6/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 32, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-IA-001	Lab Sample Number	040930265-0008	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	44
Air Volume (L)	1770	Analysis Date	1/7/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.8E-04
Stopping Rule(s):	GO = 42, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	75	1.3E+02	2.9E-02	2.2E-02 - 3.6E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	75	1.3E+02	2.9E-02	2.2E-02 - 3.6E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	73	1.3E+02	2.8E-02	2.2E-02 - 3.5E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	2	3.5E+00	7.6E-04	9.2E-05 - 2.7E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	55	9.6E+01	2.1E-02	1.6E-02 - 2.7E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	55	9.6E+01	2.1E-02	1.6E-02 - 2.7E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	53	9.3E+01	2.0E-02	1.5E-02 - 2.6E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	2	3.5E+00	7.6E-04	9.2E-05 - 2.7E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	73	1.3E+02	2.8E-02	2.2E-02 - 3.5E-02
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	73	1.3E+02	2.8E-02	2.2E-02 - 3.5E-02
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	71	1.2E+02	2.7E-02	2.1E-02 - 3.4E-02
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	2	3.5E+00	7.6E-04	9.2E-05 - 2.7E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	2	3.5E+00	7.6E-04	9.2E-05 - 2.7E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	2	3.5E+00	7.6E-04	9.2E-05 - 2.7E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	1	1.7E+00	3.8E-04	9.6E-06 - 2.1E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	1	1.7E+00	3.8E-04	9.6E-06 - 2.1E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
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National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-IA-002	Lab Sample Number	040930265-0009	Effective filter area (mm^2)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm^2)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	44
Air Volume (L)	1860	Analysis Date	1/11/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.6E-04
Stopping Rule(s):	GO = 40, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm^2)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
AHERA (d) Structures				
Total Asbestos	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	1	1.7E+00	3.6E-04	9.2E-06 - 2.0E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.3E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm^2) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Powhatan Mine Site

version 8-
DRAFT

National Asbestos Data Entry Spreadsheet (NADES) for Air & Dust Analysis by Superfund TEM
ANALYTICAL REPORT

SAMPLE/ANALYSIS INFORMATION				ANALYSIS PARAMETERS	
Field Sample Number	PM-IA-003	Lab Sample Number	040930265-0010	Effective filter area (mm²)	385
				F-factor	1.00E+00
Media	Air	Preparation	Direct	Grid opening area (mm²)	0.0130
Sample Type	Field Sample	Sample Status	Analyzed	# GOs counted	44
Air Volume (L)	1820	Analysis Date	1/11/2010		
QA Sample Type	Not QC	Method SOP	TEM ISO 10312	Sensitivity (1/cc)	3.7E-04
Stopping Rule(s):	GO = 41, Structures = 100, Sensitivity = 4.00E-04				

Number of Structures with Fatal Data Entry Errors: 0
(Structures with fatal errors are excluded from calculations below)

Desired Confidence Interval (%): 95

Mineral Class	Number of Structures (a)	Loading on Filter (b) (s/mm²)	Air Conc (c) (s/cc)	95% Confidence Interval
Total TEM-EPASM Structures				
Total Asbestos	4	7.0E+00	1.5E-03	4.0E-04 - 3.8E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	4	7.0E+00	1.5E-03	4.0E-04 - 3.8E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	4	7.0E+00	1.5E-03	4.0E-04 - 3.8E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
PCM Equivalent Structures (PCME)				
Total Asbestos	2	3.5E+00	7.4E-04	9.0E-05 - 2.7E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	2	3.5E+00	7.4E-04	9.0E-05 - 2.7E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	2	3.5E+00	7.4E-04	9.0E-05 - 2.7E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
AHERA (d) Structures				
Total Asbestos	2	3.5E+00	7.4E-04	9.0E-05 - 2.7E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	2	3.5E+00	7.4E-04	9.0E-05 - 2.7E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	2	3.5E+00	7.4E-04	9.0E-05 - 2.7E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Berman Crump (2003) Structures				
Total Asbestos	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Chrysotile (CH)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Total Amphibole	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
actinolite (AC)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
amosite (AM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
anthophyllite (AN)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
crocidolite (CR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
tremolite (TR)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Libby amphibole (LA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other amphibole (OA)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
other mineral class (OM)	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Amosite	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03
Solid Soln: Trem-Act	0	0.0E+00	0.0E+00	0.0E+00 - 1.4E-03

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 3

No restrictions for other structure types.

Binning Rule Description:

Apply to all structures where Total column > 0:

L > 5um, W ≥ 0.25um, AR ≥ 3

Binning Rule Description:

Apply to fibers (F) only:
L ≥ 0.5um, AR ≥ 5

No restrictions for other structure types.

Most "secondary" structures (structures that are part of a primary complex structure) are excluded.

Binning Rule Description:

Apply to all structures where Total column > 0:
L > 10um, W ≤ 0.4um

(a) Based on countable structures only
(b) Loading on Filter (s/mm²) = N structures / (GOs Counted * GO Area)
(c) Air Concentration (s/cc) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Air Volume * 1000)
Dust Loading (s/cm2) = (N structures * EFA) / (GOs Counted * GO Area * F-factor * Dust Collection Area)
(d) Yamate results are expected to be similar to AHERA, but use of AHERA for Yamate may be biased low due to the exclusion of structures <0.5um.

Removal Response Program
Weston Solutions, Inc., Woodlawn, MD
EPA Contract Number: EP-S3-10-05

CHAIN OF CUSTODY RECORD
Site #: WS01-10-08-0
Contact Name: Christopher Baer
Contact Phone: (484)239-4249

No: WS01-10-08-0-10/27/10-0029
Cooler #: 001
Lab: EMSL Analytical Inc.
AirbillNo: 7938-7934-5201

Lab #	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Volume	MS/MSD
	POW-102610-EB-001	Field Blank	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	17:05	1	8 oz glass	None		N
	POW-102610-FB-001	Field Blank	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	17:05	1	8 oz glass	None		N
	POW-102610-SB-0001-0609	SB-0001	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	09:40	1	8 oz glass	None		N
	POW-102610-SB-0002-1215	SB-0002	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	10:03	1	8 oz glass	None		N
	POW-102610-SB-0003-2128	SB-0003	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	11:05	1	8 oz glass	None		N
	POW-102610-SB-0004-1620	SB-0004	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	13:40	1	8 oz glass	None		N
	POW-102610-SB-0004-2023	SB-0004	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	13:55	1	8 oz glass	None		N
	POW-102610-SB-0005-1720	SB-0005	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	15:00	1	8 oz glass	None		N
	POW-102610-SB-0006-0001	SB-0006	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	16:08	1	8 oz glass	None		N
	POW-102610-SB-0006-1820	SB-0006	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	16:08	1	8 oz glass	None		N
	POW-102610-TP-0001-001	TP-0001	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	11:24	1	8 oz glass	None		N

Special Instructions: 14 day turn around time

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		10/27/10		10-28-10							

041024956

Removal Response Program
Weston Solutions, Inc., Woodlawn, MD
EPA Contract Number: EP-S3-10-05

CHAIN OF CUSTODY RECORD
Site #: WS01-10-08-0
Contact Name: Christopher Baer
Contact Phone: (484)239-4249

No: WS01-10-08-0-10/27/10-0029
Cooler #: 001
Lab: EMSL Analytical Inc.
AirbillNo: 7938-7934-5201

Lab #	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Volume	MS/MSD
	POW-102610-TP-0001-002	TP-0001	Asbestos PLM/EPA 600/R-93/116 (<1%)	Soil	10/26/2010	11:29	1	8 oz glass	None		N
	POW-102610-TP-0003-001	TP-0003	Asbestos PLM CARB 435 Level B	Soil	10/26/2010	12:05	1	8 oz glass	None		N
	POW-102710-EB-001	Field Blank	Asbestos PLM CARB 435 Level B	Sand	10/27/2010	15:05	1	8 oz glass	None		N
	POW-102710-FB-001	Field Blank	Asbestos PLM CARB 435 Level B	Sand	10/27/2010	15:05	1	8 oz glass	None		N
	POW-102710-SB-0007-0507	SB-0007	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	08:46	1	8 oz glass	None		N
	POW-102710-SB-0007-0810	SB-0007	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	08:50	1	8 oz glass	None		N
	POW-102710-SB-0008-0608	SB-0008	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	09:16	1	8 oz glass	None		N
	POW-102710-SB-0009-0812	SB-0009	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	09:36	1	8 oz glass	None		N
	POW-102710-SB-0010-0406	SB-0010	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	10:47	1	8 oz glass	None		N
	POW-102710-SB-0011-0103	SB-0011	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	11:02	1	8 oz glass	None		N
	POW-102710-SB-0012-0608	SB-0012	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	11:15	1	8 oz glass	None		N

Special Instructions: 14 day TAT

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		10/27/10		10-28-10							

041024956

Removal Response Program
Weston Solutions, Inc., Woodlawn, MD
EPA Contract Number: EP-S3-10-05

CHAIN OF CUSTODY RECORD
Site #: WS01-10-08-0
Contact Name: Christopher Baer
Contact Phone: (484)239-4249

No: WS01-10-08-0-10/27/10-0029
Cooler #: 001
Lab: EMSL Analytical Inc.
AirbillNo: 7938-7934-5201

Lab #	Sample #	Location	Analyses	Matrix	Collected	Sample Time	Numb Cont	Container	Preservative	Volume	MS/MSD
	POW-102710-SB-0013-0204	SB-0013	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	13:06	1	8 oz glass	None		N
	POW-102710-SB-0014-0103	SB-0014	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	13:30	1	8 oz glass	None		N
	POW-102710-SB-0014-0507	SB-0014	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	13:30	1	8 oz glass	None		N
	POW-102710-SB-0015-0103	SB-0015	Asbestos PLM CARB 435 Level B	Soil	10/27/2010	13:52	1	8 oz glass	None		N

Special Instructions: 14 day TAT

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
		10/27									

041024956

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
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Attn: **Dan Mioskie**
Weston Solutions, Inc.
1400 Weston Way
Building 5-2
West Chester, PA 19380

Fax: (610) 701-7401 Phone: (610) 701-7400
Project: **POWHATAN**

Customer ID: RFWE59
Customer PO: 0072632
Received: 10/28/10 10:00 AM
EMSL Order: 041024961

EMSL Proj: Powhatan
Analysis Date: 11/10/2010

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
POW-102610-TP-0001-002 *041024961-0001*	TP-0001	Brown Fibrous Heterogeneous		20% Non-fibrous (other)	**80% Chrysotile**

Initial report from

Analyst(s)

Jerry Cherian (1)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036

THIS IS THE LAST PAGE OF THE REPORT.

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone: (800) 220-3675 Fax: (856) 786-5974 Email: westmontasblab@EMSL.com

Attn: **Dan Mioskie**
Weston Solutions, Inc.
1400 Weston Way
Building 5-2
West Chester, PA 19380

Fax: (610) 701-7401 Phone: (610) 701-7400
Project: **POWHATAN**

Customer ID: RFWE59
Customer PO: 0072632
Received: 10/28/10 10:00 AM
EMSL Order: 041024956

EMSL Proj: Powhatan
Analysis Date: 11/10/2010

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
POW-102610-EB-001 *041024956-0001*	FIELD BLANK	Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102610-FB-001 *041024956-0002*	FIELD BLANK	Gray Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102610-SB-0001-0609 *041024956-0003*	SB-0001	Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**<0.1% Anthophyllite**
POW-102610-SB-0002-1215 *041024956-0004*	SB-0002	Brown Non-Fibrous Homogeneous		99.50% Non-fibrous (other)	**0.50% Anthophyllite**
POW-102610-SB-0003-2128 *041024956-0005*	SB-0003	Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102610-SB-0004-1620 *041024956-0006*	SB-0004	Brown Non-Fibrous Homogeneous		98.30% Non-fibrous (other)	**1.70% Anthophyllite**
POW-102610-SB-0004-2023 *041024956-0007*	SB-0004	Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Initial report from

Analyst(s)

Jerry Cherian (25)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson NJ

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1400 Weston Way
Building 5-2
West Chester, PA 19380

Fax: (610) 701-7401 Phone: (610) 701-7400
Project: **POWHATAN**

Customer ID: RFWE59
Customer PO: 0072632
Received: 10/28/10 10:00 AM
EMSL Order: 041024956

EMSL Proj: Powhatan
Analysis Date: 11/10/2010

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
POW-102610-SB-0005-1720 *041024956-0008*	SB-0005	Brown Non-Fibrous Homogeneous		99.20% Non-fibrous (other)	**0.80% Anthophyllite** **<0.1% Chrysotile**
POW-102610-SB-0006-0001 *041024956-0009*	SB-0006	Brown Non-Fibrous Homogeneous		99.80% Non-fibrous (other)	**0.20% Anthophyllite**
POW-102610-SB-0006-1820 *041024956-0010*	SB-0006	Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102610-TP-0001-001 *041024956-0011*	TP-0001	Brown Non-Fibrous Homogeneous		99.40% Non-fibrous (other)	**0.60% Anthophyllite** **<0.1% Chrysotile**
POW-102610-TP-0003-001 *041024956-0012*	TP-0003	Gray Fibrous Heterogeneous		88.00% Non-fibrous (other)	**12.00% Anthophyllite**
POW-102710-EB-001 *041024956-0013*	FIELD BLANK	Gray Non-Fibrous Heterogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102710-FB-001 *041024956-0014*	FIELD BLANK	Brown Non-Fibrous Heterogeneous		100.00% Non-fibrous (other)	**None Detected**

Initial report from

Analyst(s)
Jerry Cherian (25)

Stephen Siegel, CIH, Laboratory Manager
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West Chester, PA 19380

Fax: (610) 701-7401 Phone: (610) 701-7400
Project: **POWHATAN**

Customer ID: RFWE59
Customer PO: 0072632
Received: 10/28/10 10:00 AM
EMSL Order: 041024956

EMSL Proj: Powhatan
Analysis Date: 11/10/2010

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
POW-102710-SB-0007-0507 *041024956-0015*	SB-0007	Brown Fibrous Heterogeneous		88.00% Non-fibrous (other)	**12.00% Anthophyllite**
POW-102710-SB-0007-0810 *041024956-0016*	SB-0007	Brown Fibrous Heterogeneous		96.80% Non-fibrous (other)	**3.20% Anthophyllite**
POW-102710-SB-0008-0608 *041024956-0017*	SB-0008	Gray Fibrous Heterogeneous		85.00% Non-fibrous (other)	**15.00% Anthophyllite**
POW-102710-SB-0009-0812 *041024956-0018*	SB-0009	Brown Fibrous Heterogeneous		99.50% Non-fibrous (other)	**0.50% Anthophyllite**
POW-102710-SB-0010-0406 *041024956-0019*	SB-0010	Brown Non-Fibrous Heterogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102710-SB-0011-0103 *041024956-0020*	SB-0011	Brown Non-Fibrous Heterogeneous		100.00% Non-fibrous (other)	**<0.1% Anthophyllite**
POW-102710-SB-0012-0608 *041024956-0021*	SB-0012	Gray Non-Fibrous Heterogeneous		100.00% Non-fibrous (other)	**None Detected**

Initial report from

Analyst(s)
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West Chester, PA 19380

Fax: (610) 701-7401 Phone: (610) 701-7400
Project: **POWHATAN**

Customer ID: RFWE59
Customer PO: 0072632
Received: 10/28/10 10:00 AM
EMSL Order: 041024956

EMSL Proj: Powhatan
Analysis Date: 11/10/2010

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
POW-102710-SB-0013-0204 *041024956-0022*	SB-0013	Brown Fibrous Heterogeneous		88.00% Non-fibrous (other)	**12.00% Chrysotile**
POW-102710-SB-0014-0103 *041024956-0023*	SB-0014	Brown Fibrous Heterogeneous		97.60% Non-fibrous (other)	**2.40% Anthophyllite**
POW-102710-SB-0014-0507 *041024956-0024*	SB-0014	Brown Non-Fibrous Heterogeneous		100.00% Non-fibrous (other)	**None Detected**
POW-102710-SB-0015-0103 *041024956-0025*	SB-0015	Gray Fibrous Heterogeneous		85.00% Non-fibrous (other)	**15.00% Anthophyllite**

TEM CARB follow-up analysis recommended for all negative PLM CARB samples.

Initial report from

Analyst(s)
Jerry Cherian (25)

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Samples analyzed by EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson NJ

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