Appendix A. Photographic Log

Appendix A. Photographic Log

Photograph A-1: ATV Route 1 and location of soil sample (PA-ATV1-SS-05) residence in the background, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-2: Shed in Mine Camp, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Appendix A. Photographic Log

Photograph A-3: Generator shed in Mine Camp, facing northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-4: View of generator in shed interior, looking southwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Appendix A. Photographic Log

Photograph A-5: Residence in Mine Camp, looking southeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-6: Mine Camp office building, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Appendix A. Photographic Log

Photograph A-7: Mine Camp dorm building, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-8: Interior basement of Mine Camp dorm building, looking northeast. **Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona** Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Appendix A. Photographic Log

Photograph A-9: Mine Camp dorm building, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona

Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-10: Mine Camp shop building, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Appendix A. Photographic Log

Photograph A-11: Mine Camp shop building, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-12: Mine Camp chimney and foundation, looking northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-13: Mill tailings material on top of the town mill foundation, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-14: Mine Camp town mill foundation, looking southeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-15: Mine Camp pad/foundation east of the town mill with the dorm building in the background, looking southeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-16: Mine Camp pad/foundation in southeast corner of the site, looking southeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-17: Mine Camp debris pile with the residence in the background, looking southwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-18: Mine Camp pit and collapsed shed. Possible outhouse, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-19: Mine Camp dump area near the chimney, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-20: Mine Camp pit, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-21: Mine Camp metal tank, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-22: View of disturbed ground near an abandoned vehicle location at the Mine Camp, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-23: Mine Camp shooting area north of the pad/foundation looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-24: Modern poly tank in Mine Camp, facing northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-25: Mill Camp shed with groundwater well in the foreground, looking southwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 17, 2012

Photograph A-26: Mine Camp groundwater well, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 17, 2012

Photograph A-27: Mine Camp corral, looking southwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-28: Mine Camp corral and remnants of concrete trough, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-29: Mill Area metal pulley structure, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-30: Mill Area building and cable car pulley tower remnants, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-31: Interior of the northern section of the mill building in the Mill Area, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-32: Eastern section of the mill building in the Mill Area, looking west. **Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona** Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-33: Asbestos pile southeast of mill building in the Mill Area, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-34: Metal debris in the Mill Area, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-35: Soil and debris in the Mill Area, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-36: Asbestos and debris piles in the Mill Area to the east of mill building looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-37: Asbestos piles in the southwest corner of the Mill Area, adjacent to the trail looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-38: Metal bin trailer in the Mill Area looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 17, 2012

Photograph A-39: View of the Mill Area from Mill Road, looking east. A waste pile and the corner of the mill building can be seen from the center to the left of the photograph.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-40: View of the Mill Area from end of Mill Road, looking north. **Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona** Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-41: Upper Workings Adit 1 opening, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-42: Upper Workings Adit 2, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-43: Upper Workings Adit 2A, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-44: Upper Workings Adit 3, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-45: Upper Workings Adit 3, looking southwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-46: Upper Workings Adit 4 opening, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-47: Upper Workings Adit 5, partially collapsed, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-48: Upper Workings Adit 6 opening, looking southeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-49: Upper Workings Adit 6 opening, looking northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-50: Upper Workings Adit 7 opening, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-51: Upper Workings Adit 7 opening, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-52: Interior of Upper Workings Adit 7, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-53: Upper Workings Adit 8 opening, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-54: Upper Workings Adit 9 opening, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-55: Upper Workings Adit 10 opening, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-56: Upper Workings Adit 11 opening, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-57: Upper Workings Adit 12 opening, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-58: Upper Workings Area, Test Pit , looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-59: Upper Workings Area waste rock pile from Upper Workings Adit 1, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-60: Waste pile from Upper Workings Adit 2, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-61: Possible Adit 3 waste rock at the Upper Workings Area, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-62: Upper Workings Area closeup of a waste rock specimen.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-63: Upper Workings Adit 4 waste pile, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-64: View from the Upper Workings Area adits (5-8) access road, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 18, 2012

Photograph A-65: View of large waste rock piles below Upper Workings Area adits, looking northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 18, 2012

Photograph A-66: Upper Workings Area waste rock pond area, looking south. **Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona** Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-67: View of accessible Lower Workings adit across the tributary from the Mill Area,looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-68: Accessible Lower Workings adit, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-69: Phillips Canyon Workings Adit 2 opening, looking southeast. **Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona** Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-70: Side view of Phillips Canyon Workings Area waste rock pile looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-71: Top of Phillips Canyon Workings Area waste rock pile, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-72: Side view of large waste rock pile at the Phillips Canyon Workings Area, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-73: Large waste rock pile below Phillips Canyon Workings Adit 2, continues to the bottom of the canyon, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-74: View of the Mill Area, Phillips Canyon Workings Area, and cable building at the lookout area from near Upper Workings Adit 2, looking south. **Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona** Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 18, 2012

Photograph A-75: Mine debris near the Phillips Canyon Workings Area piles, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 19, 2012

Photograph A-76: Pulley cable from Phillips Canyon Workings Adit 2 to a structure above, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-77: Foundation, pulley structure remnants, and pulley cable by Phillips Canyon Workings Adit 2, looking northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-78: Corner of the foundation for the pulley structure at the Phillips Canyon Workings Area, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-79: Metal debris downslope of the pulley structure foundation at the Phillips Canyon Workings Area, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-80: Metal debris down the trail, west of Phillips Canyon Workings Adit 2, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-81: Pad/foundation and metal debris down the trail, west of Phillips Canyon Workings Adit 2, looking northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 19, 2012

Photograph A-82: View of the Phillips Canyon Workings Area waste piles from the Upper Workings Area, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Tanner Bennett (ERRG) Date: June 18, 2012

Photograph A-83: View of the mill tributary background sediment sample site, looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-84: ATV Route 2 and location of soil sample 2 (PA-ATV1-SS-02), looking west.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-85: "Marker NE-E1" at Mine Camp, looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-86: ATV Route 1 and location of soil sample (PA-ATV1-SS-07), looking northwest.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Christine Wang (ERRG) Date: June 15, 2012

Photograph A-87: Location of upper tributary sediment sample, looking south.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-88: PA-ATV2-SS-06 sample location, looking north.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-89: PA-ATV2-SS-08 sample location, looking northeast.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Photograph A-90: PA-ATV2-SS-09 sample location, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona
Photographed by: Samantha Caruthers-Knight (ERRG) Date: June 16, 2012

Appendix A. Photographic Log

Photograph A-91: Mill Area from the Upper Workings Area, looking east.
Phillips Asbestos Mine Site, Tonto National Forest, Gila County, Arizona Photographed by: Tanner Bennett (ERRG) Date: June 18, 2012

Appendix B. Summary of Previous Sample Results

Table B-1. Asbestos Sampling Results from 2008 Removal Preliminary Assessment Report

Sample ID	Description	Result	NESHAPS
MINE CAMP			
Building A – Shop			
PA-MC-A01	Shingle	5-10%	Cat I non-friable ACM
PA-MC-A02	Floor Tile, Basement Room		
	Layer #1 off-white, floor tile	<=1%	
	Layer #2 black, mastic	2-5%	Cat I non-friable ACM
PA-MC-A03	Ceiling Material, Basement Room		
	Layer #1 gray, paint	0	Cat I non-friable ACM
	Layer #2 off-white panel	50-60%	Friable RACM
Building B – Dorm			
PA-MC-B04	Roof Felt – All Over Ground	0	
PA-MC-B05	Wallboard, white panel	30-40%	Friable RACM
PA-MC-B06	Pile on Floor		
	Layer #1 white, drywall core	0	
	Layer #2 black, roof ply	0	
Building C – Town Mill Slab			
PA-MC-C07	Pile of Tile/Shingles, white drywall core	0	
PA-MC-C08	Clumped Fibers, off-white insulation	70-80%	Friable RACM
PA-MC-C09	Soil in Center of Mill, brown soil	0	
Building D – Residence			
PA-MC-D10	Stucco, exterior		
	Layer #1 off-white stucco	10-20%	Friable RACM
	Layer #2 off-white panel	50-60%	Friable RACM
PA-MC-D11	Ceiling Board, Matches Walls		
	Layer #1 off-white plaster	>1-2%	Friable RACM
	Layer #2 off-white panel	50-60%	Friable RACM

Table B-1. Asbestos Sampling Results from 2008 Removal Preliminary Assessment

Table B-1. Asbestos Sampling Results from 2008 Removal Preliminary Assessment Report *(continued)*

Sample ID	Description	Result	NESHAPS
MINE CAMP *(continued)*			
Building D – Residence *(continued)*			
PA-MC-D12	Roof Shingles gray cement/asbestos board	5-10%	Cat II ACM
Building F – Shop			
PA-MC-F13	Pile On Slab (1/3 cy) off-white debris	0	
Building G – Office			
PA-MC-G14	Debris on floor, white panel	30-40%	Friable RACM
PA-MC-G15	Exterior Wall, white stucco	10-20%	Friable RACM
MILL SITE			
PA-MS-001	Tailings on road above south of building	2-5%	NB
PA-MS-002	Residue in building on shelves and floor	30-40%	Friable RACM
PA-MS-003	Tailings below building	10-20%	NB
PA-MS-004	Tailings below building near lower edge In small surface drainage	≤1%	

Notes: All data from: Forest Service, 2009. "Removal Preliminary Assessment Report, Phillips Asbestos Mine, Mill, and Mine Camp." September.

AZ SRL = No soil remediation level set by Arizona Department of Equality

MC = mine camp

MS = mill site

NB = not a building material

PA = Phillips Asbestos

Appendix C. Laboratory Analytical Results for EE/CA Sampling

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax:(602)

454-9303

LABORATORY REPORT

Prepared For: Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project: 2011-149

Sampled: 06/15/12-06/19/12
Received: 06/20/12
Issued: 06/30/12 11:23

NELAP #01109CA / AZ100001 Arizona DHS#AZ0728

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

CASE NARRATIVE

LABORATORY ID	CLIENT ID	MATRIX
PVF1519-01	PA-MT-SD-01	Soil
PVF1519-02	PA-ATV1-SS-01	Soil
PVF1519-03	PA-ATV2-SS-01	Soil
PVF1519-04	PA-MC-SS-01	Soil
PVF1519-05	PA-MA-SS-01	Soil
PVF1519-06	PA-MC-GW-01	Water
PVF1519-07	PA-MC-GW-01	Water
PVF1519-08	PA-MT-SW-01	Water
PVF1519-09	PA-MT-SW-01	Water
PVF1519-10	PA-VW-SS-01	Soil
PVF1519-11	PA-VW-WP-08	Soil
PVF1519-12	PA-BG-SS-01	Soil
PVF1519-13	PA-PC-WP-01	Soil
PVF1519-14	PA-PT-SD-01	Soil

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax:(602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149

Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

SAMPLE RECEIPT:	Samples were received intact, at 2°C, on ice and with chain of custody documentation.
HOLDING TIMES:	All samples were analyzed within prescribed holding times and/or in accordance with the TestAmerica Sample Acceptance Policy unless otherwise noted in the report.
PRESERVATION:	Samples requiring preservation were verified prior to sample analysis.
QA/QC CRITERIA:	All analyses met method criteria, except as noted in the report with data qualifiers.
	N1 = The RPD exceeded the acceptance limit due to sample matrix effects.
COMMENTS:	No significant observations were made.
SUBCONTRACTED:	No analyses were subcontracted to an outside laboratory.

Reviewed By:

Denise Harrington

454-9303

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

EXTRACTABLE FUEL HYDROCARBONS (EPA 3510/8015D)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-06 (PA-MC-GW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: ug/l								
Extractable Fuel Hydrocarbons (C10 - C32)	EPA 8015D	12F0919	0.10	ND	1	6/23/2012	6/27/2012	
Surrogate: o-terphenyl (37-140%)				*79 %*				

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

EXTRACTABLE FUEL HYDROCARBONS (ADHS 8015AZR1)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-04 (PA-MC-SS-01 - Soil)					**Sampled: 06/16/12**			
Reporting Units: mg/kg								
DRO (C10-C22)	8015AZ R.1	12F1087	30	ND	0.992	6/27/2012	6/28/2012	
ORO (C22-C32)	8015AZ R.1	12F1087	100	**400**	0.992	6/27/2012	6/28/2012	
Total (C10-C32)	8015AZ R.1	12F1087	130	**400**	0.992	6/27/2012	6/28/2012	
Surrogate: o-terphenyl (70-130%)				*103 %*				

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-01 (PA-MT-SD-01 - Soil)					**Sampled: 06/15/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**93**	0.98	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.98	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**69**	0.98	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**24**	0.98	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**27**	0.98	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**6.9**	0.98	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	25	**5800**	0.98	6/26/2012	6/27/2012	
Manganese	EPA 6010B	12F0983	2.0	**410**	0.98	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.10	ND	1.03	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**33**	0.98	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**40**	0.98	6/26/2012	6/27/2012	
Sample ID: PVF1519-02 (PA-ATV1-SS-01 - Soil)					**Sampled: 06/15/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**83**	0.98	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.98	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**30**	0.98	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**26**	0.98	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**47**	0.98	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**10**	0.98	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	250	**47000**	9.8	6/26/2012	6/28/2012	
Manganese	EPA 6010B	12F0983	2.0	**360**	0.98	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.10	ND	0.938	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**43**	0.98	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**69**	0.98	6/26/2012	6/27/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-03 (PA-ATV2-SS-01 - Soil)					**Sampled: 06/15/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	ND	0.99	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**98**	0.99	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.99	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**62**	0.99	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**32**	0.99	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**53**	0.99	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**10**	0.99	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	25	**9100**	0.99	6/26/2012	6/27/2012	
Manganese	EPA 6010B	12F0983	2.0	**560**	0.99	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.10	ND	1.03	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**46**	0.99	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.99	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**62**	0.99	6/26/2012	6/27/2012	
Sample ID: PVF1519-04 (PA-MC-SS-01 - Soil)					**Sampled: 06/16/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	**9.7**	0.98	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**73**	0.98	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	**0.90**	0.98	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**72**	0.98	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**34**	0.98	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**56**	0.98	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**93**	0.98	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	25	**15000**	0.98	6/26/2012	6/27/2012	
Manganese	EPA 6010B	12F0983	2.0	**530**	0.98	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.11	ND	1.11	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**43**	0.98	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**340**	0.98	6/26/2012	6/27/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-05 (PA-MA-SS-01 - Soil)					**Sampled: 06/17/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	**9.5**	0.99	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**37**	0.99	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.99	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**17**	0.99	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**7.9**	0.99	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**19**	0.99	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**7.4**	0.99	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	250	**150000**	9.9	6/26/2012	6/28/2012	
Manganese	EPA 6010B	12F0983	2.0	**400**	0.99	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.10	ND	0.938	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**13**	0.99	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.99	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**190**	0.99	6/26/2012	6/27/2012	
Sample ID: PVF1519-06 (PA-MC-GW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Arsenic	EPA 200.7	12F0929	0.10	ND	1	6/24/2012	6/25/2012	
Barium	EPA 200.7	12F0929	0.010	**0.014**	1	6/24/2012	6/25/2012	
Cadmium	EPA 200.7	12F0929	0.0010	ND	1	6/24/2012	6/25/2012	
Chromium	EPA 200.7	12F0929	0.010	ND	1	6/24/2012	6/25/2012	
Cobalt	EPA 200.7	12F0929	0.040	ND	1	6/24/2012	6/25/2012	
Copper	EPA 200.7	12F0929	0.010	ND	1	6/24/2012	6/25/2012	
Hardness, Total	SM2340B	[CALC]	8.2	**120**	1	6/24/2012	6/25/2012	
Lead	EPA 200.7	12F0929	0.015	ND	1	6/24/2012	6/25/2012	
Magnesium	EPA 200.7	12F0929	2.0	**28**	1	6/24/2012	6/25/2012	
Manganese	EPA 200.7	12F0929	0.010	**0.18**	1	6/24/2012	6/25/2012	
Mercury	EPA 245.1	12F1003	0.00020	ND	1	6/27/2012	6/27/2012	
Nickel	EPA 200.7	12F0929	0.010	ND	1	6/24/2012	6/25/2012	
Selenium	EPA 200.7	12F0929	0.10	ND	1	6/24/2012	6/25/2012	
Zinc	EPA 200.7	12F0929	0.050	ND	1	6/24/2012	6/25/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-08 (PA-MT-SW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: ug/l								
Arsenic	EPA 200.7	12F0929	0.10	ND	1	6/24/2012	6/25/2012	
Barium	EPA 200.7	12F0929	0.010	**0.13**	1	6/24/2012	6/25/2012	
Cadmium	EPA 200.7	12F0929	0.0010	ND	1	6/24/2012	6/25/2012	
Chromium	EPA 200.7	12F0929	0.010	ND	1	6/24/2012	6/25/2012	
Cobalt	EPA 200.7	12F0929	0.040	ND	1	6/24/2012	6/25/2012	
Copper	EPA 200.7	12F0929	0.010	**0.011**	1	6/24/2012	6/25/2012	
Hardness, Total	SM2340B	[CALC]	8.2	**460**	1	6/24/2012	6/25/2012	
Lead	EPA 200.7	12F0929	0.015	ND	1	6/24/2012	6/25/2012	
Magnesium	EPA 200.7	12F0929	2.0	**110**	1	6/24/2012	6/25/2012	
Manganese	EPA 200.7	12F0929	0.010	**0.37**	1	6/24/2012	6/25/2012	
Mercury	EPA 245.1	12F1003	0.00020	ND	1	6/27/2012	6/27/2012	
Nickel	EPA 200.7	12F0929	0.010	ND	1	6/24/2012	6/25/2012	
Selenium	EPA 200.7	12F0929	0.10	ND	1	6/24/2012	6/25/2012	
Zinc	EPA 200.7	12F0929	0.050	ND	1	6/24/2012	6/25/2012	
Sample ID: PVF1519-10 (PA-VW-SS-01 - Soil)					**Sampled: 06/18/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	ND	0.962	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**35**	0.962	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.962	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**16**	0.962	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**29**	0.962	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**67**	0.962	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	ND	0.962	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	25	**9300**	0.962	6/26/2012	6/27/2012	
Manganese	EPA 6010B	12F0983	2.0	**310**	0.962	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.10	ND	0.968	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**33**	0.962	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.962	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**47**	0.962	6/26/2012	6/27/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-11 (PA-VW-WP-08 - Soil)					**Sampled: 06/18/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	**5.1**	0.98	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**60**	0.98	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.98	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**7.3**	0.98	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**4.2**	0.98	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**15**	0.98	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	250	**120000**	9.8	6/26/2012	6/28/2012	
Manganese	EPA 6010B	12F0983	2.0	**630**	0.98	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1001	0.10	ND	1.03	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**3.5**	0.98	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.98	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**15**	0.98	6/26/2012	6/27/2012	
Sample ID: PVF1519-12 (PA-BG-SS-01 - Soil)					**Sampled: 06/19/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	**7.2**	1	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**130**	1	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	1	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**35**	1	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**18**	1	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**23**	1	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**9.9**	1	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	25	**4000**	1	6/26/2012	6/27/2012	
Manganese	EPA 6010B	12F0983	2.0	**520**	1	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1002	0.10	ND	0.968	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**23**	1	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	1	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**40**	1	6/26/2012	6/27/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-13 (PA-PC-WP-01 - Soil)					**Sampled: 06/19/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	**5.7**	0.971	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**64**	0.971	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.971	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**20**	0.971	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**16**	0.971	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**27**	0.971	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	**9.1**	0.971	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	250	**43000**	9.71	6/26/2012	6/28/2012	
Manganese	EPA 6010B	12F0983	2.0	**320**	0.971	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1002	0.10	ND	0.952	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**24**	0.971	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.971	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**66**	0.971	6/26/2012	6/27/2012	
Sample ID: PVF1519-14 (PA-PT-SD-01 - Soil)					**Sampled: 06/19/12**			
Reporting Units: mg/kg								
Arsenic	EPA 6010B	12F0983	5.0	ND	0.962	6/26/2012	6/27/2012	
Barium	EPA 6010B	12F0983	5.0	**80**	0.962	6/26/2012	6/27/2012	
Cadmium	EPA 6010B	12F0983	0.50	ND	0.962	6/26/2012	6/27/2012	
Chromium	EPA 6010B	12F0983	2.0	**18**	0.962	6/26/2012	6/27/2012	
Cobalt	EPA 6010B	12F0983	2.0	**17**	0.962	6/26/2012	6/27/2012	
Copper	EPA 6010B	12F0983	5.0	**24**	0.962	6/26/2012	6/27/2012	
Lead	EPA 6010B	12F0983	5.0	ND	0.962	6/26/2012	6/27/2012	
Magnesium	EPA 6010B	12F0983	25	**5100**	0.962	6/26/2012	6/27/2012	
Manganese	EPA 6010B	12F0983	2.0	**270**	0.962	6/26/2012	6/27/2012	
Mercury	EPA 7471A	12F1002	0.10	ND	0.923	6/28/2012	6/28/2012	
Nickel	EPA 6010B	12F0983	2.0	**20**	0.962	6/26/2012	6/27/2012	
Selenium	EPA 6010B	12F0983	5.0	ND	0.962	6/26/2012	6/27/2012	
Zinc	EPA 6010B	12F0983	10	**30**	0.962	6/26/2012	6/27/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS BY ICP/MS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-01 (PA-MT-SD-01 - Soil)					**Sampled: 06/15/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	ND	5	6/26/2012	6/29/2012	M4, D1, T2
Sample ID: PVF1519-02 (PA-ATV1-SS-01 - Soil)					**Sampled: 06/15/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	**0.29**	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-03 (PA-ATV2-SS-01 - Soil)					**Sampled: 06/15/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	ND	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-04 (PA-MC-SS-01 - Soil)					**Sampled: 06/16/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	**0.28**	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-05 (PA-MA-SS-01 - Soil)					**Sampled: 06/17/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	**2.3**	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-06 (PA-MC-GW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Uranium	EPA 200.8	12F1184	0.0010	ND	1	6/29/2012	6/30/2012	
Sample ID: PVF1519-08 (PA-MT-SW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Uranium	EPA 200.8	12F1184	0.0010	**0.0020**	1	6/29/2012	6/30/2012	
Sample ID: PVF1519-10 (PA-VW-SS-01 - Soil)					**Sampled: 06/18/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	ND	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-11 (PA-VW-WP-08 - Soil)					**Sampled: 06/18/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	**0.80**	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-12 (PA-BG-SS-01 - Soil)					**Sampled: 06/19/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	**0.34**	5	6/26/2012	6/29/2012	D1, T2

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

TOTAL METALS BY ICP/MS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-13 (PA-PC-WP-01 - Soil)					**Sampled: 06/19/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	**0.29**	5	6/26/2012	6/29/2012	D1, T2
Sample ID: PVF1519-14 (PA-PT-SD-01 - Soil)					**Sampled: 06/19/12**			
Reporting Units: mg/kg								
Uranium	EPA 6020	12F1012	0.25	ND	5	6/26/2012	6/29/2012	D1, T2

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

DISSOLVED METALS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-07 (PA-MC-GW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Arsenic	EPA 200.7	12F1010	0.10	ND	1	6/26/2012	6/27/2012	
Barium	EPA 200.7	12F1010	0.010	**0.051**	1	6/26/2012	6/27/2012	
Cadmium	EPA 200.7	12F1010	0.0010	ND	1	6/26/2012	6/27/2012	
Chromium	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Cobalt	EPA 200.7	12F1010	0.040	ND	1	6/26/2012	6/27/2012	
Copper	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Lead	EPA 200.7	12F1010	0.015	ND	1	6/26/2012	6/27/2012	
Magnesium	EPA 200.7	12F1010	2.0	**27**	1	6/26/2012	6/27/2012	
Manganese	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Mercury	EPA 245.1	12F0953	0.00020	ND	1	6/26/2012	6/26/2012	
Nickel	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Selenium	EPA 200.7	12F1010	0.10	ND	1	6/26/2012	6/27/2012	
Zinc	EPA 200.7	12F1010	0.050	ND	1	6/26/2012	6/27/2012	
Sample ID: PVF1519-09 (PA-MT-SW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Arsenic	EPA 200.7	12F1010	0.10	ND	1	6/26/2012	6/27/2012	
Barium	EPA 200.7	12F1010	0.010	**0.15**	1	6/26/2012	6/27/2012	
Cadmium	EPA 200.7	12F1010	0.0010	ND	1	6/26/2012	6/27/2012	
Chromium	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Cobalt	EPA 200.7	12F1010	0.040	ND	1	6/26/2012	6/27/2012	
Copper	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Lead	EPA 200.7	12F1010	0.015	ND	1	6/26/2012	6/27/2012	
Magnesium	EPA 200.7	12F1010	2.0	**100**	1	6/26/2012	6/27/2012	
Manganese	EPA 200.7	12F1010	0.010	**0.065**	1	6/26/2012	6/27/2012	
Mercury	EPA 245.1	12F0953	0.00020	ND	1	6/26/2012	6/26/2012	
Nickel	EPA 200.7	12F1010	0.010	ND	1	6/26/2012	6/27/2012	
Selenium	EPA 200.7	12F1010	0.10	ND	1	6/26/2012	6/27/2012	
Zinc	EPA 200.7	12F1010	0.050	ND	1	6/26/2012	6/27/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

DISSOLVED METALS BY ICP/MS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-07 (PA-MC-GW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: ng/l								
Uranium	EPA 200.8	12F1180	0.0010	ND	1	6/29/2012	6/30/2012	
Sample ID: PVF1519-09 (PA-MT-SW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: ng/l								
Uranium	EPA 200.8	12F1180	0.0010	**0.0026**	1	6/29/2012	6/30/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

INORGANICS

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PVF1519-06 (PA-MC-GW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Alkalinity as CaCO3	SM 2320B	12F0869	6.0	**280**	1	6/22/2012	6/23/2012	
Bicarbonate Alkalinity as CaCO3	SM 2320B	12F0869	6.0	**280**	1	6/22/2012	6/23/2012	
Carbonate Alkalinity as CaCO3	SM 2320B	12F0869	6.0	ND	1	6/22/2012	6/23/2012	
Hydroxide Alkalinity as CaCO3	SM 2320B	12F0869	6.0	ND	1	6/22/2012	6/23/2012	
Total Suspended Solids	SM 2540D	12F0880	10	**27**	1	6/22/2012	6/22/2012	
Alkalinity, Phenolphthalein	SM 2320B	12F0869	6.0	ND	1	6/22/2012	6/23/2012	
Sample ID: PVF1519-08 (PA-MT-SW-01 - Water)					**Sampled: 06/17/12**			
Reporting Units: mg/l								
Alkalinity as CaCO3	SM 2320B	12F0869	6.0	**550**	1	6/22/2012	6/23/2012	
Bicarbonate Alkalinity as CaCO3	SM 2320B	12F0869	6.0	**550**	1	6/22/2012	6/23/2012	
Carbonate Alkalinity as CaCO3	SM 2320B	12F0869	6.0	ND	1	6/22/2012	6/23/2012	
Hydroxide Alkalinity as CaCO3	SM 2320B	12F0869	6.0	ND	1	6/22/2012	6/23/2012	
Total Suspended Solids	SM 2540D	12F0880	20	**430**	2	6/22/2012	6/22/2012	
Alkalinity, Phenolphthalein	SM 2320B	12F0869	6.0	ND	1	6/22/2012	6/23/2012	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

EXTRACTABLE FUEL HYDROCARBONS (EPA 3510/8015D)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0919 Extracted: 06/25/12										
Blank Analyzed: 06/25/2012 (12F0919-BLK1)										
Extractable Fuel Hydrocarbons (C10 - C32)	ND	0.10	mg/l							
Surrogate: o-terphenyl	*0.0885*		*mg/l*	*0.100*		*88*	*37-140*			
LCS Analyzed: 06/25/2012 (12F0919-BS1)										**Q8**
Extractable Fuel Hydrocarbons (C10 - C32)	0.372	0.10	mg/l	0.400		93	47-128			
Surrogate: o-terphenyl	*0.0882*		*mg/l*	*0.100*		*88*	*58-116*			
LCS Dup Analyzed: 06/25/2012 (12F0919-BSD1)										**Q8**
Extractable Fuel Hydrocarbons (C10 - C32)	0.411	0.10	mg/l	0.400		103	47-128	10	29	
Surrogate: o-terphenyl	*0.0871*		*mg/l*	*0.100*		*87*	*58-116*			

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

EXTRACTABLE FUEL HYDROCARBONS (ADHS S015AZR1)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1087 Extracted: 06/27/12										
Blank Analyzed: 06/28/2012 (12F1087-BLK1)										
DRO (C10-C22)	ND	30	mg/kg							
ORO (C22-C32)	ND	100	mg/kg							
Total (C10-C32)	ND	130	mg/kg							
Surrogate: o-terphenyl	*44.7*		*mg/kg*	*49.8*		*90*	*70-130*			
LCS Analyzed: 06/28/2012 (12F1087-BS1)										
DRO (C10-C22)	190	30	mg/kg	199		94	70-130			
ORO (C22-C32)	400	100	mg/kg	399		101	70-130			
Surrogate: o-terphenyl	*47.7*		*mg/kg*	*49.9*		*96*	*70-130*			
LCS Dup Analyzed: 06/28/2012 (12F1087-BSD1)										
DRO (C10-C22)	200	30	mg/kg	199		102	70-130	8	20	
ORO (C22-C32)	430	100	mg/kg	398		109	70-130	8	20	
Surrogate: o-terphenyl	*50.0*		*mg/kg*	*49.8*		*100*	*70-130*			
Matrix Spike Analyzed: 06/28/2012 (12F1087-MS1)					**Source: PVF1722-01**					
DRO (C10-C22)	190	30	mg/kg	199	ND	98	56-145			
ORO (C22-C32)	400	100	mg/kg	398	ND	102	77-136			
Surrogate: o-terphenyl	*47.8*		*mg/kg*	*49.8*		*96*	*70-130*			
Matrix Spike Dup Analyzed: 06/28/2012 (12F1087-MSD1)					**Source: PVF1722-01**					
DRO (C10-C22)	200	30	mg/kg	200	ND	100	56-145	3	30	
ORO (C22-C32)	420	100	mg/kg	400	ND	105	77-136	3	20	
Surrogate: o-terphenyl	*48.5*		*mg/kg*	*50.0*		*97*	*70-130*			

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0929 Extracted: 06/24/12										
Blank Analyzed: 06/25/2012 (12F0929-BLK1)										
Arsenic	ND	0.10	mg/l							
Barium	ND	0.010	mg/l							
Cadmium	ND	0.0010	mg/l							
Chromium	ND	0.010	mg/l							
Cobalt	ND	0.040	mg/l							
Copper	ND	0.010	mg/l							
Lead	ND	0.015	mg/l							
Magnesium	ND	2.0	mg/l							
Manganese	ND	0.010	mg/l							
Nickel	ND	0.010	mg/l							
Selenium	ND	0.10	mg/l							
Zinc	ND	0.050	mg/l							
LCS Analyzed: 06/25/2012 (12F0929-BS1)										
Arsenic	1.03	0.10	mg/l	1.00		103	85-115			
Barium	1.04	0.010	mg/l	1.00		104	85-115			
Cadmium	1.02	0.0010	mg/l	1.00		102	85-115			
Chromium	1.05	0.010	mg/l	1.00		105	85-115			
Cobalt	1.03	0.040	mg/l	1.00		103	85-115			
Copper	0.991	0.010	mg/l	1.00		99	85-115			
Lead	1.03	0.015	mg/l	1.00		103	85-115			
Magnesium	21.4	2.0	mg/l	21.0		102	85-115			
Manganese	1.03	0.010	mg/l	1.00		103	85-115			
Nickel	1.04	0.010	mg/l	1.00		104	85-115			
Selenium	1.03	0.10	mg/l	1.00		103	85-115			
Zinc	1.07	0.050	mg/l	1.00		107	85-115			
LCS Dup Analyzed: 06/25/2012 (12F0929-BSD1)										
Arsenic	0.982	0.10	mg/l	1.00		98	85-115	4	20	
Barium	1.01	0.010	mg/l	1.00		101	85-115	3	20	
Cadmium	0.972	0.0010	mg/l	1.00		97	85-115	5	20	
Chromium	1.01	0.010	mg/l	1.00		101	85-115	4	20	
Cobalt	0.987	0.040	mg/l	1.00		99	85-115	4	20	
Copper	0.947	0.010	mg/l	1.00		95	85-115	5	20	
Lead	0.984	0.015	mg/l	1.00		98	85-115	5	20	
Magnesium	21.0	2.0	mg/l	21.0		100	85-115	2	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0929 Extracted: 06/24/12										
LCS Dup Analyzed: 06/25/2012 (12F0929-BSD1)										
Manganese	1.00	0.010	mg/l	1.00		100	85-115	3	20	
Nickel	0.997	0.010	mg/l	1.00		100	85-115	4	20	
Selenium	0.987	0.10	mg/l	1.00		99	85-115	4	20	
Zinc	1.03	0.050	mg/l	1.00		103	85-115	4	20	
Matrix Spike Analyzed: 06/25/2012 (12F0929-MS1)					**Source: PVF1302-01**					
Arsenic	1.01	0.10	mg/l	1.00	0.0109	100	70-130			
Barium	2.01	0.010	mg/l	1.00	0.943	107	70-130			
Cadmium	0.980	0.0010	mg/l	1.00	ND	98	70-130			
Chromium	1.00	0.010	mg/l	1.00	ND	100	70-130			
Cobalt	0.985	0.040	mg/l	1.00	ND	98	70-130			
Copper	0.970	0.010	mg/l	1.00	0.00796	96	70-130			
Lead	0.992	0.015	mg/l	1.00	ND	99	70-130			
Magnesium	50.3	2.0	mg/l	21.0	27.6	108	70-130			
Manganese	1.01	0.010	mg/l	1.00	ND	101	70-130			
Nickel	0.998	0.010	mg/l	1.00	0.0115	99	70-130			
Selenium	1.00	0.10	mg/l	1.00	0.00689	100	70-130			
Zinc	1.03	0.050	mg/l	1.00	ND	103	70-130			
Matrix Spike Dup Analyzed: 06/25/2012 (12F0929-MSD1)					**Source: PVF1302-01**					
Arsenic	1.03	0.10	mg/l	1.00	0.0109	102	70-130	2	20	
Barium	2.02	0.010	mg/l	1.00	0.943	108	70-130	0.2	20	
Cadmium	1.00	0.0010	mg/l	1.00	ND	100	70-130	2	20	
Chromium	1.01	0.010	mg/l	1.00	ND	101	70-130	1	20	
Cobalt	0.996	0.040	mg/l	1.00	ND	100	70-130	1	20	
Copper	0.982	0.010	mg/l	1.00	0.00796	97	70-130	1	20	
Lead	1.01	0.015	mg/l	1.00	ND	101	70-130	2	20	
Magnesium	50.4	2.0	mg/l	21.0	27.6	108	70-130	0.07	20	
Manganese	1.02	0.010	mg/l	1.00	ND	102	70-130	1	20	
Nickel	1.01	0.010	mg/l	1.00	0.0115	100	70-130	1	20	
Selenium	1.05	0.10	mg/l	1.00	0.00689	104	70-130	4	20	
Zinc	1.06	0.050	mg/l	1.00	ND	106	70-130	3	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0983 Extracted: 06/26/12										
Blank Analyzed: 06/27/2012 (12F0983-BLK1)										
Arsenic	ND	5.0	mg/kg							
Barium	ND	5.0	mg/kg							
Cadmium	ND	0.50	mg/kg							
Chromium	ND	2.0	mg/kg							
Cobalt	ND	2.0	mg/kg							
Copper	ND	5.0	mg/kg							
Lead	ND	5.0	mg/kg							
Magnesium	ND	25	mg/kg							
Manganese	ND	2.0	mg/kg							
Nickel	ND	2.0	mg/kg							
Selenium	ND	5.0	mg/kg							
Zinc	ND	10	mg/kg							
LCS Analyzed: 06/27/2012 (12F0983-BS1)										
Arsenic	44.9	5.0	mg/kg	50.0		90	81-109			
Barium	49.0	5.0	mg/kg	50.0		98	87-114			
Cadmium	44.2	0.50	mg/kg	50.0		88	83-110			
Chromium	48.4	2.0	mg/kg	50.0		97	86-112			
Cobalt	47.4	2.0	mg/kg	50.0		95	88-111			
Copper	48.4	5.0	mg/kg	50.0		97	81-110			
Lead	46.7	5.0	mg/kg	50.0		93	83-113			
Magnesium	971	25	mg/kg	1050		92	84-109			
Manganese	48.7	2.0	mg/kg	50.0		97	87-112			
Nickel	47.4	2.0	mg/kg	50.0		95	81-114			
Selenium	41.4	5.0	mg/kg	50.0		83	78-110			
Zinc	50.2	10	mg/kg	50.0		100	82-112			
LCS Dup Analyzed: 06/27/2012 (12F0983-BSD1)										
Arsenic	44.6	5.0	mg/kg	49.0		91	81-109	0.6	20	
Barium	48.2	5.0	mg/kg	49.0		98	87-114	2	20	
Cadmium	43.8	0.50	mg/kg	49.0		89	83-110	0.8	20	
Chromium	48.1	2.0	mg/kg	49.0		98	86-112	0.7	20	
Cobalt	46.8	2.0	mg/kg	49.0		95	88-111	1	20	
Copper	47.7	5.0	mg/kg	49.0		97	81-110	1	20	
Lead	46.2	5.0	mg/kg	49.0		94	83-113	1	20	
Magnesium	960	25	mg/kg	1030		93	84-109	1	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0983 Extracted: 06/26/12										
LCS Dup Analyzed: 06/27/2012 (12F0983-BSD1)										
Manganese	48.4	2.0	mg/kg	49.0		99	87-112	0.7	20	
Nickel	47.0	2.0	mg/kg	49.0		96	81-114	0.8	20	
Selenium	41.1	5.0	mg/kg	49.0		84	78-110	0.7	20	
Zinc	47.3	10	mg/kg	49.0		97	82-112	6	20	
Matrix Spike Analyzed: 06/27/2012 (12F0983-MS1)					**Source: PVF1376-07**					
Arsenic	47.1	5.0	mg/kg	50.0	5.81	83	75-125			
Barium	222	5.0	mg/kg	50.0	149	145	75-125			*M3*
Cadmium	41.9	0.50	mg/kg	50.0	0.178	83	75-125			
Chromium	54.6	2.0	mg/kg	50.0	12.2	85	75-125			
Cobalt	46.3	2.0	mg/kg	50.0	5.35	82	75-125			
Copper	60.3	5.0	mg/kg	50.0	13.6	93	75-125			
Lead	63.3	5.0	mg/kg	50.0	19.1	88	75-125			
Magnesium	6780	25	mg/kg	1050	5230	147	75-125			*M3*
Manganese	256	2.0	mg/kg	50.0	204	105	75-125			*M3*
Nickel	52.3	2.0	mg/kg	50.0	12.9	79	75-125			
Selenium	39.2	5.0	mg/kg	50.0	1.26	76	75-125			
Zinc	240	10	mg/kg	50.0	122	235	75-125			*M3*
Matrix Spike Dup Analyzed: 06/27/2012 (12F0983-MSD1)					**Source: PVF1376-07**					
Arsenic	47.3	5.0	mg/kg	49.5	5.81	84	75-125	0.5	20	
Barium	235	5.0	mg/kg	49.5	149	172	75-125	6	20	*M3*
Cadmium	41.9	0.50	mg/kg	49.5	0.178	84	75-125	0.08	20	
Chromium	54.5	2.0	mg/kg	49.5	12.2	85	75-125	0.2	20	
Cobalt	46.3	2.0	mg/kg	49.5	5.35	83	75-125	0.03	20	
Copper	60.8	5.0	mg/kg	49.5	13.6	95	75-125	0.8	20	
Lead	61.9	5.0	mg/kg	49.5	19.1	86	75-125	2	20	
Magnesium	6900	25	mg/kg	1040	5230	160	75-125	2	20	*M3*
Manganese	257	2.0	mg/kg	49.5	204	108	75-125	0.4	20	*M3*
Nickel	52.7	2.0	mg/kg	49.5	12.9	80	75-125	0.7	20	
Selenium	39.1	5.0	mg/kg	49.5	1.26	76	75-125	0.3	20	
Zinc	182	10	mg/kg	49.5	122	120	75-125	28	20	*M3 N1*

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1001 Extracted: 06/28/12										
Blank Analyzed: 06/28/2012 (12F1001-BLK1)										
Mercury	ND	0.10	mg/kg							
LCS Analyzed: 06/28/2012 (12F1001-BS1)										
Mercury	1.59	0.10	mg/kg	1.61		99	80-120			
LCS Dup Analyzed: 06/28/2012 (12F1001-BSD1)										
Mercury	1.73	0.10	mg/kg	1.73		100	80-120	8	20	
Matrix Spike Analyzed: 06/28/2012 (12F1001-MS1)					**Source: PVF1297-08**					
Mercury	1.53	0.091	mg/kg	1.51	0.00265	101	75-125			
Matrix Spike Dup Analyzed: 06/28/2012 (12F1001-MSD1)					**Source: PVF1297-08**					
Mercury	1.54	0.10	mg/kg	1.54	0.00265	100	75-125	0.8	20	
Batch: 12F1002 Extracted: 06/28/12										
Blank Analyzed: 06/28/2012 (12F1002-BLK1)										
Mercury	ND	0.10	mg/kg							
LCS Analyzed: 06/28/2012 (12F1002-BS1)										
Mercury	1.71	0.10	mg/kg	1.58		108	80-120			
LCS Dup Analyzed: 06/28/2012 (12F1002-BSD1)										
Mercury	1.85	0.10	mg/kg	1.80		103	80-120	8	20	
Matrix Spike Analyzed: 06/28/2012 (12F1002-MS1)					**Source: PVF1638-10**					
Mercury	1.68	0.10	mg/kg	1.61	0.00464	104	75-125			

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1002 Extracted: 06/28/12										
Matrix Spike Dup Analyzed: 06/28/2012 (12F1002-MSD1)					**Source: PVF1638-10**					
Mercury	1.80	0.10	mg/kg	1.74	0.00464	103	75-125	7	20	
Batch: 12F1003 Extracted: 06/27/12										
Blank Analyzed: 06/27/2012 (12F1003-BLK1)										
Mercury	ND	0.00020	mg/l							
LCS Analyzed: 06/27/2012 (12F1003-BS1)										
Mercury	0.00883	0.00020	mg/l	0.0100		88	85-115			
LCS Dup Analyzed: 06/27/2012 (12F1003-BSD1)										
Mercury	0.00893	0.00020	mg/l	0.0100		89	85-115	1	20	
Matrix Spike Analyzed: 06/27/2012 (12F1003-MS1)					**Source: PVF1311-01**					
Mercury	0.00831	0.00020	mg/l	0.0100	ND	83	70-130			
Matrix Spike Dup Analyzed: 06/27/2012 (12F1003-MSD1)					**Source: PVF1311-01**					
Mercury	0.00858	0.00020	mg/l	0.0100	ND	86	70-130	3	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS BY ICP/MS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1012 Extracted: 06/26/12										
Blank Analyzed: 06/29/2012 (12F1012-BLK1)										
Uranium	ND	0.050	mg/kg							
LCS Analyzed: 06/29/2012 (12F1012-BS1)										
Uranium	5.05	0.050	mg/kg	5.00		101	80-120			
LCS Dup Analyzed: 06/29/2012 (12F1012-BSD1)										
Uranium	5.14	0.050	mg/kg	5.00		103	80-120	2	20	
Matrix Spike Analyzed: 06/29/2012 (12F1012-MS1)					**Source: PVF1519-01**					
Uranium	5.29	0.25	mg/kg	5.00	0.107	104	75-125			*M4*
Matrix Spike Dup Analyzed: 06/29/2012 (12F1012-MSD1)					**Source: PVF1519-01**					
Uranium	5.19	0.25	mg/kg	5.00	0.107	102	75-125	2	20	*M4, N1*
Batch: 12F1184 Extracted: 06/29/12										
Blank Analyzed: 06/30/2012 (12F1184-BLK1)										
Uranium	ND	0.0010	mg/l							
LCS Analyzed: 06/30/2012 (12F1184-BS1)										
Uranium	0.0978	0.0010	mg/l	0.100		98	85-115			
LCS Dup Analyzed: 06/30/2012 (12F1184-BSD1)										
Uranium	0.0965	0.0010	mg/l	0.100		96	85-115	1	20	
Matrix Spike Analyzed: 06/30/2012 (12F1184-MS1)					**Source: PVF1894-02**					
Uranium	0.0932	0.0010	mg/l	0.100	ND	93	70-130			

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

TOTAL METALS BY ICP/MS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1184 Extracted: 06/29/12										
Matrix Spike Dup Analyzed: 06/30/2012 (12F1184-MSD1)					**Source: PVF1894-02**					
Uranium	0.0967	0.0010	mg/l	0.100	ND	97	70-130	4	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

DISSOLVED METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0953 Extracted: 06/26/12										
Blank Analyzed: 06/26/2012 (12F0953-BLK1)										
Mercury	ND	0.00020	mg/l							
LCS Analyzed: 06/26/2012 (12F0953-BS1)										
Mercury	0.00968	0.00020	mg/l	0.0100		97	85-115			
LCS Dup Analyzed: 06/26/2012 (12F0953-BSD1)										
Mercury	0.00986	0.00020	mg/l	0.0100		99	85-115	2	20	
Matrix Spike Analyzed: 06/26/2012 (12F0953-MS1)					**Source: PVF0959-04**					
Mercury	0.0101	0.00020	mg/l	0.0100	ND	101	70-130			
Matrix Spike Dup Analyzed: 06/26/2012 (12F0953-MSD1)					**Source: PVF0959-04**					
Mercury	0.00978	0.00020	mg/l	0.0100	ND	98	70-130	3	20	
Batch: 12F1010 Extracted: 06/26/12										
Blank Analyzed: 06/27/2012 (12F1010-BLK1)										
Arsenic	ND	0.10	mg/l							
Barium	ND	0.010	mg/l							
Cadmium	ND	0.0010	mg/l							
Chromium	ND	0.010	mg/l							
Cobalt	ND	0.040	mg/l							
Copper	ND	0.010	mg/l							
Lead	ND	0.015	mg/l							
Magnesium	ND	2.0	mg/l							
Manganese	ND	0.010	mg/l							
Nickel	ND	0.010	mg/l							
Selenium	ND	0.10	mg/l							
Zinc	ND	0.050	mg/l							

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

DISSOLVED METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1010 Extracted: 06/26/12										
LCS Analyzed: 06/27/2012 (12F1010-BS1)										
Arsenic	0.988	0.10	mg/l	1.00		99	85-115			
Barium	1.02	0.010	mg/l	1.00		102	85-115			
Cadmium	0.949	0.0010	mg/l	1.00		95	85-115			
Chromium	1.00	0.010	mg/l	1.00		100	85-115			
Cobalt	0.991	0.040	mg/l	1.00		99	85-115			
Copper	0.940	0.010	mg/l	1.00		94	85-115			
Lead	0.968	0.015	mg/l	1.00		97	85-115			
Magnesium	20.4	2.0	mg/l	21.0		97	85-115			
Manganese	0.999	0.010	mg/l	1.00		100	85-115			
Nickel	1.01	0.010	mg/l	1.00		101	85-115			
Selenium	0.989	0.10	mg/l	1.00		99	85-115			
Zinc	1.05	0.050	mg/l	1.00		105	85-115			
LCS Dup Analyzed: 06/27/2012 (12F1010-BSD1)										
Arsenic	0.985	0.10	mg/l	1.00		98	85-115	0.3	20	
Barium	1.01	0.010	mg/l	1.00		101	85-115	0.4	20	
Cadmium	0.947	0.0010	mg/l	1.00		95	85-115	0.1	20	
Chromium	1.00	0.010	mg/l	1.00		100	85-115	0.006	20	
Cobalt	0.990	0.040	mg/l	1.00		99	85-115	0.1	20	
Copper	0.937	0.010	mg/l	1.00		94	85-115	0.2	20	
Lead	0.965	0.015	mg/l	1.00		97	85-115	0.3	20	
Magnesium	20.6	2.0	mg/l	21.0		98	85-115	1	20	
Manganese	1.00	0.010	mg/l	1.00		100	85-115	0.5	20	
Nickel	1.00	0.010	mg/l	1.00		100	85-115	0.3	20	
Selenium	0.987	0.10	mg/l	1.00		99	85-115	0.3	20	
Zinc	1.05	0.050	mg/l	1.00		105	85-115	0.4	20	
Matrix Spike Analyzed: 06/27/2012 (12F1010-MS1)					**Source: PVF1519-07**					
Arsenic	1.01	0.10	mg/l	1.00	0.0117	100	70-130			
Barium	1.05	0.010	mg/l	1.00	0.0508	100	70-130			
Cadmium	0.952	0.0010	mg/l	1.00	ND	95	70-130			
Chromium	0.996	0.010	mg/l	1.00	ND	100	70-130			
Cobalt	0.979	0.040	mg/l	1.00	ND	98	70-130			
Copper	0.949	0.010	mg/l	1.00	0.00276	95	70-130			
Lead	0.964	0.015	mg/l	1.00	ND	96	70-130			
Magnesium	45.7	2.0	mg/l	21.0	27.1	89	70-130			

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

DISSOLVED METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1010 Extracted: 06/26/12										
Matrix Spike Analyzed: 06/27/2012 (12F1010-MS1)					**Source: PVF1519-07**					
Manganese	1.00	0.010	mg/l	1.00	ND	100	70-130			
Nickel	0.985	0.010	mg/l	1.00	ND	98	70-130			
Selenium	0.999	0.10	mg/l	1.00	0.0177	98	70-130			
Zinc	1.05	0.050	mg/l	1.00	0.0214	103	70-130			
Matrix Spike Dup Analyzed: 06/27/2012 (12F1010-MSD1)					**Source: PVF1519-07**					
Arsenic	1.01	0.10	mg/l	1.00	0.0117	100	70-130	0.03	20	
Barium	1.05	0.010	mg/l	1.00	0.0508	100	70-130	0.5	20	
Cadmium	0.944	0.0010	mg/l	1.00	ND	94	70-130	0.8	20	
Chromium	0.994	0.010	mg/l	1.00	ND	99	70-130	0.2	20	
Cobalt	0.978	0.040	mg/l	1.00	ND	98	70-130	0.2	20	
Copper	0.947	0.010	mg/l	1.00	0.00276	94	70-130	0.2	20	
Lead	0.963	0.015	mg/l	1.00	ND	96	70-130	0.1	20	
Magnesium	45.8	2.0	mg/l	21.0	27.1	89	70-130	0.2	20	
Manganese	0.998	0.010	mg/l	1.00	ND	100	70-130	0.6	20	
Nickel	0.981	0.010	mg/l	1.00	ND	98	70-130	0.4	20	
Selenium	1.00	0.10	mg/l	1.00	0.0177	98	70-130	0.08	20	
Zinc	1.05	0.050	mg/l	1.00	0.0214	103	70-130	0.3	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

DISSOLVED METALS BY ICP/MS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F1180 Extracted: 06/29/12										
Blank Analyzed: 06/30/2012 (12F1180-BLK1)										
Uranium	ND	0.0010	mg/l							
LCS Analyzed: 06/30/2012 (12F1180-BS1)										
Uranium	0.0970	0.0010	mg/l	0.100		97	85-115			
LCS Dup Analyzed: 06/30/2012 (12F1180-BSD1)										
Uranium	0.0920	0.0010	mg/l	0.100		92	85-115	5	20	
Matrix Spike Analyzed: 06/30/2012 (12F1180-MS1)					**Source: PVF1837-04**					
Uranium	0.0990	0.0010	mg/l	0.100	0.00327	96	70-130			
Matrix Spike Dup Analyzed: 06/30/2012 (12F1180-MSD1)					**Source: PVF1837-04**					
Uranium	0.0979	0.0010	mg/l	0.100	0.00327	95	70-130	1	20	

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0869 Extracted: 06/22/12										
Blank Analyzed: 06/23/2012 (12F0869-BLK1)										
Alkalinity as CaCO3	ND	6.0	mg/l							
Bicarbonate Alkalinity as CaCO3	ND	6.0	mg/l							
Carbonate Alkalinity as CaCO3	ND	6.0	mg/l							
Hydroxide Alkalinity as CaCO3	ND	6.0	mg/l							
Alkalinity, Phenolphthalein	ND	6.0	mg/l							
LCS Analyzed: 06/23/2012 (12F0869-BS2)										
Alkalinity as CaCO3	253	6.0	mg/l	250		101	90-110			
LCS Dup Analyzed: 06/23/2012 (12F0869-BSD2)										
Alkalinity as CaCO3	254	6.0	mg/l	250		102	90-110	0.4	20	
Duplicate Analyzed: 06/23/2012 (12F0869-DUP1)					**Source: PVF1504-01**					
Alkalinity as CaCO3	140	6.0	mg/l		140			0.002	20	
Bicarbonate Alkalinity as CaCO3	140	6.0	mg/l		140			0.002	20	
Carbonate Alkalinity as CaCO3	ND	6.0	mg/l		ND				20	
Hydroxide Alkalinity as CaCO3	ND	6.0	mg/l		ND				20	
Alkalinity, Phenolphthalein	ND	6.0	mg/l		ND				20	
Duplicate Analyzed: 06/23/2012 (12F0869-DUP2)					**Source: PVF1504-03**					
Alkalinity as CaCO3	169	6.0	mg/l		169			0.2	20	
Bicarbonate Alkalinity as CaCO3	169	6.0	mg/l		169			0.2	20	
Carbonate Alkalinity as CaCO3	ND	6.0	mg/l		ND				20	
Hydroxide Alkalinity as CaCO3	ND	6.0	mg/l		ND				20	
Alkalinity, Phenolphthalein	ND	6.0	mg/l		ND				20	
Batch: 12F0880 Extracted: 06/22/12										
Blank Analyzed: 06/22/2012 (12F0880-BLK1)										
Total Suspended Solids	ND	1.0	mg/l							

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 12F0880 Extracted: 06/22/12										
LCS Analyzed: 06/22/2012 (12F0880-BS1)										
Total Suspended Solids	200	10	mg/l	200		100	90-110			
LCS Dup Analyzed: 06/22/2012 (12F0880-BSD1)										
Total Suspended Solids	199	10	mg/l	200		100	90-110	0.5	10	
Duplicate Analyzed: 06/22/2012 (12F0880-DUP1)					**Source: PVF1436-01**					
Total Suspended Solids	344	40	mg/l		360			5	10	
Duplicate Analyzed: 06/22/2012 (12F0880-DUP2)					**Source: PVF1482-01**					
Total Suspended Solids	5100	200	mg/l		4580			11	10	*R9*

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

DATA QUALIFIERS AND DEFINITIONS

D1	Sample required dilution due to matrix.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated blank spike recovery was acceptable.
M4	The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The associated blank spike recovery was acceptable.
N1	See case narrative.
Q8	Insufficient sample received to meet method QC requirements. Batch QC requirements satisfy ADEQ policies 0154.000 and 0155.000.
R9	Sample RPD exceeded the laboratory acceptance limit
T2	Cited ADHS licensed method does not contain this analyte as part of method compound list.
ND	Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.
RPD	Relative Percent Difference

ADDITIONAL COMMENTS

For Extractable Fuel Hydrocarbons (EFH, DRO, ORO) by 8015b/d :

Unless otherwise noted, Extractable Fuel Hydrocarbons by method 8015b/d (EFH, DRO, ORO) are quantitated against a Diesel Fuel Standard.

TestAmerica Phoenix

Denise Harrington
Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

4625 East Cotton Center Blvd. Ste 189, Phoenix, AZ 85040 (602) 437-3340 Fax (602) 454-9303

Engineering/Remediation Resources Group, Inc.
4585 Pacheco Blvd.
Martinez, CA 94553-2233
Attention: Samantha Caruthers-Knight

Project ID: 2011-149
Report Number: PVF1519

Sampled: 06/15/12-06/19/12
Received: 06/20/12

Certification Summary

TestAmerica Phoenix

Method	Matrix	Nelac	Arizona
8015AZ R.1	Soil		X
EPA 200.7	Water		X
EPA 200.8	Water		X
EPA 245.1	Water		X
EPA 6010B	Soil	N/A	X
EPA 6020	Soil		X
EPA 7471A	Soil		X
EPA 8015D	Water		X
SM2320B	Water		X
SM 2540D	Water		X
SM2340B	Water		X

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

TestAmerica Phoenix

Denise Harrington
Project Manager

PVF1519

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-0013-550 (10/10)

CHAIN OF CUSTODY FORM

[X] Phoenix - 4625 E. Cotton Center Blvd., Suite 189, Phoenix, AZ 85040 (602) 437-3340 FAX (602) 454-9303
[ ] Tucson - 1870 W. Prince Road, Suite 59, Tucson, AZ 85705 (520) 807-3801 FAX (520) 807-3803
[ ] Las Vegas - 6000 S Eastern Ave., Suite 5E, Las Vegas, NV 89119 (702) 429-1264

Page 1 of 1

Client Name/Address: Engineering/Remediation Resources Group, 4585 Pacheco Blvd, Martinez, CA 94553

Project/PO Number: 2011-149

Project Manager: Samantha Carruthers-Knight

Phone Number: 415 848 7108 Cell 510-851-3279

Sampler: Samantha Carruthers-Knight

Fax Number: 925 969 0751

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	EPA 6010/6020 EPA 7471 (total metals)	EPA 9045 D (PH37E pH)	EPA 6010/6020 EPA 7471 (dissolved metals)	EPA 8015 (TPH-DRO)	EPA 2007/6010P (WardVuSS)	SM 2320B (Calc. Bicarbonate)	M160.2 (TSS)	Plpl Split	Special Instructions
PA-MT-SD-01	S	8.07 jar	2	06/15/12	1220		X				-01			X	please homogenize
PA-ATV1-SS-01	S	8.07 jar	2	06/15/12	1345		X				-02			X	
PA-ATV2-SS-01	S	8.07 jar	2	06/15/12	1530		X				-03			X	
PA-MC-SS-01	S	8.07 jar	2	06/16/12	1340		X			X	-04			X	
~~PA-UT-SD-01~~	S	8.07 jar	2	06/16/12	1550		X	SCP							
PA-MA-SS-01	S	8.07 jar	2	06/17/12	1105		X				-05			X	
PA-MC-GW-01	W	various	5	06/17/12	1645	various	X		X	X	X	X	X		-06/07
PA-MT-GW-01	W	various	3	06/17/12	1700	various	X		X	X	X	X	X		-08/09
PA-UW-SS-01	S	8.07 jar	2	06/18/12	1030		X				~~-08~~			X	-10
PA-UW-WP-08	S	8.07 jar	2	06/18/12	1230		X				~~-09~~			X	-11
PA-BH-SS-01	S	8.07 jar	2	06/19/12	0840		X			6/22/12	~~-10~~			X	-12
PA-PC-WP-01	S	8.07 jar	2	06/19/12	1440		X				~~-11~~			X	-13
PA-PT-SD-01	S	8.07 jar	2	06/19/12	1310	SCP	X				~~-12~~			X	-14

Relinquished By:	Date/Time:	Received By:	Date/Time:	Turnaround Time: (Check)	
	6/20/12 1510			same day ____	72 hours ____
Relinquished By:	Date/Time:	Received By:	Date/Time:	24 hours ____	5 days ____
				48 hours ____	normal X
Relinquished By:	Date/Time:	Received in Lab By:	Date/Time:	Sample Integrity: (Check)	
			6-20-12 1510	intact X	on ice X

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

1.9°C

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com / cinnasblab@EMSL.com

EMSL Order ID:	041216229
Customer ID:	ERRG25
Customer PO:	
Project ID:	

Attn: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Proj: 2011-149

Phone:	(925) 969-0750
Fax:	
Collected:	06/17/2012
Received:	06/22/2012
Analyzed:	07/06/2012

Test Report: Determination of Asbestos Structures > 10µm in Water Performed by the 100.2 Method (EPA 600/R-94/134)

Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered (ml)	Effective Filter Area (mm^2)	Area Analyzed (mm^2)	ASBESTOS Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits
							MFL (million fibers per liter)		
PA-MC-GW-01 041216229-0001	6/22/2012 12:30 PM	5	1280	0.2640	None Detected	ND	0.97	<0.97	0.00 - 3.60
Due to excessive particulate the analytical sensitivity of 0.2 MFL as required by the method was not reached.									
PA-MT-SW-01 041216229-0002	6/22/2012 12:30 PM	0.20	1280	0.2640	None Detected	ND	24.00	<24.00	0.00 - 89.00
Due to excessive particulate the analytical sensitivity of 0.2 MFL as required by the method was not reached.									

Samples ozonated priort to analysis.

Analyst(s)
Steig Breloff (2)

Stephen Siegel, CIH, Laboratory Manager
or Other Approved Signatory

Any questions please contact Steve Siegel.

Initial report from: 07/06/2012 14:16:55

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnasblab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
PA-MT-SD-01 *041216520-0001*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV1-SS-01 *041216520-0002*		Brown Non-Fibrous Homogeneous		99.25% Non-fibrous (other)	**0.75% Chrysotile**
PA-ATV1-SS-02 *041216520-0003*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV1-SS-03 *041216520-0004*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV1-SS-04 *041216520-0005*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV1-SS-05 *041216520-0006*		Brown Non-Fibrous Homogeneous		99.00% Non-fibrous (other)	**1.00% Chrysotile**
PA-ATV1-SS-07 *041216520-0007*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnaslab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
PA-ATV2-SS-01 *041216520-0008*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV1-SS-06 *041216520-0009*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-MC-SS-01 *041216520-0010*		Brown Non-Fibrous Homogeneous		99.75% Non-fibrous (other)	**0.25% Chrysotile**
PA-MC-SS-02 *041216520-0011*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-MC-SS-03 *041216520-0012*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-MC-SS-04 *041216520-0013*		Brown Non-Fibrous Homogeneous		99.75% Non-fibrous (other)	**0.25% Chrysotile**
PA-MC-SS-05 *041216520-0014*		Brown Non-Fibrous Homogeneous		99.00% Non-fibrous (other)	**1.00% Chrysotile**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnaslab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
PA-UT-SD-01 *041216520-0015*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-02 *041216520-0016*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-03 *041216520-0017*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-04 *041216520-0018*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-05 *041216520-0019*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-06 *041216520-0020*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-07 *041216520-0021*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnaslab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
PA-ATV2-SS-08 *041216520-0022*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-09 *041216520-0023*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-10 *041216520-0024*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-11 *041216520-0025*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-ATV2-SS-12 *041216520-0026*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-MA-SS-01 *041216520-0027*		Brown Non-Fibrous Homogeneous		98.75% Non-fibrous (other)	**1.25% Chrysotile**
PA-MA-SS-02 *041216520-0028*		Brown Non-Fibrous Homogeneous		94.25% Non-fibrous (other)	**5.75% Chrysotile**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnasblab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
PA-MA-SS-03 *041216520-0029*		Brown Non-Fibrous Homogeneous		90.50% Non-fibrous (other)	**9.50% Chrysotile**
PA-MA-SS-04 *041216520-0030*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-MA-SS-05 *041216520-0031*		Brown Non-Fibrous Homogeneous		99.50% Non-fibrous (other)	**0.50% Chrysotile**
PA-UW-SS-01 *041216520-0032*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-UW-SS-02 *041216520-0033*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-UW-SS-03 *041216520-0034*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-UW-SS-04 *041216520-0035*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnaslab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
PA-UW-SS-05 *041216520-0036*		Brown Non-Fibrous Homogeneous		99.50% Non-fibrous (other)	**0.50% Chrysotile**
PA-UW-SS-06 *041216520-0037*		Brown Non-Fibrous Homogeneous		99.75% Non-fibrous (other)	**0.25% Chrysotile**
PA-UW-WP-07 *041216520-0038*		Brown Non-Fibrous Homogeneous		86.25% Non-fibrous (other)	**13.75% Chrysotile**
PA-UW-WP-08 *041216520-0039*		Brown Non-Fibrous Homogeneous		97.75% Non-fibrous (other)	**2.25% Chrysotile**
PA-UW-WP-09 *041216520-0040*		Brown Non-Fibrous Homogeneous		95.00% Non-fibrous (other)	**5.00% Chrysotile**
PA-BG-SS-01 *041216520-0041*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-BG-SS-02 *041216520-0042*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-5974
http://www.emsl.com cinnaslab@EMSL.com

EMSL Order:	041216520
CustomerID:	ERRG25
CustomerPO:	
ProjectID:	

Attn: **Samantha Caruthers-Knight**
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Project: **2011-149**

Phone:	(925) 969-0750
Fax:	
Received:	06/22/12 9:30 AM
Analysis Date:	7/8/2012
Collected:	6/15/2012

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling) Level A for 0.25% Target Analytical Sensitivity

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
PA-BG-SS-03 *041216520-0043*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-BG-SS-04 *041216520-0044*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**
PA-PC-WP-01 *041216520-0045*		Brown Non-Fibrous Homogeneous		99.75% Non-fibrous (other)	**0.25% Chrysotile**
PA-PT-SD-01 *041216520-0046*		Brown Non-Fibrous Homogeneous		100.00% Non-fibrous (other)	**None Detected**

Analyst(s)

Baojia Ke (1)
Matthew Batongbacal (45)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

Initial report from 07/08/2012 18:02:27

EMSL Analytical, Inc.

Asbestos Data Package

Engineering/Remediation Resources Group, Inc.
Project 2011-149 Phillip's Mine
Data Package 1

EMSL Order ID 041216273

Prepared By: EMSL Special Projects Group

Date: August 7, 2012

TABLE OF CONTENTS

1. Case Narrative

EMSL ANALYTICAL, INC.
200 RT. 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX: (856) 786-0235

August 7, 2012

Engineering/Remediation Resources Group
Samantha Caruthers-Knight
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553
Phone: (925)-969-0750

Re: Narrative, TEM ISO 10312 & ISO 13794; Phillip's Mine; EMSL order ID 041216273
Dear Samantha:

On June 22, 2012, EMSL Analytical, Inc. in Cinnaminson, NJ received forty-eight air samples via FedEx for asbestos content analysis via TEM ISO 10312. The samples were logged in following normal lab procedures. Samples were received under Chain of Custody from Engineering/Remediation Resources Group and arrived in good condition.

TEM ISO 10312

TEM analysis was performed using the following method: TEM ISO 10312: 1995-05-01 Ambient Air-Determination of Asbestos Fibres-Direct Transfer Transmission Electron Microscopy. Client specified analysis utilizing specifications found in Annex E.

Client specified modifications to method as follows:

- An analytical sensitivity of 0.002 S/cc for Ambient Air Samples and 0.004 S/cc for Activity Based Samples was specified verbally by client.
- All field blanks and laboratory blanks each had 10 grid openings analyzed.
- PCM (0.8u) 25mm MCE cassettes were used for sampling.
- Aspect ratio applied was modified to greater than or equal to 3:1.
- A minimum of 4 grid openings were analyzed, from 2 separate grid preparations.
- Width requirement of countable structures was altered to 0.25 microns.
- Structures greater than 5.0 microns in length were recorded.

Results
Samples were analyzed via transmission electron microscopy (TEM) using procedures from ISO 10312. Analysis was performed on a JEOL 100 CX II microscope at approximately 10,000X. Analysis was performed in EMSL's New York, NY laboratory.

The following results were edited and reported on 7/27/2012:
041216273-0027

EMSL ANALYTICAL, INC.
200 RT. 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX: (856) 786-0235

The following results were edited and reported on 8/3/2012:
041216273-0017, 041216273-0030, 041216273-0036, 041216273-0045 along with benchsheets for sample 041216273-0024.

TEM ISO 13794

TEM analysis was performed using the following method for applicable samples: TEM ISO 13794: 1999-07-15 Ambient Air-Determination of Asbestos Fibres-Indirect Transfer Transmission Electron Microscopy. Samples that were deemed overloaded or displayed a non uniform deposition, either before or after analysis by ISO 10312, proceeded to analysis by ISO 13794 following approval from client. Filter remnants were slowly ashed and the residue was suspended in de-ionized water. An aliquot of each suspension was filtered onto an MCE filter.

The following samples were analyzed via ISO 13794:
EMSL sample ID: 041216273-0016; Client sample ID: PA-ATVI-AM-03
EMSL sample ID: 041216273-0017; Client sample ID: PA-ATVI-AM-04
EMSL sample ID: 041216273-0040; Client sample ID: PA-ATV2-AM-04

All client-specified modifications for TEM ISO 10312 were also applied to samples analyzed by ISO 13794.

Results
Samples were analyzed via transmission electron microscopy (TEM) using procedures from ISO 13794. Analysis was performed on a JEOL 1200 EX microscope at approximately 10,000X. Analysis was performed in EMSL's Cinnaminson, NJ laboratory.

All reports for samples analyzed by TEM ISO 13794 were amended and reported on 7/27/2012.

Quality Control Performed
The Quality Control (QC) and equipment calibration was performed in compliance with EMSL's Quality Assurance Manual. For this order ID, three inter-analyst QC's were analyzed as well as one intra-analyst QC. Five lab blanks, one ashing blank, one filtration blank, and one hood blank were analyzed for this sample set. All QC results presented within this package were found to be concordant.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. In addition, I certify, that to the best of my knowledge and belief, the data as reported are true and accurate. Release of the data contained in this data package has been authorized by the Laboratory Manager(s) or his designee, as verified by the following signature(s).

Robyn Denton 07 Aug 2012
Date

Robyn Denton
Asbestos Laboratory Manager
EMSL Cinnaminson, NJ

2. Tabulated Sample Results

EMSL

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/5/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0001	
Customer Sample #:		PA-MC-AA-01	
Date sampled:		6/16/2012	
Initials of Analyst:		DY	
Air volume:		791.1	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		19	
Analytical Sensitivity:		0.0018	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:		< 0.0054	Str/cc
Concentration of Amphibole Asbestos:		< 0.0054	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)		< 0.0054	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)		< 0.0054	Str/cc
Concentration of Asbestos (total):		< 0.0054	Str/cc

Comments:
Non-Countable Asbestos structure present during analysis.
Particulate loading 1-5%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/5/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0002	
Customer Sample #:		PA-MC-AA-03	
Date sampled:		6/16/2012	
Initials of Analyst:		DY	
Air volume:		709.155	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		21	
Analytical Sensitivity:		0.00190	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:		< 0.0057	Str/cc
Concentration of Amphibole Asbestos:		< 0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)		< 0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)		< 0.0057	Str/cc
Concentration of Asbestos (total):		**< 0.0057**	**Str/cc**

Comments:
Particulate loading 1-5%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 6/26/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0003	
Customer Sample #:		PA-MC-AM-04	
Date sampled:		6/16/2012	
Initials of Analyst:		PH	
Air volume:		483.975	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		16	
Analytical Sensitivity:		0.0038	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0114	Str/cc
Concentration of Amphibole Asbestos:	<	0.0114	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0114	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0114	Str/cc
Concentration of Asbestos (total):	**<**	**0.0114**	**Str/cc**

Comments:
Particulate Loading 8 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0004	
Customer Sample #:		PA-MC-AA-02	
Date sampled:		6/16/2012	
Initials of Analyst:		DY	
Air volume:		641.325	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.013	mm²
Number of Grid Openings Analyzed:		24	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0058	Str/cc
Concentration of Amphibole Asbestos:	<	0.0058	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0058	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0058	Str/cc
Concentration of Asbestos (total):	<	0.0058	**Str/cc**

Comments:
Particulate Loading 1-5%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 6/26/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0005	
Customer Sample #:		PA-MC-AM-01	
Date sampled:		6/16/2012	
Initials of Analyst:		PH	
Air volume:		487.575	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		16	
Analytical Sensitivity:		0.0037	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0111	Str/cc
Concentration of Amphibole Asbestos:	<	0.0111	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0111	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0111	Str/cc
Concentration of Asbestos (total):	**<**	**0.0111**	**Str/cc**

Comments:
Particulate Loading 3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/5/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0006	
Customer Sample #:		PA-MC-AM-03	
Date sampled:		6/16/2012	
Initials of Analyst:		GI	
Air volume:		561.6	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		15	
Analytical Sensitivity:		0.0035	Str/cc
Number of Primary Asbestos Structures Counted:		1	
Number of total asbestos structures counted:		1	
Number of Asbestos Structures > 5 microns:		1	
Number of Asbestos fibers and bundles > 5 microns:		1	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.0166	Str/cc
Concentration of Amphibole Asbestos:	<	0.0166	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0166	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0166	Str/cc
Concentration of Asbestos (total):	**<**	**0.0166**	**Str/cc**

Comments:
Particulate Loading 10%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0007	
Customer Sample #:		PA-MC-AM-02	
Date sampled:		6/16/2012	
Initials of Analyst:		AF	
Air volume:		584.55	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		14	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0108	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0108	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0108**	**Str/cc**

Comments:
Particulate Loading 5-10%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0008	
Customer Sample #:		PA-ATV1-AA-01	
Date sampled:		6/17/2012	
Initials of Analyst:		AF	
Air volume:		493.2	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		31	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate loading 10-15%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0009	
Customer Sample #:		PA-ATV1-AA-02	
Date sampled:		6/17/2012	
Initials of Analyst:		AF	
Air volume:		374.94	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		40	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A/	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A/	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate loading 10-15%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0010	
Customer Sample #:		PA-ATV1-AA-03	
Date sampled:		6/17/2012	
Initials of Analyst:		AF	
Air volume:		375.85	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		40	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-5%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0012	
Customer Sample #:		PA-ATV1-AA-05	
Date sampled:		6/17/2012	
Initials of Analyst:		DY	
Air volume:		385.38	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		40	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		1	
Number of total asbestos structures counted:		1	
Number of Asbestos Structures > 5 microns:		1	
Number of Asbestos fibers and bundles > 5 microns:		1	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.0090	Str/cc
Concentration of Amphibole Asbestos:	<	0.0090	Str/cc
Lower 95% Confidence Limit (Chrysotile)		<N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0090	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0090	Str/cc
Concentration of Asbestos (total):	**<**	**0.0090**	**Str/cc**

Comments:
Particulate Loading 3-5%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0013	
Customer Sample #:		PA-ATV1-AA-06	
Date sampled:		6/17/2012	
Initials of Analyst:		DY	
Air volume:		512.28	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		30	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 15-20%

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0014	
Customer Sample #:		PA-ATV1-AM-01	
Date sampled:		6/17/2012	
Initials of Analyst:		ES	
Air volume:		430.2	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		19	
Analytical Sensitivity:		0.0035	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0105	Str/cc
Concentration of Amphibole Asbestos:	<	0.0105	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0105	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0105	Str/cc
Concentration of Asbestos (total):	**<**	**0.0105**	**Str/cc**

Comments:
Particulate Loading 5-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/6/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0015	
Customer Sample #:		PA-ATV1-AM-02	
Date sampled:		6/17/2012	
Initials of Analyst:		ES	
Air volume:		403.2	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		20	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0108	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0108	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0108**	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

EMSL

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/20/2012
Report Date: 07/26/12

ISO 13794-Ambient Air - Determination of Asbestos Fibers Indirect Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0016	
Customer Sample #:		PA-ATV1-AM-03	
Date sampled:		6/17/2012	
Initials of Analyst:		PH	
Air volume:		396.36	Liters
Area of collection filter:		385	mm^2
Area of analytical filter:		364.9	mm^2
Percent of filter Ashed:		100	%
Volume of water used for ash dispersal:		40	mL
Volume of dispersion applied to analytical filter:		5	mL
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:	>	0.25	microns
Mean dimension of grid openings:		0.0132	mm^2
Number of Grid Openings Analyzed:		10	
Analytical Sensitivity:		0.0558	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.1668	Str/cc
Concentration of Amphibole Asbestos:	<	0.1668	Str/cc
Lower 95% Confidence Limit (Chrysotile)		NA	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.1668	Str/cc
Lower 95% Confidence Limit (Amphibole)		NA	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.1668	Str/cc
Concentration of Asbestos (total):	**<**	0.1668	**Str/cc**

Comments:
Indirect preparation
Revised 07/26/12

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/7/2012
Report Date: 08/03/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0017	
Customer Sample #:		PA-ATV1-AM-04	
Date sampled:		6/17/2012	
Initials of Analyst:		JA	
Air volume:		381.6	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:			
Analytical Sensitivity:		N/A	Str/cc
Number of Primary Asbestos Structures Counted:		N/A	
Number of total asbestos structures counted:		N/A	
Number of Asbestos Structures > 5 microns:		N/A	
Number of Asbestos fibers and bundles > 5 microns:		N/A	
Number of PCM equivalent asbestos structures:		N/A	
Number of PCM equivalent asbestos fibers:		N/A	
Concentration of Chrysotile Asbestos:		N/A	Str/cc
Concentration of Amphibole Asbestos:		N/A	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)		N/A	Str/cc
		N/A	
Concentration of Asbestos (total):		N/A	**Str/cc**

Comments:
Particulate Loading 50-60 %. Sample overloaded with particulate and could not be analyzed

Robyn Denton
Approved Signatory

EMSL

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/20/2012
Report Date: 07/26/12

ISO 13794-Ambient Air - Determination of Asbestos Fibers Indirect Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0017	
Customer Sample #:		PA-ATV1-AM-04	
Date sampled:		6/17/2012	
Initials of Analyst:		PH	
Air volume:		381.6	Liters
Area of collection filter:		385	mm^2
Area of analytical filter:		364.9	mm^2
Percent of filter Ashed:		75	%
Volume of water used for ash dispersal:		40	mL
Volume of dispersion applied to analytical filter:		5	mL
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:	>	0.25	microns
Mean dimension of grid openings:		0.0132	mm^2
Number of Grid Openings Analyzed:		10	
Analytical Sensitivity:		0.0773	Str/cc
Number of Primary Asbestos Structures Counted:		1	
Number of total asbestos structures counted:		1	
Number of Asbestos Structures > 5 microns:		1	
Number of Asbestos fibers and bundles > 5 microns:		1	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.3664	Str/cc
Concentration of Amphibole Asbestos:	<	0.2311	Str/cc
Lower 95% Confidence Limit (Chrysotile)		NA	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.3664	Str/cc
Lower 95% Confidence Limit (Amphibole)		NA	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.2311	Str/cc
Concentration of Asbestos (total):	**<**	**0.3664**	**Str/cc**

Comments:
Indirect preparation
Revised 7/26/2012

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/7/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0018	
Customer Sample #:		PA-MA-AA-01	
Date sampled:		6/17/2012	
Initials of Analyst:		JA	
Air volume:		374.94	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		40	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/7/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0018	
Customer Sample #:		PA-MA-AA-01	
Date sampled:		6/17/2012	
Initials of Analyst:		JA	
Air volume:		374.94	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		40	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/9/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0019	
Customer Sample #:		PA-MA-AA-02	
Date sampled:		6/17/2012	
Initials of Analyst:		GI	
Air volume:		375.84	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		40	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-2 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/9/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0020	
Customer Sample #:		PA-MA-AM-01	
Date sampled:		6/17/2012	
Initials of Analyst:		GI	
Air volume:		430.2	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		19	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		8	
Number of total asbestos structures counted:		8	
Number of Asbestos Structures > 5 microns:		8	
Number of Asbestos fibers and bundles > 5 microns:		8	
Number of PCM equivalent asbestos structures:		3	
Number of PCM equivalent asbestos fibers:		8	
Concentration of Chrysotile Asbestos:		0.0288	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		0.0124	Str/cc
Upper 95% Confidence Limit (Chrysotile)		0.0568	Str/cc
Lower 95% Confidence Limit (Amphibole)	<	N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):		0.0288	**Str/cc**

Comments:
Particulate Loading 3-5 %
Significant amount of non-countable asbestos observed.
Structures were not countable due to structure size.

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/2/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0021	
Customer Sample #:		PA-MA-AM-02	
Date sampled:		6/17/2012	
Initials of Analyst:		GI	
Air volume:		458.82	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		18	
Analytical Sensitivity:		0.0035	Str/cc
Number of Primary Asbestos Structures Counted:		11	
Number of total asbestos structures counted:		11	
Number of Asbestos Structures > 5 microns:		11	
Number of Asbestos fibers and bundles > 5 microns:		11	
Number of PCM equivalent asbestos structures:		5	
Number of PCM equivalent asbestos fibers:		11	
Concentration of Chrysotile Asbestos:		0.0385	Str/cc
Concentration of Amphibole Asbestos:	<	0.0105	Str/cc
Lower 95% Confidence Limit (Chrysotile)		0.0192	Str/cc
Upper 95% Confidence Limit (Chrysotile)		0.0689	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0105	Str/cc
		0.0105	
Concentration of Asbestos (total):		0.0385	**Str/cc**

Comments:
Particulate Loading 3-5 %
Significant amount of non-countable asbestos observed.
Structures were not countable due to structure size.

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/9/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0022	
Customer Sample #:		PA-MA-AM-03	
Date sampled:		6/17/2012	
Initials of Analyst:		AF	
Air volume:		396.36	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		20	
Analytical Sensitivity:		0.0037	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0111	Str/cc
Concentration of Amphibole Asbestos:	<	0.0111	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0111	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0111	Str/cc
Concentration of Asbestos (total):	**<**	0.0111	**Str/cc**

Comments:
Particulate Loading 5-10 %
Significant amounts of non countable asbestos observed.
Structures were not counable due to structure size.

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/9/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0023	
Customer Sample #:		PA-MA-AM-04	
Date sampled:		6/17/2012	
Initials of Analyst:		JA	
Air volume:		381.6	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		21	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		2	
Number of total asbestos structures counted:		2	
Number of Asbestos Structures > 5 microns:		2	
Number of Asbestos fibers and bundles > 5 microns:		2	
Number of PCM equivalent asbestos structures:		2	
Number of PCM equivalent asbestos fibers:		2	
Concentration of Chrysotile Asbestos:	<	0.0227	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0227	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0227**	**Str/cc**

Comments:
Particulate Loading 5-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0024	
Customer Sample #:		PA-MA-AM-05	
Date sampled:		6/17/2012	
Initials of Analyst:		GI	
Air volume:		403.2	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		20	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		5	
Number of total asbestos structures counted:		5	
Number of Asbestos Structures > 5 microns:		5	
Number of Asbestos fibers and bundles > 5 microns:		5	
Number of PCM equivalent asbestos structures:		3	
Number of PCM equivalent asbestos fibers:		5	
Concentration of Chrysotile Asbestos:		0.0180	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		0.0058	Str/cc
Upper 95% Confidence Limit (Chrysotile)		0.0420	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):		0.0180	**Str/cc**

Comments:
Particulate Loading 3-5 %
Significant amount of non-countable asbestos observed.
Structures not countable due to structures size.

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0025	
Customer Sample #:		PA-UW-AA-01	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		393.9	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		39	
Analytical Sensitivity:		0.0018	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0054	Str/cc
Concentration of Amphibole Asbestos:	<	0.0054	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0054	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0054	Str/cc
Concentration of Asbestos (total):	**<**	**0.0054**	**Str/cc**

Comments:
Particulate Loading 1-2 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0026	
Customer Sample #:		PA-UW-AA-02	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		406.9	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		37	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-2 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0027	
Customer Sample #:		PA-UW-AM-01	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		468.195	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		17	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		2	
Number of total asbestos structures counted:		2	
Number of Asbestos Structures > 5 microns:		2	
Number of Asbestos fibers and bundles > 5 microns:		2	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.0227	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0227	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	<	0.0227	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0028	
Customer Sample #:		PA-UW-AM-02	
Date sampled:		6/18/2012	
Initials of Analyst:		AF	
Air volume:		423.54	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		19	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0108	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0108	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0108**	**Str/cc**

Comments:
Particulate Loading 5-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0029	
Customer Sample #:		PA-UW-AM-03	
Date sampled:		6/18/2012	
Initials of Analyst:		AF	
Air volume:		398.19	Liters
Area of collection filter:		385	mm^2
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm^2
Number of Grid Openings Analyzed:		20	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		1	
Number of total asbestos structures counted:		1	
Number of Asbestos Structures > 5 microns:		1	
Number of Asbestos fibers and bundles > 5 microns:		1	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.0171	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0171	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	0.0171	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 08/03/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0030	
Customer Sample #:		PA-UW-AM-04	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		456.69	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		18	
Analytical Sensitivity:		0.0035	Str/cc
Number of Primary Asbestos Structures Counted:		5	
Number of total asbestos structures counted:		5	
Number of Asbestos Structures > 5 microns:		5	
Number of Asbestos fibers and bundles > 5 microns:		5	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		5	
Concentration of Chrysotile Asbestos:		0.0175	Str/cc
Concentration of Amphibole Asbestos:	<	0.0105	Str/cc
Lower 95% Confidence Limit (Chrysotile)		0.0057	Str/cc
Upper 95% Confidence Limit (Chrysotile)		0.0408	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0105	Str/cc
Concentration of Asbestos (total):		**0.0175**	**Str/cc**

Comments:
Particulate Loading 7-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0031	
Customer Sample #:		PA-UW-AM-05	
Date sampled:		6/18/2012	
Initials of Analyst:		AF	
Air volume:		503.295	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		16	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0108	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0108	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0108**	**Str/cc**

Comments:
Particulate Loading 5-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 07/10/12
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0032	
Customer Sample #:		PA-ATV2-AA-01	
Date sampled:		6/18/2012	
Initials of Analyst:		AF	
Air volume:		424.2	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		36	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 5-7 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0033	
Customer Sample #:		PA-ATV2-AA-02	
Date sampled:		6/18/2012	
Initials of Analyst:		ES	
Air volume:		438.27	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		35	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	0.0057	**Str/cc**

Comments:
Particulate Loading 1-3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/10/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0034	
Customer Sample #:		PA-ATV2-AA-03	
Date sampled:		6/18/2012	
Initials of Analyst:		ES	
Air volume:		396.8	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		38	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0035	
Customer Sample #:		PA-ATV2-AA-04	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		425	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		36	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	0.0057	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 08/03/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0036	
Customer Sample #:		PA-ATV2-AA-05	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		513.36	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		30	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1- 3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0037	
Customer Sample #:		PA-ATV2-AM-01	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		432.18	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		19	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0108	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0108	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0108**	**Str/cc**

Comments:
Particulate Loading 1-3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0038	
Customer Sample #:		PA-ATV2-AM-02	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		390.96	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		20	
Analytical Sensitivity:		0.0037	Str/cc
Number of Primary Asbestos Structures Counted:		2	
Number of total asbestos structures counted:		2	
Number of Asbestos Structures > 5 microns:		2	
Number of Asbestos fibers and bundles > 5 microns:		2	
Number of PCM equivalent asbestos structures:		2	
Number of PCM equivalent asbestos fibers:		2	
Concentration of Chrysotile Asbestos:	<	0.0233	Str/cc
Concentration of Amphibole Asbestos:	<	0.0111	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0233	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0111	Str/cc
Concentration of Asbestos (total):	**<**	0.0233	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0039	
Customer Sample #:		PA-ATV2-AM-03	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		367.56	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		22	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0108	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0108	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0108**	**Str/cc**

Comments:
Particulate Loading 10-15 %

Robyn Denton
Approved Signatory

EMSL

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/20/2012
Report Date: 07/26/12

ISO 13794-Ambient Air - Determination of Asbestos Fibers Indirect Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0040	
Customer Sample #:		PA-ATV2-AM-04	
Date sampled:		6/18/2012	
Initials of Analyst:		PH	
Air volume:		421.56	Liters
Area of collection filter:		385	mm^2
Area of analytical filter:		364.9	mm^2
Percent of filter Ashed:		100	%
Volume of water used for ash dispersal:		40	mL
Volume of dispersion applied to analytical filter:		5	mL
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~20,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:	>	0.25	microns
Mean dimension of grid openings:		0.0132	mm^2
Number of Grid Openings Analyzed:		10	
Analytical Sensitivity:		0.0525	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.1570	Str/cc
Concentration of Amphibole Asbestos:	<	0.1570	Str/cc
Lower 95% Confidence Limit (Chrysotile)		NA	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.1570	Str/cc
Lower 95% Confidence Limit (Amphibole)		NA	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.1570	Str/cc
Concentration of Asbestos (total):	**<**	0.1570	**Str/cc**

Comments:
Indirect preparation
Revised 7/26/2012

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0041	
Customer Sample #:		PA-ATV2-AM-05	
Date sampled:		6/18/2011	
Initials of Analyst:		DY	
Air volume:		464.58	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		17	
Analytical Sensitivity:		0.0037	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0111	Str/cc
Concentration of Amphibole Asbestos:	<	0.0111	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0111	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0111	Str/cc
Concentration of Asbestos (total):	**<**	**0.0111**	**Str/cc**

Comments:
Particulate Loading 7-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0042	
Customer Sample #:		PA-BG-AM-01	
Date sampled:		6/19/2012	
Initials of Analyst:		DY	
Air volume:		372.96	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		21	
Analytical Sensitivity:		0.0038	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0114	Str/cc
Concentration of Amphibole Asbestos:	<	0.0114	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0114	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0114	Str/cc
Concentration of Asbestos (total):	**<**	**0.0114**	**Str/cc**

Comments:
Particulate Loading 7-10 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0043	
Customer Sample #:		PA-BG-AM-02	
Date sampled:		6/19/2012	
Initials of Analyst:		GI	
Air volume:		363.78	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		22	
Analytical Sensitivity:		0.0037	Str/cc
Number of Primary Asbestos Structures Counted:		1	
Number of total asbestos structures counted:		1	
Number of Asbestos Structures > 5 microns:		1	
Number of Asbestos fibers and bundles > 5 microns:		1	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.0175	Str/cc
Concentration of Amphibole Asbestos:	<	0.0175	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0175	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0175	Str/cc
Concentration of Asbestos (total):	**<**	0.0175	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0044	
Customer Sample #:		PA-BG-AM-03	
Date sampled:		6/19/2012	
Initials of Analyst:		GI	
Air volume:		361.08	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		22	
Analytical Sensitivity:		0.0037	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0111	Str/cc
Concentration of Amphibole Asbestos:	<	0.0111	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0111	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0111	Str/cc
Concentration of Asbestos (total):	**<**	**0.0111**	**Str/cc**

Comments:
Particulate Loading 1-3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 6/26/12
Report Date: 08/03/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0045	
Customer Sample #:		PA-BG-AM-04	
Date sampled:		6/19/2012	
Initials of Analyst:		PH	
Air volume:		512.28	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.013	mm²
Number of Grid Openings Analyzed:		15	
Analytical Sensitivity:		0.0039	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0117	Str/cc
Concentration of Amphibole Asbestos:	<	0.0117	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0117	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0117	Str/cc
Concentration of Asbestos (total):	**<**	0.0117	**Str/cc**

Comments:
Particulate Loading 3-5 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0046	
Customer Sample #:		PA-BG-AA-01	
Date sampled:		6/19/2012	
Initials of Analyst:		JA	
Air volume:		429.3	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		36	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0047	
Customer Sample #:		PA-BG-AA-02	
Date sampled:		6/19/2012	
Initials of Analyst:		JA	
Air volume:		492.48	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		31	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	**0.0057**	**Str/cc**

Comments:
Particulate Loading 1-3 %

Robyn Denton
Approved Signatory

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/11/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers
Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0048	
Customer Sample #:		PA-BC-AA-01	
Date sampled:		6/20/2012	
Initials of Analyst:		JA	
Air volume:		0	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		11	
Analytical Sensitivity:		6.99	Str/mm²
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	20.9001	Str/mm²
Concentration of Amphibole Asbestos:	<	20.9001	Str/mm²
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/mm²
Upper 95% Confidence Limit (Chrysotile)	<	20.9001	Str/mm²
Lower 95% Confidence Limit (Amphibole)		N/A	Str/mm²
Upper 95% Confidence Limit (Amphibole)	<	20.9001	Str/mm²
Concentration of Asbestos (total):	**<**	**20.9001**	**Str/mm²**

Comments:
Field Blank

Robyn Denton
Approved Signatory

3. Worksheets/Benchsheets

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0001**	Volume (L):	791.1	Scope:	03-01
Customer Sample:	PA-MC-AA-01	Prepped By:	A. Folgar	GO area (mm²):	0.0130
Sample Description:	Ambient	Prepped Date:	7/8/12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	B (1-3)	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~19~~ 20		none	**3:1**	5:1
GO Analyzed:	~~19~~ 20				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B1	B2	ND									
	B4										
	B6										
	B8										
	B10										
	D9										
	D7										
	D5										
	D3										
	D1	↓									

ND= None Detected

NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 1-5%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0001

Customer Sample ID: PA-MC-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B2	G10	ND									
	G8	F	Ø	Ø	3.25	0.275	ADX	Actinolite ~~Tremolite~~ DY 7/5/17	*	#63115 (D)	YES
	G6	ND									
	G4	↓									
	G2										
	D1										
	D3										
	D5										
	D7										
	D9	↓									

ND = None Detected

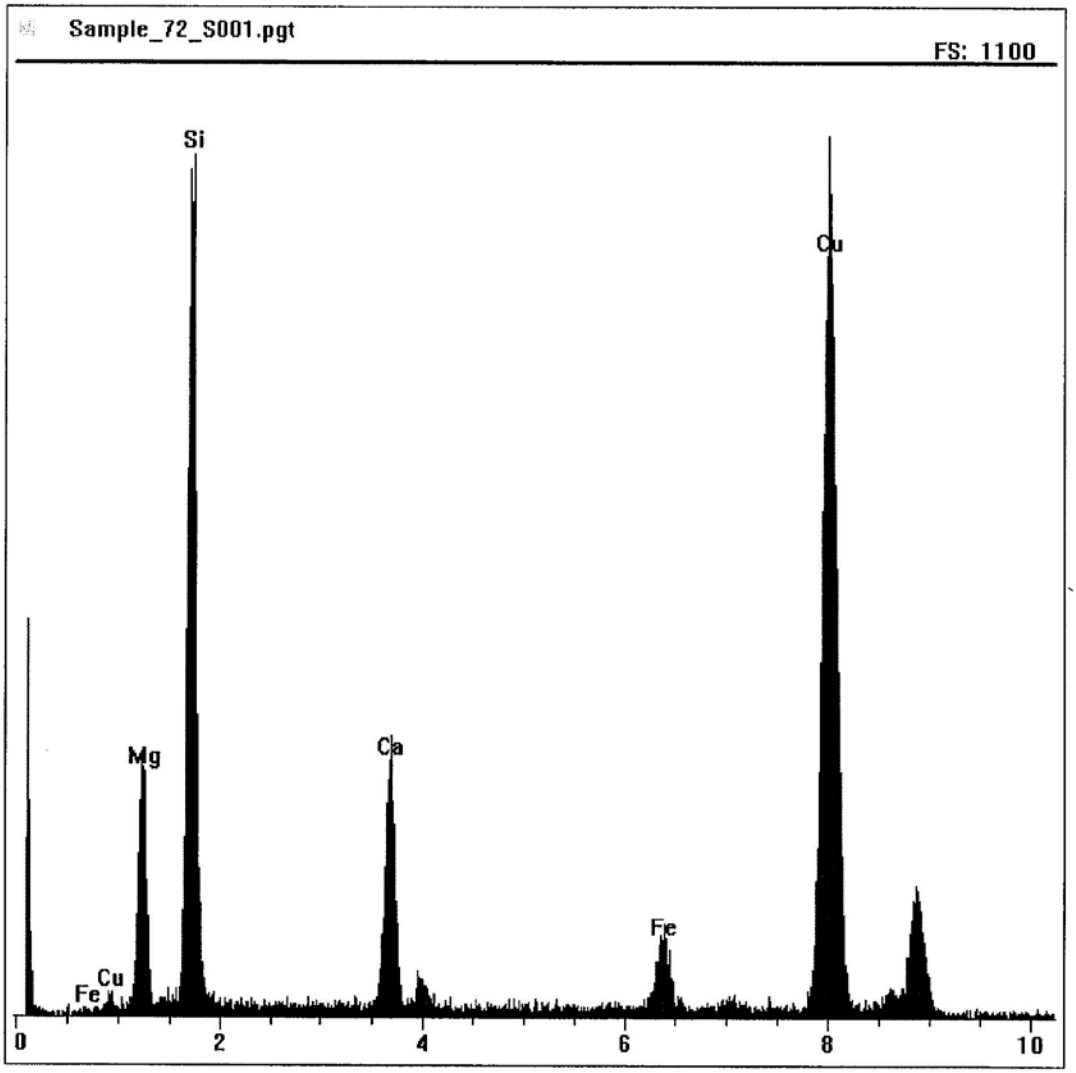
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273-01 PA-MC-AA-01 B2 G8 ACTINOLITE
Collected: July 06, 2012 13:58:43

Live Time:	233.30	Count Rate:	454	Dead Time:	11.81 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

AMPHIBOLE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63115 SCOPE # 03-01

Reference / Sample Number: PA-MC-AA-01

Preliminary ID: ACTINOLITE By: DY

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Measured Inter-row spacing: 4.178571429 mm
Mean Distance between spots on Center row (d2): 2.45 mm
Mean distance between spots on slant vector (d1): 4.7 mm

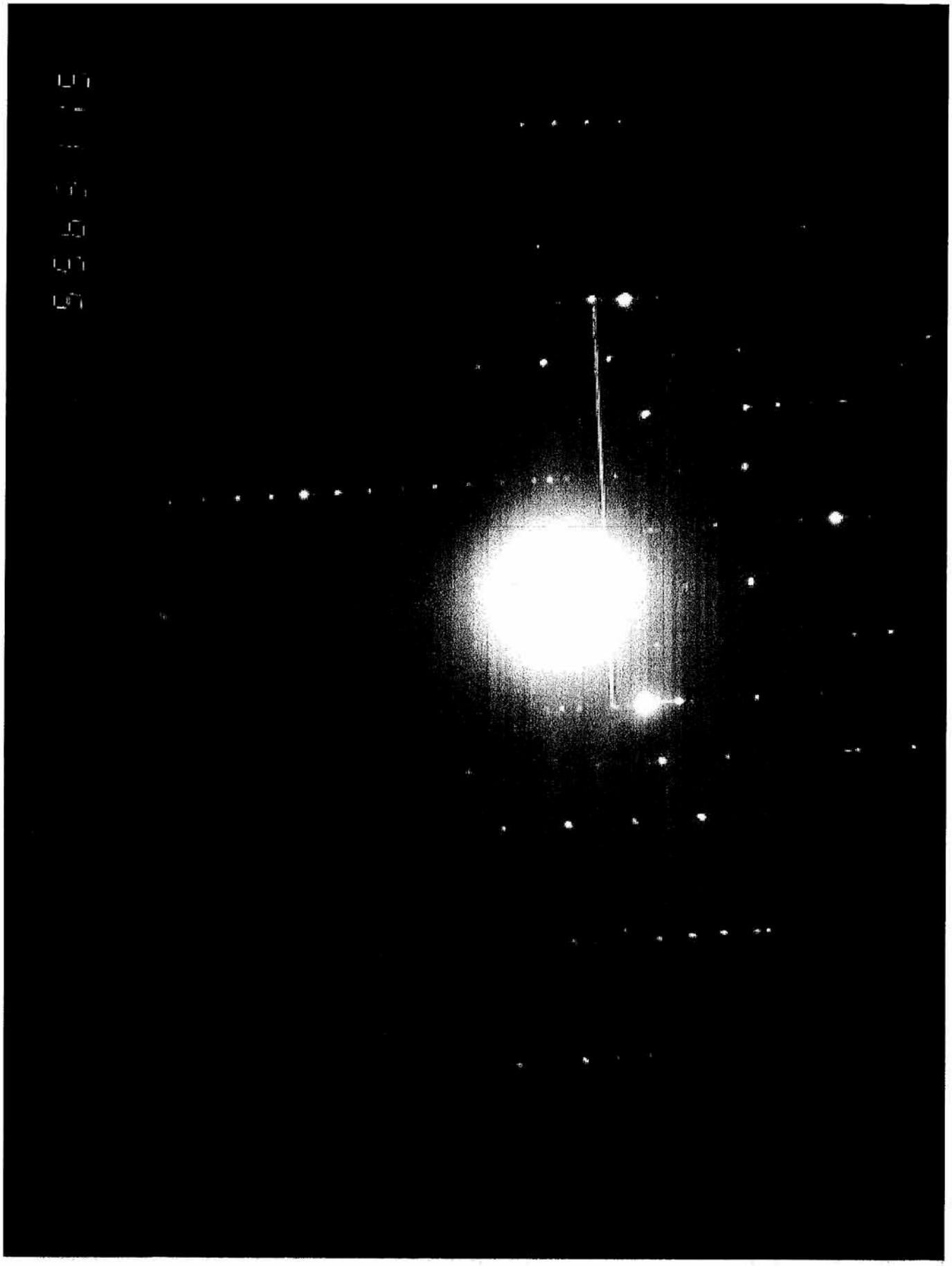
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.24**	5.160	**4.902**	**5.418**
d2 or hk0 (Camera K/zero row dist.)	**8.93**	9.050	**8.598**	**9.503**
d1 or hk1 (Camera K/slant vector dist.)	**4.66**	4.482	**4.258**	**4.706**
Ratio of hk0/hk1	**1.92**	2.02	**1.919**	**2.121**
Angle of Slant Vector (Measured)	61.0	60.3	**57.285**	**63.315**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Actinolite By: DY
With a Zone Axis of: [1 0 0]

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100



TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0002**	Volume (L):	709.155	Scope:	03-01
Customer Sample:	PA-MC-AA-03	Prepped By:	A. Folgar	GO area (mm²):	0.0130
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	C (1-3)	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~21~~ 22		none	**3:1**	5:1	
GO Analyzed:	~~21~~ 22					
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron	
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
C1	B10	ND									
	B8	|									
	B6	|									
	B4	|									
	B2	|									
	E1	|									
	E3	|									
	E5	|									
	E7	|									
	E9	|									

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Traverse Direction: Vertical
Particulate Loading: 1-5%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0002

Customer Sample ID: PA-MC-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
C2	1	ND									
	3	"									
	5	"									
	7	"									
	9	"									
	E 10	"									
	E 8	"									
	E 6	"									
	E 4	"									
	E 2	"									
	G 1	"									
	G 3	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0003**	Volume (L):	483.975	Scope:	JEOL 1200 EX (04-03)
Customer Sample:	PA-MC-AM-04	Prepped By:	SM	GO area (mm²):	0.0130
Sample Description:	ABS	Prepped Date:	6.25.12	Magnification:	20,000 x
Pore Size (micron):	0.45	Grid Box :	Special Project	Analyzed By:	P Harrison
EFA (mm²):	385	Grid Location:	B	Analysis Date:	6/26/12

Analysis Information

Target Sensitivity:	**0.004**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	**16**		none	**3:1**	5:1
GO Analyzed:	16				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.2**	micron

Comments: 8% particulate loading vertical traverse

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B1	B6	ND									
↓	H7	↓									
↓	A9	↓									
↓	E7	↓									
↓	F5	↓									
↓	J9	↓									
B2	J5	↓									
↓	C5	↓									
↓	I3	↓									
↓	F2	↓									

ND= None Detected

NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0003

Customer Sample ID: PA-MC-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B2	D1	ND									
B3	I8	↓									
↓	D4										
	F4										
	E2										
↓	A4										

ND = None Detected

NAM = Non Asbestos Material

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

SAMPLE/ANALYSIS INFORMATION

Enter Site or Project Name Here:	2011-149 Phillips Mine
State/Federal Site or Project Identifier:	

Site/Project Identifier Code:	2011-149

Laboratory name:	EMSL04
Instrument:	JEOL 1200 EX
Voltage (kV):	100
Magnification: Enter one or more (a)	20,000x
Grid opening area (mm^2):	0.0130

	High Mag:	Low Mag:
Scale: 1L =	1.000	1.000
Scale: 1D =	1.000	1.000

Filter Size (mm):	
Filter Pore Size (um):	
Method SOP (Revision No.):	
Grid Storage Location:	
Archive filter(s) storage location:	Cinnaminson

Client Sample Number:	PA-MC-AM-04
Date received by lab:	06/22/12
Lab Job Number:	041216273
Lab Sample Number:	041216273-0003
Chain of Custody Number:	RD 6-27-12

Sample Type: (FS=Field Sample, FB=Field Blank, LT=Lot Blank, QC=Lab QC)	FS
QC Sample Type: (Not QC, LB=Lab Blank, RS=Recount Same, RD, Recount Diff., RP=Reprep., VA=Verified Analysis, IL=Interlab)	Not QC
Media: (Air, Dust, Dustfall, N/A)	Air
Air volume (L), dust area (cm^2), or dustfall container area (cm^2):	484

Number of grids prepared:	3
Prepared by:	
Preparation date:	
Preparation Type: (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Y/N)	

Primary Filter Area (mm^2):	385
Secondary Filter Area (mm^2):	
F- factor:	
Filter Status: (A=Analyzed, O=Overloaded, D=Damaged, M=Missing, C=Cancelled)	A
Analyzed by:	P Harrison
Analysis date:	6/26/12

F-factor Input Parameters:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter:

	Fraction of secondary filter used for ashing

Project Stopping Rules:

Maximum Area Examined (mm^2):	
Total Number of Asbestos Structures Observed Equals:	
Analytical Sensitivity is at least:	0.004

Project Recording Rules:

Minimum Aspect Ratio:	3:1
Minimum Length (µm):	>5.0
Minimum Width (µm):	>0.25

COMMENTS

8% particulate loading

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20,000x OR 5,000x OR 20,000/5,000x

If sample was analyzed using more than one TEM instrument, enter TEM Instrument details below.

	Instrument #2	Instrument #3
Instrument:		
Voltage (KV):		
Magnification:		

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

	Analyst #2	Analyst #3
Analyzed by:		
Analysis date:		

IMPORTANT NOTE: If this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates, be sure to complete the column labeled "Multiple" when entering raw structure results for each grid opening.

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

STRUCTURE INFORMATION

Client Sample No.:	PA-MC-AM-04	Sample Type	FS	Preparation Type		
Lab Sample No.:	041216273-0001	QC Sample Type	Not QC	Analysis Date	6/26/12	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification Code (b)	Mineral Type (c)	Other Mineral Description	1 = yes, blank = no			Multiple (d)	Low Mag	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS			
B1	B6	ND													
	H7	ND													
	A9	ND													
	E7	ND													
	F5	ND													
	J9	ND													
B2	J5	ND													
	C5	ND													
	I3	ND													
	F2	ND													
	D1	ND													
B3	I8	ND													
	D4	ND													
	F4	ND													
	E2	ND													
	A4	ND													
								PH 6/26/12							

(a) Enter dimensions either in absolute units (um) or in screen units. If reported as screen units, confirm that the Length & Dimension Scales are set as appropriate.
(b) See Annex D of ISO 10312 for identification codes.
(c) Valid Mineral Types:

AC	actinolite	CH	chrysotile	LA	Libby amphibole	OM	other mineral type (specify in "other mineral description" field)
AM	amosite	CR	crocidolite	OA	other amphibole	Amosite	Solid solution series: Amosite, cummingtonite-grunerite
AN	anthophyllite	TR	tremolite	NAM	non-asbestos material	Trem-Act	Solid solution series: Tremolite-Actinolite

(d) Populate this field only if sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates.
(e) If the analyst changes to low magnification, populate this field with a numerical value for what the analysts has chosen.

Grid opening traverse direction (circle one):
H Horizontal
(V) Vertical

Are prepped grids acceptable for analysis? (circle one) (Yes) No
If No, explain:

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0004	Volume (L):	641.325	Scope:	03-01
Customer Sample:	PA-MC-AA-02	Prepped By:	A. Folgar	GO area (mm²):	0.0130
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000x
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	D(1-3)	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~23~~ 24		none	**3:1**	5:1
GO Analyzed:	~~23~~ 24				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
D1	G1	ND									
	G3										
	G5										
	G7										
	G9										
	D10										
	D8										
	D6										
	D4										
	D2	↓									

ND= None Detected

NAM= Non Asbestos Material

Traverse Direction: Vertical

Particulate Loading: 1-5%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0004

Customer Sample ID: PA-MC-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
D2	H2	ND									
	H4	″									
	H6	″									
	H8	″									
	H10	″									
	E10	″									
	E8	″									
	E6	″									
	E4	″									
	E2	″									
	C1	″									
	C3	″									
	C5	″									
	C7	″									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0005	Volume (L):	487.575	Scope:	JEOL 1200 EX 04-03
Customer Sample:	PA-MC-AM-01	Prepped By:	SM	GO area (mm²):	0.0130
Sample Description:	ABS	Prepped Date:	10.25.12	Magnification:	20,000x
Pore Size (micron):	0.45	Grid Box :	Special Project	Analyzed By:	P Harrison
EFA (mm²):	385	Grid Location:	B	Analysis Date:	6/26/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	16		none	3:1	5:1
GO Analyzed:	16				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.2	micron

Comments:
3% particulate loading
Vertical traverse direction

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B4	A5	ND									
|	C7	|								
|	E9	|								
|	F6	|								
|	G4	|								
↓	I7	|								
B5	C4	|								
|	D6	|								
|	G8	|								
↓	I5	↓									

ND= None Detected

NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0005

Customer Sample ID: PA-MC-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B5	J7	ND									
B6	J1	↓									
↓	I4										
	I5										
	F2										
	D5										

PH 6/28/12

ND = None Detected

NAM = Non Asbestos Material

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

Enter Site or Project Name Here:	2011-149 Phillips Mine
State/Federal Site or Project Identifier:	

Site/Project Identifier Code:	2011-149

F-factor Input Parameters:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Laboratory name:	EMSL04
Instrument:	JEOL 1200 EX
Voltage (kV):	100
Magnification: Enter one or more (a)	20,000 X
Grid opening area (mm^2):	0.0130

	High Mag:	Low Mag:
Scale: 1L =	1.000	1.000
Scale: 1D =	1.000	1.000

Filter Size (mm):	
Filter Pore Size (um):	
Method SOP (Revision No.):	
Grid Storage Location:	
Archive filter(s) storage location:	Cinnaminson

Client Sample Number:	PA-MC-AM-01
Date received by lab:	06/22/12
Lab Job Number:	041216273
Lab Sample Number:	041216273-0025
Chain of Custody Number:	RD 6/27/12

Number of grids prepared:	3
Prepared by:	
Preparation date:	
Preparation Type: (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Y/N)	

Primary Filter Area (mm^2):	385
Secondary Filter Area (mm^2):	
F- factor:	
Filter Status: (A=Analyzed, O=Overloaded, D=Damaged, M=Missing, C=Cancelled)	A
Analyzed by:	P Harrison
Analysis date:	6/26/12

Sample Type: (FS=Field Sample, FB=Field Blank, LT=Lot Blank, QC=Lab QC)	FS
QC Sample Type: (Not QC, LB=Lab Blank, RS=Recount Same, RD, Recount Diff., RP=Reprep., VA=Verified Analysis, IL=Interlab)	Not QC
Media: (Air, Dust, Dustfall, N/A)	Air
Air volume (L), dust area (cm^2), or dustfall container area (cm^2):	488

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Project Stopping Rules:

Maximum Area Examined (mm^2):	
Total Number of Asbestos Structures Observed Equals:	
Analytical Sensitivity is at least:	0.004

Project Recording Rules:

Minimum Aspect Ratio:	3:1
Minimum Length (µm):	>5.0
Minimum Width (µm):	>0.25

Input for Ashing of Secondary Filter:

	Fraction of secondary filter used for ashing

COMMENTS

3% particulate loading

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20,000x OR 5,000x OR 20,000/5,000x

If sample was analyzed using more than one TEM instrument, enter TEM Instrument details below.

	Instrument #2	Instrument #3
Instrument:		
Voltage (KV):		
Magnification:		

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

	Analyst #2	Analyst #3
Analyzed by:		
Analysis date:		

IMPORTANT NOTE: If this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates, be sure to complete the column labeled "Multiple" when entering raw structure results for each grid opening.

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

STRUCTURE INFORMATION

Client Sample No.:	PA-MC-AM-01	Sample Type	FS	Preparation Type	
Lab Sample No.:	041216273-0002	QC Sample Type	Not QC	Analysis Date	6/26/12

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification Code (b)	Mineral Type (c)	Other Mineral Description	1 = yes, blank = no			Multiple (d)	Low Mag	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS			
B4	A5	ND													
	C7	ND													
	E9	ND													
	F6	ND													
	G4	ND													
	I7	ND													
B5	C4	ND													
	D6	ND													
	G8	ND													
	H5	ND													
	J7	ND													
B6	J1	ND													
	I4	ND													
	H5	ND													
	F2	ND													
	D5	ND													
						PH									
						6/26/12									

(a) Enter dimensions either in absolute units (um) or in screen units. If reported as screen units, confirm that the Length & Dimension Scales are set as appropriate.

(b) See Annex D of ISO 10312 for identification codes.

(c) Valid Mineral Types:

AC	actinolite	CH	chrysotile	LA	Libby amphibole	OM	other mineral type (specify in "other mineral description" field)
AM	amosite	CR	crocidolite	OA	other amphibole	Amosite	Solid solution series: Amosite, cummingtonite-grunerite
AN	anthophyllite	TR	tremolite	NAM	non-asbestos material	Trem-Act	Solid solution series: Tremolite-Actinolite

(d) Populate this field only if sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates.

(e) If the analyst changes to low magnification, populate this field with a numerical value for what the analysts has chosen.

Grid opening traverse direction (circle one):

H Horizontal

(V) Vertical

Are prepped grids acceptable for analysis? (circle one) (Yes) No

If No, explain:

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0006	Volume (L):	561.6	Scope:	03-01
Customer Sample:	PA-MC-AM-03	Prepped By:	DYoung / A. Folyan	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box:	0312 ERRG -01	Analyzed By:	Gerald Lamson
EFA (mm²):	385	Grid Location:	E 1-3	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~1415~~		none	3:1	5:1
GO Analyzed:	~~827.44~~ 15				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:
$X^2 = 17.789 = Random$

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
E1	H9	ND									
	H7	ND									
	H5	F	ϕ	ϕ	5.35	1.25	NAM	NAM			YES
	D8	ND									
	D6	F	1	1	14.58	2.43	~~CD~~ & ~~CHR~~ 7/5	~~CHR~~ & ~~CHR~~ 7/5		63113 63114 ~~63115~~ DY 7/5/12	YES
	D4	ND									
E2	F2	ND									
	F4	ND									
	F6	ND									
	H3	ND									

ND= None Detected

NAM= Non Asbestos Material

Particulate: 10%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0006

Customer Sample ID: PA-MC-AM-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H5	ND									
	H7	ND									
E3	G9	ND									
	G7	ND									
	G5	ND									

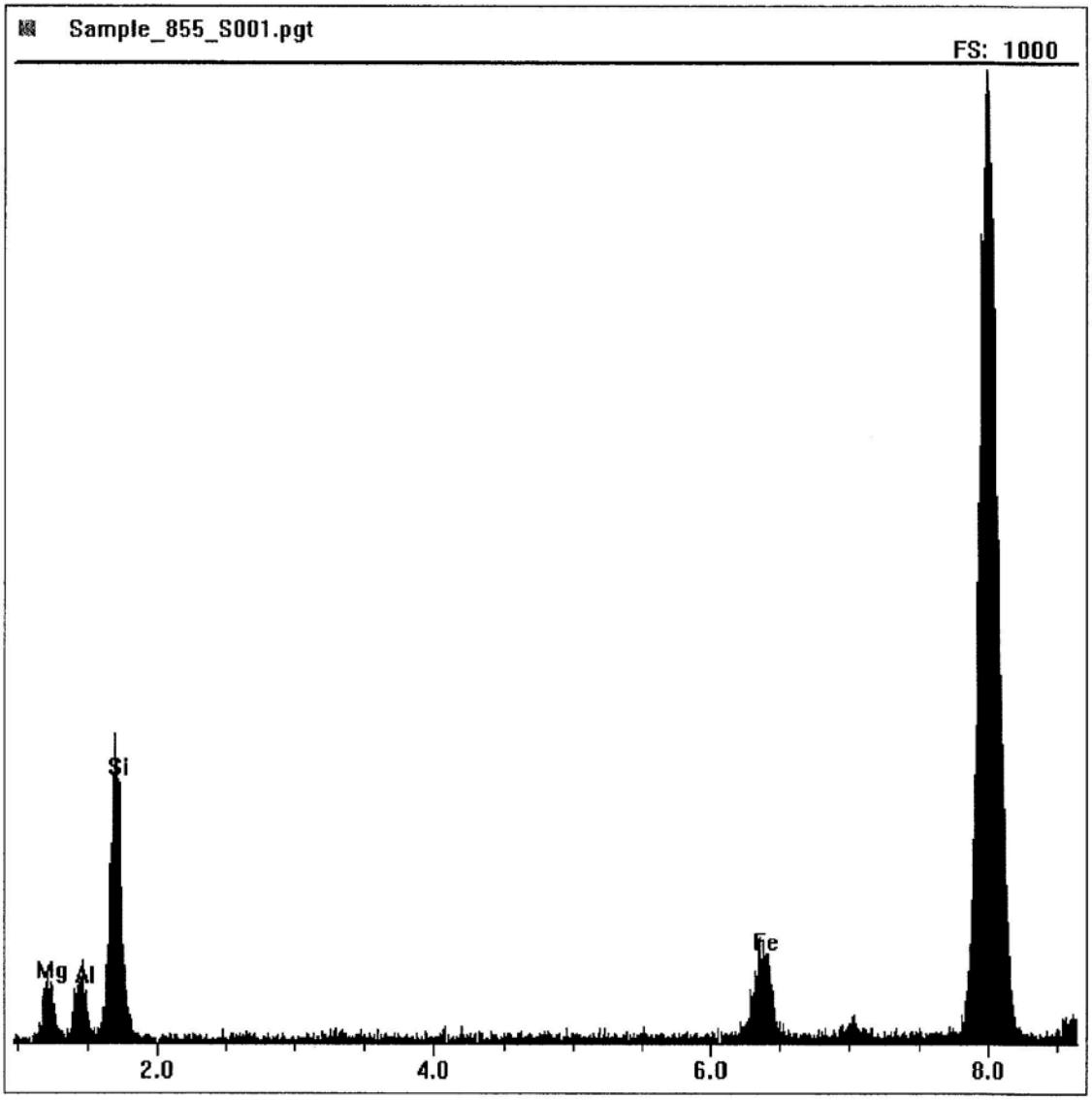
ND = None Detected NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MC-AM-03 E1 H5 NAM
Collected: July 05, 2012 16:12:12

Live Time:	21.72	Count Rate:	3087	Dead Time:	50.99 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

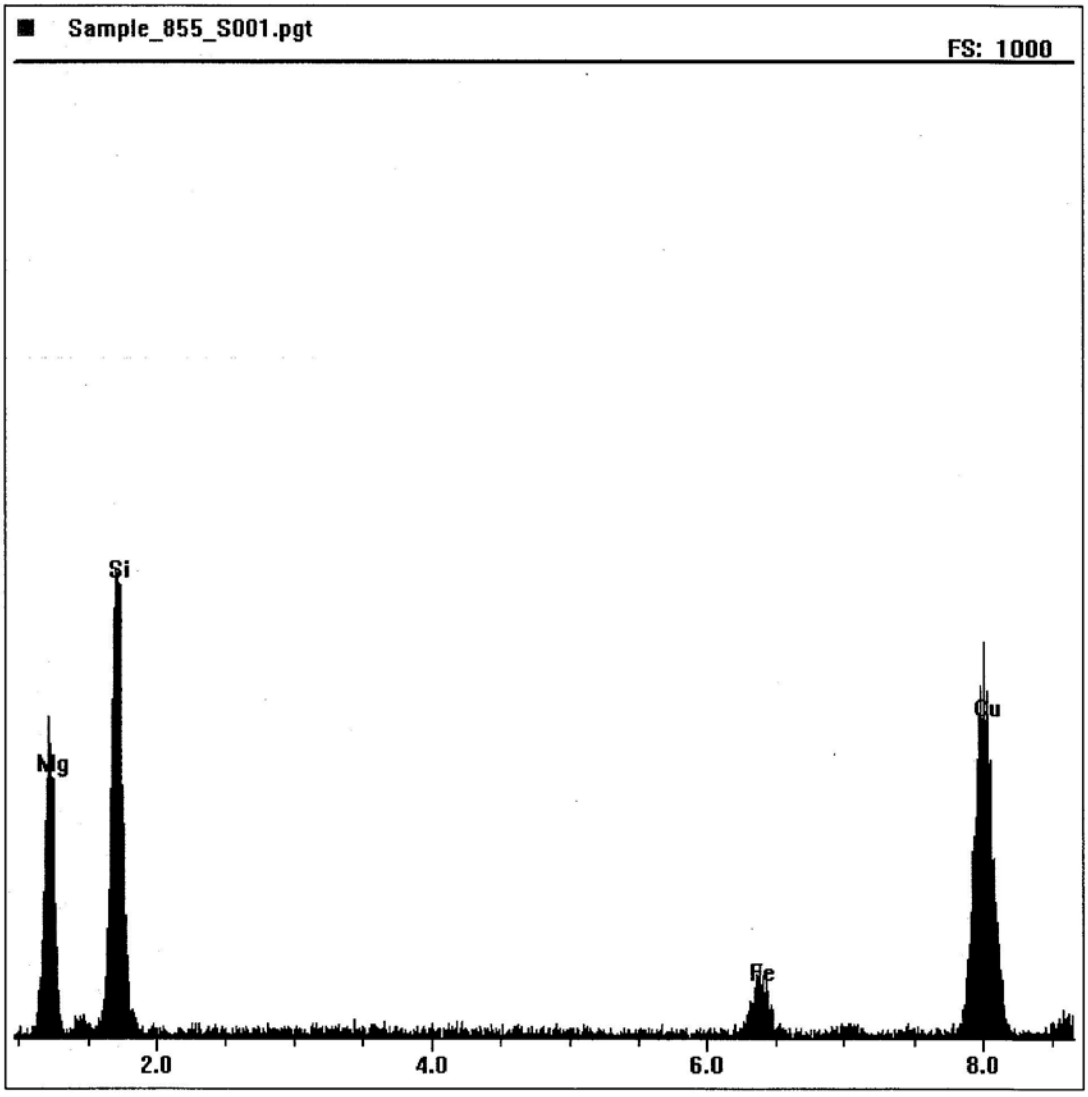
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

DH 7/10/12

EMSL ANALYTICAL, INC.

File: 041216273 PA-MC-AM-03 E1 D6 CHRYSOTILE
Collected: July 05, 2012 16:12:12

Live Time:	53.13	Count Rate:	884	Dead Time:	18.26 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63114 SCOPE #: 03-01

Reference / Sample Number: PA-MC-AM-03

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.85	mm

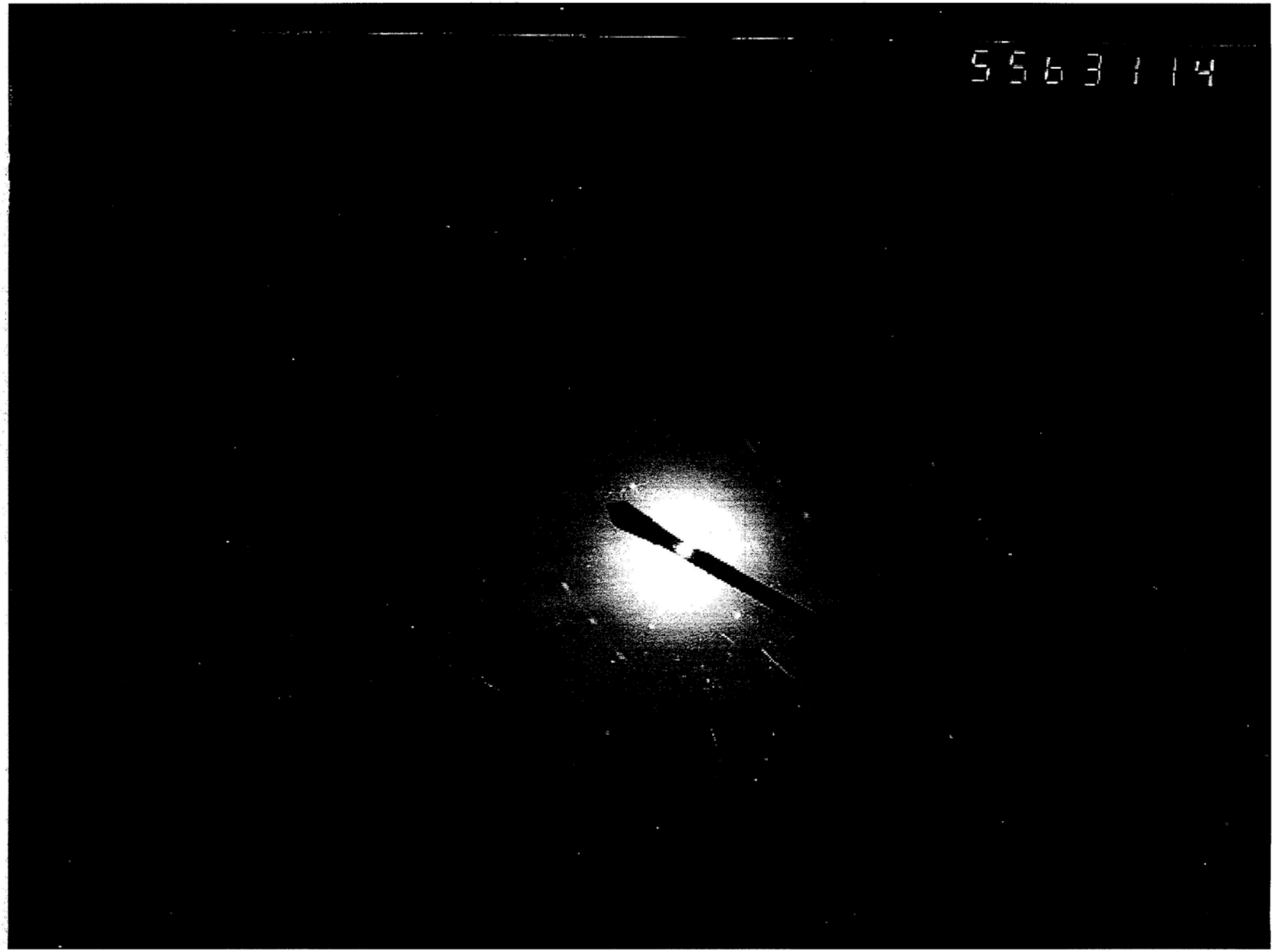
	Calculated	Ref	-5%	+5%
Inter-row spacing (Ångstroms)	**5.47**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	58	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.51**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


5563114

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0007**
Customer Sample: PA-MC-AM-02
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm^2): 385

Volume (L): 584.55
Prepped By: A. FolGAR
Prepped Date: 7/02/2012
Grid Box: 0312-ERRG-01
Grid Location: F(1-3)

Scope: 03-01
GO area (mm^2): .013
Magnification: 10,000 X
Analyzed By: Alicia FolGAR
Analysis Date: 7/6/2012

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: ~~13~~ 14
GO Analyzed: ~~13~~ 14
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
F1	H9	ND									
	H7	ND									
	H5	ND									
	H3	ND									
	H1	ND									
	C6	ND									
	C3	ND									
F2	G10	ND									
	G8	ND									
	G6	ND									

ND= None Detected
NAM= Non Asbestos Material

Particulate Loading: 5-10%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0007

Customer Sample ID: PA-MC-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
F2	G4	ND									
	G2	ND									
	B5	ND									
	B3	ND									

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0008**
Customer Sample: PA-ATV1-AA-01
Sample Description: Ambient
Pore Size (micron): 0.45
EFA (mm^2): 385

Volume (L): 493.2
Prepped By: A. FOIGAR
Prepped Date: 7/2/12
Grid Box : 0312-ERRG-01
Grid Location: G (1-3)

Scope: ~~03-02~~ 03-01 AF 7/16
GO area (mm^2): 0.013
Magnification: 10,000 X
Analyzed By: A. FOIGAR
Analysis Date: 7/6/12

Analysis Information

Target Sensitivity: **0.002** s/cc
GO Required: ~~30~~ 31
GO Analyzed: ~~30~~ 31
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
G2	B1	ND									
	B3	ND									
	B5	ND									
	B7	ND									
	B9	ND									
	F2										
	F4										
	F6										
	F8										
	F10										

ND= None Detected
NAM= Non Asbestos Material

Particulate Loading: 10-15%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0008

Customer Sample ID: PA-ATV1-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
G2	I1	ND									
	I3	ND									
	J4	ND									
	J6	ND									
	J8	ND									
G3	f10	ND									
	f8										
	f6										
	f4										
	f2										
	A1										
	A3										
	A5										
	A7										
	A9	↓									

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0008

Customer Sample ID: PA-ATV1-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
G3	C2	ND									
	C4	↓									
	C6										
	C8										
	C10										
	G7	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0009**
Customer Sample: PA-ATV1-AA-02
Sample Description: Ambient
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 374.94
Prepped By: A. FOLGAR
Prepped Date: 7/2/12
Grid Box: 0312-ERRG-01
Grid Location: H (1-3)

Scope: ~~A3-02a3-01~~ AF 7/16
GO area (mm²): .013
Magnification: 10,000 X
Analyzed By: A. FOLGAR
Analysis Date: 7/6/12

Analysis Information

Target Sensitivity: **0.002** s/cc
GO Required: ~~39~~ 40
GO Analyzed: 39 40
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
H1	B2	ND									
	B4										
	B6										
	B8										
	B10										
	D1										
	D3										
	D5										
	D7										
	D9										

ND= None Detected
NAM= Non Asbestos Material

Particulate Loading: 10-15%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0009

Customer Sample ID: PA-ATV1-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
H1	G1	ND									
	G3	↓									
	G5	↓									
	H2	↓									
	H4	F	0	0	10.5	1.5	NAM	NAM	AC Present		✓
	H6	ND									
	H8	↓									
	H10	↓									
	J4	↓									
	J6	↓									
H2	I10	ND									
	I8	↓									
	I6	↓									
	I4	↓									
	I2	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0009

Customer Sample ID: PA-ATV1-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
H2	G9	ND									
	G7	↓									
	G5										
	G3										
	G1										
	D10										
	D8										
	D6										
	D4										
	D2										
	B9										
	B7										
	B5										
	B3	↓									
	f8	ND									

ND = None Detected

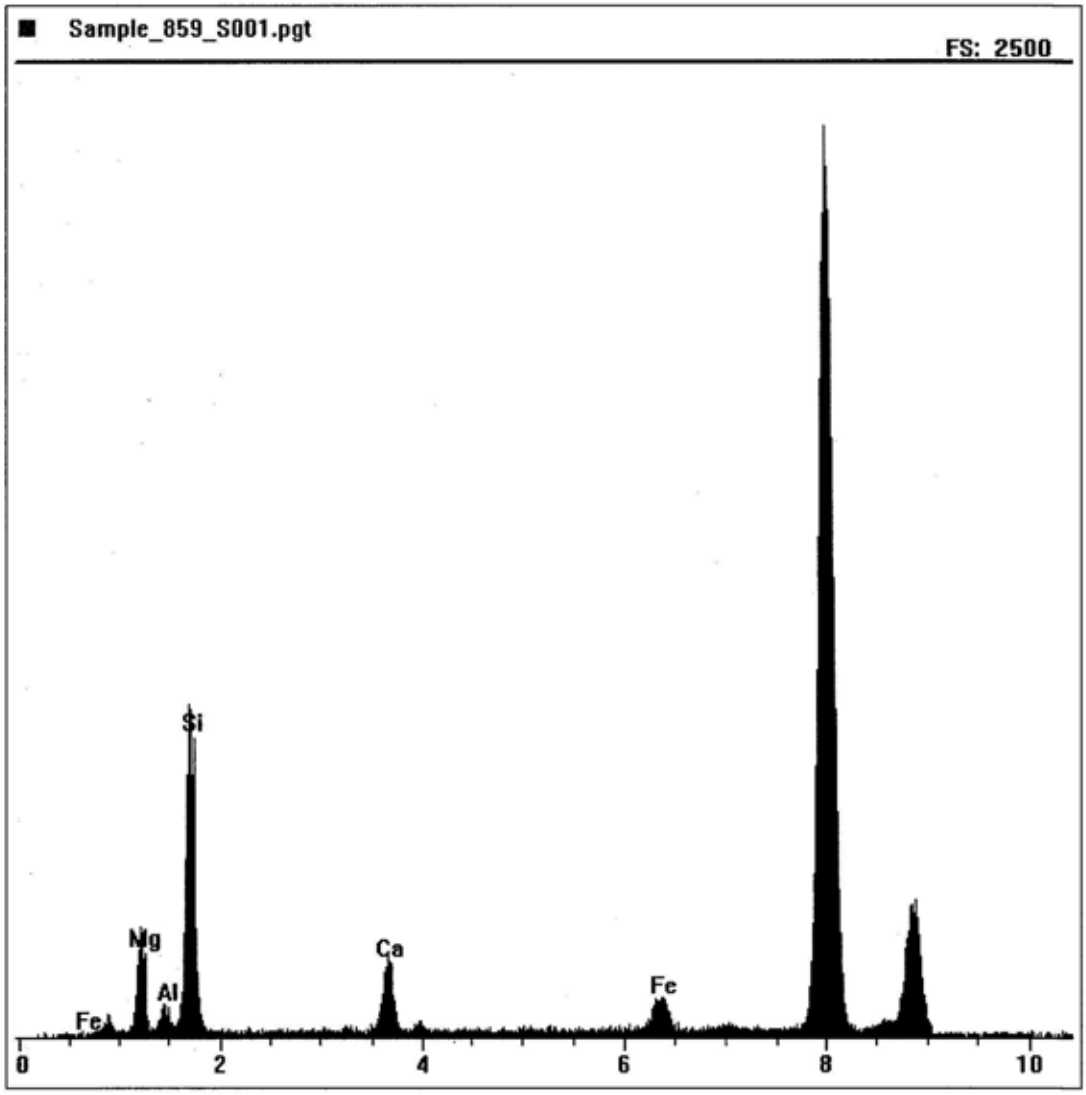
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273-~~009~~ PA-ATV1-AA-02 H1 H4 NAM
Collected: July 06, 2012 13:18:48

Live Time:	40.36	Count Rate:	4058	Dead Time:	61.89 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0010**
Customer Sample: PA-ATV1-AA-03
Sample Description: Ambient
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 375.85
Prepped By: A. FOLGAR
Prepped Date: 7/2/12
Grid Box : 0312-ERRG-01
Grid Location: I (1-3)

Scope: ~~03 03~~ 03 01 AF 7/16
GO area (mm²): .013
Magnification: 10,000X
Analyzed By: A. FOLGAR
Analysis Date: 7/6/12

Analysis Information

Target Sensitivity: **0.002** s/cc
GO Required: ~~39~~ 40
GO Analyzed: ~~39~~ 40
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
I1	I9	ND									
	I7										
	I5										
	I3										
	I1										
	G9										
	G7										
	G5										
	G3										
	G1										

ND= None Detected
NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate loading: 1-5%
Traverse Direction: Vertical.

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0010 **Customer Sample ID:** PA-ATV1-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
I1	E9	ND									
	E7										
	E5										
	E3										
	E1										
	C9										
	C7										
	C5										
	C3										
	C1										
I2	A2										
	A4										
	A6										
	A8										
	A10										

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0010

Customer Sample ID: PA-ATV1-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
I9	C2	ND									
	C4										
	C6										
	C8										
	C10										
	f2										
	f4										
	f6										
	f8										
	f10										
	I4										
	I6										
	I8										
	I10										
	B5	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0011**
Customer Sample: PA-ATV1-AA-04
Sample Description: Ambient
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 377.1
Prepped By: A. Folgar
Prepped Date: 7/2/12
Grid Box: 0312-ERRG-01
Grid Location: J (1-3)

Scope: ~~03-02~~ 03-01 AF 7/16
GO area (mm²): .013
Magnification: 10,000 X
Analyzed By: A. Folgar
Analysis Date: 7/6/12

Analysis Information

Target Sensitivity: **0.002** s/cc
GO Required: ~~39~~ 40
GO Analyzed: 39 40
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
J1	I10	ND									
	I8										
	I6										
	I4										
	I2										
	G9										
	G7										
	G5										
	G3										
	G1										

ND= None Detected
NAM= Non Asbestos Material

EMSL Analytical, Inc
Particulate Loading: 3-5%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0011

Customer Sample ID: PA-ATV1-AA-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
J1	f10	ND									
	f8										
	f6										
	f4										
	f2										
	B9										
	B7										
	B5										
	B3										
	B1										
J2	E1										
	E3										
	E5										
	E7										
	E9										

ND = None Detected

NAM = Non Asbestos Material

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0011

Customer Sample ID: PA-ATV1-AA-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
J2	G1	ND									
	G3										
	G5										
	G7										
	G9										
	H2										
	H4										
	H6										
	H8										
	H10										
	I1										
	I3										
	I5										
	I7	↓									
	f2	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0012	Volume (L):	385.38	Scope:	03-01
Customer Sample:	PA-ATV1-AA-05	Prepped By:	A. Tolpa	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-CRRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	K(1-3)	Analysis Date:	7/6/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~39~~ 40		none	**3:1**	5:1
GO Analyzed:	3940				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:
$x^2 = 42.909$ = Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K1	E1	ND									
	E3	|									
	E5	|									
	E7	|									
	E9	|									
	C10	|									
	C8	|									
	C6	|									
	C4	|									
	C2	V									

ND= None Detected NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 3-5%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0012

Customer Sample ID: PA-ATV1-AA-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K1	A1	ND									
	A3	↓									
	A5										
	A7										
	A9										
K2	J10										
	J8										
	J6										
	J4										
	J2										
	H1										
	H3										
	H5										
	H7										
	H9	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0012

Customer Sample ID: PA-ATV1-AA-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K3	G10	ND									
	G8	↓									
	G6										
	G4										
	G2										
	E1	B	1	1	10.5	0.55	CD	CH		#63118(D)	✓
	E3	ND									
	E5	↓									
	E7										
	E9										
	B10										
	B8										
	B6										
	B4										
	B2	↓									

ND = None Detected

NAM = Non Asbestos Material

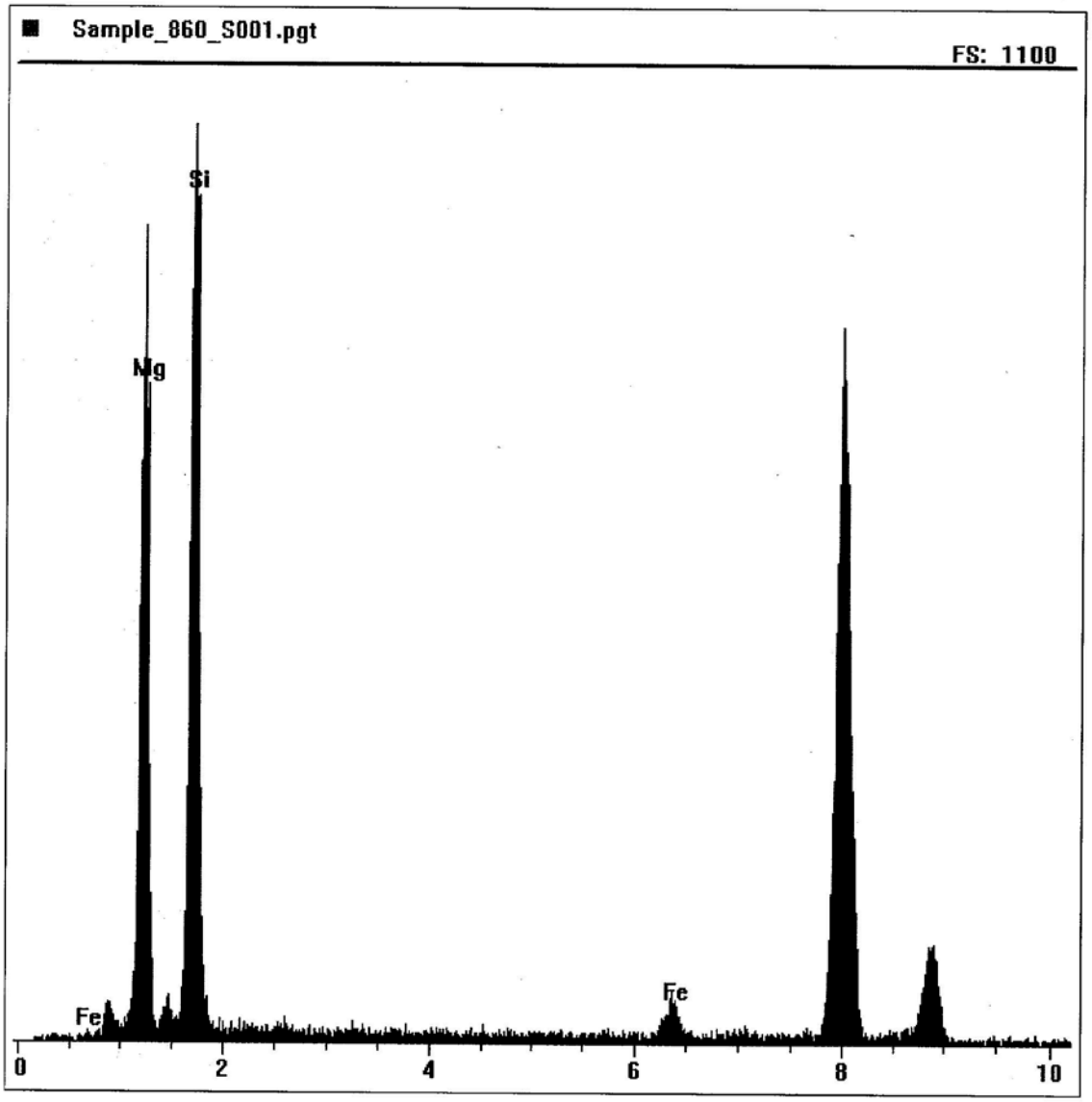
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

DY 7/6/12

File: 041216273-12 PA-ATV1-AA-05 K3 E1 1 CHRYSOTILE
Collected: July 06, 2012 15:03:31

Live Time:	137.87	Count Rate:	679	Dead Time:	14.61 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63118 SCOPE #: 03-01

Reference / Sample Number: PA-ATV1-AA-05

Preliminary ID: Chrysotile By: DY

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4.075 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.85	mm

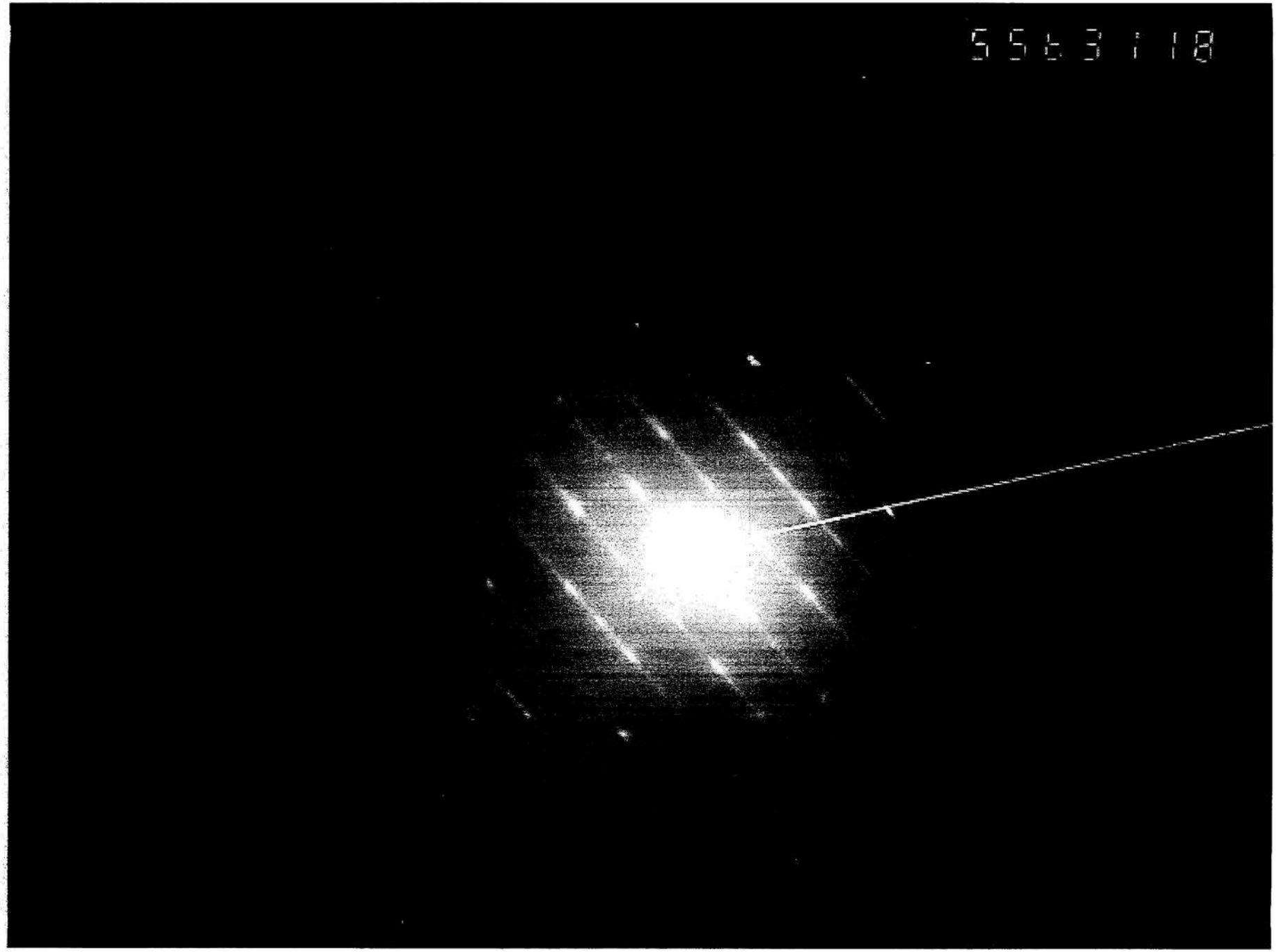
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.37**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	62	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.51**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


55:3:18

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0013	Volume (L):	512.28	Scope:	03-01
Customer Sample:	PA-ATV1-AA-06	Prepped By:	A. Folgar	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	L(1-3)	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~29~~ 30		none	**3:1**	5:1
GO Analyzed:	~~29~~ 30				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
L1	D10	ND									
	D8	↓									
	D6										
	D4										
	D2										
	F1										
	F3										
	F5										
	F7										
	F9	↓									

ND= None Detected NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 15-20%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0013

Customer Sample ID: PA-ATV1-AA-06

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
L1	H10	ND									
	H8										
	H6										
	H4										
	H2										
L2	G9										
	G7										
	G5										
	G3										
	B10										
	B8	↓									
	B6	B	Ø	Ø	8.5	1.15	nam	nam	Al Present Fe/Ca Too High		✓
	B4	ND									
	B2										
	E3	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0013

Customer Sample ID: PA-ATV1-AA-06

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
L3	H1	ND									
	H3										
	H5										
	H7										
	H9	V									

ND = None Detected

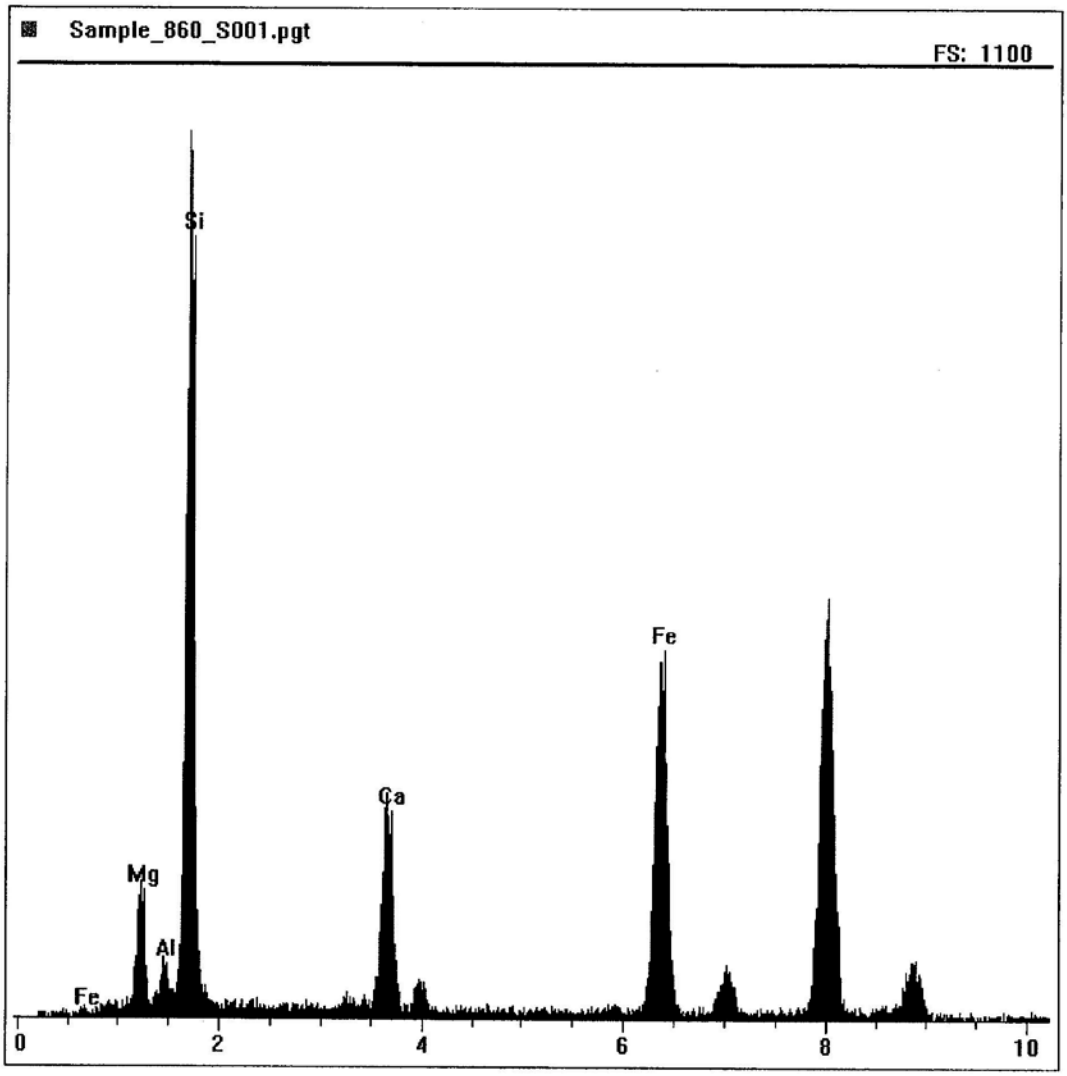
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV1-AA-06 L2 B6 NAM
Collected: July 06, 2012 15:03:31

Live Time:	69.67	Count Rate:	1228	Dead Time:	24.22 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0014**
Customer Sample: PA-ATV1-AM-01
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 430.2
Prepped By: A. FOLGAR
Prepped Date: 7/2/12
Grid Box : 0312-ERRG-01
Grid Location: M (1-3)

Scope: ~~SEM~~ 03-01
GO area (mm²): 0.013
Magnification: 10,000X
Analyzed By: E. Siauka
Analysis Date: 7/6/12

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: 19 ~~18-ES~~ 7/10/12
GO Analyzed: 19 ~~18ES~~ 7/10/12
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
M1	D6	F	0	0	8.46	1.21	NAM	NAM	Al PRESENT Fe Too High		✓
	D8	ND									
	D10	↓									
	F1										
	F3										
	F5										
	F7										
	F9										
	G2	MD11	1		13.09	8.23	NAM	~~NAM~~ ES 7/10/12	Al PRESENT		X SH 7/31/12
		MF		0	13.09	0.94		NAM			✓

ND= None Detected
NAM= Non Asbestos Material

Particulate Loading: 5-10%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0014

Customer Sample ID: PA-ATV1-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
M1	G4	ND									
	G6	↓									
M2	J7										
	J5										
	J3										
	I10										
	I4	F	0	0	5.09	1.07	NAM	NAM	✓ ASBESTOS PRESENT		✓
	I2	ND									
	G9	ND									
	G7	ND									

ND = None Detected

NAM = Non Asbestos Material

EMSL ANALYTICAL, INC.

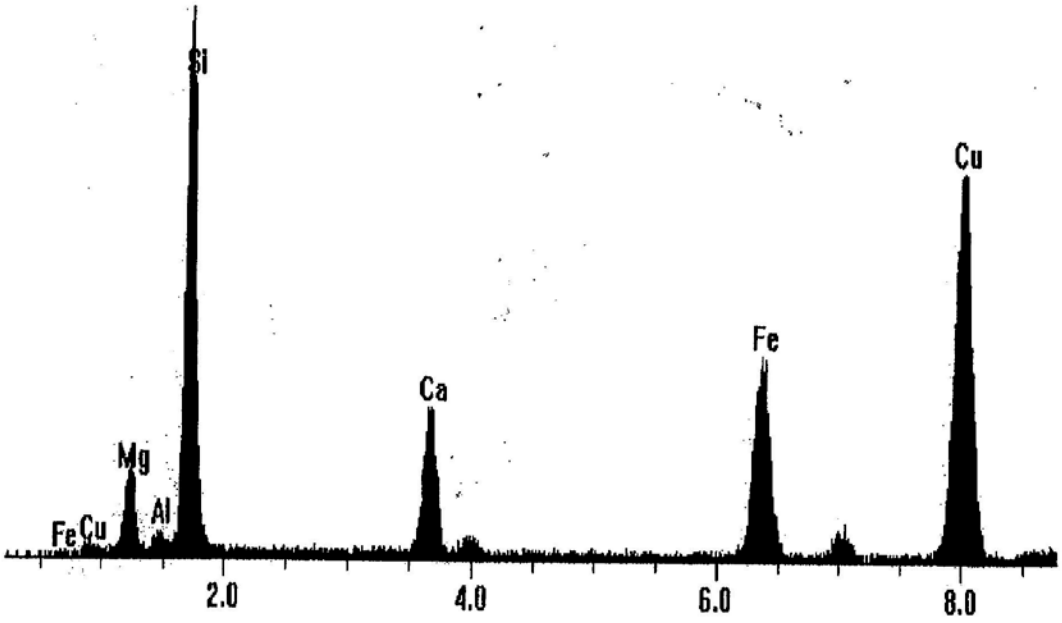
Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

File: 041216273-PA-ATV1-AM-01-M1-D6 NAM
Collected: July 06, 2012 17:19:28

Live Time:	121.15	Count Rate:	899	Dead Time:	18.69 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

Sample_861_S001.pgt

FS: 1200



EMSL ANALYTICAL, INC.

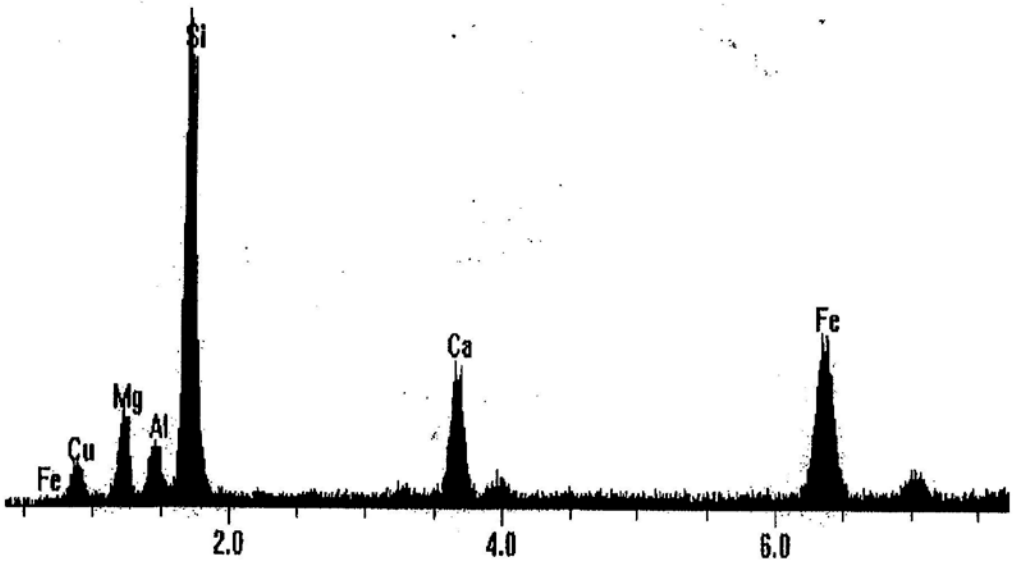
Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

File: 041216273 PA-ATV1-AM-01 M1 G2 NAM
Collected: July 06, 2012 17:19:28

Live Time:	109.13	Count Rate:	2215	Dead Time:	39.55 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

■ Sample_861_S001.pgt

FS: 1200



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

EMSL ANALYTICAL, INC.

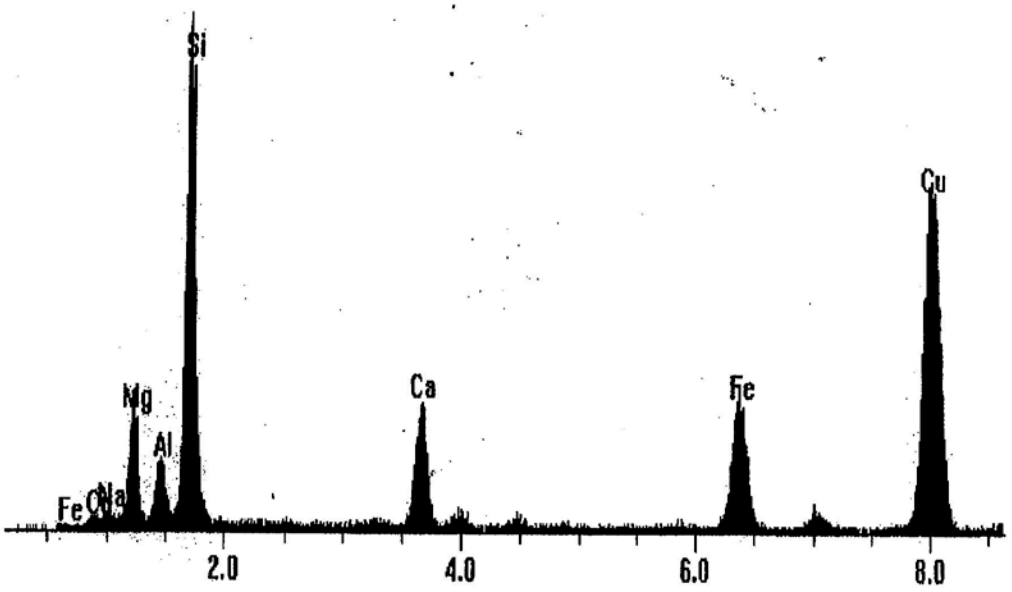
Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

File: 041216273-PA-ATV1-AM-01-M2-I4.NAM
Collected: July 06, 2012 18:26:29

Live Time:	255.75	Count Rate:	409	Dead Time:	9.80 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

■ Sample_862_S001.pgt

FS: 1200



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0015
Customer Sample: PA-ATV1-AM-02
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 403.2
Prepped By: A. FOLGAR
Prepped Date: 7/2/12
Grid Box : 0312-ERRG-01
Grid Location: N (1-3)

Scope: 03-01
GO area (mm²): 0.013
Magnification: 10000X
Analyzed By: Evie Sioukri
Analysis Date: 7/6/12

Analysis Information

Target Sensitivity: 0.004 s/cc
GO Required: 20 ~~19~~ ES 7/10/12
GO Analyzed: 20 ~~19~~ ES 7/10/12
Level of Analysis Chrysotile: CD
Level of Analysis Amphibole: ADX

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: >5 micron
Min Width: 0.25 micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
N1	J4	ND									
	J2	F	0	0	5.8	1.4	NAM	NAM	\ Al PRESENT Fe Too High		✓
	B5	ND									
	B3										
	A2										
N2	C2										
	C4										
	C6										
	C8										
	C10	↓									

ND= None Detected
NAM= Non Asbestos Material

Particulate Materials: 3-5%
Traverse direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0015

Customer Sample ID: PA-ATV1-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
N2	H9	ND									
	J7										
	J10										
N3	A4										
	A6										
	A8										
	A10										
	G8										
	G10										
	I 10										

ND = None Detected

NAM = Non Asbestos Material

EMSL ANALYTICAL, INC.

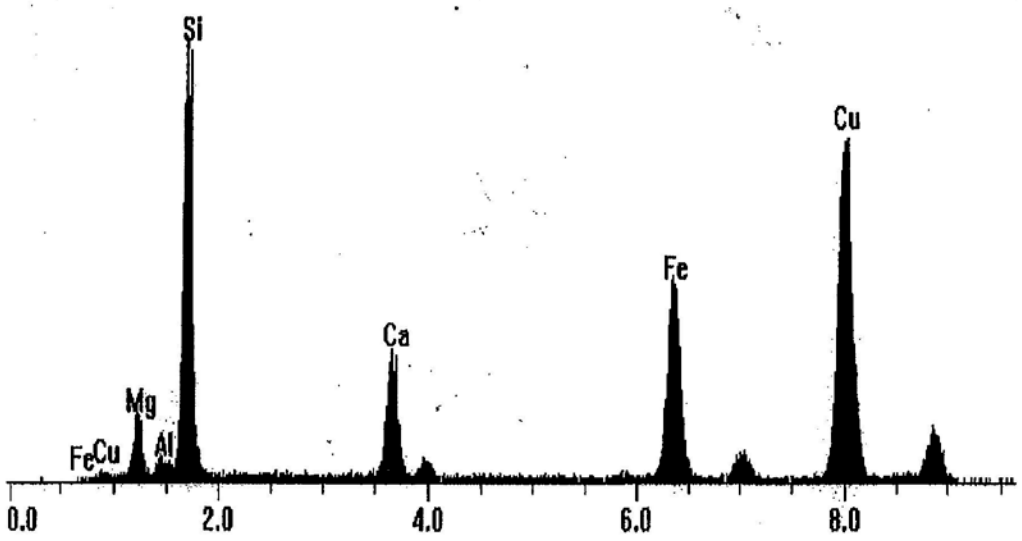
Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

File: 041216273 PA-ATV1-AM-02 N1 J2 NAM
Collected: July 06, 2012 19:12:05

Live Time:	89.03	Count Rate:	1314	Dead Time:	25.63 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

Sample_863_S001.pgt

FS: 1400



TEM ISO 13794
Asbestos Count Sheet

EMSL Sample ID: **041216273-0016**
Customer Sample: PA-ATV1-AM-03
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm²): ~~385~~ 364.9 7/23/12 DHM

Volume (L): 396.36
Prepped By: D. Stanhope
Prepped Date: 7/11/12
Grid Box: Special Projects
Grid Location: C

Scope: JEOL 1200 EX (04-53)
GO area (mm²): 0.0132
Magnification: 20kx
Analyzed By: R. Harrison
Analysis Date: 7/20/12

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: 10
GO Analyzed: 10
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:
Indirect prep, see indirect prep log for filter information
Filter aliquot used: 5 mL

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
C5	A8	ND									
↓	B10	↓									
	C7										
	D5										
↓	I8	↓									
C6	E1	F	0	0	10.5	1.0	NAM	NAM	[redacted]	03298	1
↓	D6	ND									
↓	A3	↓									
C7	B8										
↓	D7	↓									

ND= None Detected
NAM= Non Asbestos Material

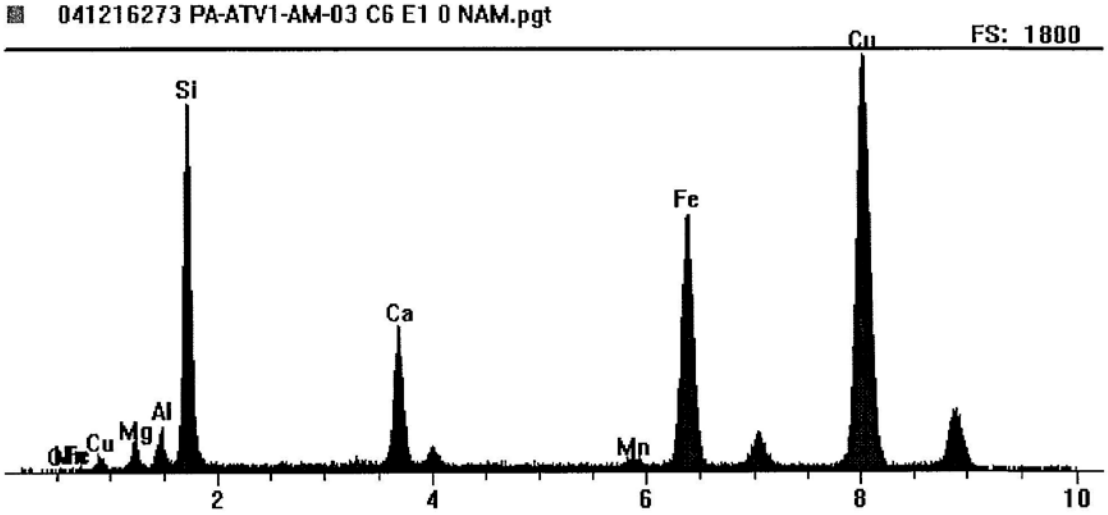
Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

EMSL ANALYTICAL, INC.

File: L:\EDS Spe...ope 04-03\2012\041216273 PA-ATV1-AM-03 C6 E1 0 NAM.pgt
Collected: July 20, 2012 08:38:41

Live Time:	121.02	Count Rate:	1589	Dead Time:	30.02 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00
Thickness limit:	35899.69				

041216273 PA-ATV1-AM-03 C6 E1 0 NAM.pgt



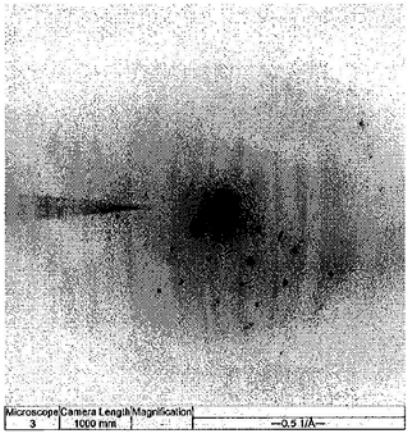
Element	Line	keV	CL Ratio	Wt%	At%	At Prop	Compound	Cmpd Wt%
Mg	KA1	1.254	1.7200	0.65	0.91	1.3	MgO	1.08
Al	KA1	1.487	1.1500	0.69	0.87	1.2	Al2O3	1.31
Si	KA1	1.740	1.0000	6.70	8.12	11.2	SiO	10.52
Ca	KA1	3.691	1.1400	3.58	3.04	4.2	CaO	5.01
Mn	KA1	5.898	0.0000	0.00	0.00	0.0	MnO	0.00
Fe	KA1	6.403	1.5300	11.60	7.07	9.8	Fe2O3	16.59
Cu	KA1	8.046	3.8285	52.32	28.01	38.8	CuO	65.50
O	KA1	0.523	0.0000	24.45	51.99	72.0		
Total			**0.0000**	**100.00**	**100.00**	**138.5**	**Total**	**100.00**

Element	Line	Gross (cps)	BKG (cps)	Net (cps)
Mg	KA1	14.1	3.7	10.4
Al	KA1	21.2	4.5	16.6
Si	KA1	190.0	5.2	184.8
Ca	KA1	93.3	6.7	86.6
Mn	KA1	12.5	6.9	5.6
Fe	KA1	216.9	7.4	209.1
Cu	KA1	383.6	6.7	376.9
O	KA1	1.2	0.9	0.3

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041216273	**Date:**	Jul 20, 2012
Image Number:	03298		
Reference / Sample Number:	0016		
Preliminary ID:	NRA		
Camera Constant:	1.875e-003	**1/A Pixels**	
Calibration Reference:	072012-04-03-03297_C		

	Measured	Reference	-5%	+5%
Inter-row Spacing:	**5.251**	5.300	**5.035**	**5.565**
d2 or hk0 (Camera K/zero row dist.):	**N/A**	N/A	-	-
d1 or hkl (Camera K/slant vector dist.):	**N/A**	N/A	-	-
Ratio of hk0/hkl:	**N/A**	N/A	-	-
Vector Angle:	**N/A**	N/A	-	-



From SAED Reference Book, "unknown" diffraction pattern was found to be that of: **NRA**

With a Zone Axis of: [**N/A**]

Preliminary Identification was:

X	CORRECT
	INCORRECT

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0017	Volume (L):	381.6	Scope:	03-01
Customer Sample:	PA-ATV1-AM-04	Prepped By:	A. FOLGAR	GO area (mm²):	0.0130
Sample Description:	ABS	Prepped Date:	7-2-12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	José Arriaga
EFA (mm²):	385	Grid Location:	O (1-3)	Analysis Date:	7-7-12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~20~~ 21 JA 7-9-12		none	3:1	5:1
GO Analyzed:					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
01	Sample Overloaded.										

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Traverse Direction : Vertical
Particulate Loading : 50-60%

TEM ISO 13794
Asbestos Count Sheet

EMSL Sample ID: **041216273-0017**
Customer Sample: PA-ATV1-AM-04
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm²): ~~385~~ 364.9 7/23/12 DM

Volume (L): 381.6
Prepped By: D. Stanhope
Prepped Date: 7/11/12
Grid Box : Special 7th Sq. Prospects
Grid Location: D

Scope: JEOL 200 EX (64-03)
GO area (mm²): 0.0132
Magnification: 20kx
Analyzed By: P. Harrison
Analysis Date: 7/20/12

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: 10
GO Analyzed: 10
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:
Indirect prep, please see prep log for filter information
Filter aliquot used: 5 mL

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
D5	A7	ND									
|	B9	↓									
|	D10	B	1	1	5.2	0.5	CD	CH		03299	1
|	F8	ND									
↓	H6	↓									
D6	A8	↓									
|	B5	↓									
|	C9	↓									
|	F8	↓									
↓	J5	↓									

ND= None Detected
NAM= Non Asbestos Material

Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

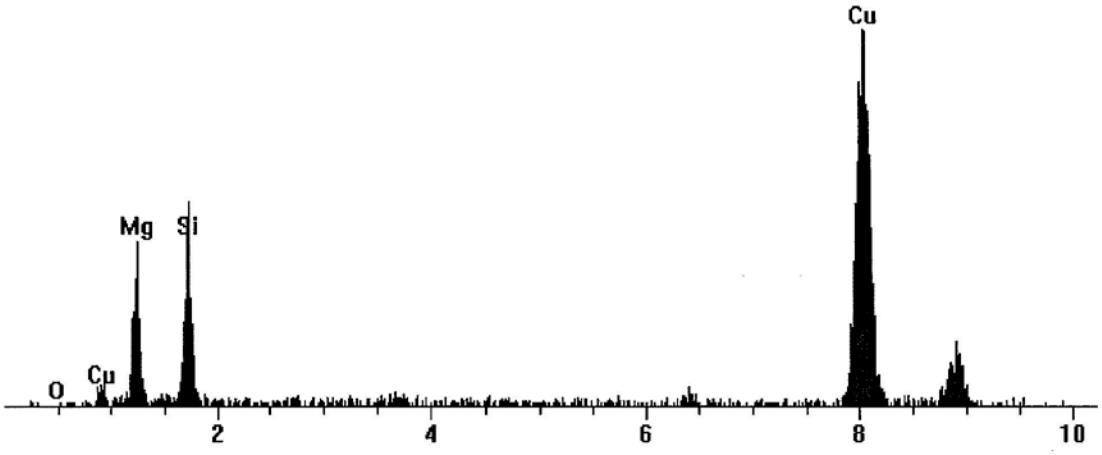
EMSL ANALYTICAL, INC.

File: L:\EDS Spe...ope 04-03\2012\041216273 PA-ATV1-AM-04 D5 D10 1 CH.pgt
Collected: July 20, 2012 08:38:41

Live Time:	108.96	Count Rate:	147	Dead Time:	3.20 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00
Thickness limit:	54071.46				

■ 041216273 PA-ATV1-AM-04 D5 D10 1 CH.pgt

FS: 275



Element	Line	keV	CL Ratio	Wt%	At%	At Prop	Compound	Cmpd Wt%
Mg	KA1	1.254	1.7200	35.17	30.23	43.5	MgO	58.30
Si	KA1	1.740	1.0000	26.56	19.77	28.5	SiO	41.70
Cu	KA1	8.046	0.0000	0.00	0.00	0.0		
O	KA1	0.523	0.0000	38.27	50.00	72.0		
Total			**0.0000**	**100.00**	**100.00**	**144.0**	**Total**	**100.00**

Element	Line	Gross (cps)	BKG (cps)	Net (cps)
Mg	KA1	11.3	0.5	10.8
Si	KA1	14.6	0.5	14.1
Cu	KA1	56.1	1.0	55.2
O	KA1	0.3	0.3	0.1

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0018	Volume (L):	374.94	Scope:	03-01
Customer Sample:	PA-MA-AA-01	Prepped By:	A. FOLGAR	GO area (mm²):	0.0130
Sample Description:	Ambient	Prepped Date:	7-2-12	Magnification:	10,000 x
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	José Arriaga
EFA (mm²):	385	Grid Location:	P (1-3)	Analysis Date:	7-7-12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~38~~ 40 Ja 7-9-12		none	**3:1**	5:1
GO Analyzed:	~~39~~ 40				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
P1	B2	ND									
	B4	↓									
	B6										
	B8										
	B10										
	D2										
	D4										
	D6										
	D8										
	D10										

ND= None Detected NAM= Non Asbestos Material

Traverse Direction : Vertical

Particulate Loading : 1-5%

Ja 7-9-12

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0018

Customer Sample ID: PA-MA-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
P1	F2	ND									
	F4	↓									
	F6										
	F8										
	F10										
	H2										
	H4										
	H6										
	H8										
	H10										
P2	C2										
	C4										
	C6										
	C8	↓									

ND = None Detected

NAM = Non Asbestos Material

JA 7-9-12

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0018

Customer Sample ID: PA-MA-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
P2	C10	ND									
	E2	↓									
	E4										
	E6										
	E8										
	E10										
	G2										
	G4										
	G6										
	G8										
	G10										
	I2										
	I4										
	I6	↓									
	I8	F	Ø	Ø	58.8	3.75	NAM	NAM	Al Present		✓

ND = None Detected

NAM = Non Asbestos Material

ja 7-9-12

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0018

Customer Sample ID: PA-MA-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
P2	I10	ND									

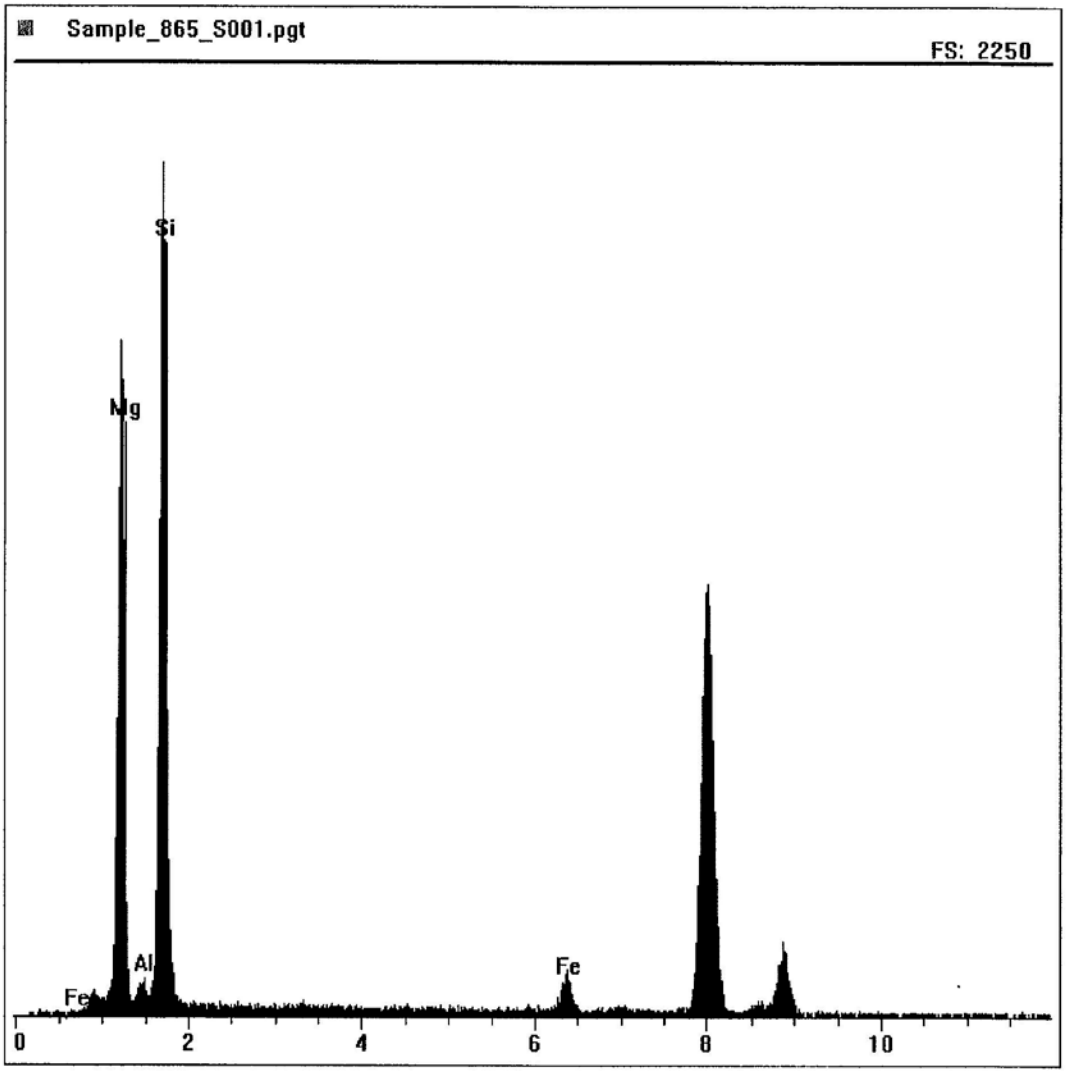
ND = None Detected NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AA-01 P2 I8 NAM
Collected: July 07, 2012 10:46:14

Live Time:	163.58	Count Rate:	947	Dead Time:	18.83 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0019**	Volume (L):	375.84	Scope:	03-01
Customer Sample:	PA-MA-AA-02	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERRG-01	Analyzed By:	G. Lannon
EFA (mm²):	385	Grid Location:	Q(1,2,3)	Analysis Date:	7/9/12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~.39~~ 40		none	**3:1**	5:1	~~Significant Amount of non-countable Asbestos~~ Observed DL 7/9
GO Analyzed:	~~39~~ 40					
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron	
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
Q1	B2	ND									
	B4	↓									
	B6										
	B8										
	B10										
	D1										
	D3										
	D5										
	D7										
	D9										

ND= None Detected NAM= Non Asbestos Material

Particle loading 1-2%
Transverse Direction Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0019

Customer Sample ID: PA-MA-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H2	ND									
	H4										
	H6										
Q2	H9										
	H7										
	H5										
	F10										
	F8										
	D10										
	D5										
	D3										
	C6										
	C4										
	A8										
	A6	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0019

Customer Sample ID: PA-MA-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	A4	ND									
Q3	A3										
	A5										
	A7										
	A9										
	B6										
	B8										
	C3										
	C5										
	C7										
	E9										
	G1										
	I1										
	I3										
	I5	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0020	Volume (L):	430.2	Scope:	03-01
Customer Sample:	PA-MA-AM-01	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-1	Analyzed By:	G. Lannon
EFA (mm²):	385	Grid Location:	R1-3	Analysis Date:	7/9/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~18~~ 19		none	**3:1**	5:1
GO Analyzed:	19				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:
Sig. cut amount of non-countable Asbestos Observed. $x^2 = 34.750$ = Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
R4	J9	ND									
	J7	ND									
	J5	ND									
	C10	F	1	1	~~4.86~~ 9.72	2.19	CD	CH		63123 63124,25	YES
		MD11	2		20.34	2430	CD	CH			
		MF		2	20.34	0.25	CD	CH		63126 63127	YES
	C8	ND									
	C6	ND									
	C4	ND									
R2	D2	MD11	3		12.15	8.50	CD	CH		63128 63129	~~YES~~

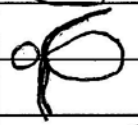
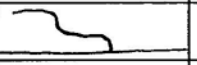
ND= None Detected NAM= Non Asbestos Material

AR 7/10

Particle loading 3-5%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0020 **Customer Sample ID:** PA-MA-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
		MF		3	12.15	0.25	CD	CH			YES
	D4	MD11	4		34.02	1944	CD	CH			
		MB		4	34.02	0.47	CD	CH		63130 63131	YES
		MD11	5		60.75	10.93	CD	CH			
		MB		5	60.75	0.70	CD	CH			
		F	6	6	10.21	0.50	CD	CH			
	G3	ND									
	G5	ND									
	G7	F	7	7	68.04	0.52	CD	CH			
		MD11	8		10.94	5.83	CD	CH			
		MB		8	10.94	0.30	CD	CH			
	I3	ND									
B3	D3	ND									
	D5	ND									
	F3	ND									

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0020

Customer Sample ID: PA-MA-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	F5	ND									
	F7	ND									
	I4	ND									

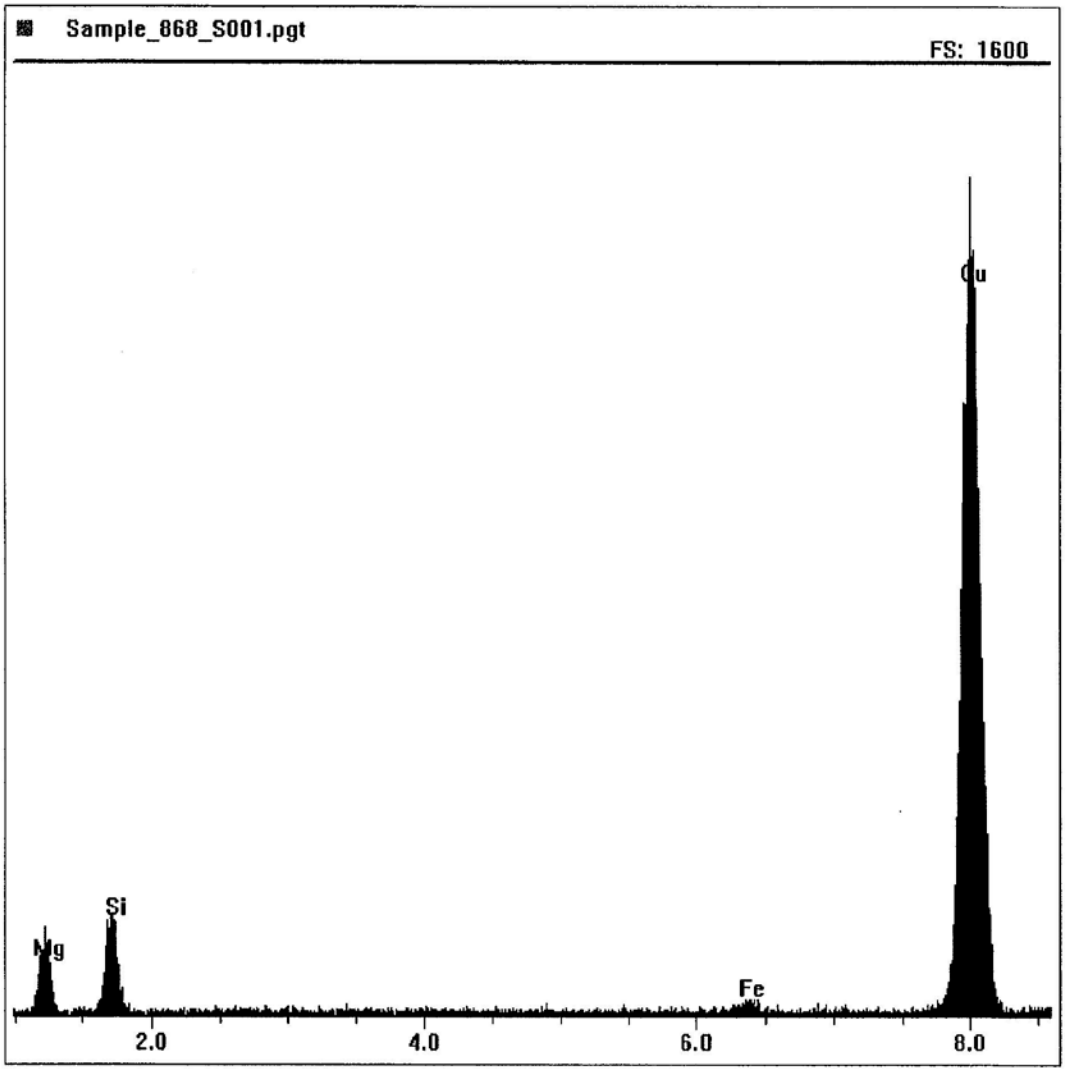
ND = None Detected NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-01 R1 C10 1 Chrysotile
Collected: July 09, 2012 10:26:18

Live Time:	19.65	Count Rate:	3980	Dead Time:	61.14 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

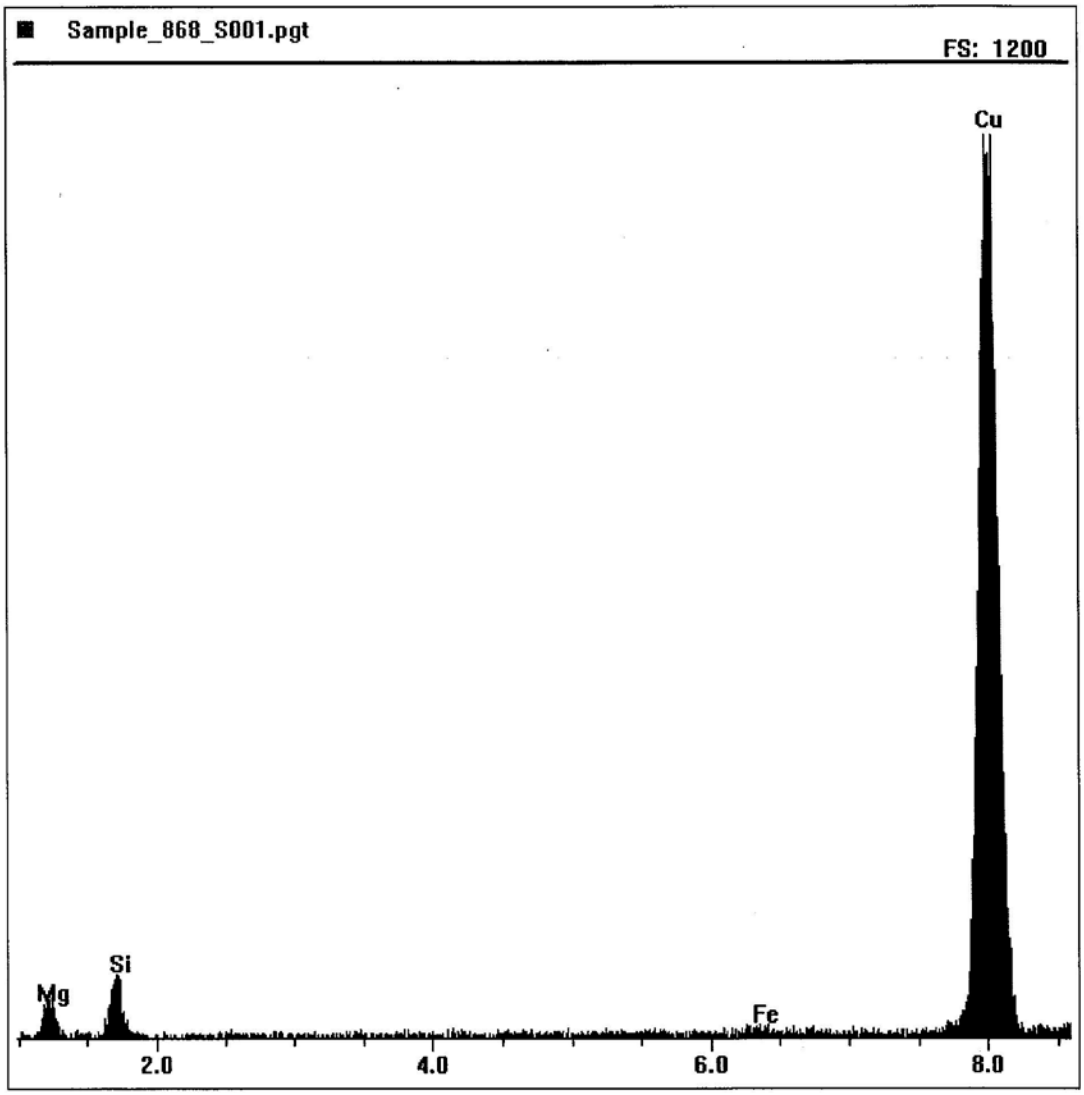


Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-01 R1 C10 2 Chrysotile
Collected: July 09, 2012 10:26:18

Live Time:	89.03	Count Rate:	672	Dead Time:	15.38 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

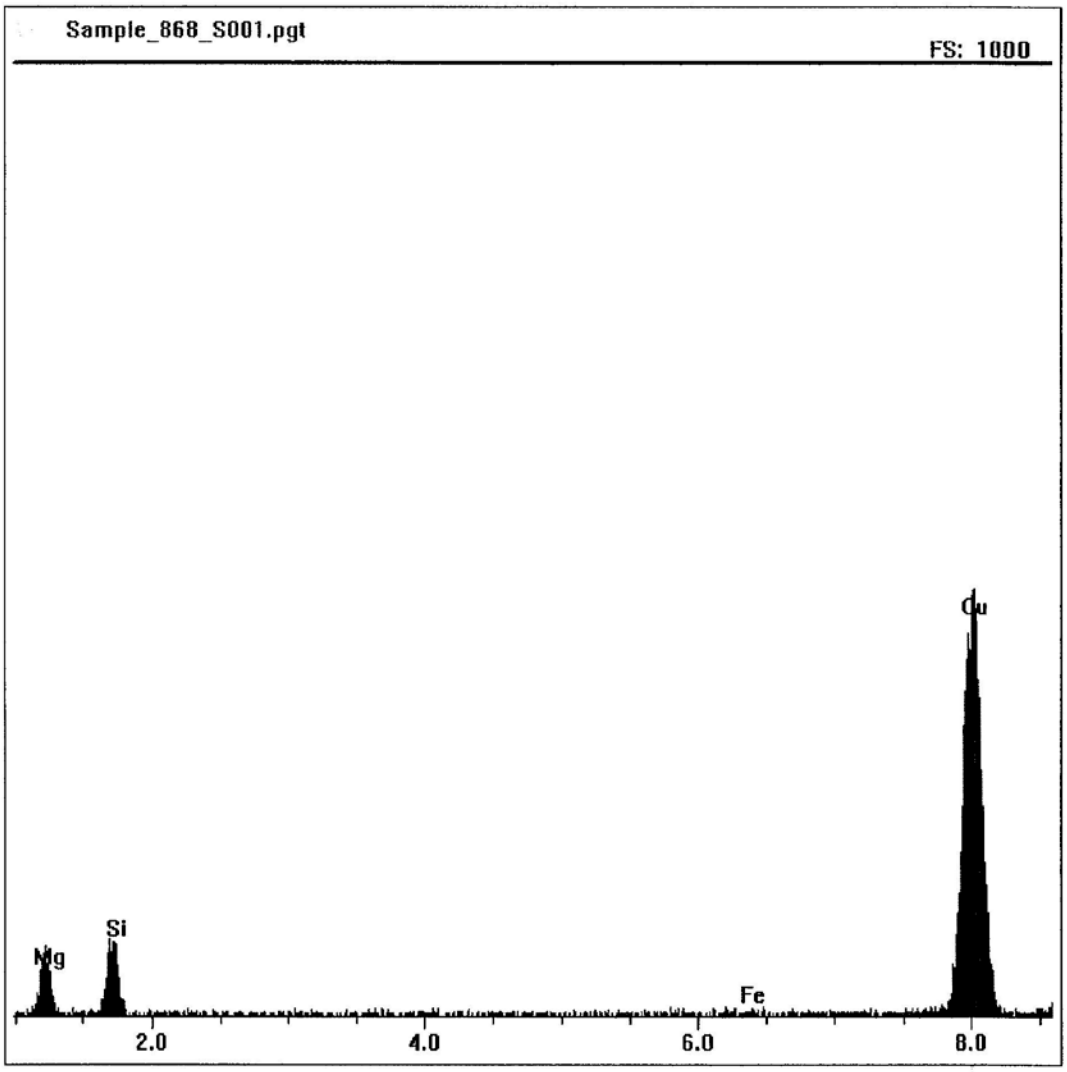


Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-01 R2 D2 3 Chrysotile
Collected: July 09, 2012 10:26:18

Live Time:	118.57	Count Rate:	232	Dead Time:	6.87 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



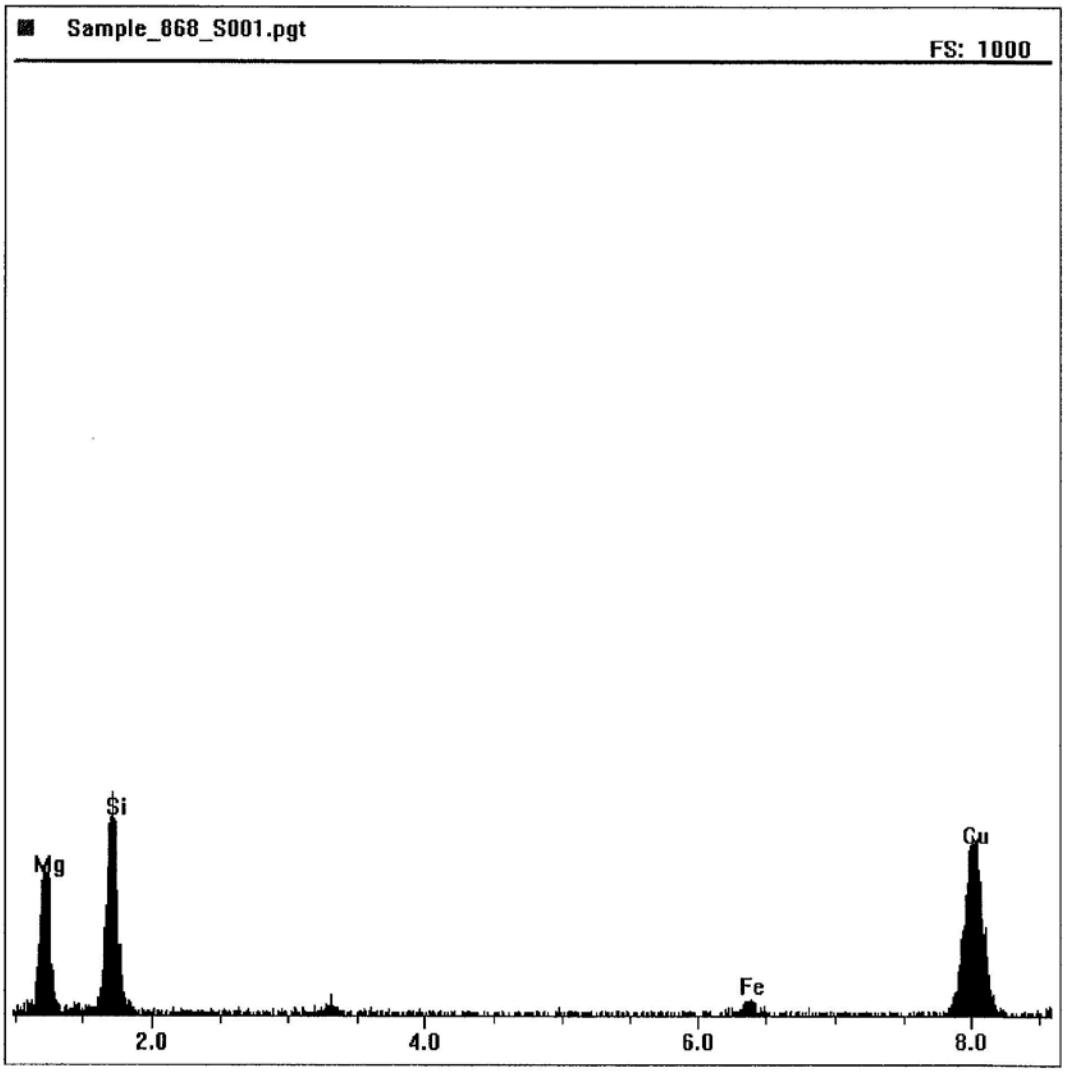
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-01 R2 D4 4 Chrysotile

Collected: July 09, 2012 10:26:18

Live Time:	75.61	Count Rate:	288	Dead Time:	7.62 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63129 SCOPE #: 03-01

Reference / Sample Number: PA-MA-AM-01

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4.075 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.85	mm

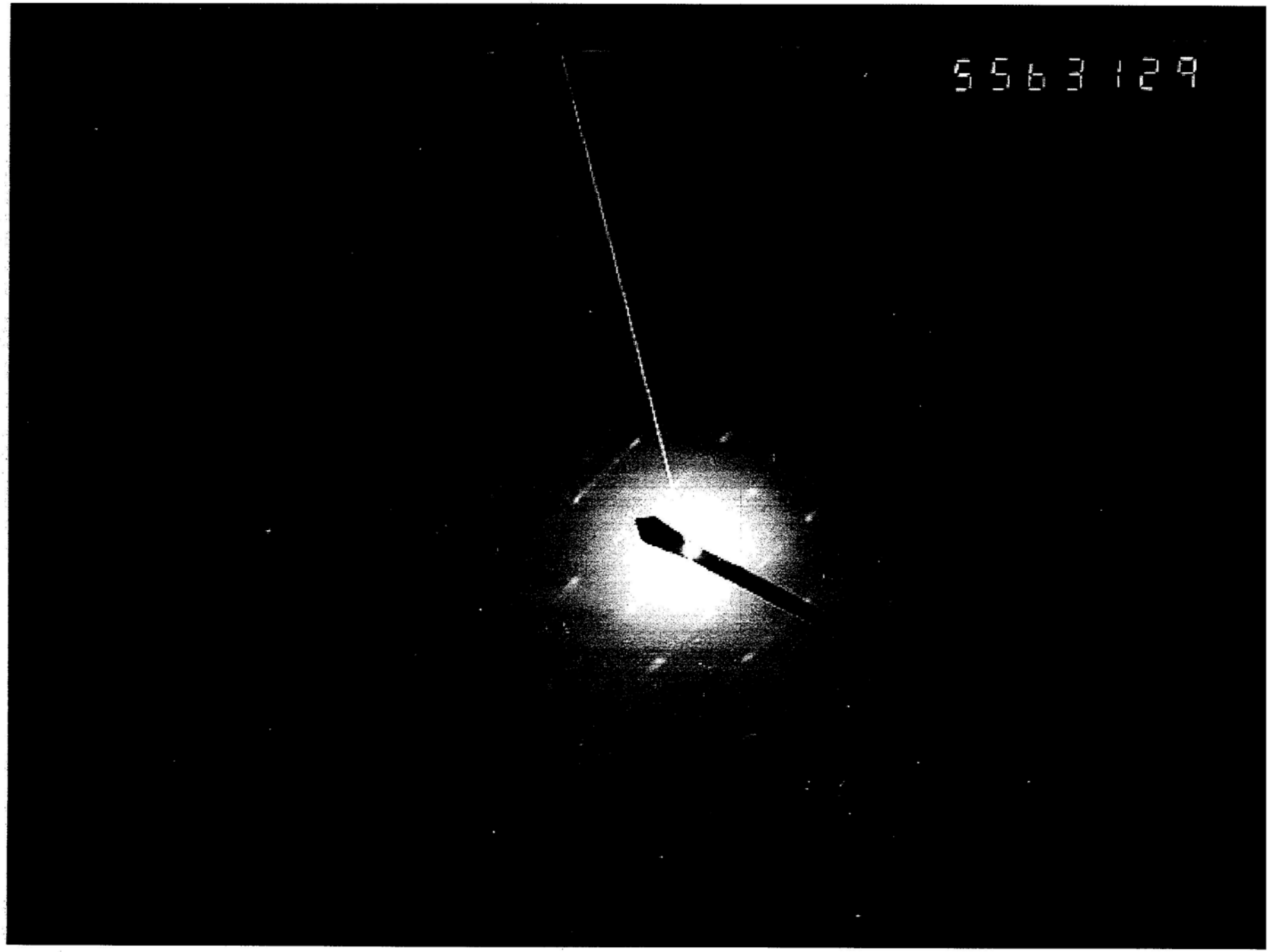
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.37**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	59.5	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.51**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


5563129

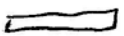
TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0021	Volume (L):	458.82	Scope:	03-01
Customer Sample:	PA-MA-AM-02	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box:	0312-ERR601	Analyzed By:	G. Lennon
EFA (mm²):	385	Grid Location:	S1-3	Analysis Date:	7/2/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~17~~ 18		none	**3:1**	5:1
GO Analyzed:	18				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:
Significant Amount of non-countable Asbestos Observed. $x^2 = 13,545$ = Random

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
S1	A9	F	1	1	8.50	0.52	CD	CH		63132 63133	YES
	A7	F	2	2	12.88	1.17	CD	CH			
		MD11	3		24.30	21.87	CD	CH			
		MF		3	19.48	0.45	CD	CH		63134	
	A5	ND									
	A3	ND									
S2	B3	ND									
	B5	F	4	4	12.40	2.11	CD	CH			
	B8	MD11	5	~~4~~ 5	~~14.04~~ 37.44	~~14.04~~ 16.38	CD	CH			
		MF		5	37.44	2.50	CD	CH			

ND= None Detected

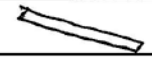
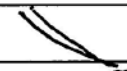
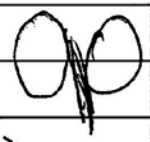
NAM= Non Asbestos Material

Particulate loading 3-5%
Transverse Direction. Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0021

Customer Sample ID: PA-MA-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	D2	F	6	6	12.63	0.95	CD	CH			
	D6	ND									
	D8	ND									
	F6	B	7	7	11.67	0.57	CD	CH			
		MD11	8		29.16	21.87	CD	CH			
		MB		8	29.16	0.50	CD	CH			
	F8	ND									
S3	C4	ND									
	C6	MD11	9		10.17	10.93	CD	CH			
		MB		9	8.01	0.68	CD	CH			
	C8	MD11	10		9.45	8.65	CD	CH			
		MB		10	8.74	0.95	CD	CH			
	H3	MD11	11		12.87	5.35	CD	CH			
		MB		11	12.87	0.52	CD	CH			
	H5	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0021

Customer Sample ID: PA-MA-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H7	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0021

Customer Sample ID: PA-MA-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H7	ND									

ND = None Detected

NAM = Non Asbestos Material

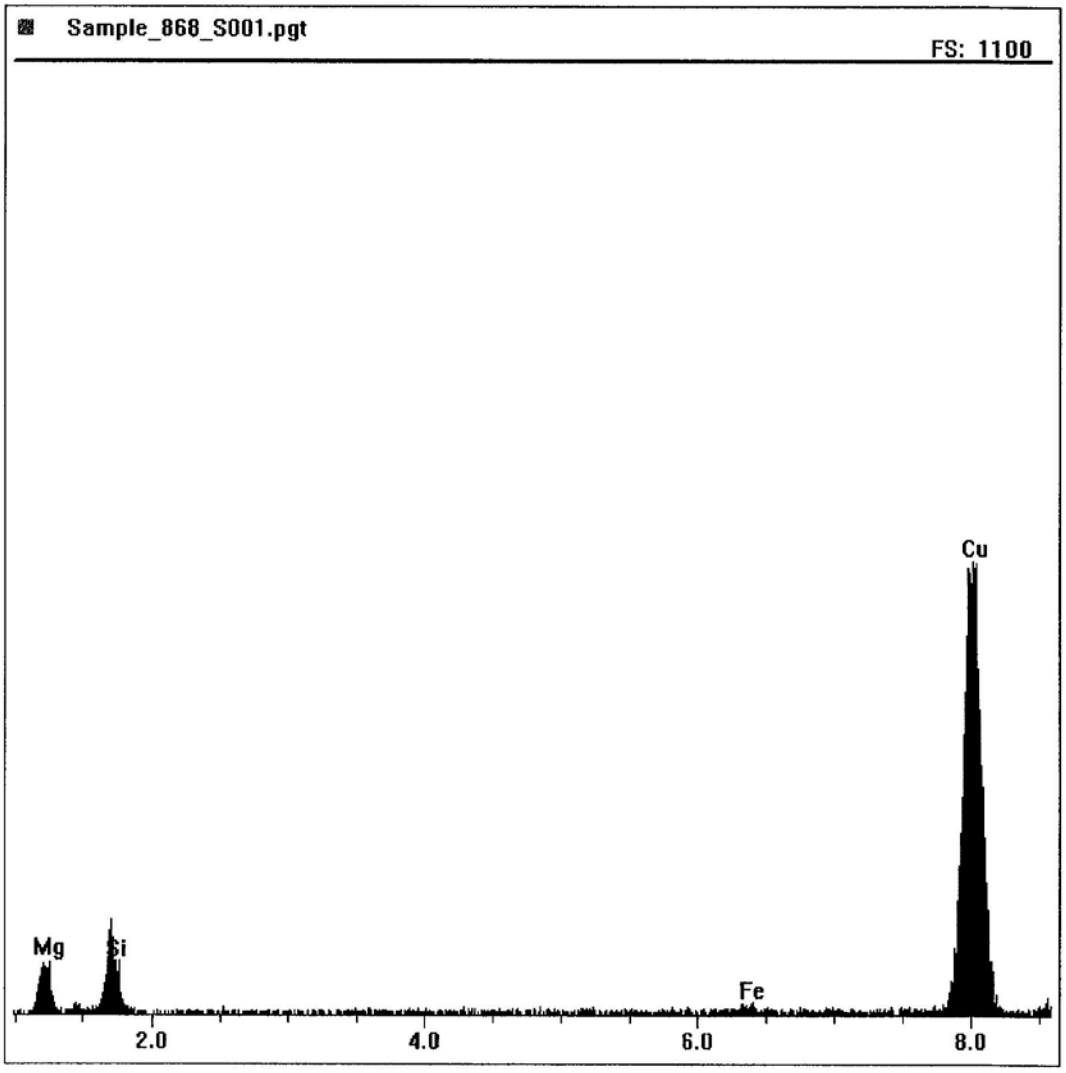
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-02 S1 A9 1 Chrysotile

Collected: July 09, 2012 10:26:18

Live Time:	15.00	Count Rate:	2135	Dead Time:	39.17 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63134 SCOPE #: 03-01

Reference / Sample Number: PA-MA-AM-02

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4.075 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	2.93	mm
Measured distance, center spot to closest hk1 spot (110):	4.85	mm

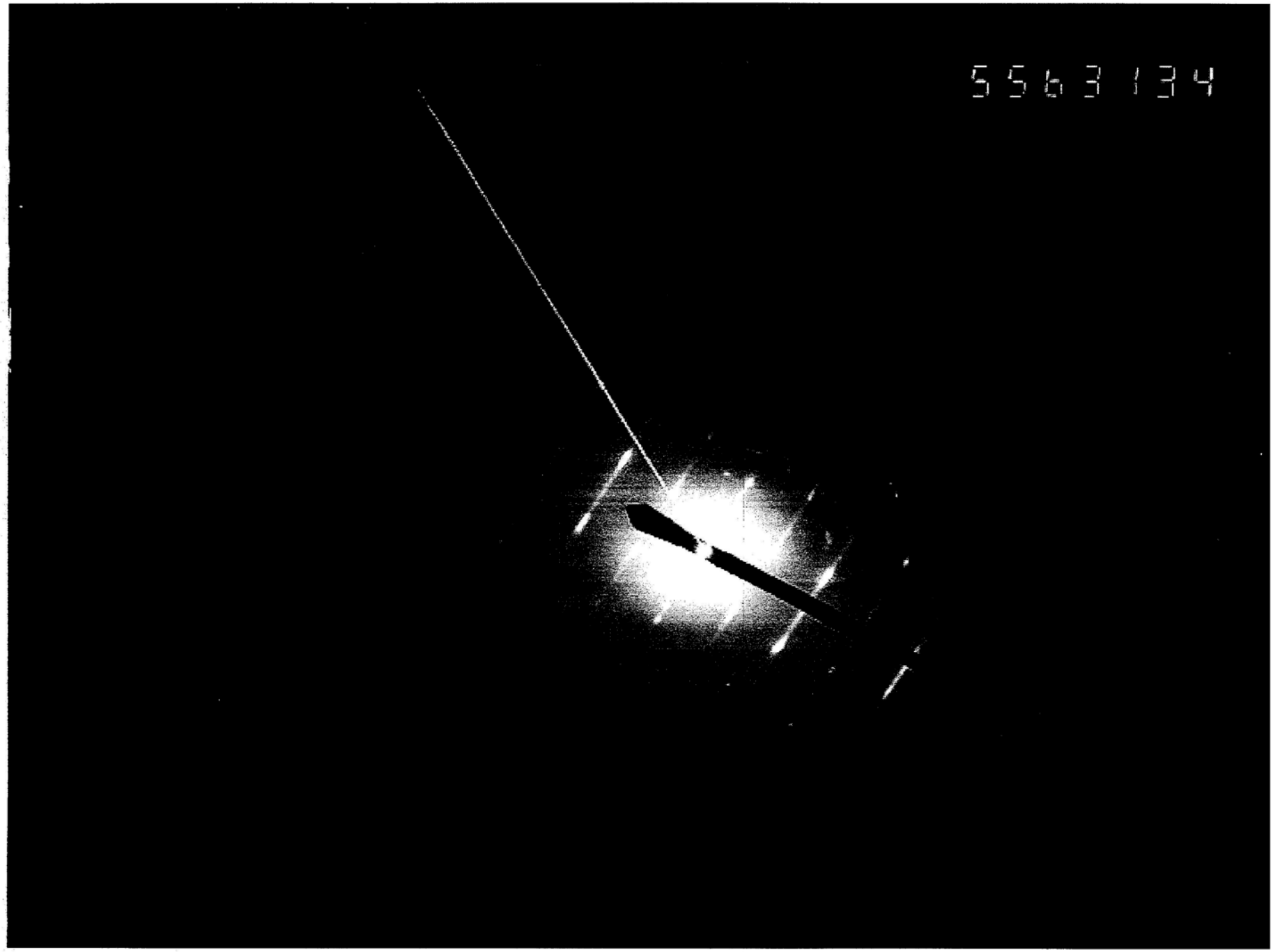
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.37**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	63	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.48**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.51**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


5563134

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0022	Volume (L):	396.36	Scope:	03-01
Customer Sample:	PA-MA-AM-03	Prepped By:	A. FOLGAR	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	A. FOLGAR
EFA (mm²):	385	Grid Location:	T(1-3)	Analysis Date:	7/9/2012

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~19~~ 20		none	**3:1**	5:1
GO Analyzed:	20				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:
Significant amount of non-countable asbestos observed.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
T1	C10	ND									
	C8										
	C6										
	C4										
	B9										
	B7										
	B5										
	B1										
	A6										
	A4	↓									

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate loading: 5-10%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0022

Customer Sample ID: PA-MA-AM-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
T2	J9	ND									
	J7	ND									
	J5	ND									
	J3	ND									
	J1	ND									
	f10	↓									
	f8										
	f6										
	B8										
	B6										

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

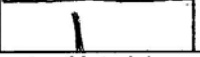
EMSL Sample ID:	041216273-0023	Volume (L):	381.6	Scope:	03-01
Customer Sample:	PA-MA-AM-04	Prepped By:	A. FOLGAR	GO area (mm²):	0.0130
Sample Description:	ABS	Prepped Date:	7-2-12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	José Arriaga
EFA (mm²):	385	Grid Location:	U (1-3)	Analysis Date:	7-9-12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~20~~ 21 JA 7-9-12		none	3:1	5:1
GO Analyzed:	21				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

$x^2 = 19 =$ Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U1	B2	ND									
	B4	MD11	1		15.8	9.72	NAM	NAM			
		MB		0	15.8	0.28	NAM	NAM	Al Present 		✓
	B6	ND									
	B8	ND									
	D2	ND									
	D4	ND									
	D6	MD11	2		34.0	21.9	NAM	NAM	Al Present 		
		MF		0	34.0	4.86	NAM	NAM			✓
	D8	B	3	1	8.0	0.30	CD	CH			✓

ND= None Detected

NAM= Non Asbestos Material

Traverse Direction : Vertical

Particulate Loading : 5-10 %

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0023 **Customer Sample ID:** PA-MA-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U1	D10	ND									
	F2	ND									
	F4	ND									
U2	I9	ND									
	I7	ND									
	I5	ND									
	I3	ND									
	I1	ND									
	G9	MD11	4		33.0	7.29	CD	CH			
		MB		2	33.0	1.18	CD	CH		63136	✓
		MD11	5		24.3	6.80	NAM	NAM			
		MB		Ø	24.3	1.13	NAM	NAM			✓
	G7	ND									
	G5	ND									

ND = None Detected NAM = Non Asbestos Material

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0023

Customer Sample ID: PA-MA-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U2	G3	ND									
	G1	ND									

ND = None Detected NAM = Non Asbestos Material

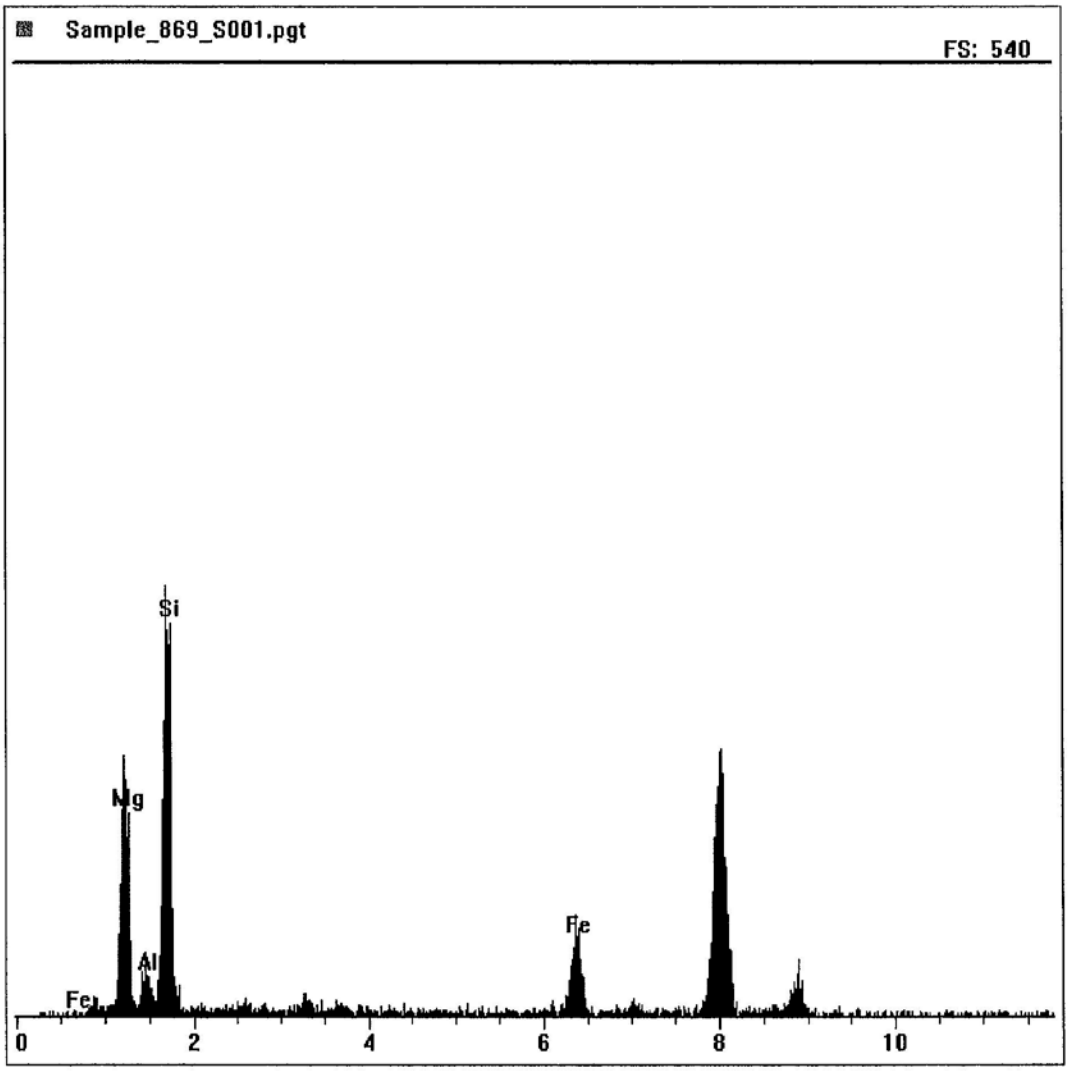
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

DM 7/10/12

File: 041216273 PA-MA-AM-04 U1 B4 / NAM
Collected: July 09, 2012 17:02:02

Live Time:	138.46	Count Rate:	155	Dead Time:	5.24 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

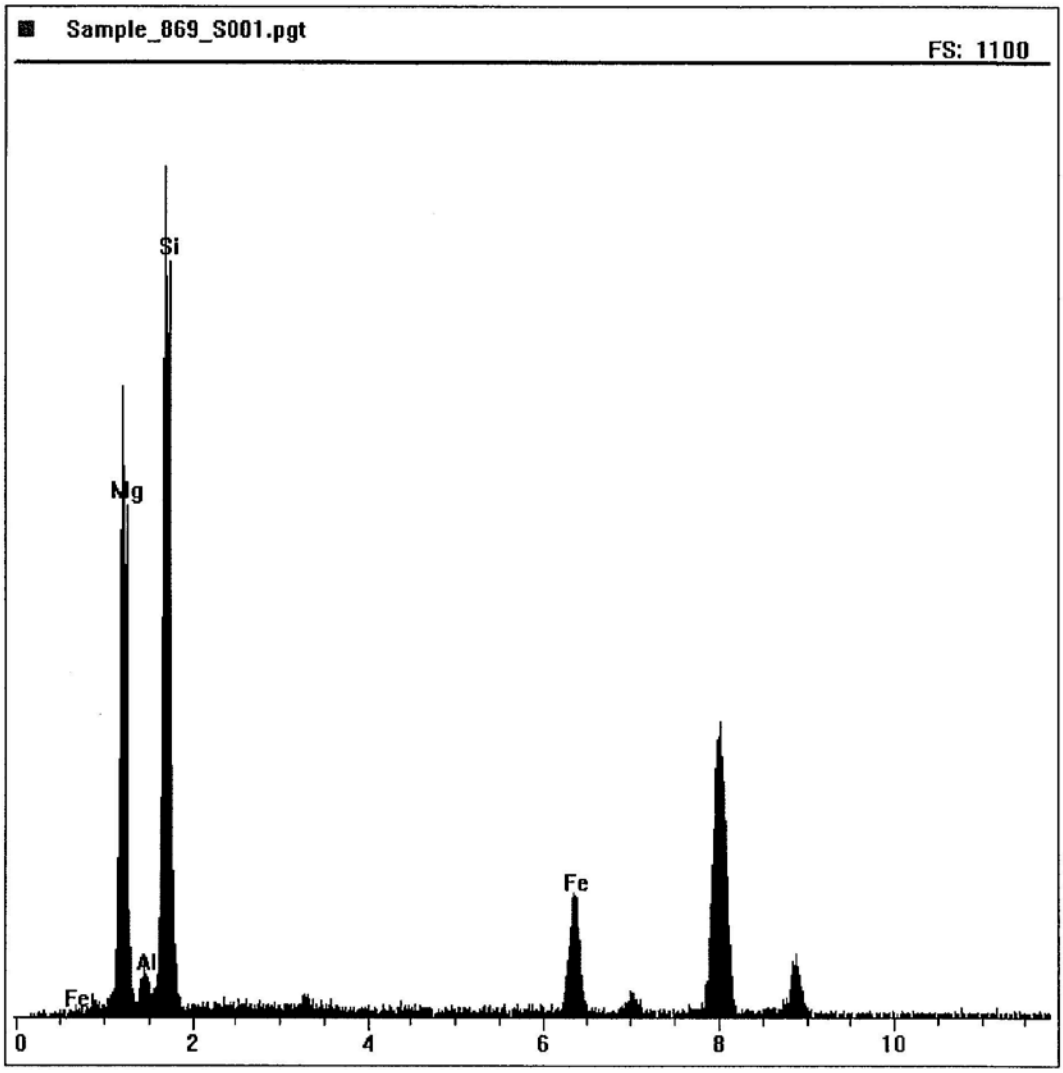
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

7/11/12

File: 041216273 PA-MA-AM-04 U1 D6 NAM
Collected: July 09, 2012 17:02:02

Live Time:	58.81	Count Rate:	1234	Dead Time:	23.62 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00

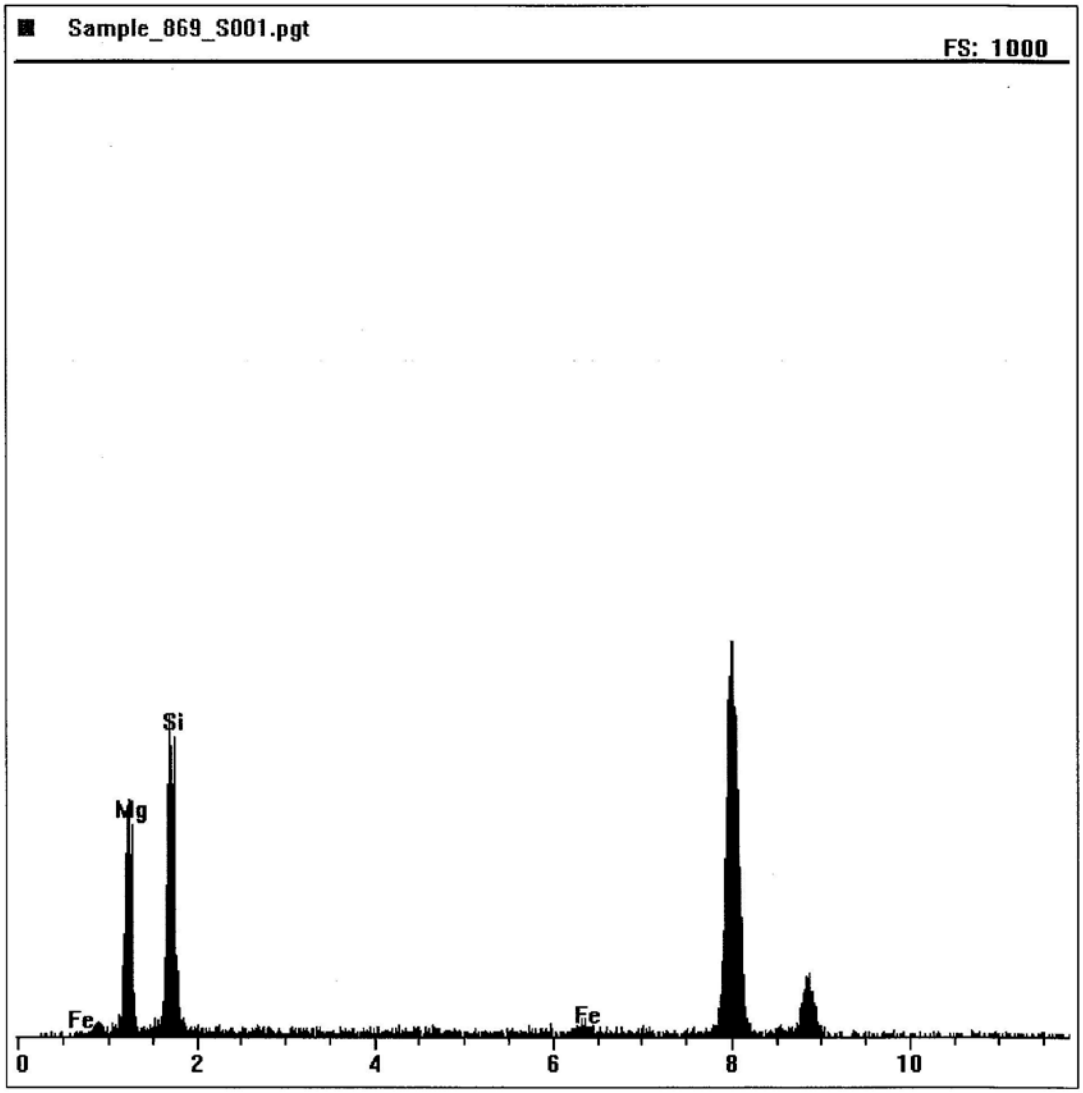


Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-04 U1 D8 1 CHRYSOTILE
Collected: July 09, 2012 17:02:02

Live Time:	390.49	Count Rate:	100	Dead Time:	4.23 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



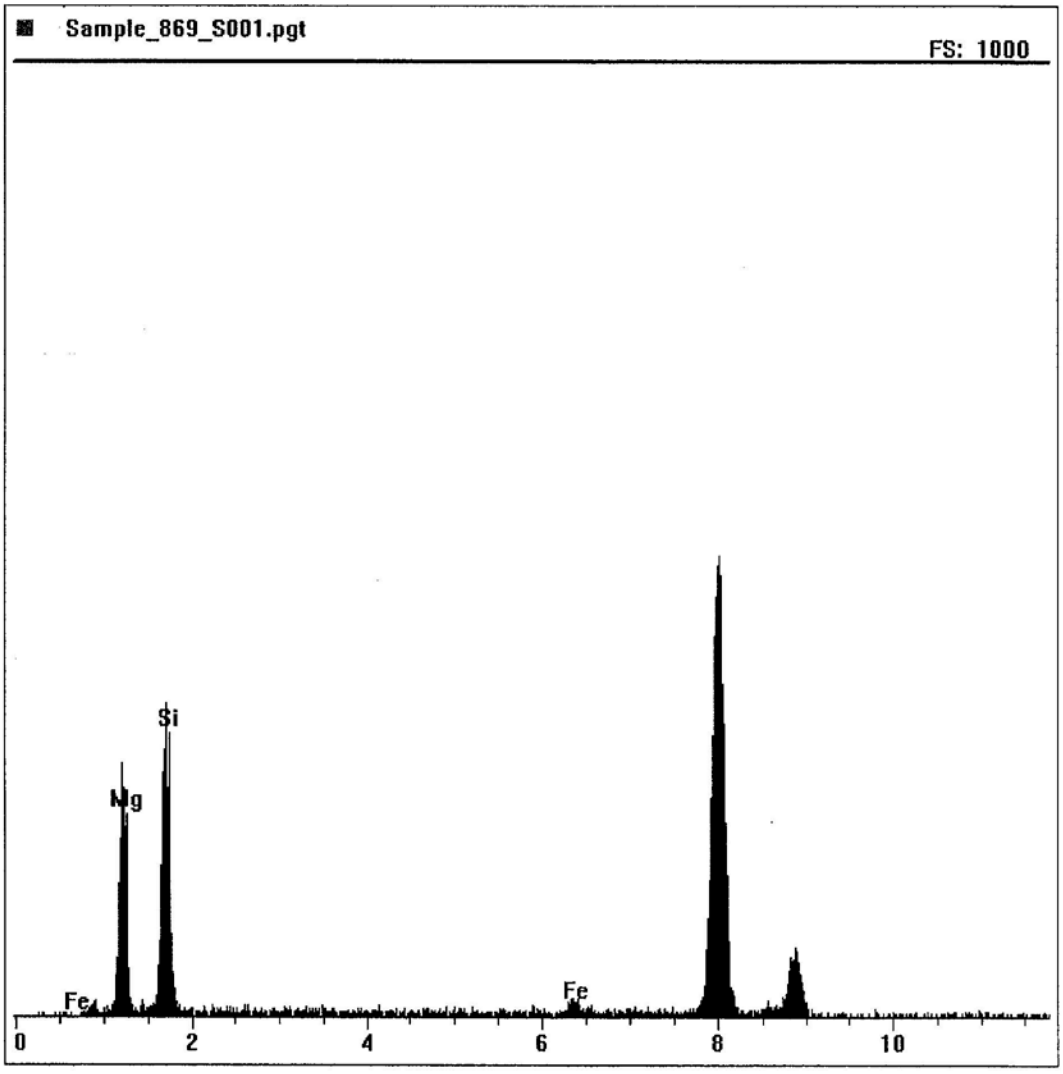
EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-04 U2 G9 2 CHRYSOTILE
Collected: July 09, 2012 17:02:02

Live Time:	91.33	Count Rate:	453	Dead Time:	10.98 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

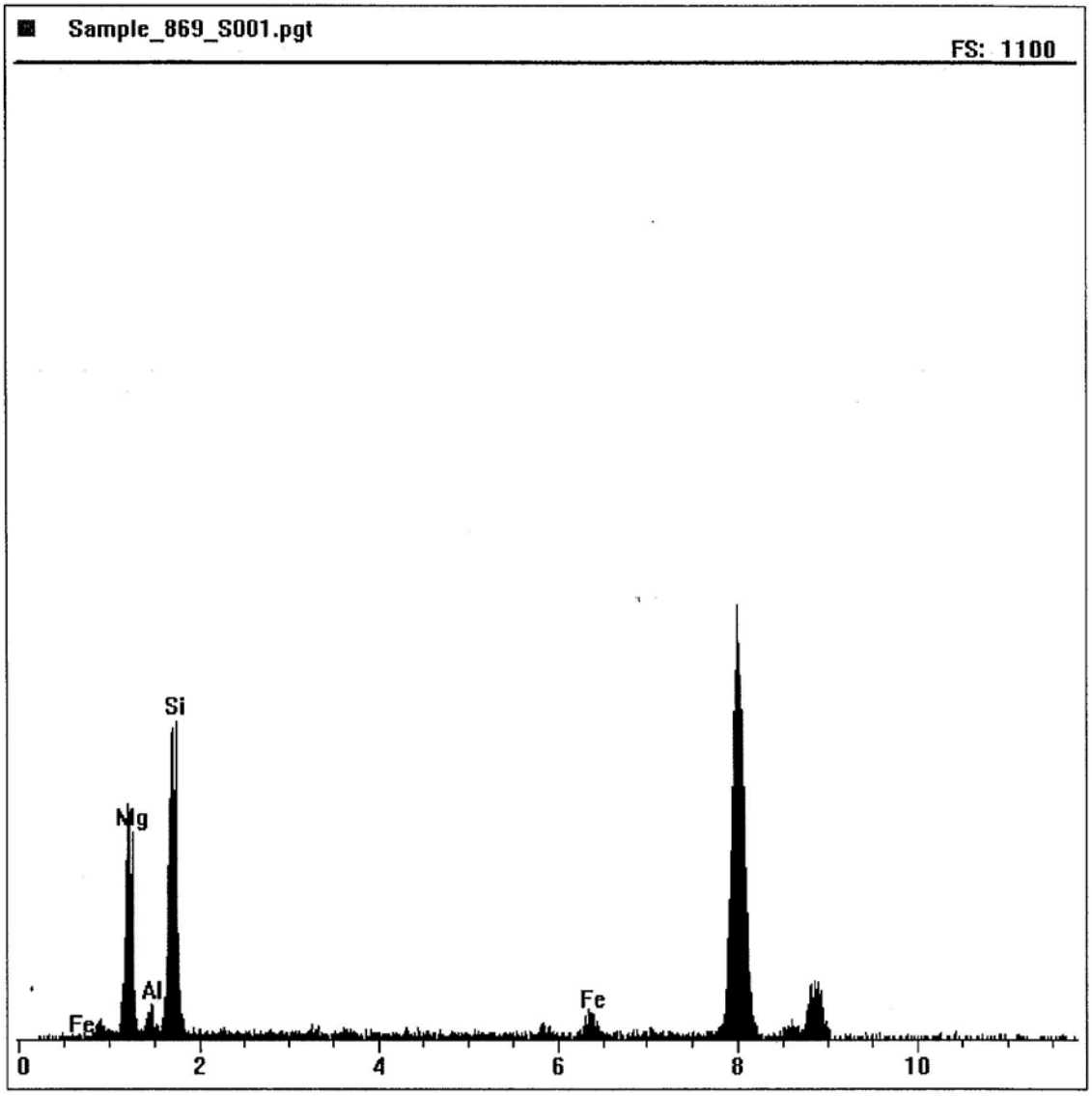
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

DM 7/11/12

File: 041216273 PA-MA-AM-04 U2 G9 3 NAM
Collected: July 09, 2012 17:02:02

Live Time:	178.29	Count Rate:	254	Dead Time:	7.18 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63136 SCOPE #: 03-01

Reference / Sample Number: PA-MA-AM-04

Preliminary ID: Chrysotile By: JA

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4.075 mm

110 reflections present? Enter Yes or No: Yes

200 doublets present? Enter Yes or No: Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.85	mm

	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.37**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	63	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.51**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


5 4 6 3 1 3 6

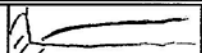
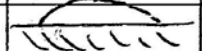
TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0024	Volume (L):	403.2	Scope:	03-01
Customer Sample:	PA-MA-AM-05	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERRG-02	Analyzed By:	Glunnuzzi
EFA (mm²):	385	Grid Location:	A1-3	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~20~~ ~~19~~ ~~18~~ 7/10		none	**3:1**	5:1
GO Analyzed:	20				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:
Significant amount of non-Countable Asbestos observed. X9=15=Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A1	H9	F	1	1	54.67	0.35	CD	CH		63137 63138	YES
	H7	F	Ø	Ø	5.75	0.90	NAM	NAM			YES
	H5	ND									
	E9	MD11	2		17.01	14.58	CD	CH			~~YES~~ JR 7/10
		MB		2	17.01	0.90	CD	CH			YES
	F5	MD11	3		9.72	3.65	CD	CH			
		MB		3	9.72	0.30	CD	CH			
	C7	ND									
	C5	ND									
	B4	ND									

ND= None Detected

NAM= Non Asbestos Material

Particulate loading 3-5%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0024

Customer Sample ID: PA-MA-AM-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A2	G9	MO11	4		24.30	14.58	CD	CH			
		MB		4	24.30	0.25	CD	CH			
	G3	ND									
	G1	ND									
	I8	ND									
	I6	ND									
	B8	ND									
	A6	ND									
A3	D4	ND									
	D6	ND									
	D8	ND									
	I5	F	5	5	19.44	0.52	CD	CH		63139	
	I7	ND									

ND = None Detected

NAM = Non Asbestos Material

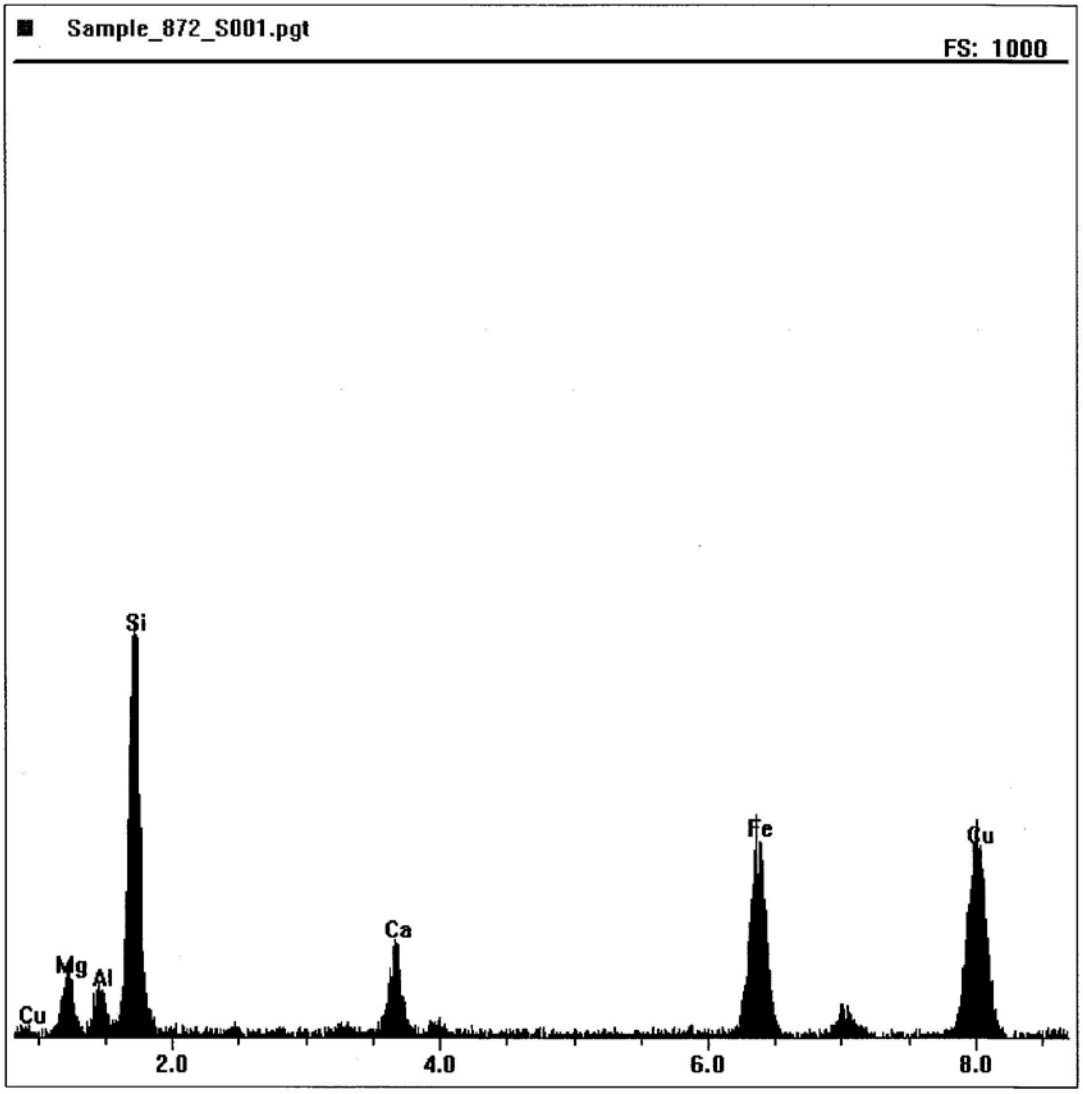
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-05 A1 H7 NAM

Collected: July 10, 2012 09:33:32

Live Time:	32.77	Count Rate:	1185	Dead Time:	23.09 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

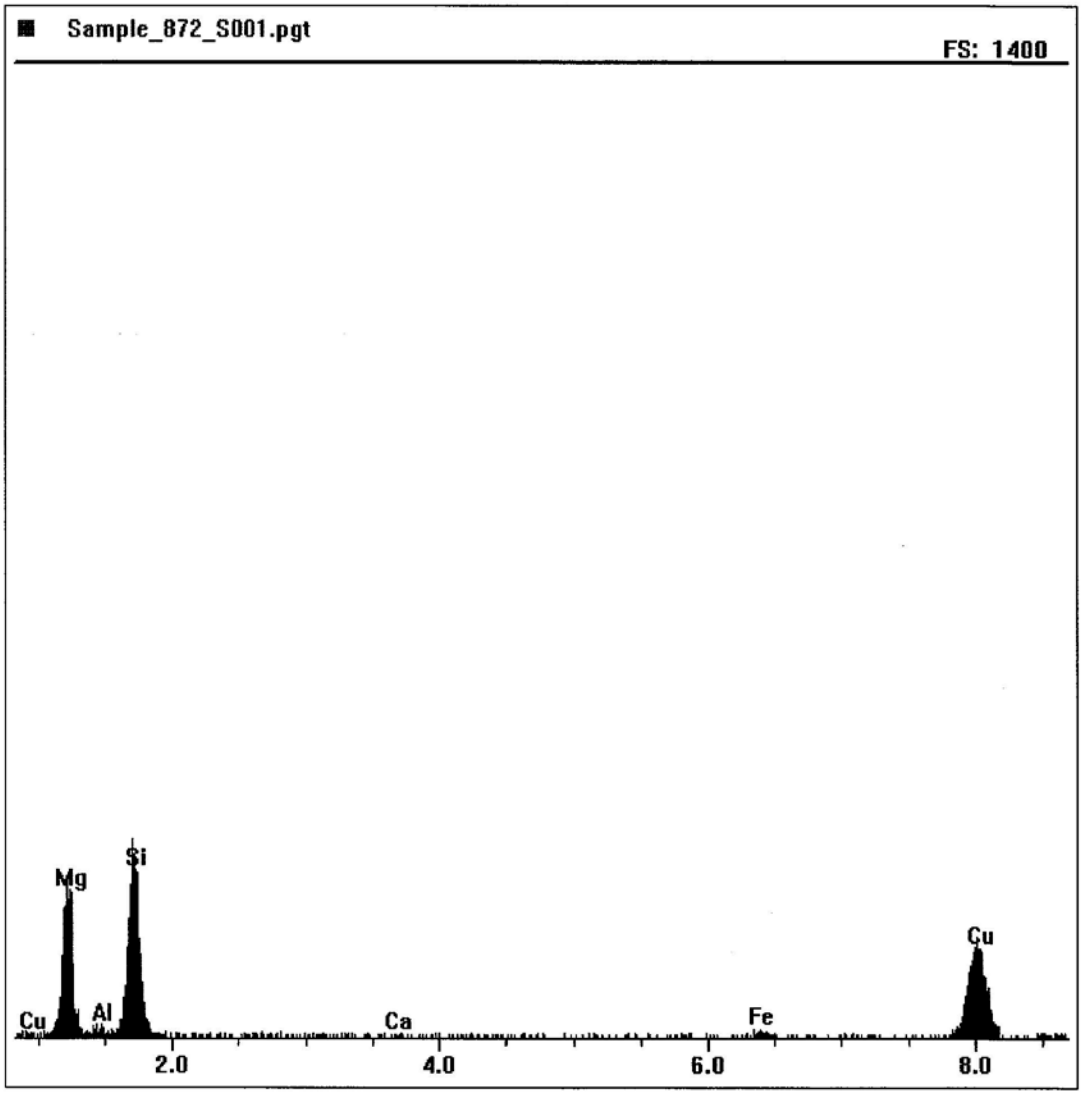
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-MA-AM-05 A1 E9 2 Chrysotile

Collected: July 10, 2012 09:33:32

Live Time:	39.46	Count Rate:	519	Dead Time:	11.76 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com

Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/10/12

Indexing of negative number: 63137 SCOPE #: 03-01

Reference / Sample Number: PA-MA-AM-05

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4.075 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.85	mm

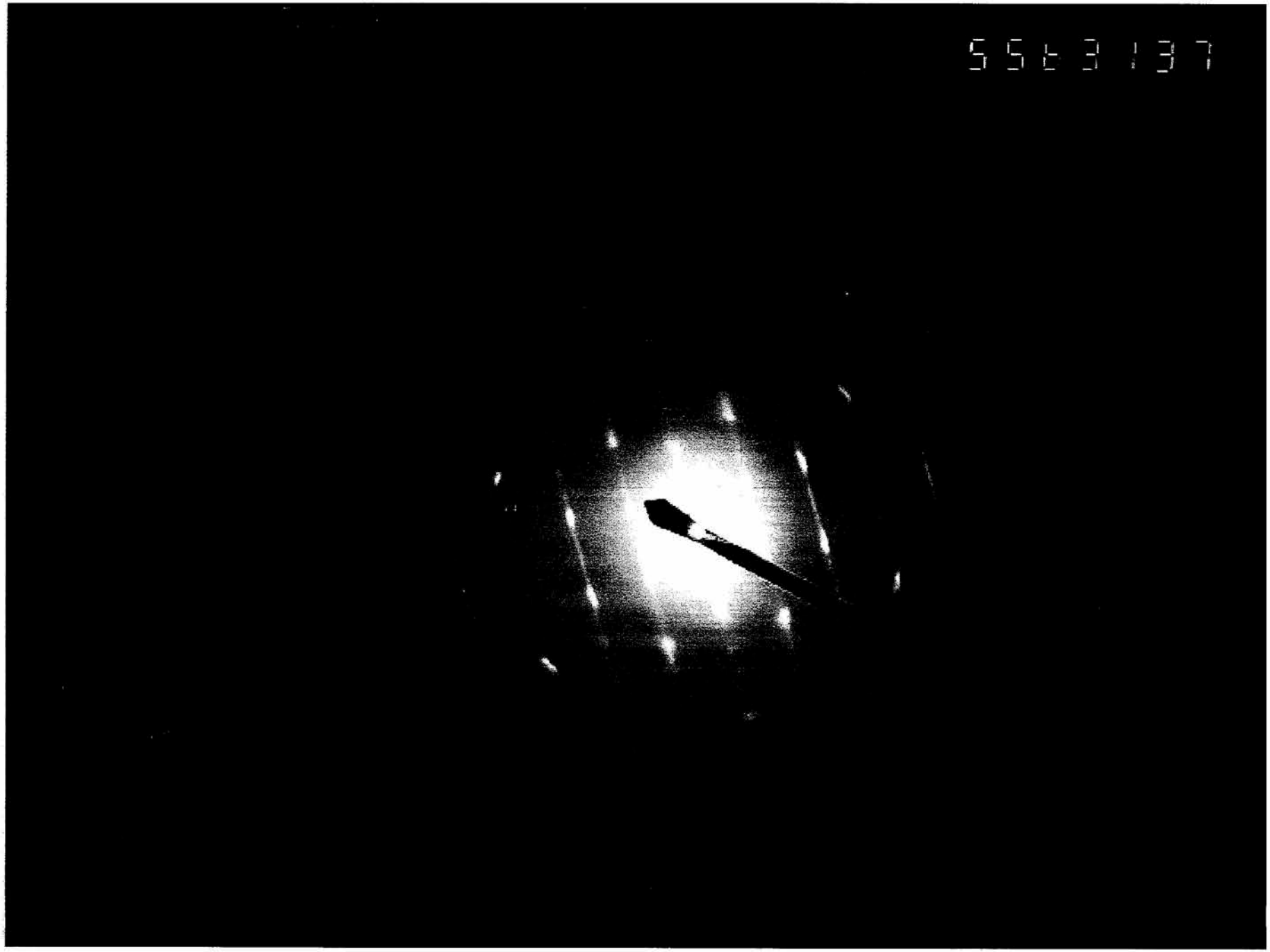
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.37**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	61	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.51**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


55t3137

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0025	Volume (L):	393.9	Scope:	0301
Customer Sample:	PA-UW-AA-01	Prepped By:	AF	GO area (mm²):	013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERRG02	Analyzed By:	Glanns22
EFA (mm²):	385	Grid Location:	B1-3	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~38~~ 39 per 7/10		none	**3:1**	5:1
GO Analyzed:	39				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B1	B2	ND									
	B4	↓									
	B6										
	B8										
	D2										
	D4										
	D6										
	D8										
	F2										
	F4	↓									

ND= None Detected

NAM= Non Asbestos Material

Particulate Loading 1-2%

Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0025

Customer Sample ID: PA-UW-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	F6	ND									
	F8										
B2	I10										
	I8										
	I6										
	I4										
	G9										
	G7										
	G5										
	D10										
	D8										
	D4										
	D2										
	B9										
	B7	"									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0025

Customer Sample ID: PA-UW-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B3	J9	ND									
	J7	↓									
	J5										
	J3										
	H9										
	H7										
	H5										
	H3										
	G8										
	G6										
	G4										
	C8										
	C6	↓									
	C4	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0026	Volume (L):	406.9	Scope:	03-01
Customer Sample:	PA-UW-AA-02	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7/2	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ENRG02	Analyzed By:	Glennon
EFA (mm²):	385	Grid Location:	C(1-3)	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~36~~ 37		none	**3:1**	5:1	
GO Analyzed:	37					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
C1	J10	ND									
	J8	↓									
	J6										
	J4										
	H9										
	H7										
	H5										
	H3										
	F9										
	F7	✓									

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate loading 1-2%
Transverse Direction: Vertical

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0026

Customer Sample ID: PA-UW-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	F5	ND									
	F3										
C2	I8										
	I6										
	I4										
	G9										
	G7										
	G5										
	G3										
	E9										
	E7										
	E5										
	E3										
	C7										
	C5	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0026

Customer Sample ID: PA-UW-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
C3	B1	ND									
	B3	↓									
	B5										
	B7										
	B9										
	D3										
	D5										
	D7										
	D9										
	G5										
	G7										
	G9										

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0027	Volume (L):	468.195	Scope:	03-01
Customer Sample:	PA-UW-AM-01	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box:	B312 ERR6-02	Analyzed By:	Glanvall
EFA (mm²):	385	Grid Location:	D 1-3	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~16~~ 17 ~~8~~ 7/10		none	3:1	5:1
GO Analyzed:	17				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

$x^2 = 18.619 = Random$

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
D1	I8	ND									
	I6	ND									
	I4	ND									
	C8	ND									
	C6	ND									
	C4	MD11	1		10.21	3.15	CD	CH		63140	~~YES~~ 7/10
		MB		1	10.21	0.35	CD	CH			YES
D2	C3	ND									
	C5	ND									
	C7	ND									

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate Loading 3-5%
Transverse Direct. on: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0027

Customer Sample ID: PA-UW-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	F3	F	2	2	24.30	0.90	CD	CH		63156	YES
	F5	ND									
	F7	ND									
D3	D3	ND									
	D5	ND									
	D7	ND									
	H4	ND									
	H6	ND									

ND = None Detected NAM = Non Asbestos Material

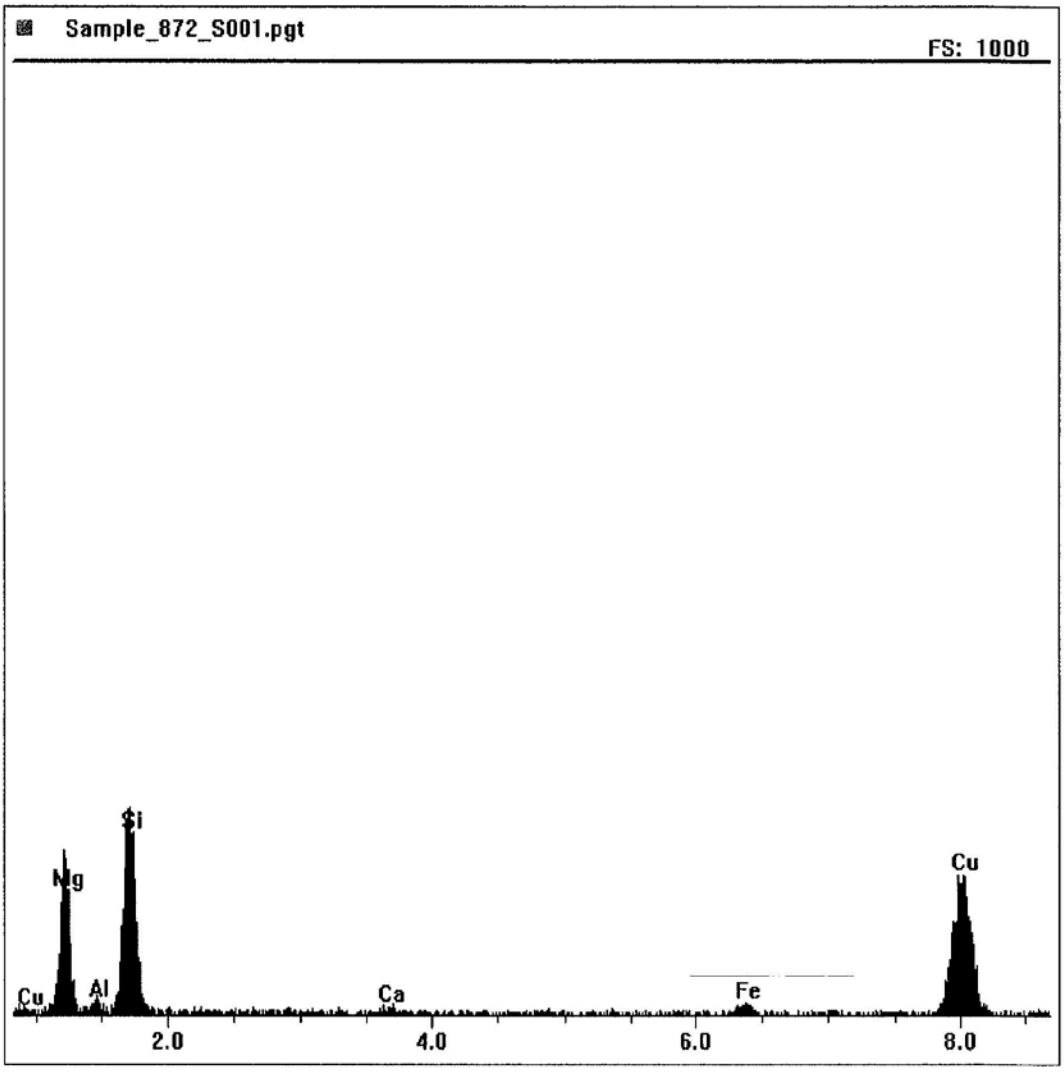
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-UW-AM-01 D1 C4 1 Chrysotile

Collected: July 10, 2012 09:33:32

Live Time:	262.78	Count Rate:	73	Dead Time:	3.81 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



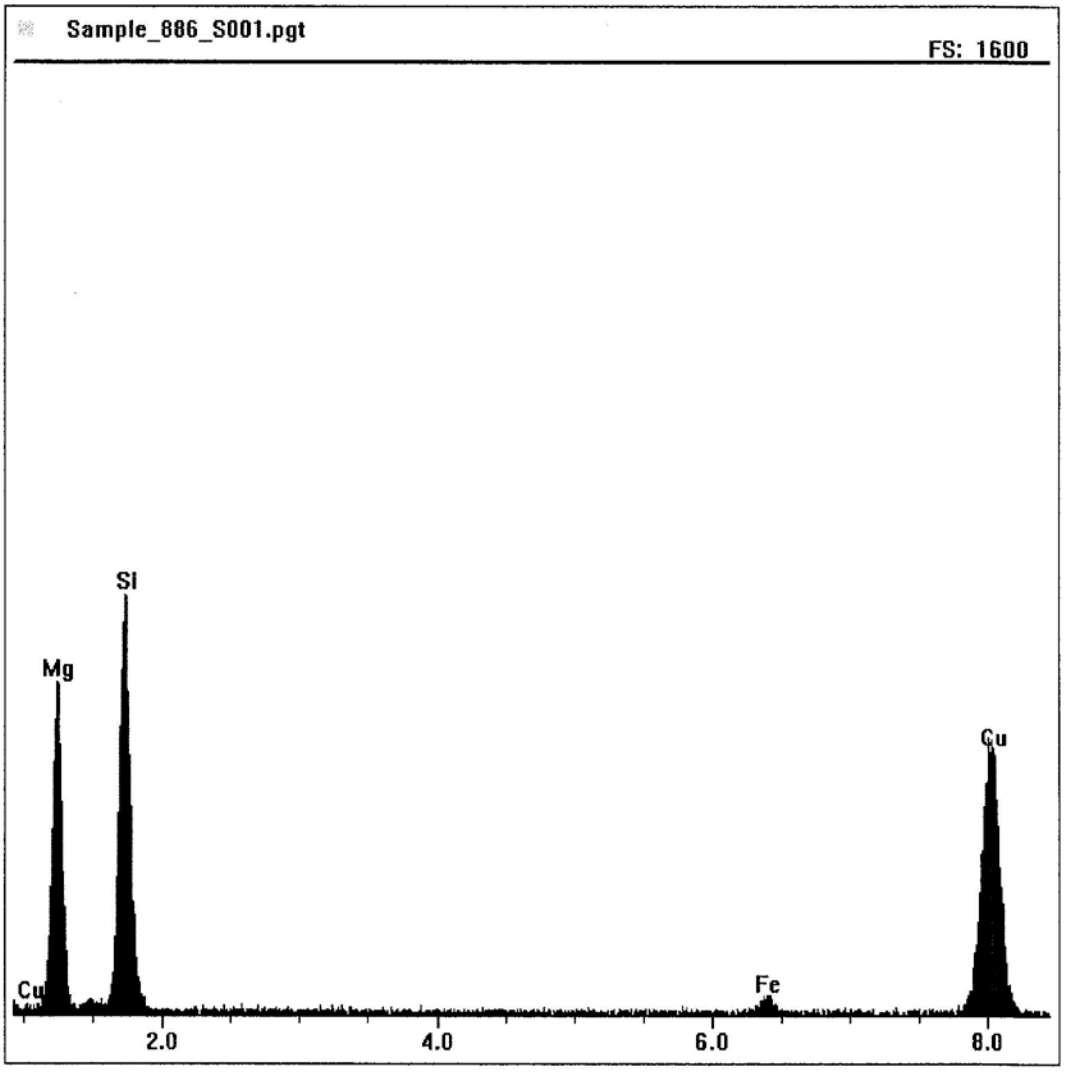
EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-UW-AM-01 D2 F3 2 Chrysotile
Collected: July 12, 2012 13:56:38

Live Time:	101.18	Count Rate:	581	Dead Time:	13.02 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/11/12

Indexing of negative number: 63140 SCOPE #: 03-01

Reference / Sample Number: PA-UW-AM-01

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	2.88	mm
Measured distance, center spot to closest hk1 spot (110):	4.65	mm

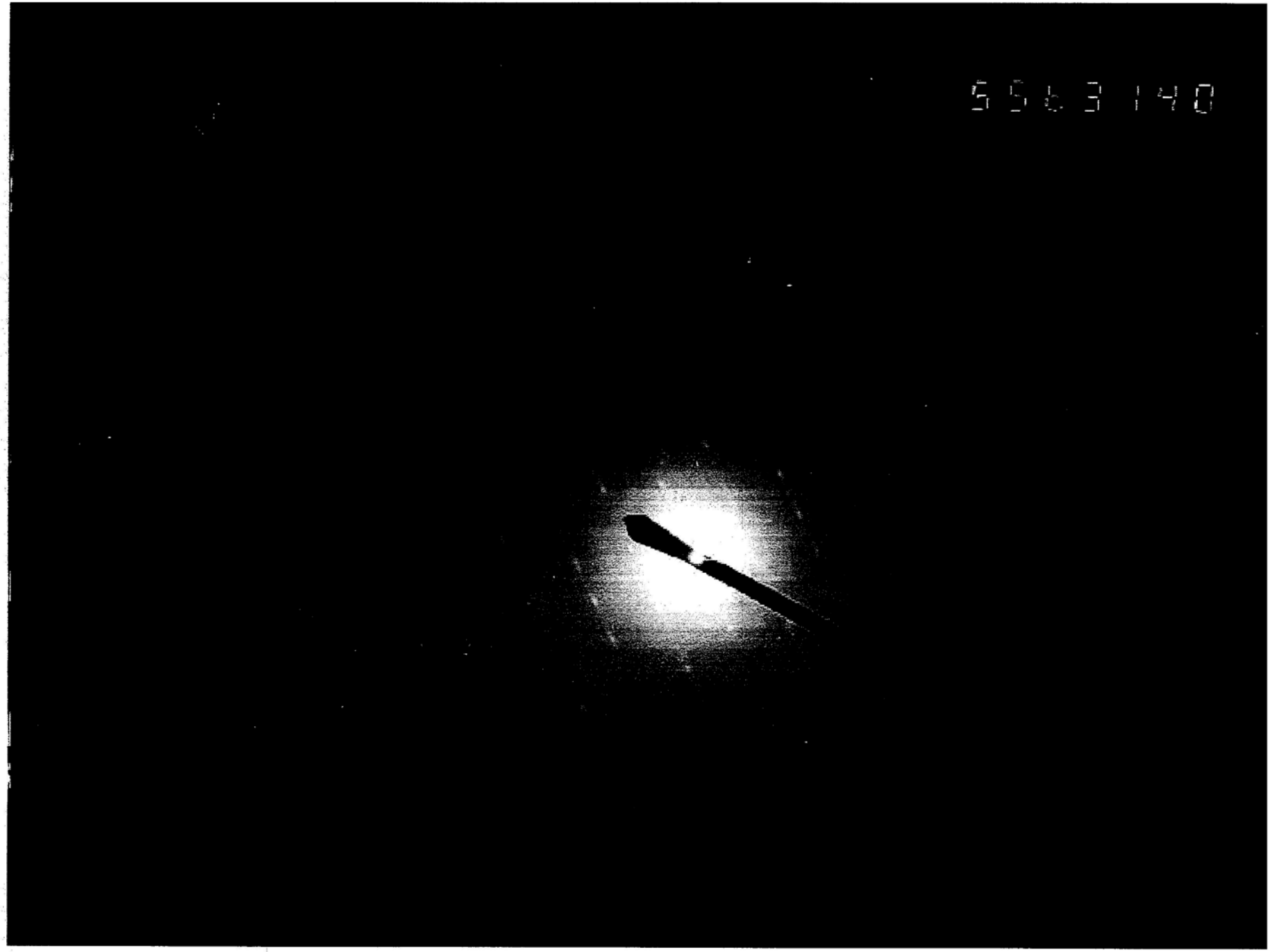
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.47**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	61	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.61**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.71**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


55 3 140

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0028	Volume (L):	423.54	Scope:	03-01
Customer Sample:	PA-UW-AM-02	Prepped By:	A. FOLGAR	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312.E&RG-02	Analyzed By:	A. FOLGAR
EFA (mm²):	385	Grid Location:	E6 C1-3	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	18 19 AF 7/10		none	**3:1**	5:1
GO Analyzed:	19				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
E1	A1	ND									
	A3	ND									
	A5	ND									
	f2	ND									
	f4	ND									
	f6	ND									
	f8	ND									
	H8	ND									
	H10	ND									
	J2	ND									

ND= None Detected

NAM= Non Asbestos Material

Particulate Loading: 5-10%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0028

Customer Sample ID: PA-UW-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
E3	G4	ND									
	G2	ND									
	C9										
	C7										
	C5										
	C3										
	A7										
	A5										
	A3	↓									

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0029	Volume (L):	398.19	Scope:	03-01
Customer Sample:	PA-UW-AM-03	Prepped By:	A. FOIGAR	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312 · EBRG-02	Analyzed By:	A. FOIGAR
EFA (mm²):	385	Grid Location:	f (1-3)	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~19~~ 20 AF 7/10		none	**3:1**	5:1
GO Analyzed:	20				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

$X^2 = 22.833$ = Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
f1	C2	ND									
	C4	ND									
	E1	ND									
	E3	ND									
	E5	ND									
	f8	B	1	1	20.1	2.5	CD	CH	[redacted]	63141 63142	Yes
	f10	ND									
	H3	↓									
	H5										
	J4										

ND= None Detected

NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate loading: 3-5%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0029

Customer Sample ID: PA-UW-AM-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
f2	B3	ND									
	B5										
	E3										
	E5										
	E7										
	E9										
	f6										
	f8										
	f10										
	I7										

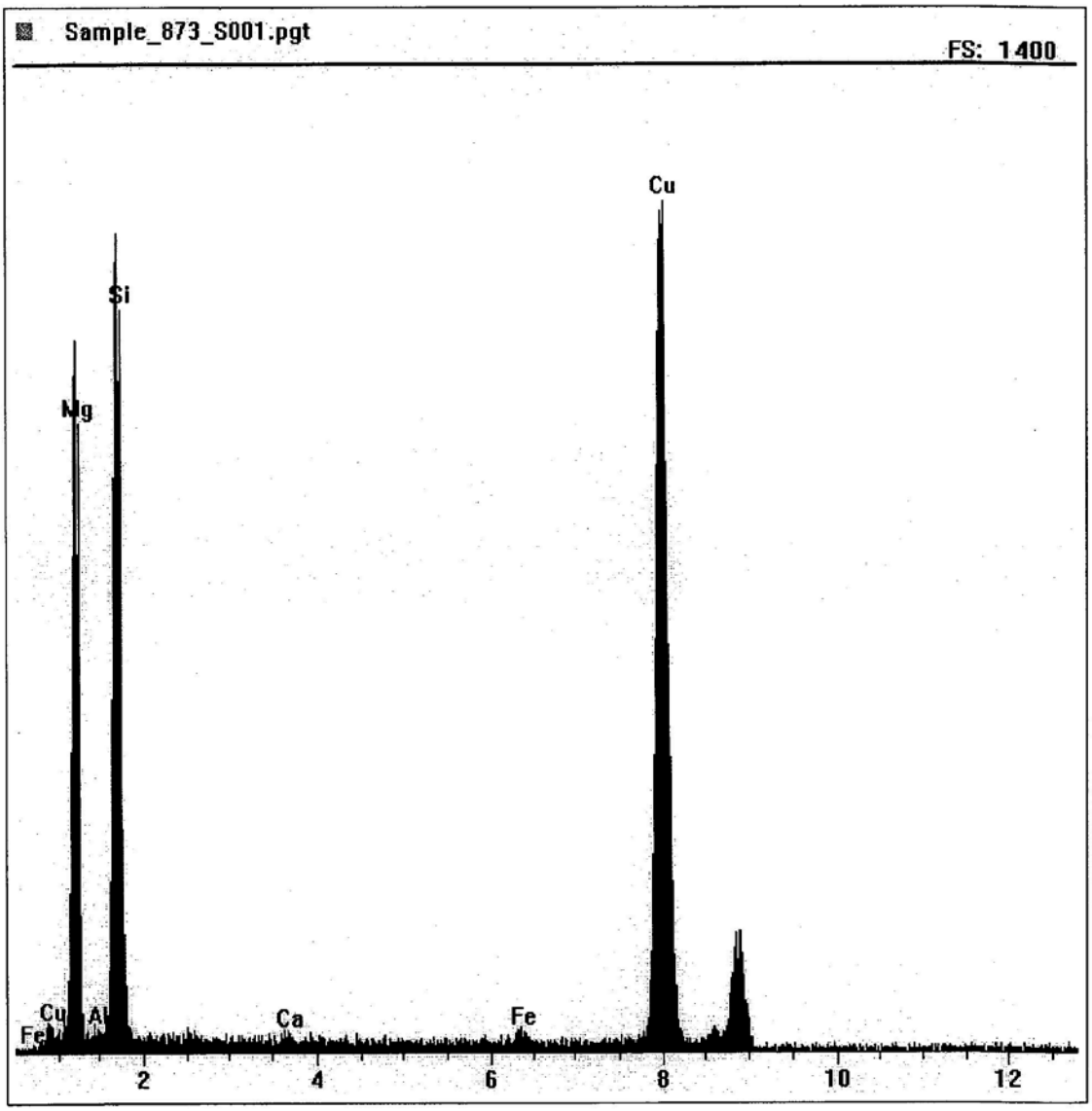
ND = None Detected NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-UW-AM-03 F1 F8 1 CHRYSOTILE
Collected: July 10, 2012 13:51:54

Live Time:	267.70	Count Rate:	471	Dead Time:	11.19 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/11/12

Indexing of negative number: 63141 SCOPE #: 03-01

Reference / Sample Number: PA-UW-AM-03

Preliminary ID: Chrysotile By: AF

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.08	mm
Measured distance, center spot to closest hk1 spot (110):	4.65	mm

	Calculated	Ref	-5%	+5%
Inter-row spacing (Ångstroms)	**5.47**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	60	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.12**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.71**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


5563141

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0030	Volume (L):	456.69	Scope:	03-01
Customer Sample:	PA-UW-AM-04	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERR6-02	Analyzed By:	G. Lunnsz
EFA (mm²):	385	Grid Location:	G1-3	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~17~~ 18 JL 7/10/12		none	**3:1**	5:1
GO Analyzed:	18				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

$x^2 = 16.091 = Random$

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
G1	H9	ND									
	H7	ND									
	H5	ND									
	D9	MD11	1		10.66	5.31	CD	CH			
		MB		1	10.66	0.25	CD	CH		63143 63144	YES
	D7	ND									
	D5	ND									
G2	C3	ND									
	C5	ND									
	C7	MD11	2		18.72	4.68	CD	CH			

ND= None Detected

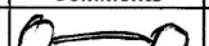
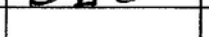
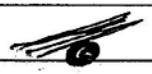
NAM= Non Asbestos Material

Particulate loading: 7-10%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0030

Customer Sample ID: PA-UW-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
		MF	~~2~~ 1/10	2	18.72	0.36	CD	CH		63145	
	F2	ND									
	F4	ND									
	F6	MD11	3		21.53	14.51	CD	CH			
		MB		3	21.53	0.90	CD	CH		63146	
G3	D5	ND									
	D7	ND									
	D9	B	4	4	19.44	0.92	CD	CH			
	G3	F	∅	∅	5.45	1.10	NAM	NAM			YES
	G5	MD11	5		25.52	4.86	CD	CH			
		MB		5	25.52	1.17	CD	CH			
	G7	ND									

ND = None Detected

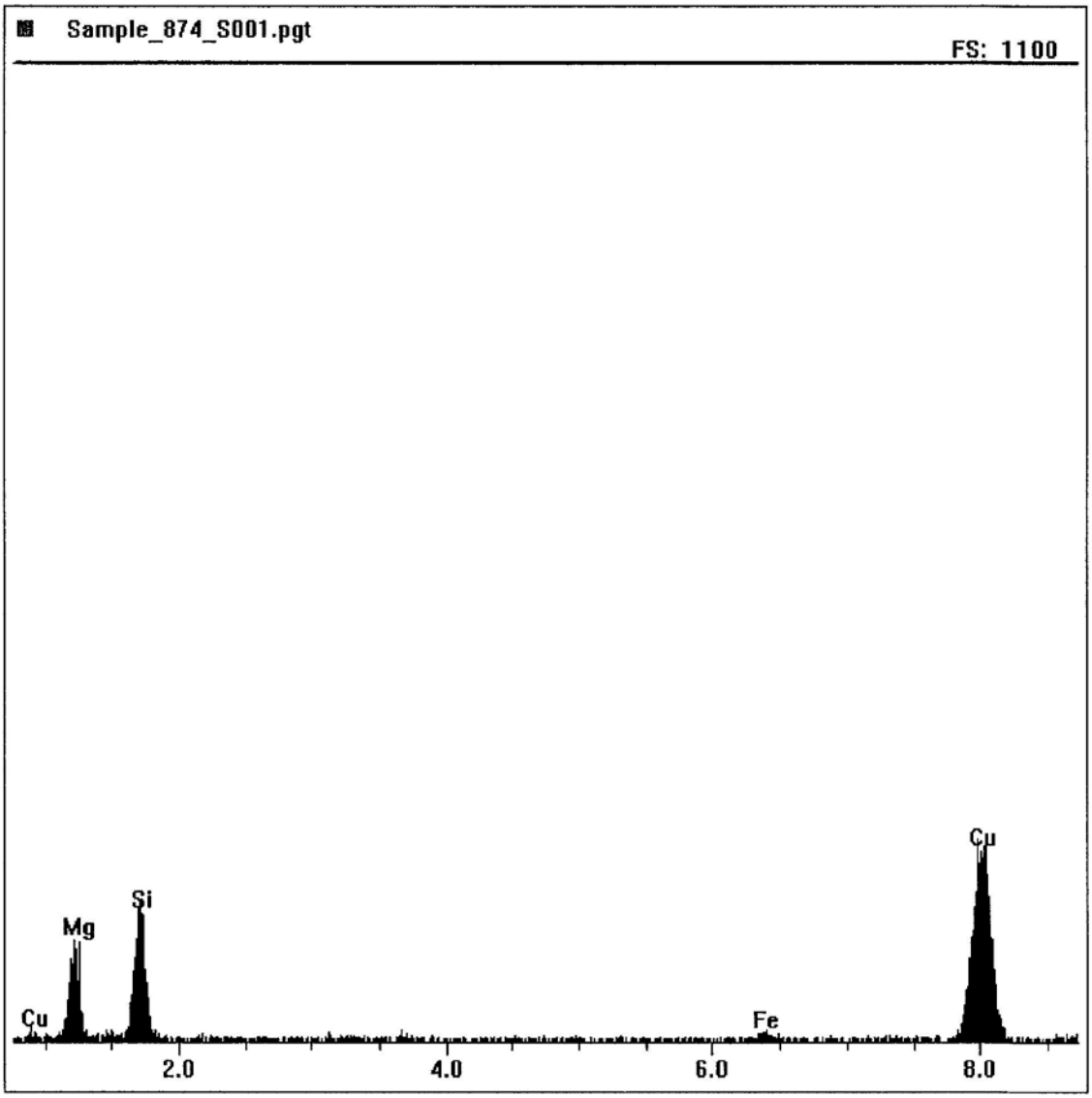
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-UW-AM-04 G1 D9 1 Chrysotile
Collected: July 10, 2012 14:53:37

Live Time:	84.48	Count Rate:	243	Dead Time:	7.19 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

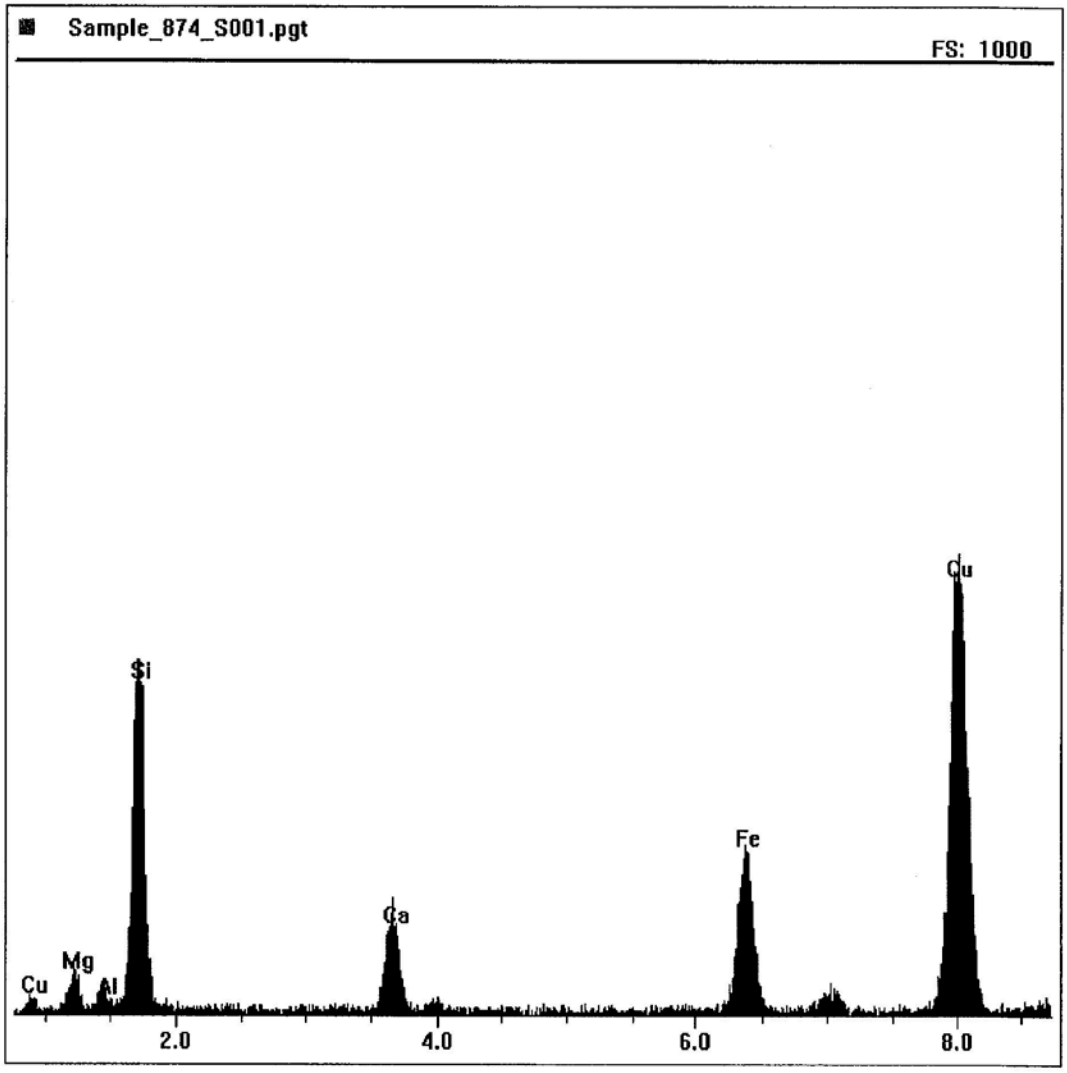
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-UW-AM-04 G3 G3 NAM

Collected: July 10, 2012 14:53:37

Live Time:	18.72	Count Rate:	2653	Dead Time:	44.99 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/11/12

Indexing of negative number: 63143 SCOPE #: 03-01

Reference / Sample Number: PA-UW-AM-04

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4.25 mm

110 reflections present? Enter Yes or No: Yes

200 doublets present? Enter Yes or No: Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.75	mm

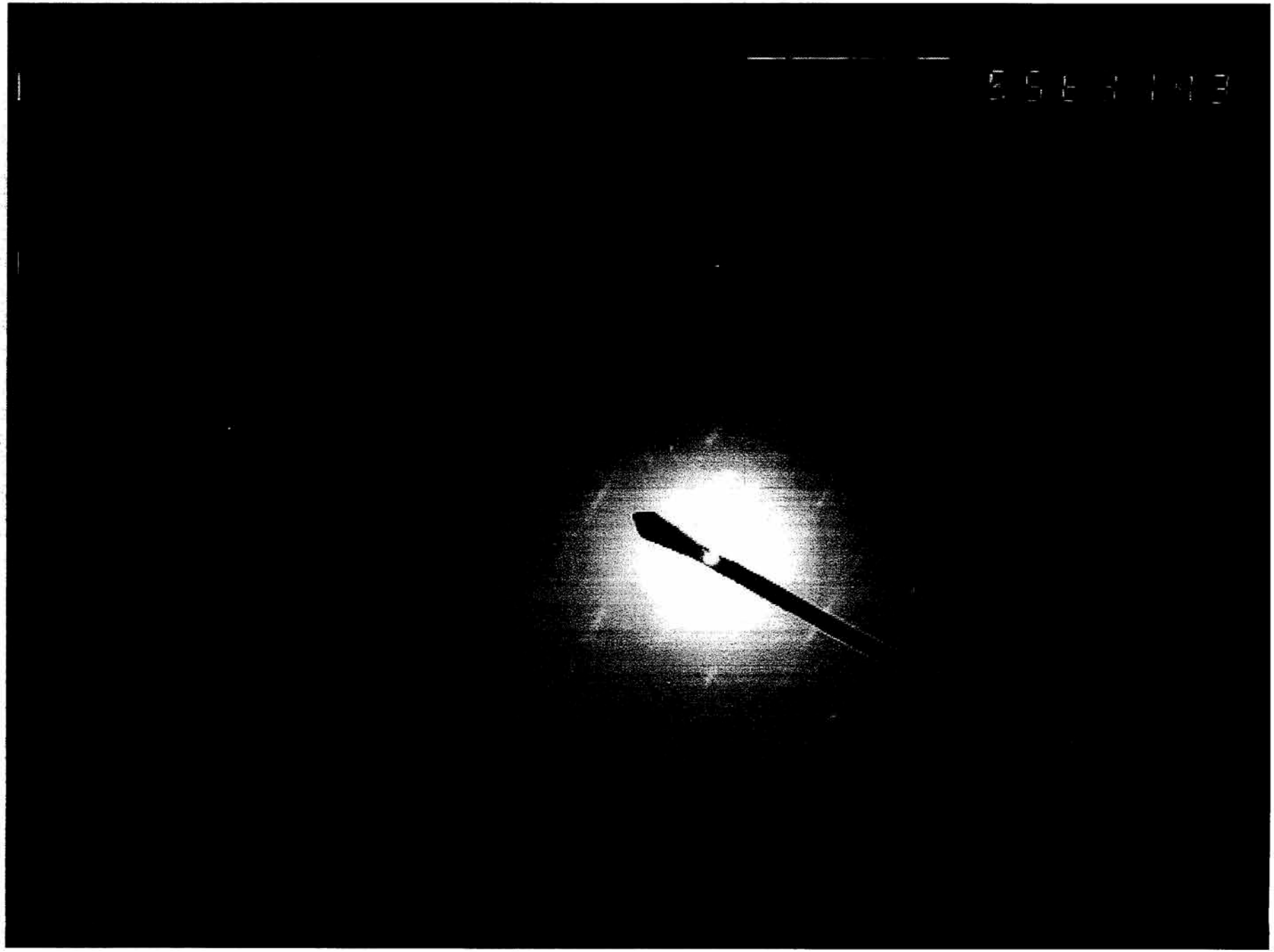
	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.15**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	63	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.61**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100



TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0031**	Volume (L):	503.295	Scope:	03-01
Customer Sample:	PA-UW-AM-05	Prepped By:	A. FOLGAR	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	A. FOLGAR
EFA (mm²):	385	Grid Location:	H(1-3)	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	**0.004**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~15~~ 16 AF 7/10		none	**3:1**	5:1
GO Analyzed:	16				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
H1	B2	ND									
	B4	↓									
	B6										
	B8										
	H1										
	H3										
	J3										
	J5	↓									
H2	C2	ND									
	C4	↓									

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate Loading: 5-18%
Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0031

Customer Sample ID: PA-UW-AM-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
H2	H2	ND									
	H4	↓									
	H6										
	A5										
	A7										
	J6										

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0032**
Customer Sample: PA-ATV2-AA-01
Sample Description: Ambient
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 424.2
Prepped By: A. Folgar
Prepped Date: 7/2/12
Grid Box : 0312-ERRG-02
Grid Location: I (1-3)

Scope: ~~03-02~~ 0301 AF 7/16
GO area (mm²): 0.013
Magnification: 10,000X
Analyzed By: A. Folgar
Analysis Date: 7/10/12

Analysis Information

Target Sensitivity: **0.002** s/cc
GO Required: ~~35~~ 36 AF 7/10
GO Analyzed: 36
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
I1	B1	ND									
	B3										
	B5										
	B8										
	B10										
	D1										
	D3										
	D5										
	E2										
	E4	↓									

ND= None Detected
NAM= Non Asbestos Material

Particulate Loading: 5-7%
Traverse Direction: Vertical

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0032

Customer Sample ID: PA-ATV2-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
I1	E6	ND									
	E8	↓									
	E10										
	H2										
	H4										
	H6										
	I3										
	I5										
I2	A1										
	A3										
	A5										
	A7										
	A9										
	B2										
	B4	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0032

Customer Sample ID: PA-ATV2-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
I2	B6	ND									
	B8	↓									
	B10										
	H1										
	H3										
	H5										
	H7										
	H9										
	J4										
	J6										
	J8	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0033	Volume (L):	438.27	Scope:	03-01
Customer Sample:	PA-ATV2-AA-02	Prepped By:	A. FOLGAR	GO area (mm²):	0.0130
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	Evie Sioutri
EFA (mm²):	385	Grid Location:	J (1-3)	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	35 ~~34~~ ES 7/10/12		none	**3:1**	5:1	
GO Analyzed:	35					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
J1	J6	ND									
	J4	↓									
	J2										
	H6										
	H4										
	H2	F	~~0~~	~~0~~	8.0	1.7	NAM	NAM	AR present Ca too high		✓
	G5	ND									
	G3	↓									
	G1										
	F6	↓									

ND= None Detected

NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 1-3%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0033

Customer Sample ID: PA-ATV2-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
J1	F4	ND									
	E5										
	E3										
	E1										
	D6										
	D4										
	D2										
	C5										
	C3										
	C1										
	B6										
	B4										
	B2										
	A5										
J2	G3	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0033

Customer Sample ID: PA-ATV2-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
J2	G5	ND									
	G7	↓									
	G9										
	H4										
	H6										
	H8										
	H10										
	I3										
	I5	↓									
	J7	F	~~0~~	~~0~~	5.5	0.8	NAM	NAM	Asbestos present Fe too high		✓

ND = None Detected

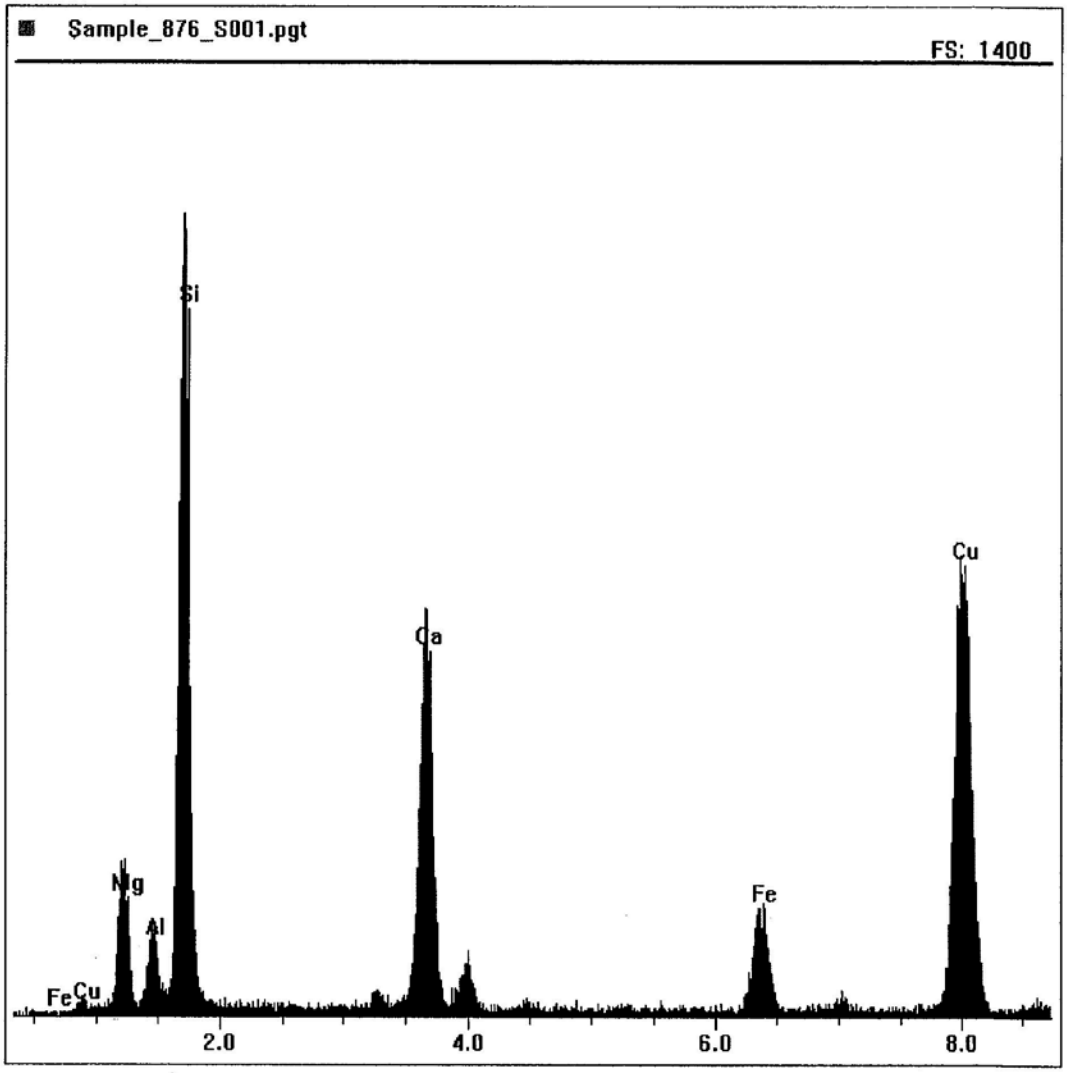
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AA-02 J1 H2 NAM
Collected: July 10, 2012 17:47:42

Live Time:	60.93	Count Rate:	1725	Dead Time:	31.55 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



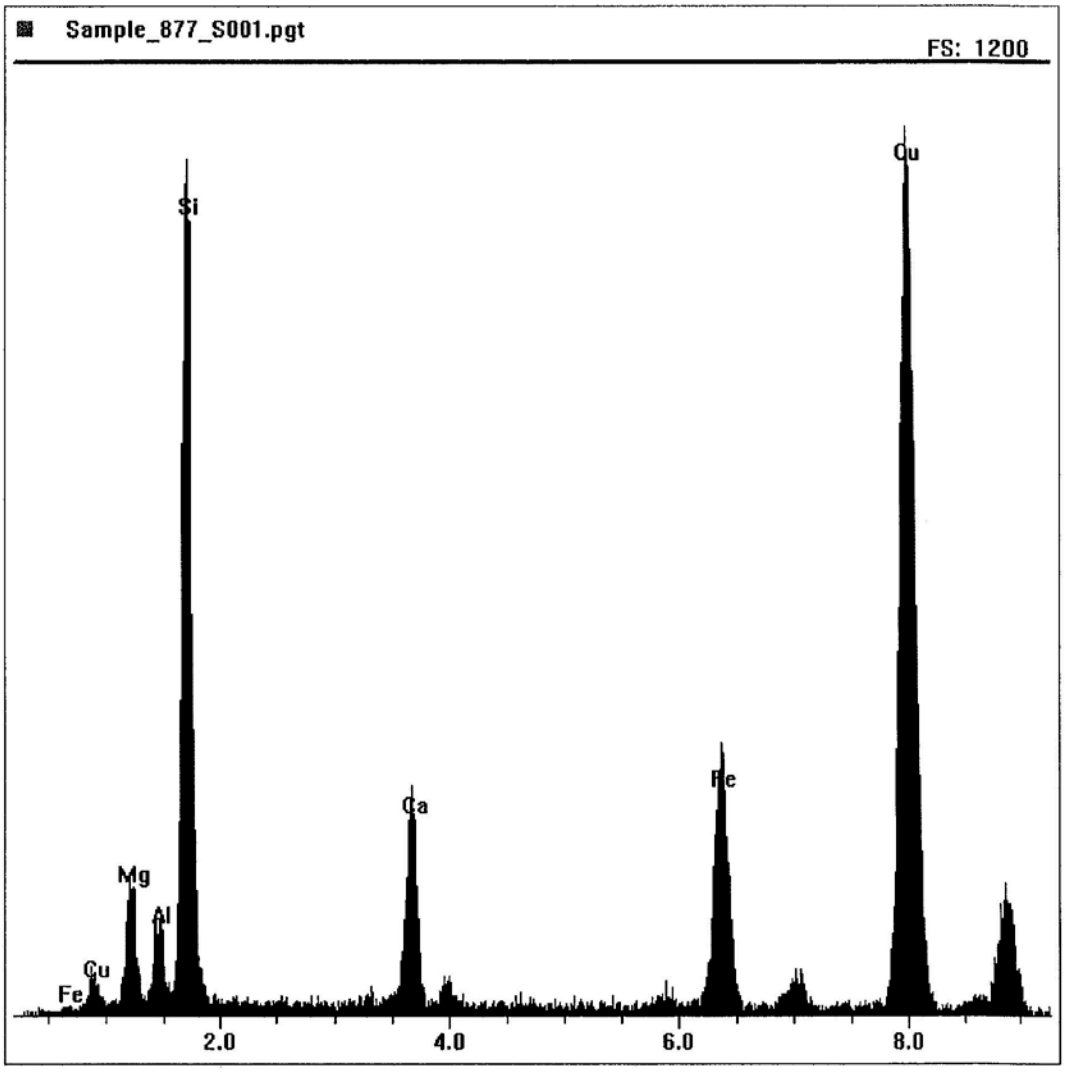
EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AA-02 J2 J7 NAM
Collected: July 10, 2012 18:51:25

Live Time:	93.90	Count Rate:	1258	Dead Time:	24.44 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com

Locally Focused ... Nationally Recognized

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0034	Volume (L):	396.8	Scope:	03-01
Customer Sample:	PA-ATV2-AA-03	Prepped By:	A. FOLGAR	GO area (mm²):	0.0130
Sample Description:	Ambient	Prepped Date:	7/2/2012	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	Evie Sioukri
EFA (mm²):	385	Grid Location:	K (1-3)	Analysis Date:	7/10/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	38 ~~37~~ ES 7/10/12		none	**3:1**	5:1
GO Analyzed:	38				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K2	F2	ND									
	F4										
	F6										
	F8										
	F10										
	G1										
	G3										
	G5										
	G7										
	G9	↓									

ND= None Detected NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 1-3%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0034

Customer Sample ID: PA-ATV2-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K2	H2	ND									
	H4	↓									
	H6										
	H8										
	I3										
	I5										
	I7										
	J2										
	J4										
	J6	↓									
K3	A3	ND									
	A5	↓									
	A7										
	A9										
	B2	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0034

Customer Sample ID: PA-ATV2-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K3	B4	ND									
	B6	↓									
	B8										
	B10										
	C1										
	C3										
	C5										
	C7										
	C9										
	D4										
	D6										
	D8										
	D10										

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0035	Volume (L):	425	Scope:	03-01
Customer Sample:	PA-ATV2-AA-04	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	G. Lanning
EFA (mm²):	385	Grid Location:	L1-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)			**Comments:**
GO Required:	~~35~~ 36 JR 7/11/12		none	**3:1**	5:1	
GO Analyzed:	36					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
L1	B2	ND									
	B4	F	Ø	Ø	9.03	1.65	NAM	NAM			YES
	B6	ND									
	B8	ND									
	E2	ND									
	E4	ND									
	E6	ND									
	E8	ND									
	G4	ND									
	G6	ND									

ND= None Detected NAM= Non Asbestos Material

Particulate Loading: 3-5%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0035 **Customer Sample ID:** PA-ATV2-AA-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	G8	ND									
	I3	ND									
L2	B2	ND									
	B4	ND									
	B6	ND									
	B8	ND									
	D1	ND									
	D4	ND									
	D8	ND									
	F1	ND									
	F4	ND									
	F6	ND									
	H3	B	Ø	Ø	5.35	0.70	NAM	NAM	Ø	63147 63148	YES
	~~8 7/15~~	F	Ø	Ø	19.44	1.41	NAM	NAM		63149	
	H5	ND									

ND = None Detected NAM = Non Asbestos Material

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0035

Customer Sample ID: PA-ATV2-AA-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
L3	J7	ND									
	J5	F	Ø	Ø	5.90	1.10	NAM	NAM			
	J3	ND									
	J1	ND									
	H7	ND									
	H5	ND									
	H3	ND									
	F6	ND									
	F4	ND									
	F2	ND									
	D6	ND									
	D4	ND									

ND = None Detected

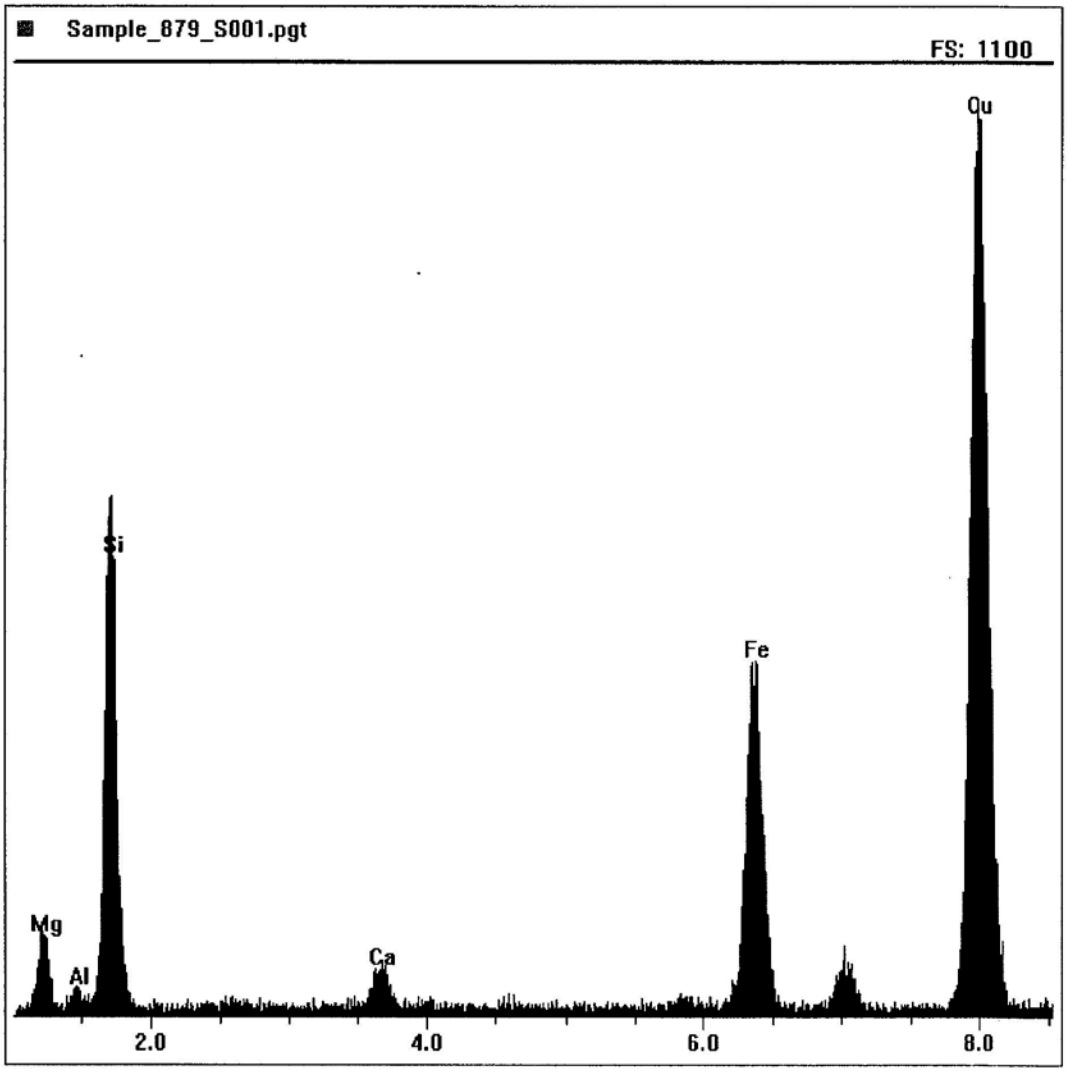
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AA-04 L1 B4 NAM
Collected: July 11, 2012 08:36:43

Live Time:	59.33	Count Rate:	1608	Dead Time:	31.36 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

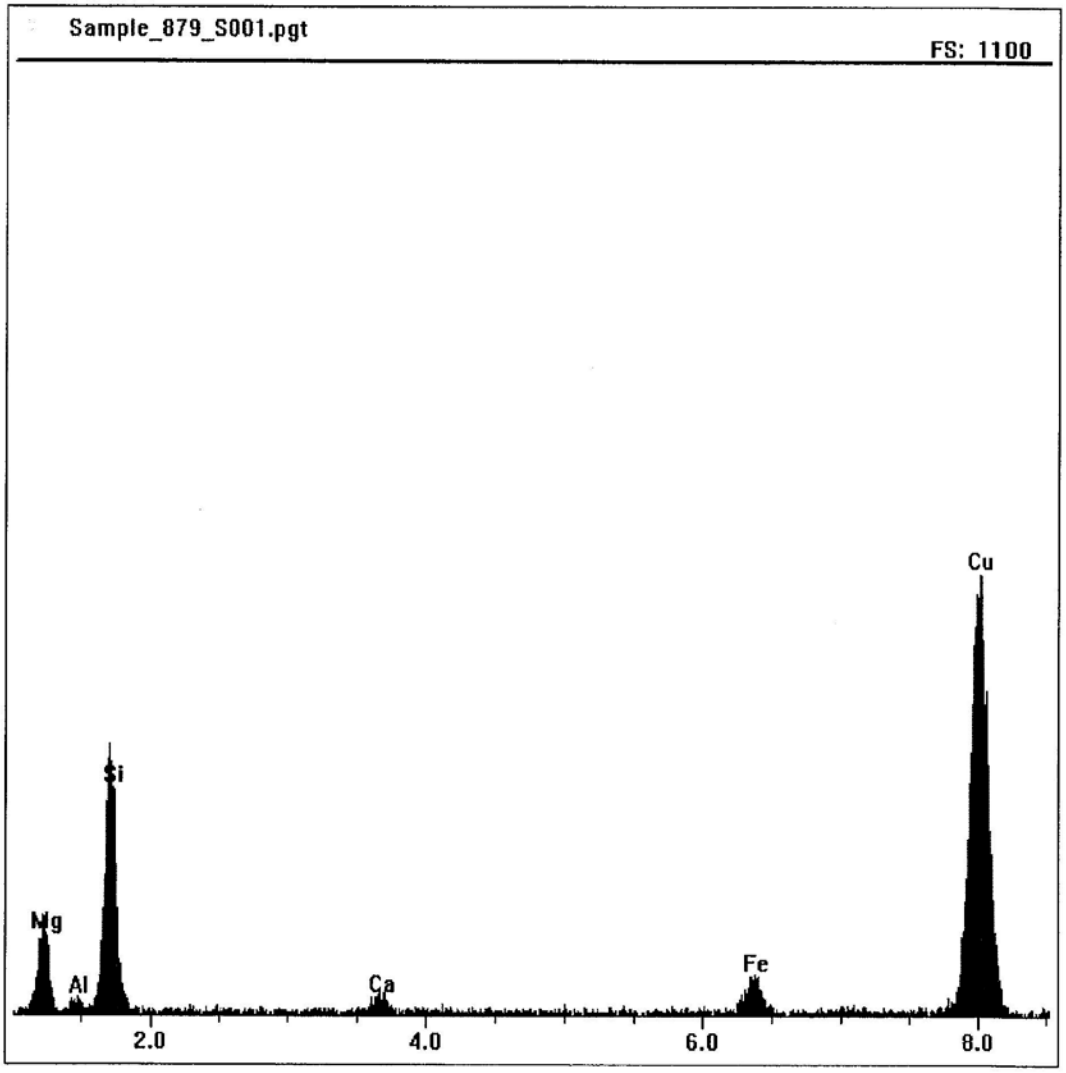
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AA-04 L2 H3 NAM

Collected: July 11, 2012 08:36:43

Live Time:	66.92	Count Rate:	591	Dead Time:	13.58 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0036	Volume (L):	513.36	Scope:	03-01
Customer Sample:	PA-ATV2-AA-05	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312 ERRG02	Analyzed By:	G. Lamnozzi
EFA (mm²):	385	Grid Location:	M1-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~29~~ 30 7/11/12		none	**3:1**	5:1
GO Analyzed:	30				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
M1	B2	ND									
	B4	↓									
	B6										
	B8										
	B10										
	D2										
	D4										
	D6										
	D8										
	D10										

ND= None Detected NAM= Non Asbestos Material

Particulate loading: 1-3%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0036

Customer Sample ID: PA-ATV2-AA-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
M2	B2	ND									
	B4	↓									
	B6										
	B8										
	F3										
	F5										
	F7										
	H2										
	H4										
	H6										
M3	J7										
	J5										
	J3										
	H10										
	H5	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0036

Customer Sample ID: PA-ATV2-AA-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H2	ND									
	D8	↓									
	D6	↓									
	D3	↓									
	B7	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0037	Volume (L):	432.18	Scope:	03-01
Customer Sample:	PA-ATV2-AM-01	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/11/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	03122ERR602	Analyzed By:	Glunn322
EFA (mm²):	385	Grid Location:	N1-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~18~~ 19 ~~27~~ 7/11/12		none	3:1	5:1
GO Analyzed:	19				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
N1	H8	ND									
	H6	ND									
	H4	ND									
	F8	ND									
	F6	ND									
	F4	ND									
	C7	MD11	1		13.10	9.03					
		MB		Ø	5.25	0.45	NAM	NAM			YES
N2	H9	ND									
	H7	ND									

ND= None Detected

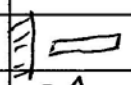
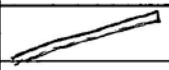
NAM= Non Asbestos Material

Particulate loading: 1-3%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0037

Customer Sample ID: PA-ATV2-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H5	ND									
	F9	ND									
	F7	ND									
	F5	ND									
N3	B2	ND									
	B4	ND									
	B6	F	Ø	Ø	5.25	0.75	NAM	NAM			
		F	Ø	Ø	6.16	0.70	NAM	NAM			
	F2	ND									
	F4	F	Ø	Ø	31.61	1.41	NAM	NAM			
	H2	ND									

ND = None Detected

NAM = Non Asbestos Material

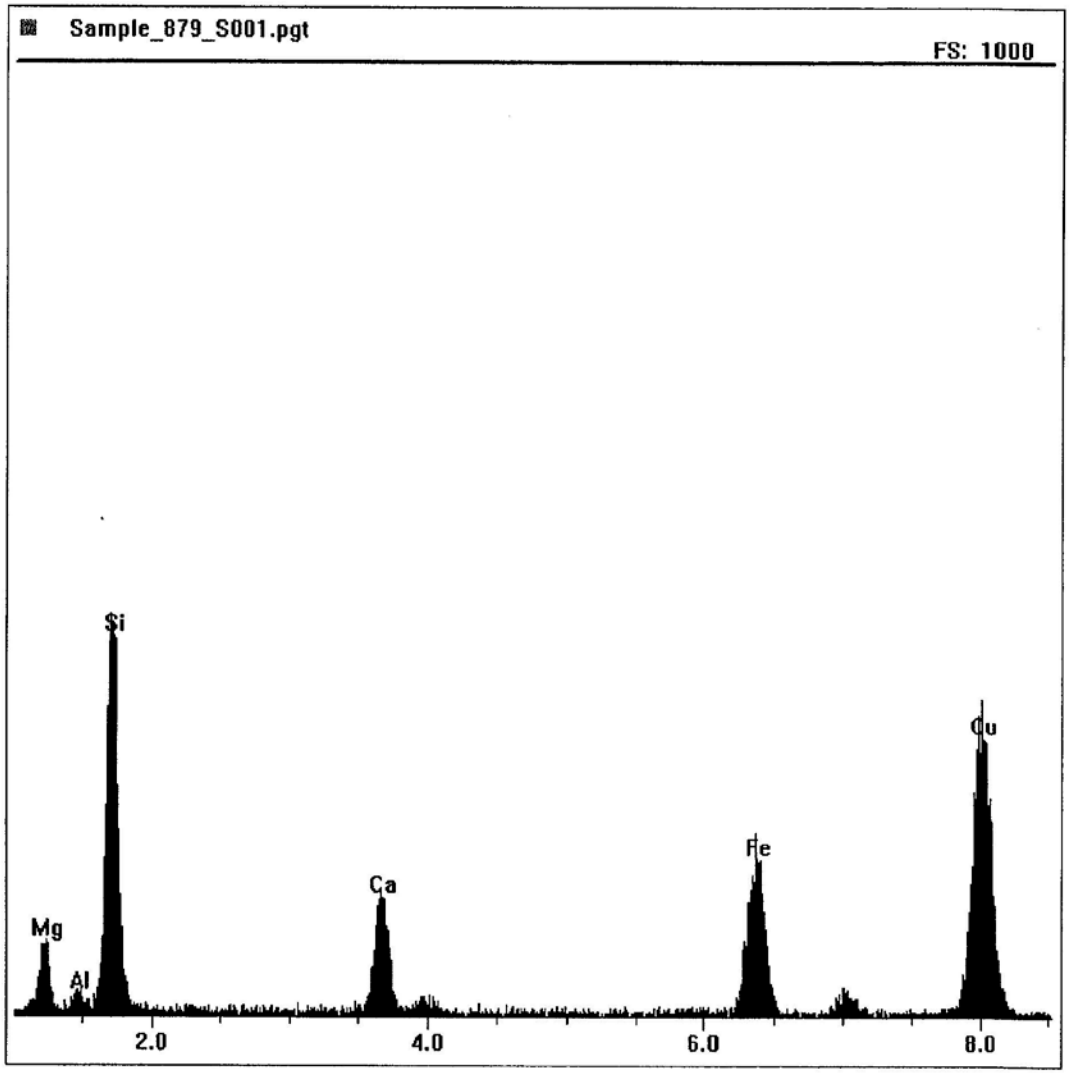
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AM-01 N1 C7 NAM

Collected: July 11, 2012 08:36:43

Live Time:	141.50	Count Rate:	301	Dead Time:	8.42 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

TEM ISO 10312
Asbestos Count Sheet

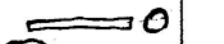
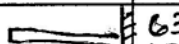
EMSL Sample ID:	041216273-0038	Volume (L):	390.96	Scope:	03-01
Customer Sample:	PA-ATV2-AM-02	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box:	03MERR602	Analyzed By:	Glanna22'
EFA (mm²):	385	Grid Location:	01-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)			
GO Required:	~~18~~ 20 & 7/11/12		none	3:1	5:1	
GO Analyzed:	20					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Comments:

$X^2 = 21.667$ = Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
01	7/11 G9H9	ND									
	7/11 G7H7	ND									
	7/11 G5H5	ND									
	F9	ND									
	F7	F	Ø	Ø	9.35	0.65	NAM	NAM			YES
	F5	F	1	1	30.06	0.70	CD	CH		63150 63151	YES
	D8	ND									
02	C4	ND									
	C6	ND									
	C8	ND									

ND= None Detected

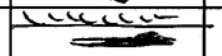
NAM= Non Asbestos Material

Particulate loading 3-5%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0038

Customer Sample ID: PA-ATV2-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	H3	ND									
	H5	ND									
	H7	ND									
03	H8	ND									
	H6	F	Ø	Ø	5.15	053	NAM	NAM			
		F	2	2	10.17	0.75	CD	CH			
	H4	ND									
	F8	ND									
	F6	ND									
	F4	ND									
	D6	ND									

ND = None Detected

NAM = Non Asbestos Material

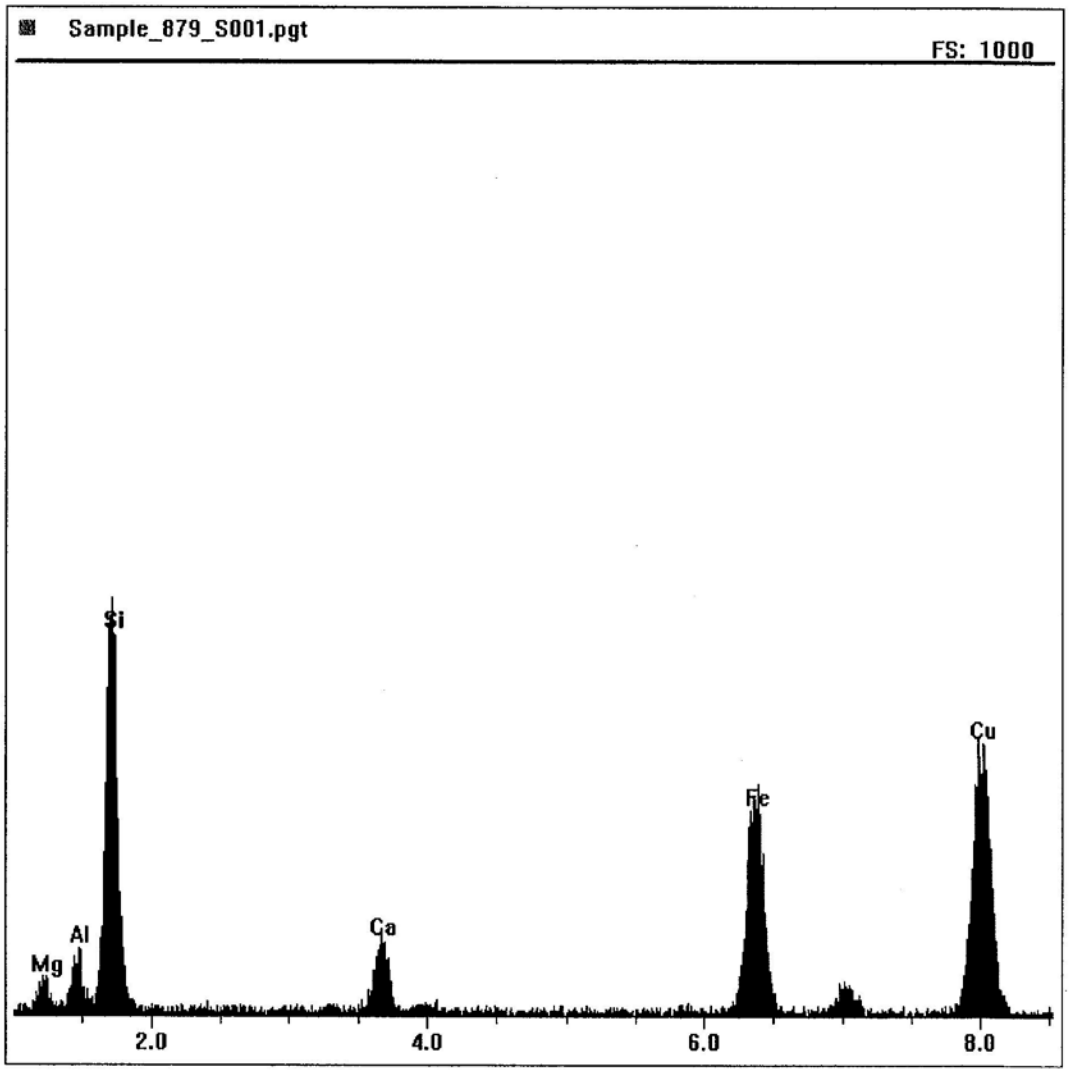
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AM-02 O1 F7 NAM

Collected: July 11, 2012 08:36:43

Live Time:	114.92	Count Rate:	380	Dead Time:	9.92 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

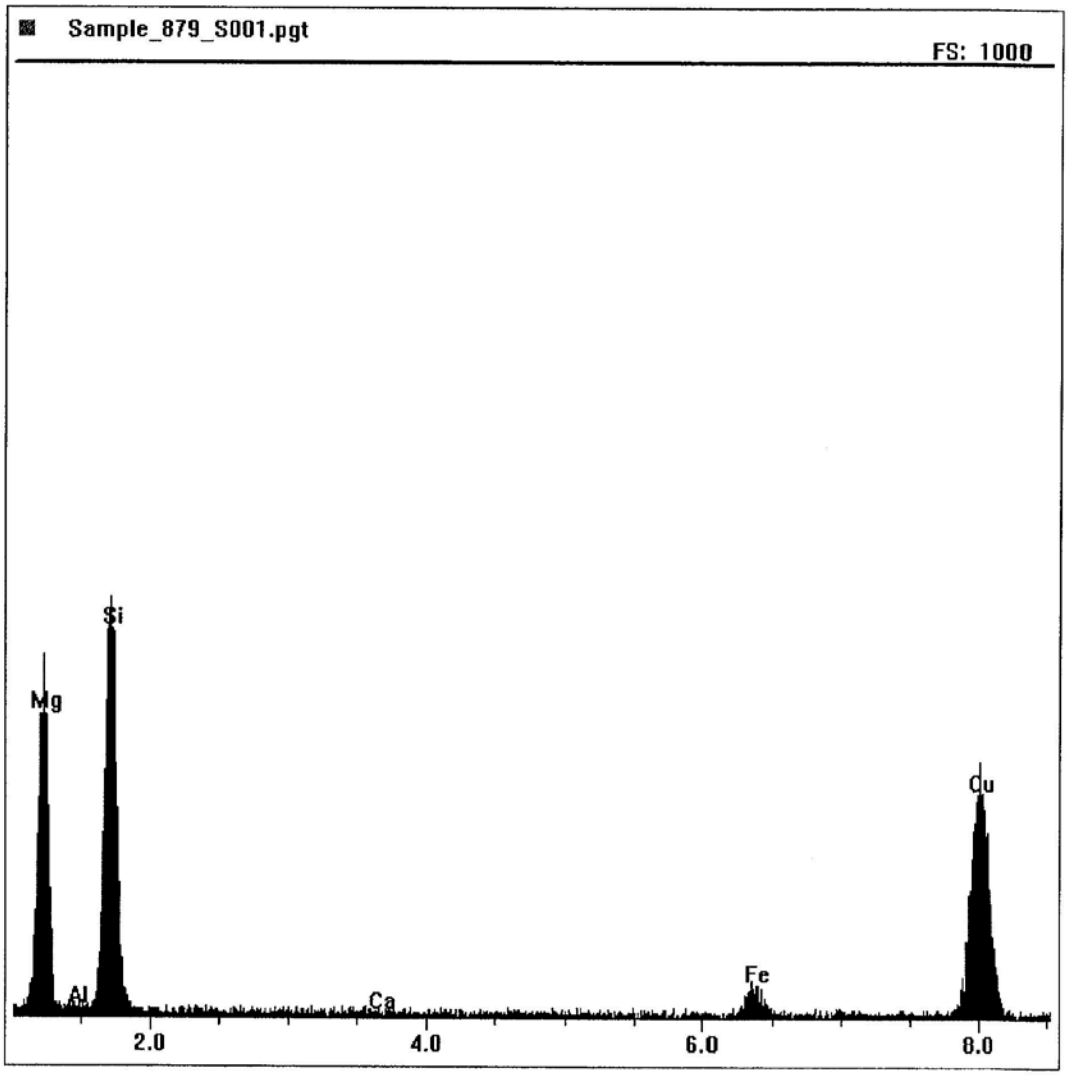
Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-ATV2-AM-02 O1 F5 1 Chrysotile

Collected: July 11, 2012 08:36:43

Live Time:	56.77	Count Rate:	657	Dead Time:	14.28 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/11/12

Indexing of negative number: 63151 SCOPE #: 03-01

Reference / Sample Number: PA-ATV2-AM-02

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4 mm

110 reflections present? Enter Yes or No Yes

200 doublets present? Enter Yes or No Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.04	mm
Measured distance, center spot to closest hk1 spot (110):	4.60	mm

	Calculated	Ref	-5%	+5%
Inter-row spacing (Ångstroms)	**5.47**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	59.5	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.21**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.76**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0039**	Volume (L):	367.56	Scope:	03-01
Customer Sample:	PA-ATV2-AM-03	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERRG02	Analyzed By:	Glanville
EFA (mm²):	385	Grid Location:	P1-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	**0.004**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	22 ~~87~~		none	**3:1**	5:1
GO Analyzed:	22				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
P1	B2	ND									
	B4	ND									
	B6	ND									
	B8	ND									
	G2	ND									
	G4	ND									
	G6	ND									
	I3	ND									
P2	D3	ND									
	D5	ND									

ND= None Detected NAM= Non Asbestos Material

Particulate Loading: 10-15%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0039

Customer Sample ID: PA-ATV2-AM-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	D7	ND									
	D9	ND									
	G3	ND									
	G5	ND									
	G7	ND									
B3	H9	ND									
	H7	ND									
	H5	ND									
	D9	ND									
	D7	ND									
	D5	ND									
	B8	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 13794
Asbestos Count Sheet

EMSL Sample ID: **041216273-0040**
Customer Sample: PA-ATV2-AM-04
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm²): ~~385~~ 364.9 7/23/12 DM

Volume (L): 421.56
Prepped By: D. Stanhope
Prepped Date: 7/11/12
Grid Box: Special Project
Grid Location: E

Scope: JEOL 1200 EX (04-05)
GO area (mm²): 0.0132
Magnification: 20kx
Analyzed By: P. Harrison
Analysis Date: 7/20/12

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: 10
GO Analyzed: 10
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: **>5** micron
Min Width: **0.25** micron

Comments:
Indirect prep, please check prep record for filter analysis.
Filter aliquot used: 5 mL

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
E5	H9	ND									
E6	F5										
↓	D7										
E8	C6										
|	D4										
|	E6										
|	F2										
|	G6										
|	H4	PM 7/20/12									
✓	I6	FQ	0	0	15.4	2.1	NAM	NAM	[redacted]	03300	1

ND= None Detected
NAM= Non Asbestos Material

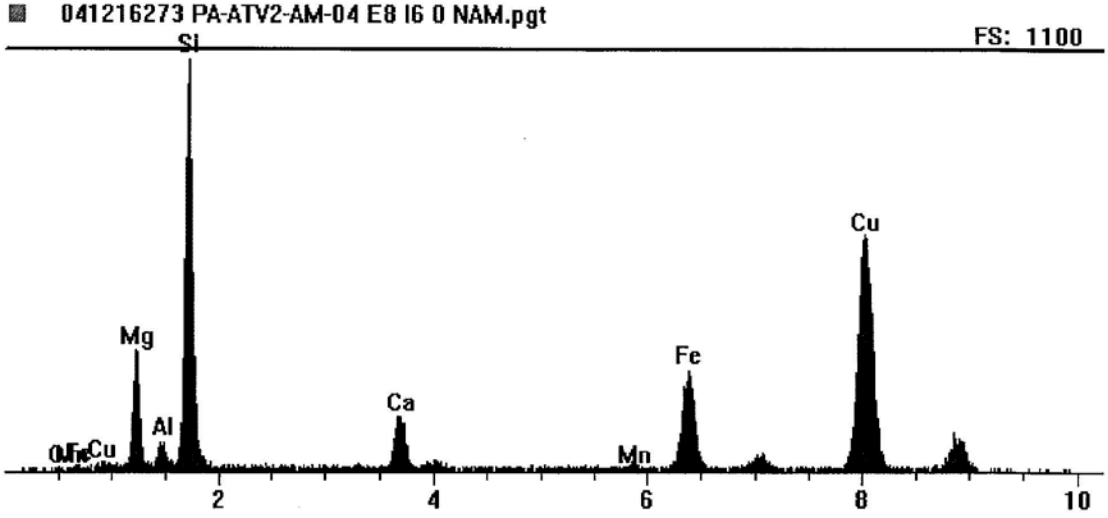
Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

EMSL ANALYTICAL, INC.

File: L:\EDS Spe...ope 04-03\2012\041216273 PA-ATV2-AM-04 E8 I6 0 NAM.pgt
Collected: July 20, 2012 08:38:41

Live Time:	187.88	Count Rate:	411	Dead Time:	8.40 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00
Thickness limit:	34899.81				

041216273 PA-ATV2-AM-04 E8 I6 0 NAM.pgt



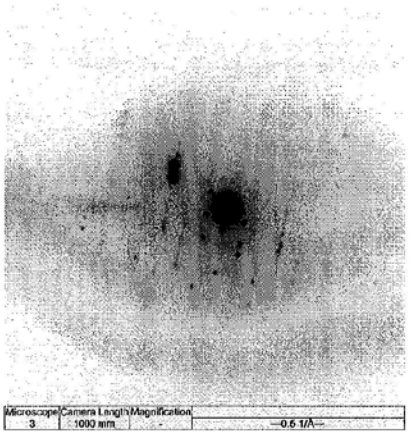
Element	Line	keV	CL Ratio	Wt%	At%	At Prop	Compound	Cmpd Wt%
Mg	KA1	1.254	0.9349	2.60	3.43	4.8	MgO	4.31
Al	KA1	1.487	0.9545	0.54	0.64	0.9	Al2O3	1.02
Si	KA1	1.740	1.0000	10.42	11.89	16.5	SiO	16.36
Ca	KA1	3.691	1.5184	2.91	2.32	3.2	CaO	4.07
Mn	KA1	5.898	2.5410	0.26	0.15	0.2	MnO	0.34
Fe	KA1	6.403	2.7559	11.58	6.64	9.2	Fe2O3	16.55
Cu	KA1	8.046	3.9376	45.81	23.10	32.1	CuO	57.35
O	KA1	0.523	0.0000	25.88	51.82	72.0		
Total			**0.0000**	**100.00**	**100.00**	**138.9**	**Total**	**100.00**

Element	Line	Gross (cps)	BKG (cps)	Net (cps)
Mg	KA1	23.0	1.9	21.1
Al	KA1	6.4	2.1	4.3
Si	KA1	81.1	2.1	78.9
Ca	KA1	16.0	1.5	14.5
Mn	KA1	2.3	1.5	0.8
Fe	KA1	33.4	1.5	31.8
Cu	KA1	89.8	1.7	88.1
O	KA1	0.5	0.4	0.0

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041216273	**Date:**	Jul 20, 2012
Image Number:	03300		
Reference / Sample Number:	0040		
Preliminary ID:	NRA		
Camera Constant:	1.875e-003	**1/A Pixels**	
Calibration Reference:	072012-04-03-03297_C		

	Measured	Reference	-5%	+5%
Inter-row Spacing:	**5.270**	5.300	**5.035**	**5.565**
d2 or hk0 (Camera K/zero row dist.):	**N/A**	N/A	-	-
d1 or hkl (Camera K/slant vector dist.):	**N/A**	N/A	-	-
Ratio of hk0/hkl:	**N/A**	N/A	-	-
Vector Angle:	**N/A**	N/A	-	-



From SAED Reference Book, "unknown" diffraction pattern was found to be that of: **NRA**

With a Zone Axis of: [**N/A**]

Preliminary Identification was:

☐ CORRECT

☐ INCORRECT

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0041	Volume (L):	464.58	Scope:	03-01
Customer Sample:	PA-ATV2-AM-05	Prepped By:	A. Folgar	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	Q(1-3)	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~16~~ 17 D.Young 7/11/12		none	**3:1**	5:1	
GO Analyzed:	17					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
Q1	G10	ND									
	G8	↓									
	G6										
	G4										
	G2										
	D1										
	D3										
	D5										
	D7										
	D9	↓									

ND= None Detected

NAM= Non Asbestos Material

Particulate Loading: 7-10%

Traverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0041

Customer Sample ID: PA-ATV2-AM-05

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
Q2	E1	ND									
	E3	↓									
	E5										
	E7										
	E9										
	H10										
	H8										
		↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0042	Volume (L):	372.96	Scope:	03-01
Customer Sample:	PA-BG-AM-01	Prepped By:	A. Folgar	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000x
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	B (1-3)	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~20~~ 21 D.Young 7/11/12		none	**3:1**	5:1	
GO Analyzed:	21					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B1	H2	ND									
	H4	↓									
	H6										
	H8										
	H10										
	D10										
	D8										
	D6										
	B2										
	B4										

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Traverse Direction: Vertical
Particulate Loading: 7-10%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0042

Customer Sample ID: PA-BG-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B2	F1	ND									
	F3	↓									
	F5										
	F7										
	F9										
	B10										
	B8										
	B6										
	B4										
	B2										
	D2	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0043	Volume (L):	363.78	Scope:	03-01
Customer Sample:	PA-BG-AM-02	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERRG-02	Analyzed By:	G. Lamm
EFA (mm²):	385	Grid Location:	S1-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~21~~ 22 ~~8~~ 7/11/12		none	**3:1**	5:1
GO Analyzed:	22				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

$X^2 = 24.846$ = Random

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
S1	C2	ND									
	C4	ND									
	C6	ND									
	F2	ND									
	F4	ND									
	F6	ND									
	H4	ND									
	H6	ND									
S2	C3	ND									
	C5	ND									

ND= None Detected NAM= Non Asbestos Material

EMSL Analytical, Inc

Particulate loading: 5-7%
Transverse Direction: Vert. cut

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0043

Customer Sample ID: PA-BG-AM-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	C7	ND									
	G3	ND									
	G5	ND									
	G7	ND									
	I5	ND									
53	D4	ND									
	D6	ND									
	D8	ND									
	G3	MD11	1		148.99	9.72	CD	CH			
		MB		1	148.99	0.95	CD	CH		63152 63153	YES
	G5	ND									
	G7	ND									
	I6	ND									

ND = None Detected

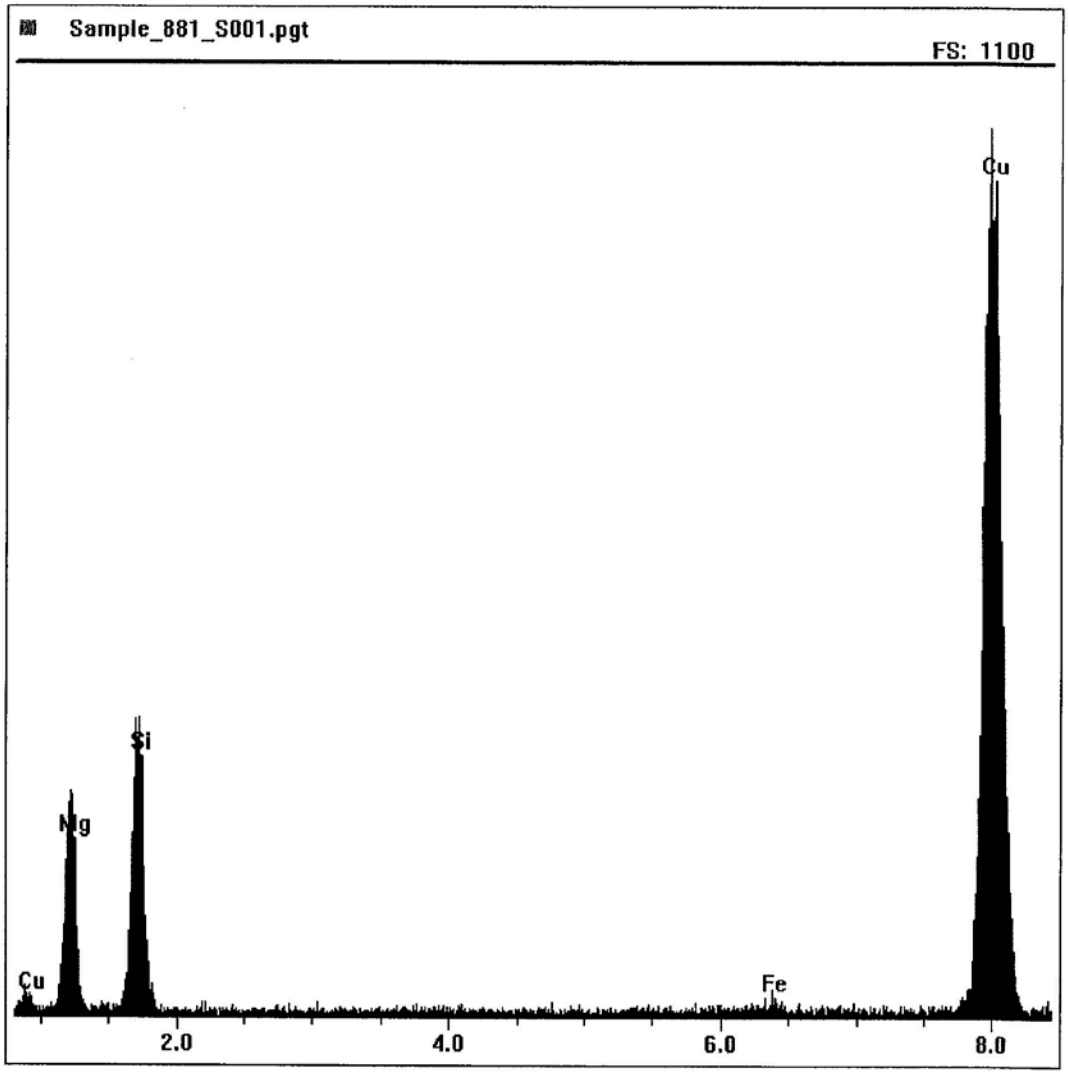
NAM = Non Asbestos Material

Energy Dispersive X-Ray Analysis
Qualitative Spectrum

EMSL ANALYTICAL, INC.

File: 041216273 PA-BG-AM-02 S3 G3 1 Chrysotile
Collected: July 11, 2012 14:33:10

Live Time:	16.03	Count Rate:	4351	Dead Time:	64.78 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00



EMSL Analytical Inc. 307 West 38th Street, New York, NY, 10118
TEL: (212) 290-0051 • FAX: (212) 290-0058 • www.EMSL.com
Locally Focused ... Nationally Recognized

CHRYSOTILE SAED INDEXING FORM

EMSL Order ID : 041216273 DATE: 07/11/12

Indexing of negative number: 63152 SCOPE #: 03-01

Reference / Sample Number: PA-BG-AM-02

Preliminary ID: Chrysotile By: GI

Using Camera Constant of: 21.89 mm Angstroms

Determined from negative number: 63094

Quick Check

Measured Inter-row spacing: 4 mm

110 reflections present? Enter Yes or No: Yes

200 doublets present? Enter Yes or No: Yes

Full Index

Measured distance, center spot to closest hk0 spot (002):	3.00	mm
Measured distance, center spot to closest hk1 spot (110):	4.75	mm

	Calculated	Ref	- 5%	+ 5%
Inter-row spacing (Ångstroms)	**5.47**	**5.30**	**5.035**	**5.565**
Angle to 110 reflection (Measured °)	63	**60.0**	**57.0**	**63.0**
d2 or d hk 0 (002) (Angstroms)	**7.30**	**7.32**	**6.954**	**7.686**
d1 or d hk 1 (110) (Angstroms)	**4.61**	**4.58**	**4.351**	**4.809**

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Chrysotile By: DY

Preliminary Identification was: [X] CORRECT

[ ] INCORRECT

percent accuracy to date: 100


5563152

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0044	Volume (L):	361.08	Scope:	03-01
Customer Sample:	PA-BG-AM-03	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312ERRG-02	Analyzed By:	G. Lanning
EFA (mm²):	385	Grid Location:	T1-3	Analysis Date:	7/11/12

Analysis Information

Target Sensitivity:	0.004	s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~22~~ 22 AF 7/11		none	**3:1**	5:1	
GO Analyzed:	22					
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron	
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
T1	C2	ND									
	C4	ND									
	C6	ND									
	C8	ND									
	G2	ND									
	G4	ND									
	G6	ND									
	G8	ND									
T2	I7	ND									
	I5	ND									

ND= None Detected NAM= Non Asbestos Material

Particulate loading: 1-3%
Transverse Direction: Vertical

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0044

Customer Sample ID: PA-BG-AM-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	I3	ND									
	C8	ND									
	C6	ND									
	C4	ND									
	C2	ND									
B	H8	ND									
	H6	ND									
	H4	ND									
	H2	ND									
	D8	ND									
	D6	ND									
	D4	ND									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: **041216273-0045**
Customer Sample: PA-BG-AM-04
Sample Description: ABS
Pore Size (micron): 0.45
EFA (mm^2): 385

Volume (L): 512.28
Prepped By: SM
Prepped Date: 6.25.12
Grid Box : Special Project
Grid Location: B

Scope: JEOL 1200 Ex (04-03)
GO area (mm^2): 0.0130
Magnification: 20,000X
Analyzed By: PJ Harrison
Analysis Date: 6/26/12

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: **15**
GO Analyzed: 15
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1

Min Length: **>5** micron
Min Width: **0.2** micron

Comments: 2% particulate loading vertical traverse

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B7	J1	ND									
	I4										
	G6										
	F2										
	D1										
↓	A5										
B8	J1										
	I3										
	E4										
↓	D6	✓									

ND= None Detected

NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0045

Customer Sample ID: PA-BG-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B8	A4	~~NST~~	ND								
B9	E5										
	D2										
	C7										
	B4										
	A1										

ND = None Detected

NAM = Non Asbestos Material

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

SAMPLE/ANALYSIS INFORMATION

Enter Site or Project Name Here:	2011-149 Phillips Mine
State/Federal Site or Project Identifier:	

Site/Project Identifier Code:	2011-149

Laboratory name:	EMSL04
Instrument:	JEOL 1200 EX
Voltage (kV):	100
Magnification: Enter one or more (a)	20,000 x
Grid opening area (mm^2):	0.0130

	High Mag:	Low Mag:
Scale: 1L =	1.000	1.000
Scale: 1D =	1.000	1.000

Filter Size (mm):	
Filter Pore Size (um):	
Method SOP (Revision No.):	
Grid Storage Location:	
Archive filter(s) storage location:	Cinnaminson

Client Sample Number:	PA-BG-AM-04
Date received by lab:	06/22/12
Lab Job Number:	041216273
Lab Sample Number:	041216273-~~0003~~ 0045
Chain of Custody Number:	RD 6.27.12

Sample Type: (FS=Field Sample, FB=Field Blank, LT=Lot Blank, QC=Lab QC)	FS
QC Sample Type: (Not QC, LB=Lab Blank, RS=Recount Same, RD, Recount Diff., RP=Reprep., VA=Verified Analysis, IL=Interlab)	Not QC
Media: (Air, Dust, Dustfall, N/A)	Air
Air volume (L), dust area (cm^2), or dustfall container area (cm^2):	512

Number of grids prepared:	3
Prepared by:	
Preparation date:	
Preparation Type: (D=Direct, I=Indirect, IA=Indirect, ashed)	
If sample type = air, is there loose material or debris in the cowl? (Y/N)	

Primary Filter Area (mm^2):	385
Secondary Filter Area (mm^2):	
F- factor:	
Filter Status: (A=Analyzed, O=Overloaded, D=Damaged, M=Missing, C=Cancelled)	A
Analyzed by:	PHarrison
Analysis date:	6/26/12

F-factor Input Parameters:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter:

	Fraction of secondary filter used for ashing

Project Stopping Rules:

Maximum Area Examined (mm^2):	
Total Number of Asbestos Structures Observed Equals:	
Analytical Sensitivity is at least:	0.004

Project Recording Rules:

Minimum Aspect Ratio:	3:1
Minimum Length (µm):	>5.0
Minimum Width (µm):	>0.25

COMMENTS

2% particulate loading

(a) Enter one or both magnifications (high and/or low) in this box. Examples: 20,000x OR 5,000x OR 20,000/5,000x

If sample was analyzed using more than one TEM instrument, enter TEM Instrument details below.

	Instrument #2	Instrument #3
Instrument:		
Voltage (KV):		
Magnification:		

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

	Analyst #2	Analyst #3
Analyzed by:		
Analysis date:		

IMPORTANT NOTE: If this sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates, be sure to complete the column labeled "Multiple" when entering raw structure results for each grid opening.

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

STRUCTURE INFORMATION

Client Sample No.:	PA-BG-AM-04	Sample Type	FS	Preparation Type	
Lab Sample No.:	041216273-0003	QC Sample Type	Not QC	Analysis Date	6/26/12

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification Code (b)	Mineral Type (c)	Other Mineral Description	1 = yes, blank = no			Multiple (d)	Low Mag	Comments
			Primary	Total	Length	Width				Sketch	Photo	EDS			
B7	J1	ND													
	I4	ND													
	G6	ND													
	F2	ND													
	D1	ND													
	A5	ND													
B8	J1	ND													
	~~F3~~	ND													
	E4	ND													
	D6	ND													
	A4	ND													
B9	E5	ND													
	D2	ND													
	C7	ND													
	B4	ND													
	A1	ND													
						PA									
						6/26/12									

(a) Enter dimensions either in absolute units (um) or in screen units. If reported as screen units, confirm that the Length & Dimension Scales are set as appropriate.

(b) See Annex D of ISO 10312 for identification codes.

(c) Valid Mineral Types:

AC	actinolite	CH	chrysotile	LA	Libby amphibole	OM	other mineral type (specify in "other mineral description" field)
AM	amosite	CR	crocidolite	OA	other amphibole	Amosite	Solid solution series: Amosite, cummingtonite-grunerite
AN	anthophyllite	TR	tremolite	NAM	non-asbestos material	Trem-Act	Solid solution series: Tremolite-Actinolite

(d) Populate this field only if sample was analyzed using more than one instrument, by more than one analyst, or across multiple analysis dates.

(e) If the analyst changes to low magnification, populate this field with a numerical value for what the analysts has chosen.

Grid opening traverse direction (circle one):

H Horizontal

V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0046**	Volume (L):	429.3	Scope:	03-01
Customer Sample:	PA-BG-AA-01	Prepped By:	A. FOLGAR	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7-2-12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	José Arriaga
EFA (mm²):	385	Grid Location:	U (1-3)	Analysis Date:	7-11-12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~35~~ 36 JA 7-11-12		none	**3:1**	5:1
GO Analyzed:	36				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U1	I8	ND									
	I6	↓									
	I2										
	G9										
	G7										
	G4										
	G2										
	E8										
	E6										
	E4										

ND= None Detected

NAM= Non Asbestos Material

Traverse Direction : Vertical
Particulate loading : 1-3 %

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0046

Customer Sample ID: PA-BG-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U1	E2	ND									
	C9	↓									
	C7										
	C5										
	C3										
	A9										
	A7										
	A5	↓									
U2	I9	ND									
	I6	↓									
	I3										
	G9										
	G6										
	G4	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0046

Customer Sample ID: PA-BG-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
M2	E8	ND									
	E6	↓									
	E4										
	C9										
	C7										
	C5										
	A8										
	A6										
	A4										
M3	I8										
	I5										
	G6	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0047**	Volume (L):	492.48	Scope:	03-01
Customer Sample:	PA-BG-AA-02	Prepped By:	A. FOLGAR	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7-2-12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-03	Analyzed By:	José Arriaga
EFA (mm²):	385	Grid Location:	A (1-3)	Analysis Date:	7-11-12

Analysis Information

Target Sensitivity:	**0.002** s/cc	Minimum Aspect Ratio: (circle one)			***Comments:***
GO Required:	~~30~~ 31 JA 7-11-12	none	**3:1**	5:1	
GO Analyzed:	31				
Level of Analysis Chrysotile:	**CD**	Min Length:	**>5**	micron	
Level of Analysis Amphibole:	**ADX**	Min Width:	**0.25**	micron	

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A1	I8	ND									
	I6	↓									
	I4										
	I2										
	G8										
	G6										
	G4										
	G2										
	E7										
	E5	↓									

ND= None Detected NAM= Non Asbestos Material

Traverse Direction: Vertical

Particulate Loading: 1-3 %

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0047

Customer Sample ID: PA-BG-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A1	E3	ND									
	E1	↓									
	C8	↓									
	C6	↓									
	C4	↓									
	C2	↓									
A2	B4	ND									
	B6	↓									
	B8	↓									
	B10	↓									
	D4	↓									
	D6	↓									
	D8	↓									
	D10	↓									

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0047

Customer Sample ID: PA-BG-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A2	F4	ND									
	F6	↓									
	F8										
	F10										
	H4										
	H6										
	H8										

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273-0048	Volume (L):	0	Scope:	03-01
Customer Sample:	PA-BC-AA-01	Prepped By:	A. FOLGAR	GO area (mm²):	0.013
Sample Description:	Ambient	Prepped Date:	7-2-12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-03	Analyzed By:	José Arriaga
EFA (mm²):	385	Grid Location:	B (1-3)	Analysis Date:	7-11-12

Analysis Information

Target Sensitivity:	0.002	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	~~10~~ 11 Ja 7-11-12		none	**3:1**	5:1
GO Analyzed:	11				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B1	C3	ND									
	C5	↓									
	C7										
	E3										
	E5										
	E7										
B2	I8	ND									
	I6	↓									
	I4										

ND= None Detected NAM= Non Asbestos Material

Traverse Direction : Vertical
Particulate Loading : 0.5%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0048

Customer Sample ID: PA-BC-AA-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
B2	G8	ND									
	G6	↓									

ND = None Detected NAM = Non Asbestos Material

TEM Air TEM Dust PCM
(Circle One)

Indirect Preparation Record

EFA 364.9 (mm2) LOT# Filter 6100510 PH # N/A
Funnel # N/A

INDIRECT PREPARATION RECORD
REVISION 1
FEBRUARY 9, 2009

		Indirect without ashing			Dilution Filtration						Indirect with Ashing			
pped by: DS	Date 7/11/12	Fraction of filter used	1st Resuspend Volume	Volume applied to filter	Volume of 1st Resuspend used	2nd Re-suspend Volume	Volume applied to filter	Volume of 2nd Re-suspend used	3rd Re-suspend Volume	Volume applied to filter	Fraction of filter ashed	Volume used to resuspend residue	Volume applied to 2nd filter	OK to Prep to Grid?
Order ID	Sample #		mL	mL	mL	mL	mL	mL	mL	mL		mL	mL	Y/N
041216273	0016										1	40	1	✓
													5	✓
													34	
	0017										3/4	40	1	✓
													5	✓
													10	✓ 7/11
													24	
	0040										1	40	1	✓
													5	✓
													34	
	Ash BK										1	40	40	✓
	Filtration BK	—	100	100										✓

4. QC Data Reports/Logs

EMSL ANALYTICAL, INC.

Quality Control Report
ISO 10312, ISO 13794, ASTM 6281
-Blanks-

	Order ID	Analysis	Blank Type	Analyst	Total Str	No. GO analyzed	GO area	Conc str/mm²	Conclusion*
1	041216273	ISO 10312	Lab Blank # 1	DY	0	10	0.0130	None Detected	PASS
2	041216273	ISO 10312	Lab Blank # 2	AF	0	10	0.0130	None Detected	PASS
3	041216273	ISO 10312	Lab Blank # 3	DY	0	10	0.0130	None Detected	PASS
4	041216273	ISO 10312	Lab Blank # 4	DY	0	10	0.0130	None Detected	PASS
5	041216273	ISO 10312	Lab Blank # 5	DY	0	10	0.0130	None Detected	PASS
6	041216273	ISO 13794	Ashing Blank	PH	0	10	0.0132	None Detected	PASS
7	041216273	ISO 13794	Filtration Blank	PH	0	10	0.0132	None Detected	PASS
8	041216273	ISO 13794	Hood Blank	PH	0	10	0.0132	None Detected	PASS

*Pass Fail Criteria

Unless Quality Control limits are specified by the client, EMSL will use in-house QC limits published in EMSL's Quality Assurance Manual.

*Air Blanks are considered passing if concentration is <5str/mm²

Quality Control Report
ISO 10312, ISO 13794, ASTM 6281

EMSL ANALYTICAL, INC.

8/6/2012

					Original		QC				
	Order ID	Sample ID	Analysis	QC Type	Analyst	Total Str	Analyst	Total Str.	LCL	UCL	Conclusion*
1	041216273-0004	PA-MC-AA-02	ISO 10312	Inter Analyst	DY	0	AF.	0	NA	2.99	PASS
2	041216273-0023	PA-MC-AM-04	ISO 10312	Inter Analyst	JA	2	DY	3	NA	6.3	PASS
3	041216273-0027	PA-UW-AM-01	ISO 10312	Intra Analyst	GI	2	GI	2	NA	6.3	PASS

*Pass Fail Criteria

Unless Quality Control limits are specified by the client, EMSL will use in-house QC limits published in EMSL's Quality Assurance Manual.
Repeat results cannot differ at the 95% confidence interval.
For TEM Samples only grid openings that are still intact during QC analysis are evaluated and compared.

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0004QC	
Customer Sample #:		PA-MC-AA-02	
Date sampled:		6/16/2012	
Initials of Analyst:		AF	
Air volume:		641.325	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.013	mm²
Number of Grid Openings Analyzed:		24	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0058	Str/cc
Concentration of Amphibole Asbestos:	<	0.0058	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0058	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0058	Str/cc
Concentration of Asbestos (total):	**<**	0.0058	**Str/cc**

Comments:
Inter Analyst QC

Robyn Denton
Approved Signatory

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0004**	Volume (L):	641.325	Scope:	03-01
Customer Sample:	PA-MC-AA-02	Prepped By:	A. FOLGAR	GO area (mm²):	.013
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312. BRR. G-01	Analyzed By:	A. FOLGAR
EFA (mm²):	385	Grid Location:	D (1-3)	Analysis Date:	7/13/12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	**24**		none	**3:1**	5:1
GO Analyzed:					
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:
~~Intra~~ INTER Analyst QC
>Y 7/13/12

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
D1	G1	ND									
	G3										
	G5										
	G7										
	G9										
	D10										
	D8										
	D6										
	D4										
	D2	↓									

ND= None Detected

NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0004

Customer Sample ID: PA-MC-AA-02

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
D2	H2	ND									
	H4										
	H6										
	H8										
	H10										
	E10										
	E8										
	E6										
	E4										
	E2										
	C1										
	C3										
	C5										
	C7										

ND = None Detected

NAM = Non Asbestos Material

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/9/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0023QC	
Customer Sample #:		PA-MA-AM-04	
Date sampled:		6/17/2012	
Initials of Analyst:		DY	
Air volume:		381.6	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		21	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		3	
Number of total asbestos structures counted:		3	
Number of Asbestos Structures > 5 microns:		3	
Number of Asbestos fibers and bundles > 5 microns:		3	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		3	
Concentration of Chrysotile Asbestos:	<	0.0279	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0279	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0279	Str/cc
Concentration of Asbestos (total):	**<**	0.0279	**Str/cc**

Comments:
Inter-Analyst QC

Robyn Denton
Approved Signatory

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0023**	Volume (L):	381.6	Scope:	03-01
Customer Sample:	PA-MA-AM-04	Prepped By:	A. Felgar	GO area (mm²):	0013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000x
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Faury
EFA (mm²):	385	Grid Location:	u(1-3)	Analysis Date:	7/13/12

Analysis Information

Target Sensitivity:	**0.004**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	**21**		none	**3:1**	5:1
GO Analyzed:	21				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:
Inter-Analyst QC

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
u1	B2	ND									
	B4	MDII	1		15.5	7.25	nam	nam			
		MB		0	15.5	0.75	nam	nam	AT PRESENT Questionable Morphology		
	B6	ND									
	B8	↓									
	D2										
	D4										
	D6	MDII	2		35.0	10.0	nam	nam			
		MF		0	35.0	4.75	nam	nam			
	D8	B	3	1	8.0	0.3	CD	CH			

ND= None Detected NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0023 **Customer Sample ID:** PA-MA-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U1	D10	ND									
	F2	↓									
	F4	↓									
U2	J9	ND									
	J7	↓									
	J5	↓									
	J3	↓									
	J1	MDII	4		8.75	4.5	CD	CH			
		MB		2	8.75	1.75	CD	CH			
	G9	MDII	5		33.0	7.25	CD	CH			
		MB		3	33.0	1.15	CD	CH			
		MDII	6		24.25	6.75	nam	nam	AT PRESENT		
		MB		0	24.25	1.15	nam	nam			
	G7	ND									
	G5	↓									

ND = None Detected NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0023

Customer Sample ID: PA-MA-AM-04

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
U2	G3	ND									
	G1	↓									

ND = None Detected NAM = Non Asbestos Material

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date: 7/12/2012
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0027QC	
Customer Sample #:		PA-UW-AM-01	
Date sampled:		6/18/2012	
Initials of Analyst:		GI	
Air volume:		468.195	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		17	
Analytical Sensitivity:		0.0036	Str/cc
Number of Primary Asbestos Structures Counted:		2	
Number of total asbestos structures counted:		2	
Number of Asbestos Structures > 5 microns:		2	
Number of Asbestos fibers and bundles > 5 microns:		2	
Number of PCM equivalent asbestos structures:		1	
Number of PCM equivalent asbestos fibers:		1	
Concentration of Chrysotile Asbestos:	<	0.0243	Str/cc
Concentration of Amphibole Asbestos:	<	0.0108	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0243	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0108	Str/cc
Concentration of Asbestos (total):	**<**	**0.0243**	**Str/cc**

Comments:
Intra Analyst QC

Robyn Denton
Approved Signatory

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0027**	Volume (L):	468.195	Scope:	03-01
Customer Sample:	PA-UW-AM-01	Prepped By:	AF	GO area (mm²):	0.013
Sample Description:	ABS	Prepped Date:	7/2/12	Magnification:	10,000
Pore Size (micron):	0.45	Grid Box :	0312 ERRG-02	Analyzed By:	G. Lunn
EFA (mm²):	385	Grid Location:	D1-3	Analysis Date:	7/12/12

Analysis Information

Target Sensitivity: **0.004** s/cc
GO Required: **17**
GO Analyzed: 17
Level of Analysis Chrysotile: **CD**
Level of Analysis Amphibole: **ADX**

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1

Min Length: **>5** micron
Min Width: **0.25** micron

Comments:
~~Intra~~-~~Inter~~-Analyst QC
D.Y 7/13/12
$x^2 = 18.619 = Random$

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
D1	I8	ND									
	I6	ND									
	I4	ND									
	C8	ND									
	C6	ND									
	Q4	MD11	1		10.69	3.65					
		MB		1	10.69	0.35	CD	CH			
D2	C3	ND									
	C5	ND									
	C7	ND									

ND= None Detected
NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0027

Customer Sample ID: PA-UW-AM-01

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
	F3	F	2	2	24.30	0.90	CO	CH		63156	YES
	F5	ND									
	F7	ND									
D3	D3	ND									
	D5	ND									
	D7	ND									
	H4	ND									
	H6	ND									

ND = None Detected

NAM = Non Asbestos Material

Attention: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd.
Suite 200
Martinez, CA 94553
Phone: (925) 969-0750
Project: 2011-149 Phillips Mine

Customer ID: ERRG25
Customer PO:
Received: 6/22/12 9:30 AM

EMSL Order: 041216273
Analysis Date:
Report Date: 07/18/12

ISO 10312-Ambient Air - Determination of Asbestos Fibers Direct Transfer Transmission Electron Microscopy

EMSL Sample #:		041216273-0034QC	
Customer Sample #:		PA-ATV2-AA-03	
Date sampled:		6/18/2012	
Initials of Analyst:		DY	
Air volume:		396.8	Liters
Area of collection filter:		385	mm²
Level of analysis (chrysotile):		CD	
Level of analysis (amphibole):		ADX	
Magnification used for fiber counting:		~10,000	X
Aspect ratio for fiber definition:		3:1	
Minimum length to be counted:	>	5.0	microns
Minimum width to be counted:		0.25	microns
Mean dimension of grid openings:		0.0130	mm²
Number of Grid Openings Analyzed:		38	
Analytical Sensitivity:		0.0019	Str/cc
Number of Primary Asbestos Structures Counted:		0	
Number of total asbestos structures counted:		0	
Number of Asbestos Structures > 5 microns:		0	
Number of Asbestos fibers and bundles > 5 microns:		0	
Number of PCM equivalent asbestos structures:		0	
Number of PCM equivalent asbestos fibers:		0	
Concentration of Chrysotile Asbestos:	<	0.0057	Str/cc
Concentration of Amphibole Asbestos:	<	0.0057	Str/cc
Lower 95% Confidence Limit (Chrysotile)		N/A	Str/cc
Upper 95% Confidence Limit (Chrysotile)	<	0.0057	Str/cc
Lower 95% Confidence Limit (Amphibole)		N/A	Str/cc
Upper 95% Confidence Limit (Amphibole)	<	0.0057	Str/cc
Concentration of Asbestos (total):	**<**	0.0057	**Str/cc**

Comments:
Inter-Analyst QC

Robyn Denton
Approved Signatory

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	**041216273-0034**	Volume (L):	396.8	Scope:	03-01
Customer Sample:	PA-ATV2-AA-03	Prepped By:	A. Folgar	GO area (mm²):	0.130
Sample Description:	Ambient	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-02	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	K(1-3)	Analysis Date:	7/13/12

Analysis Information

Target Sensitivity:	**0.002**	s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	**38**		none	**3:1**	5:1
GO Analyzed:	38				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:
Inter-Analyst QC

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K2	F2	ND									
	F4										
	F6										
	F8										
	F10										
	G1										
	G3										
	G5										
	G7										
	G9	V									

ND= None Detected NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0034

Customer Sample ID: PA-ATV2-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K2	H2	ND									
	H4										
	H6										
	H8										
	J3										
	J5										
	J7										
	J2										
	JH										
	J6										
K3	A3										
	A5										
	A7										
	A9										
	B2	↓									

ND = None Detected

NAM = Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273-0034

Customer Sample ID: PA-ATV2-AA-03

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
K3	B4	ND									
	B6										
	B8										
	B10										
	C1										
	C3										
	C5										
	C7										
	C9										
	D4										
	D6										
	D8										
	D10										
		V									

ND = None Detected

NAM = Non Asbestos Material

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273	Volume (L):	0	Scope:	03-01
Customer Sample:		Prepped By:	A. Folgar	GO area (mm²):	0.0130
Sample Description:	Lab Blank #1	Prepped Date:	7/2/12	Magnification:	10,000x
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	A (1-2)	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:		s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	10		none	**3:1**	5:1
GO Analyzed:	10				
Level of Analysis Chrysotile:	CD		Min Length:	>5	micron
Level of Analysis Amphibole:	ADX		Min Width:	0.25	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A1	G9	ND									
	G7	↓									
	G5										
	G3										
	G1										
A2	G10										
	G8										
	G6										
	G4										
	G2	↓									

ND= None Detected

NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 1%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273
Customer Sample:
Sample Description: Lab Blank #2
Pore Size (micron): 0.45
EFA (mm²): 385

Volume (L): 0
Prepped By: A. Felgar
Prepped Date: 7/2/12
Grid Box : 0312-ERRG-01
Grid Location: A (3-4)

Scope: 03-01
GO area (mm²): 0.0130
Magnification: 10,000 X
Analyzed By: D. Young
Analysis Date: 7/5/12

Analysis Information

Target Sensitivity: s/cc
GO Required: 10
GO Analyzed: 10
Level of Analysis Chrysotile: CD
Level of Analysis Amphibole: ADX

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1
Min Length: >5 micron
Min Width: 0.25 micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
A3	H2	ND									
	H4	↓									
	H6										
	H8										
	H10										
A4	A10										
	A8										
	A6										
	A4										
	A2	↓									

ND= None Detected
NAM= Non Asbestos Material

Traverse Direction: Vertical
Particulate Loading: 1%

EMSL

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273	Volume (L):	0	Scope:	03-01
Customer Sample:		Prepped By:	A. Folger	GO area (mm²):	0.0130
Sample Description:	Lab Blank #3	Prepped Date:	7/2/12	Magnification:	10,000X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	A (5-6)	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:		s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	10		none	**3:1**	5:1
GO Analyzed:	10				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A5	C1	ND									
	C3	"									
	C5	"									
	C7	"									
	C9	"									
A6	G10	"									
	G8	"									
	G6	"									
	G4	"									
	G2	"									

ND= None Detected

NAM= Non Asbestos Material

EMSL Analytical, Inc

Traverse Direction: Vertical

Particulate Loading: 1%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID:	041216273	Volume (L):	0	Scope:	03-01
Customer Sample:		Prepped By:	A. Folgar	GO area (mm²):	0.0130
Sample Description:	Lab Blank #4	Prepped Date:	7/2/12	Magnification:	10,000 X
Pore Size (micron):	0.45	Grid Box :	0312-ERRG-01	Analyzed By:	D. Young
EFA (mm²):	385	Grid Location:	A(7-8)	Analysis Date:	7/5/12

Analysis Information

Target Sensitivity:		s/cc	Minimum Aspect Ratio: (circle one)		
GO Required:	10		none	**3:1**	5:1
GO Analyzed:	10				
Level of Analysis Chrysotile:	**CD**		Min Length:	**>5**	micron
Level of Analysis Amphibole:	**ADX**		Min Width:	**0.25**	micron

Comments:

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (µm)		Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
			Primary	*Total*	*Length*	*Width*					
A7	1 10	ND									
	1 8										
	1 6										
	1 4										
	1 2										
A8	H1										
	H3										
	H5										
	H7										
	H9	↓									

ND= None Detected

NAM= Non Asbestos Material

EMSL Analytical, Inc

Traverse Direction: Vertical

Particulate Loading: 1%

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273 | Volume (L): 0 | Scope: JEOL 1200 EX (04-03)
Customer Sample: | Prepped By: | GO area (mm²): 0.0132
Sample Description: Lab Blank | Prepped Date: | Magnification: 20kx
Pore Size (micron): 0.45 | Grid Box: Special Project | Analyzed By: P. Harrison
EFA (mm²): 385 | Grid Location: F G | Analysis Date: 7/20/12
PH 7/20/12

Analysis Information

Target Sensitivity: s/cc
GO Required: 10
GO Analyzed: 10
Level of Analysis Chrysotile: CD
Level of Analysis Amphibole: ADX

Minimum Aspect Ratio: (circle one) none **3:1** 5:1
Min Length: >5 micron
Min Width: 0.2 micron

Comments:
Indirect - Ashing Blank

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
PH 7/20/12 G1	F4	J2	ND								
G2	J3										
	I6										
	G4										
	B5										
	A3										
G3	C8										
	E6										
	F4										
	I5										

ND= None Detected
NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273 | Volume (L): 0 | Scope: JEOL 1200 EX (04-03)
Customer Sample: | Prepped By: | GO area (mm²): 0.0132
Sample Description: Lab Blank | Prepped Date: | Magnification: 20k x
Pore Size (micron): 0.45 | Grid Box: Special Project | Analyzed By: P. Harrison
EFA (mm²): 385 | Grid Location: F G | Analysis Date: 7/20/12
Analysis Information | Pit 7/20/12

Target Sensitivity: s/cc | Minimum Aspect Ratio: (circle one) none **3:1** 5:1
GO Required: 10 | GO Analyzed: 10
Level of Analysis Chrysotile: CD | Min Length: >5 micron
Level of Analysis Amphibole: ADX | Min Width: 0.2 micron

Comments:
Indirect · Filtration Blank

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
G4	H6	ND									
↓	H8	↓									
↓	F1	↓									
↓	E1	↓									
↓	C5	↓									
G5	H10	↓									
↓	E3	↓									
G6	C7	↓									
↓	H5	↓									
↓	H1	↓									

ND= None Detected | NAM= Non Asbestos Material

TEM ISO 10312
Asbestos Count Sheet

EMSL Sample ID: 041216273 | Volume (L): 0 | Scope: JEOL 1200 EX (04-03)
Customer Sample: | Prepped By: | GO area (mm²): 0.0132
Sample Description: Lab Blank | Prepped Date: | Magnification: 20k x
Pore Size (micron): 0.45 | Grid Box: Special Project | Analyzed By: P. Harrison
EFA (mm²): 385 | Grid Location: F | Analysis Date: 7/20/12

Analysis Information

Target Sensitivity: s/cc
GO Required: 10
GO Analyzed: 10
Level of Analysis Chrysotile: CD
Level of Analysis Amphibole: ADX

Minimum Aspect Ratio: (circle one)
none **3:1** 5:1

Min Length: >5 micron
Min Width: 0.2 micron

Comments:
Indirect - Hood Blank

Grid	Grid Opening	Structure Type	No. of Structures Primary	No. of Structures Total	Dimensions (µm) Length	Dimensions (µm) Width	Level of ID	Mineral Type	Sketch Comments	Photo Number	EDXA Printed
F7	A8	ND									
↓	D5	↓									
↓	E10	↓									
↓	F8	↓									
↓	I9	↓									
F8	B4	↓									
↓	C6	↓									
↓	D8	↓									
↓	G2	↓									
↓	H5	↓									

ND= None Detected
NAM= Non Asbestos Material

5. Client and EMSL Internal Chains of Custody

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

~~Microbiology~~ Chain of Custody

EMSL Order Number (*Lab Use Only*):

361201904

0412116273

EMSL ANALYTICAL, INC.
3356 W. CATALINA DR.
PHOENIX, AZ 85017
PHONE: (602) 276-4344
FAX: (602) 276-4053

Company: Engineering/Remediation Resources Group		**EMSL-Bill to:** ☑ Same ☐ Different If Bill to is Different note instructions in Comments**	
Street: 4585 Pacheco Blvd		*Third Party Billing requires written authorization from third party*	
City: Martinez	**State/Province:** CA	**Zip/Postal Code:** 94553	**Country:** USA
Report To (Name): Samantha Carruthers-Knight		**Telephone #:** 925 909 0750	
Email Address: samantha.knight@errg.com		**Fax #:** 925 909 0751	**Purchase Order:**
Project Name/Number: 2011-149		**Please Provide Results:** ☐ Fax ☑ Email	
U.S. State Samples Taken: AZ		**Connecticut Samples:** ☐ Commercial ☐ Residential	

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ☐ 72 Hour | ☐ 96 Hour | ☐ 1 Week | ☒ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide. TATs are subject to methodology requirements*

Non Culturable Air Samples (Spore Traps)

- **M001** Air-O-Cell
- **M049** BioSIS
- **M030** Micro 5
- **M173** Allegro M2
- **M003** Burkard
- **M174** MoldSnap
- **M004** Allergenco
- **M043** Cyclex
- **M176** Relle Smart
- **M032** Allergenco-D
- **M002** Cyclex-d
- **M130** Via-Cell
- **M172** Versa Trap

Other Microbiology Test Codes

- **M041** Fungal Direct Examination
- **M005** Viable Fungi ID and Count
- **M006** Viable Fungi ID and Count (Speciation)
- **M007** Culturable Fungi
- **M008** Culturable Fungi (Speciation)
- **M009** Gram Stain Culturable Bacteria
- **M010** Bacterial Count and ID – 3 Most Prominent
- **M011** Bacterial Count and ID – 5 Most Prominent
- **M013** Sewage Contamination in Buildings
- **M014** Endotoxin Analysis
- **M015** Heterotrophic Plate Count
- **M180** Real Time Q-PCR-ERMI 36 Panel
- **M018** Total Coliform (Membrane Filtration)
- **M020** Fecal *Streptococcus* (Membrane Filtration)
- **M210-215** *Legionella* Detection
- **M026** Recreational Water Screen
- **M027** Mycotoxin Analysis
- **M029** *Enterococci*
- **M019** Fecal Coliform
- **M133** MRSA Analysis
- **M028** *Cryptococcus neoformans* Detection
- **M120** *Histoplasma capsulatum* Detection
- **M033-39** Allergen Testing
- **M044** Group Allergen (Cat, Dog, Cockroach, Dustmites)
- **Other** See Analytical Price Guide

Preservation Method (Water):

Name of Sampler: Samantha Carruthers-Knight **Signature of Sampler:**

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
PA-MC-AA-01	Phillips Mine	Air	ISO 10312	791.1	06/16/12 1030-1500
PA-MC-AA-03				709.155	06/16/12 1045-1500
PA-MC-AM-04				483.975	06/16/12 1030-1415
PA-MC-AA-02				641.325	06/16/12 1045-1500
PA-MC-AM-01				487.575	06/16/12 1030-1415
PA-MC-AM-03				561.6	06/16/12 1030-1415
PA-MC-AM-02				584.55	06/16/12 1030-1415
PA-ATV-AA-01				493.2	06/17/12 1445-1745
PA-ATV-AA-02				374.94	06/17/12 1445/1745
PA-ATV-AA-03				375.85	06/17/12 1445-1745

Client Sample # (s): **Total # of Samples:** 48

Relinquished (Client): **Date:** 6/20/12 **Time:** 1250

Received (Client): Andrea Noman **Date:** 6/20/12 **Time:** 1250

Comments: 1 in 10 Samples analyze SEM as well

RECEIVED
JUN 22 2012

receive ~DMO ami fx 6/22/12 9:30 AM Page 1 of 3 pages

48xC (SM)

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*:

361201904

04121627 3

EMSL ANALYTICAL, INC.
3356 WEST CATALINA DR
PHOENIX, AZ 85017

PHONE: (602) 276-4344
FAX:(602 276-4053

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
PA-ATV1-AA-04	Phillips Mine	Air	D5010312	377.1	06/17/12 1445-1745
PA-ATV1-AA-05				385.38	06/17/12 1445-1745
PA-ATV1-AA-06				512.28	06/17/12 1445-1745
PA-ATV1-AM-01				430.2	06/17/12 1445-1745
PA-ATV1-AM-02				~~458.82~~ 403.2 (ECA)	06/17/12 1445-1745
PA-ATV1-AM-03				396.36	06/17/12 1445-1745
PA-ATV1-AM-04				381.6	06/17/12 1445-1745
PA-MA-AA-01				~~393.12~~ 374.94 (ECA)	06/17/12 1000-1300
PA-MA-AA-02				375.84	06/17/12 1000-1300
PA-MA-AM-01				430.2	06/17/12 1000-1300
PA-MA-AM-02				458.82	06/17/12 1000-1300
PA-MA-AM-03				396.36	06/17/12 1000-1300
PA-MA-AM-04				381.6	06/17/12 1000-1300
PA-MA-AM-05				403.2	06/17/12 1000-1300
PA-UW-AA-01				393.9	06/18/12 0900-1245
PA-UW-AA-02				406.9	06/18/12 0900-1245
PA-UW-AM-01				~~432.18~~ 468.195 (ECA)	06/18/12 0900-1245
PA-UW-AM-02				423.54	06/18/12 0900-1245
PA-UW-AM-03				398.19	06/18/12 0900-1245
PA-UW-AM-04				456.69	06/18/12 0900-1245
PA-UW-AM-05				503.295	06/18/12 0900-1245
PA-ATV2-AA-01				424.2	06/18/12 1430-1800
PA-ATV2-AA-02				438.27	06/18/12 1430-1800
PA-ATV2-AA-03				396.8	06/18/12 1430-1750

****Comments/Special Instructions**

RECEIVED
JUN 22 2012

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*:

361201904
041216273

EMSL ANALYTICAL, INC.
3356 WEST CATALINA DR
PHOENIX, AZ 85017

PHONE: (602) 276-4344
FAX:(602 276-4053

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location	Sample Type	Test Code	Volume/Area	Date/Time Collected
PA-ATV2-AA-04	Phillips Mine	Air	ISO 10312	425.0	06/18/12 1430-1750
PA-ATV2-AA-05				513.36	06/18/12 1430-1730
PA-ATV2-AM-01				432.18	06/18/12 1430-1730
PA-ATV2-AM-02				390.96	06/18/12 1430-1730
PA-ATV2-AM-03				367.56	06/18/12 1430-1730
PA-ATV2-AM-04				421.56	06/18/12 1430-1730
PA-ATV2-AM-05				464.58	06/18/12 1430-1730
PA-BC1-AM-01				372.96	06/19/12 0830-1130
PA-BC1-AM-02				363.78	06/19/12 0830-1130
PA-BC1-AM-03				361.08	06/19/12 0830-1130
PA-BC1-AM-04				512.28	06/19/12 0830-1130
PA-BC1-AA-01				429.3	06/19/12 0830-1130
PA-BC1-AA-02				492.48	06/19/12 0830-1130
PA-BC-AA-01				—	06/20/12 1215

**Comments/Special Instructions

INTERNAL CHAIN OF CUSTODY

Order ID: 041216273 *6/28/2012 4:19:36 PM*

Attn: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Fax: Phone: (925) 969-0750

Project: **2011-149 Phillips Mine**

Customer ID: ERRG25
Customer PO:
Received: 06/22/12 9:30 AM

EMSL Order: 041216273
EMSL Proj ID:
Cust COC ID

REPORT TO INSTRUCTIONS

- [x] Send Receipt Confirmation Emails
- [ ] Email Report Only-Do not send hard copy
- [ ] No electronic signatures
- [ ] Project ID required
- [ ] Cust. COC ID required
- [ ] Miscellaneous account

Sales Rep and Comment: imurdock

Instructions

Note: Sample 3,5,45 analyzed at Corporate.
Note: Sample 16 & 40 not prepped due to non-unif. deposition.

BILL TO INSTRUCTIONS

- [ ] Exempt from prep charge
- [ ] Exempt from off hour min charges
- [ ] Exempt from layer/aliquot charges
- [ ] Email Invoice Only- Do not send hard copy.
- [ ] Credit Card on File
- [ ] P.O. Required

Billing Frequency: --

Use Billing Contact:
Accounting Terms: N30
Payment Directions:

Instructions

Internal Comment

Test: TEM ISO 10312 **Matrix** Air **TAT:** 2 Week **Qty:** 48

- [ ] Lab Opening Exempt For Test
- [ ] Prep Charge Exempt For Test
- [ ] Layer/Aliquot Charge Exempt For Test

Logged: dmcdaniel **Date:** 6/22/2012
Sample Condition: [x] Acceptable [ ] Unacceptable

Comments

Prepped: SM **Date** 6/28/12
Analyzed: JA, D Young, GT, AF, ES, PA **Date** 7/5/12-7/11/12
Data Entry **Date**
Screened: RD **Date** 8.6.12
Mailed: YMM **Date** 8/7/12

Special Test Instructions

Lab Sample #	Cust. Sample #	Location	Due Date
✓ 041216273-0001	PA-MC-AA-01	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0002	PA-MC-AA-03	Phillips Mine	7/6/2012 9:30:00 AM
[redacted]	PA-MC-AM-04 - already analyzed not prepped	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0004	PA-MC-AA-02	Phillips Mine	7/6/2012 9:30:00 AM
✓ [redacted]	PA-MC-AM-01 - already analyzed not prepped	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0006	PA-MC-AM-03	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0007	PA-MC-AM-02	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0008	PA-ATV1-AA-01	Phillips Mine Not Sci	7/6/2012 9:30:00 AM

INTERNAL CHAIN OF CUSTODY

Order ID: 041216273 *6/28/2012 4:19:36 PM*

Attn: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Fax: Phone: (925) 969-0750

Project: **2011-149 Phillips Mine**

Customer ID: ERRG25
Customer PO:
Received: 06/22/12 9:30 AM

EMSL Order: 041216273
EMSL Proj ID:
Cust COC ID

041216273-0009	PA-ATV1-AA-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0010	PA-ATV1-AA-03	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0011	PA-ATV1-AA-04	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0012	PA-ATV1-AA-05	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0013	PA-ATV1-AA-06	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0014	PA-ATV1-AM-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0015	PA-ATV1-AM-02	Phillips Mine	7/6/2012 9:30:00 AM
[redacted]	PA-ATV1-AM-03 now uniformed deposition Not prepped - Mat Sci	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0017	PA-ATV1-AM-04 - now uniformed deposition	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0018	PA-MA-AA-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0019	PA-MA-AA-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0020	PA-MA-AM-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0021	PA-MA-AM-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0022	PA-MA-AM-03	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0023	PA-MA-AM-04	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0024	PA-MA-AM-05	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0025	PA-UW-AA-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0026	PA-UW-AA-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0027	PA-UW-AM-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0028	PA-UW-AM-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0029	PA-UW-AM-03	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0030	PA-UW-AM-04 - now uniformed deposition. - Mat Sci	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0031	PA-UW-AM-05	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0032	PA-ATV2-AA-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0033	PA-ATV2-AA-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0034	PA-ATV2-AA-03	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0035	PA-ATV2-AA-04	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0036	PA-ATV2-AA-05 - MatSci	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0037	PA-ATV2-AM-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0038	PA-ATV2-AM-02 - ~~slight now uniformed deposition~~	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0039	PA-ATV2-AM-03 - slight now uniformed deposition	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0040	[redacted] now uniformed deposition - Not prepped	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0041	PA-ATV2-AM-05	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0042	PA-BG-AM-01	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0043	PA-BG-AM-02	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0044	PA-BG-AM-03	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0045	PA-BG-AM-04 - already analyzed not prepped	Phillips Mine	7/6/2012 9:30:00 AM

INTERNAL CHAIN OF CUSTODY

Order ID: 041216273 *6/28/2012 4:19:36 PM*

Attn: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Fax: Phone: (925) 969-0750

Project: **2011-149 Phillips Mine**

Customer ID: ERRG25
Customer PO:
Received: 06/22/12 9:30 AM

EMSL Order: 041216273
EMSL Proj ID:
Cust COC ID

✓041216273-0046	PA-BG-AA-01	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0047	PA-BG-AA-02 -matSi	Phillips Mine	7/6/2012 9:30:00 AM
✓ 041216273-0048	PA-BC-AA-01	Phillips Mine	7/6/2012 9:30:00 AM

INTERNAL CHAIN OF CUSTODY

Order ID: 041216273 *7/11/2012 10:16:30 AM*

Attn: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA 94553

Fax: Phone: (510) 851-3279

Project: **2011-149 Phillips Mine**

Customer ID: ERRG25
Customer PO:
Received: 06/22/12 9:30 AM

EMSL Order: 041216273
EMSL Proj ID:
Cust COC ID

Test: **TEM ISO 13794** **Matrix** Air **TAT:** 2 Week **Qty:** 3

☐ Lab Opening Exempt For Test
☐ Prep Charge Exempt For Test
☐ Layer/Aliquot Charge Exempt For Test

Logged: dmcdaniel **Date:** 6/22/2012
Sample Condition: ☑ Acceptable ☐ Unacceptable

Comments

Special Project C-F

Prepped: DS **Date** 7/11/12
Analyzed: PK **Date** 7/20/12
Data Entry ↓ **Date**
Screened: RD **Date** 8.6.12
Mailed: DM **Date** 8/7/12

Special Test Instructions

Lab Sample #	Cust. Sample #	Location	Due Date
041216273-0016	PA-ATV1-AM-03	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0017	PA-ATV1-AM-04	Phillips Mine	7/6/2012 9:30:00 AM
041216273-0040	PA-ATV2-AM-04	Phillips Mine	7/6/2012 9:30:00 AM

Prepped 1 and 5ml for each sample

6. Equipment Performance Checks

Daily TEM Calibration Sheet

Month: July Year: 2012 Scope: 03-01

Day (1-31)	Analyst Initials	Scope Align.	LN Dewar Filled	Al Peak Actual	Al Peak Accepted Limit	Cu Peak Actual	Cu Peak Accepted Limit	Pass/Fail* (circle)
1	DJ	✓		1.494	1.47-1.49	8.046	8.03-8.05	Pass/Fail
2	ES/RG	✓		1.482	1.47-1.49	8.043	8.03-8.05	Pass/Fail
3	CSE/RG	✓		1.476	1.47-1.49	8.042	8.03-8.05	Pass/Fail
4	CSE	✓	CSE	1.483	1.47-1.49	8.041	8.03-8.05	Pass/Fail
5	RG	✓		1.470	1.47-1.49	8.034	8.03-8.05	Pass/Fail
6	AP	✓		1.480	1.47-1.49	8.042	8.03-8.05	Pass/Fail
7	CSE	✓		1.471	1.47-1.49	8.038	8.03-8.05	Pass/Fail
8	GI	✓		1.477	1.47-1.49	8.043	8.03-8.05	Pass/Fail
9	GI	✓	RG	1.472	1.47-1.49	8.038	8.03-8.05	Pass/Fail
10	GI	✓		1.473	1.47-1.49	8.042	8.03-8.05	Pass/Fail
11	GI/DJ	✓		1.487	1.47-1.49	8.043	8.03-8.05	Pass/Fail
12	CSE	✓	GI	1.474	1.47-1.49	8.038	8.03-8.05	Pass/Fail
13	DJ	✓		1.473	1.47-1.49	8.041	8.03-8.05	Pass/Fail
14					1.47-1.49		8.03-8.05	Pass/Fail
15					1.47-1.49		8.03-8.05	Pass/Fail
16					1.47-1.49		8.03-8.05	Pass/Fail
17					1.47-1.49		8.03-8.05	Pass/Fail
18					1.47-1.49		8.03-8.05	Pass/Fail
19					1.47-1.49		8.03-8.05	Pass/Fail
20					1.47-1.49		8.03-8.05	Pass/Fail
21					1.47-1.49		8.03-8.05	Pass/Fail
22					1.47-1.49		8.03-8.05	Pass/Fail
23					1.47-1.49		8.03-8.05	Pass/Fail
24					1.47-1.49		8.03-8.05	Pass/Fail
25					1.47-1.49		8.03-8.05	Pass/Fail
26					1.47-1.49		8.03-8.05	Pass/Fail
27					1.47-1.49		8.03-8.05	Pass/Fail
28					1.47-1.49		8.03-8.05	Pass/Fail
29					1.47-1.49		8.03-8.05	Pass/Fail
30					1.47-1.49		8.03-8.05	Pass/Fail
31					1.47-1.49		8.03-8.05	Pass/Fail

*** Any failing results need immediate corrective action**

Daily TEM Calibration Sheet

Month: July Year: 2012 Scope: 04-03

Day (1-31)	Analyst Initials	Scope Align.	LN Dewar Filled	Al Peak Actual	Al Peak Accepted Limit	Cu Peak Actual	Cu Peak Accepted Limit	Pass/Fail* (circle)
1	PH	PH	PH 6/2/12	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
2	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
3	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
4					1.47-1.49		8.03-8.05	Pass/Fail
5	PH	PH		1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
6	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
7					1.47-1.49		8.03-8.05	Pass/Fail
8			FC		1.47-1.49		8.03-8.05	Pass/Fail
9	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
10	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
11	PH	PH	FC	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
12	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
13	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
14					1.47-1.49		8.03-8.05	Pass/Fail
15					1.47-1.49		8.03-8.05	Pass/Fail
16			FC		1.47-1.49		8.03-8.05	Pass/Fail
17	RD	RD		1.48	1.47-1.49	8.03	8.03-8.05	Pass/Fail
18	RD	RD	FC	1.48	1.47-1.49	8.03	8.03-8.05	Pass/Fail
19					1.47-1.49		8.03-8.05	Pass/Fail
20	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
21	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
22					1.47-1.49		8.03-8.05	Pass/Fail
23	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
24	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
25	PH	PH	FC	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
26	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
27	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
28					1.47-1.49		8.03-8.05	Pass/Fail
29					1.47-1.49		8.03-8.05	Pass/Fail
30	PH	PH	PH	1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail
31	PH	PH		1.48	1.47-1.49	8.04	8.03-8.05	Pass/Fail

changed 2 times

*** Any failing results need immediate corrective action**

Monthly Report for TEM Calibrations

Laboratory: Manhattan

Scope: 03-01

Detector: 3324

Chrysotile Beam Dose Sensitivity

(Quarterly)

Date	Initials	Negative Numbers		At least 90% of patterns >15 seconds ?
		SAED	Morphology	
12/15/2009	ES	62077	62078	PASS
3/17/2010	ES	62287	62288	PASS
6/25/2010	JA	62497	62498	PASS
9/16/2010	DY	62592	62594	PASS
12/6/2010	DY	62669	62670	PASS
1/10/2011	DY	62694	62695	PASS
3/12/2011	DY	62728	62729	PASS
6/8/2011	DY	62799	62800	PASS
9/9/2011	DY	62864	62865	PASS
12/12/2011	DY	62912	62913	PASS
3/1/2012	DY	62981	62982	PASS
6/23/2012	DY	63097	63098	PASS

Comments:

Camera Constant Calibrations

(Monthly / Weekly when Water Analysis is performed)

Negative (Camera)					
Date	Initials	Negative Number	Camera Length	Camera Constant	Is 2 Standard Dev. < 5% Mean?
8/23/2011	DY	62853	55	21.82	PASS
9/16/2011	DY	62863	55	21.82	PASS
9/21/2011	DY	62870	55	22.10	PASS
9/26/2011	DY	62872	55	21.79	PASS
10/6/2011	DY	62885	55	21.76	PASS
10/14/2011	DY	62888	55	22.21	PASS
10/25/2011	DY	62901	55	21.44	PASS
11/3/2011	AF	62903	55	21.50	PASS
11/8/2011	DY	62904	55	21.71	PASS
11/21/2011	DY	62908	55	22.27	PASS
12/12/2011	DY	62915	55	21.68	PASS
12/19/2011	DY	62919	55	21.53	PASS
1/16/2012	DY	62929	55	21.76	PASS
2/1/2012	DY	62937	55	21.50	PASS
2/24/2012	DY	62967	55	22.12	PASS
3/1/2012	DY	62978	55	21.92	PASS
3/9/2012	DY	62993	55	21.87	PASS
4/9/2012	DY	63055	55	21.81	PASS
5/4/2012	DY	63076	55	22.04	PASS
6/23/2012	DY	63094	55	21.89	PASS

Comments:

Monthly Report for TEM Calibrations

Laboratory: Manhattan

Scope: 03-01

Detector: 3324

Camera Constant Calibrations

(Monthly / Weekly when Water Analysis is performed)

On Screen					
Date	Initials	Camera Length	Aperture #	Aperture Diameter	Is 2 Standard Dev. < 5% Mean?
12/28/2010	DY	22	1	2.65	PASS
1/10/2011	DY	22	1	2.65	PASS
2/7/2011	DY	22	1	2.65	PASS
3/12/2011	DY	22	1	2.65	PASS
4/11/2011	DY	22	1	2.65	PASS
5/16/2011	DY	22	1	2.65	PASS
6/20/2011	DY	22	1	2.65	PASS
7/19/2011	DY	22	1	2.65	PASS
8/15/2011	DY	22	1	2.65	PASS
9/16/2011	DY	22	1	2.65	PASS
10/25/2011	DY	22	1	2.86	PASS
11/21/2011	DY	22	1	2.86	PASS
12/12/2011	DY	22	1	2.70	PASS
1/10/2012	DY	22	1	2.65	PASS
2/1/2012	DY	22	1	2.65	PASS
3/1/2012	DY	22	1	2.65	PASS
3/9/2012	DY	22	1	2.65	PASS
4/9/2012	DY	22	1	2.65	PASS
5/4/2012	DY	22	1	2.65	PASS
6/23/2012	DY	22	1	2.65	PASS

The above aperture diameter represents the on screen diameter in reciprocal space. Multiply this number times the number of layer lines seen to get layer line spacing.

Comments:

Plasma Asher Calibration

(Quarterly)

Time To Ash 5% of Collapsed MCE Filter			
Date	Initials	Min	Sec
2/3/2010	ES	6	52
5/11/2010	SJS	5	52
8/6/2010	ES	5	07
11/6/2010	CV	3	55
2/11/2011	CV	7	15
5/12/2011	CV	7	03
8/12/2011	CV	8	46
11/30/2011	CV	7	56
3/5/2012	WB	6	22
6/12/2012	WB	5	15

Comments:

Monthly Report for TEM Calibrations

Laboratory: Manhattan

Scope: 03-01

Detector: 3324

Magnification Calibrations
(Monthly)

20,000x - Negative

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
11/2/2010	AF	19164	19440	PASS
12/1/2010	DY	19164	19008	PASS
1/10/2011	DY	19164	19008	PASS
2/1/2011	DY	19164	19008	PASS
3/12/2011	DY	19164	19008	PASS
4/5/2011	DY	19164	19008	PASS
5/3/2011	DY	19164	19440	PASS
6/27/2011	DY	19164	18900	PASS
7/7/2011	DY	19164	19116	PASS
8/15/2011	DY	19164	19116	PASS
9/16/2011	DY	19164	19062	PASS
10/14/2011	DY	19164	19008	PASS
11/8/2011	DY	19164	19548	PASS
12/12/2011	DY	19164	19656	PASS
1/10/2012	DY	19164	19548	PASS
2/1/2012	DY	19164	18900	PASS
3/1/2012	DY	19164	19116	PASS
4/9/2012	DY	19164	19224	PASS
5/4/2012	DY	19164	19008	PASS
6/23/2012	DY	19164	18684	PASS

Comments:

20,000x - Screen

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
11/2/2010	AF	15368	15309	PASS
12/1/2010	DY	15368	15383	PASS
1/10/2011	DY	15368	15017	PASS
2/1/2011	DY	15368	15017	PASS
3/12/2011	DY	15368	15017	PASS
4/5/2011	DY	15368	15612	PASS
5/3/2011	DY	15368	15017	PASS
6/27/2011	DY	15368	15383	PASS
7/7/2011	DY	15368	15612	PASS
8/15/2011	DY	15368	15017	PASS
9/16/2011	DY	15368	15459	PASS
10/14/2011	DY	15368	15459	PASS
11/8/2011	DY	15368	15459	PASS
12/12/2011	DY	15368	15768	PASS
1/10/2012	DY	15368	15768	PASS
2/1/2012	DY	15368	15768	PASS
3/1/2012	DY	15368	15383	PASS
4/9/2012	DY	15368	15535	PASS
5/4/2012	DY	15368	15017	PASS
6/23/2012	DY	15368	15017	PASS

Comments:

10,000x - Negative

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
11/2/2010	AF	10087	9855	PASS
12/1/2010	DY	10087	10125	PASS
1/10/2011	DY	10087	10044	PASS
2/1/2011	DY	10087	10098	PASS
3/12/2011	DY	10087	10044	PASS
4/5/2011	DY	10087	10152	PASS
5/3/2011	DY	10087	10260	PASS
6/27/2011	DY	10087	9936	PASS
7/7/2011	DY	10087	10071	PASS
8/15/2011	DY	10087	10017	PASS
9/16/2011	DY	10087	10017	PASS
10/14/2011	DY	10087	9936	PASS
11/8/2011	DY	10087	10152	PASS
12/12/2011	DY	10087	10206	PASS
1/10/2012	DY	10087	10152	PASS
2/1/2012	DY	10087	10179	PASS
3/1/2012	DY	10087	10098	PASS
4/9/2012	DY	10087	10152	PASS
5/4/2012	DY	10087	10152	PASS
6/23/2012	DY	10087	10152	PASS

Comments:

10,000x - Screen

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
11/2/2010	AF	8071	7884	PASS
12/1/2010	DY	8071	7884	PASS
1/10/2011	DY	8071	7984	PASS
2/1/2011	DY	8071	8086	PASS
3/12/2011	DY	8071	7984	PASS
4/5/2011	DY	8071	8170	PASS
5/3/2011	DY	8071	7984	PASS
6/27/2011	DY	8071	8086	PASS
7/7/2011	DY	8071	8086	PASS
8/15/2011	DY	8071	7984	PASS
9/16/2011	DY	8071	7984	PASS
10/14/2011	DY	8071	7884	PASS
11/8/2011	DY	8071	8299	PASS
12/12/2011	DY	8071	8410	PASS
1/10/2012	DY	8071	8299	PASS
2/1/2012	DY	8071	8086	PASS
3/1/2012	DY	8071	8086	PASS
4/9/2012	DY	8071	8086	PASS
5/4/2012	DY	8071	8086	PASS
6/23/2012	DY	8071	8086	PASS

Comments:

Monthly Report for TEM Calibrations

Laboratory: Manhattan

Scope: 03-01

Detector: 3324

Calibration of On Screen 0.5 and 5µm
Measuring Aids at EPA AHERA Magnification
(Monthly)

Date	Initials	Small Circle microns	Large Circle microns
11/2/2010	AF	0.46	4.77
12/1/2010	DY	0.46	4.75
1/10/2011	DY	0.47	4.86
2/1/2011	DY	0.47	4.86
3/12/2011	DY	0.47	4.86
4/5/2011	DY	0.45	4.68
5/3/2011	DY	0.47	4.86
6/27/2011	DY	0.46	4.75
7/7/2011	DY	0.45	4.68
8/15/2011	DY	0.47	4.86
9/16/2011	DY	0.45	4.72
10/14/2011	DY	0.45	4.72
11/8/2011	DY	0.45	4.72
12/12/2011	DY	0.44	4.63
1/10/2012	DY	0.44	4.63
2/1/2012	DY	0.44	4.63
3/1/2012	DY	0.46	4.75
4/9/2012	DY	0.45	4.70
5/4/2012	DY	0.47	4.86
6/23/2012	DY	0.47	4.86
Comments:			

Calibration of On Screen 1.0 and 10µm
Measuring Aids at EPA 100.2 Magnification
(Monthly)

Date	Initials	Small Circle microns	Large Circle microns
11/2/2010	AF	0.89	9.26
12/1/2010	DY	0.89	9.26
1/10/2011	DY	0.88	9.14
2/1/2011	DY	0.87	9.03
3/12/2011	DY	0.88	9.14
4/5/2011	DY	0.86	8.94
5/3/2011	DY	0.88	9.14
6/27/2011	DY	0.87	9.03
7/7/2011	DY	0.87	9.03
8/15/2011	DY	0.88	9.14
9/16/2011	DY	0.88	9.14
10/14/2011	DY	0.89	9.26
11/8/2011	DY	0.84	8.80
12/12/2011	DY	0.83	8.68
1/10/2012	DY	0.84	8.80
2/1/2012	DY	0.87	9.03
3/1/2012	DY	0.87	9.03
4/9/2012	DY	0.87	9.03
5/4/2012	DY	0.87	9.03
6/23/2012	DY	0.87	9.03
Comments:			

Spot Size Measurements
(Quarterly)

Date	Initials	Actual Spot	Target Spot Size	FAIL ≤250nm =	Is 2 SD <25% of
6/25/2009	ES	206.91	≤ 250 nm	PASS	PASS
6/29/2009	ES	206.91	≤ 250 nm	PASS	PASS
6/30/2009	ES	206.91	≤ 250 nm	PASS	PASS
7/8/2009	ES	206.91	≤ 250 nm	PASS	PASS
7/17/2009	ES	181.05	≤ 250 nm	PASS	PASS
7/25/2009	ES	182.06	≤ 250 nm	PASS	PASS
7/31/2009	ES	182.06	≤ 250 nm	PASS	PASS
8/3/2009	ES	236.07	≤ 250 nm	PASS	PASS
11/11/2009	ES	211.04	≤ 250 nm	PASS	PASS
1/21/2010	GI	155.18	≤ 250 nm	PASS	PASS
3/24/2010	GI	205.76	≤ 250 nm	PASS	PASS
6/25/2010	JA	211.64	≤ 250 nm	PASS	PASS
9/3/2010	DY	219.84	≤ 250 nm	PASS	PASS
12/1/2010	DY	197.29	≤ 250 nm	PASS	PASS
3/12/2011	DY	210.44	≤ 250 nm	PASS	PASS
6/27/2011	DY	238.10	≤ 250 nm	PASS	PASS
9/16/2011	DY	157.38	≤ 250 nm	PASS	PASS
12/12/2011	DY	228.94	≤ 250 nm	PASS	PASS
3/1/2012	DY	209.25	≤ 250 nm	PASS	PASS
6/23/2012	DY	214.09	≤ 250 nm	PASS	PASS
Comments:					

Monthly Report for TEM Calibrations

Laboratory: Manhattan

Scope: 03-01

Detector: 3324

K Factors

(Semi-Annually)

Test Dates	Initials	Mean K Factor	Pass Criteria	Actual	PASS FAIL	Acceptance Criteria	PASS/FAIL
11/20/2011	DY	Mg:Si	1.0 - 2.0	1.74	PASS	2SD < 10% Mean	PASS
6/24/2012	DY	Ca:Si	1.0 - 1.75	1.17	PASS	2SD < 10% Mean	PASS
----		Fe:Si	1.0 - 2.0	1.51	PASS	2SD < 10% Mean	PASS
----		Mg:Fe	1.5 or less	1.16	PASS	N / A	N / A
11/20/2011	DY	Na:Si	1.0 - 4.0	3.14	PASS	2SD < 20% Mean	PASS
6/24/2012	DY	Al:Si	1.0 - 1.75	1.27	PASS	2SD < 10% Mean	PASS

Comments:

Detector Resolution

(Semi-Annually / Quarterly when necessary to meet TNI Standard)

Date	@Mn Kα Peak Initials	Resolution	<175?	Resolution + 2(s) <180?
3/20/2009	ES	150.2	Pass	Pass
6/12/2009	ES	155.6	Pass	Pass
11/17/2009	ES	140.2	Pass	Pass
5/17/2010	ES/AF	149.3	Pass	Pass
11/11/2010	ES	151.8	Pass	Pass
5/31/2011	DY	128.6	Pass	Pass
10/4/2011	DY	131.0	Pass	Pass
10/14/2011	DY	132.0	Pass	Pass
1/10/2012	DY	126.4	Pass	Pass
4/9/2012	DY	138.4	Pass	Pass

Comments:

Significant Na and Resolvable Mg-Si Peaks

(Quarterly)

Significant Na Date	Initials		Resolvable Date	Initials	Mg	Si
3/17/2010	ES	Pass	3/17/10	ES	Yes	Yes
6/28/2010	ES	Pass	6/30/10	JA	Yes	Yes
9/3/2010	DY	Pass	9/16/10	DY	Yes	Yes
12/1/2010	DY	Pass	12/1/10	DY	Yes	Yes
3/12/2011	DY	Pass	3/12/11	DY	Yes	Yes
6/8/2011	DY	Pass	6/8/11	DY	Yes	Yes
9/9/2011	DY	Pass	9/9/11	DY	Yes	Yes
12/20/2011	DY	Pass	12/20/11	DY	Yes	Yes
3/1/2012	DY	Pass	3/1/12	DY	Yes	Yes
6/23/2012	DY	Pass	6/23/12	DY	Yes	Yes

Comments:

Monthly Report for TEM Calibrations

Laboratory: Cinnaminson

Scope: 04-03

Detector: PGT Avalon

Chrysotile Beam Dose Sensitivity

(Quarterly)

Date	Initials	Negative Numbers		At least 90% of patterns >15 seconds ?
		SAED	Morphology	
11/3/2009	KLB	03-356	03-357	PASS
2/8/2010	DY	03_372	03_373	PASS
5/18/2010	DY	03373	03374	PASS
8/16/2010	DY	03030	03031	PASS
11/5/2010	CG	11-5-10CG6	11-5-10CG5	PASS
2/18/2011	CG	03125	03126	PASS
5/20/2011	CG	03155	03154	PASS
8/18/2011	CG	03227	03228	PASS
11/4/2011	CG	03316	03317	PASS
2/7/2012	RD	MSL 0403 12	EMSL 0403 129	PASS
4/30/2012	PH	03128	03129	PASS
7/23/2012	PH	03303	03304	PASS

Comments:

Camera Constant Calibrations

(Monthly / Weekly when Water Analysis is performed)

Negative (Camera)					
Date	Initials	Negative Number	Camera Length	Camera Constant	Is 2 Standard Dev. < 5% Mean?
4/13/2012	PH	03108	100	520.42	PASS
4/20/2012	PH	03117	100	523.40	PASS
4/27/2012	PH	03127	100	521.30	PASS
5/4/2012	PH	03131	100	516.78	PASS
5/11/2012	PH	03135	100	517.01	PASS
5/18/2012	PH	03140	100	515.10	PASS
5/25/2012	PH	03173	100	516.15	PASS
5/30/2012	PH	03187	100	521.56	PASS
6/6/2012	PH	03188	100	522.45	PASS
6/12/2012	PH	03203	100	522.34	PASS
6/18/2012	PH	03255	100	524.45	PASS
6/25/2012	PH	03261	100	521.42	PASS
6/29/2012	PH	03282	100	532.98	PASS
7/2/2012	PH	03286	100	536.29	PASS
7/9/2012	PH	03287	100	539.13	PASS
7/13/2012	PH	03294	100	523.68	PASS
7/20/2012	PH	03297	100	534.25	PASS
7/23/2012	PH	03305	100	533.52	PASS
7/30/2012	PH	03311	100	533.18	PASS
8/6/2012	PH	03316	100	533.04	PASS

Comments: Scope down for repair 2/23/12 through 2/29/12. Weekly calibrations not done during this time.

Monthly Report for TEM Calibrations

Laboratory: Cinnaminson

Scope: 04-03

Detector: PGT Avalon

Camera Constant Calibrations

(Monthly / Weekly when Water Analysis is performed)

On Screen					
Date	Initials	Camera Length	Aperture #	Aperture Diameter	Is 2 Standard Dev. < 5% Mean?
4/13/2012	PH	24	1	1.18	PASS
4/20/2012	PH	24	1	1.20	PASS
4/27/2012	PH	24	1	1.18	PASS
5/4/2012	PH	24	1	1.18	PASS
5/11/2012	PH	24	1	1.20	PASS
5/18/2012	PH	24	1	1.20	PASS
5/25/2012	PH	24	1	1.18	PASS
5/30/2012	PH	24	1	1.18	PASS
6/6/2012	PH	24	1	1.18	PASS
6/12/2012	PH	24	1	1.18	PASS
6/18/2012	PH	24	1	1.20	PASS
6/25/2012	PH	24	1	1.20	PASS
6/29/2012	PH	24	1	1.20	PASS
7/2/2012	PH	24	1	1.18	PASS
7/9/2012	PH	24	1	1.18	PASS
7/13/2012	PH	24	1	1.20	PASS
7/20/2012	PH	24	1	1.20	PASS
7/23/2012	PH	24	1	1.18	PASS
7/30/2012	PH	24	1	1.20	PASS
8/6/2012	PH	24	1	1.20	PASS

The above aperture diameter represents the on screen diameter in reciprocal space. Multiply this number times the number of layer lines seen to get layer line spacing.

Comments: Scope down for repair 2/23/12 through 2/29/12, Weekly calibrations not done during that time.

Plasma Asher Calibration

(Quarterly)

Time To Ash 5% of Collapsed MCE Filter			
Date	Initials	Min	Sec
10/28/2009	SNS	3	18
2/2/2010	SNS	6	49
5/12/2010	DY	7	28
8/20/2010	DS	9	32
9/13/2010	WP	4	15

Comments: This asher is no longer in use as of Dec 2010. The asher currently in use for TEM prep is on the Scope 0401 calibration report.

Monthly Report for TEM Calibrations

Laboratory: Cinnaminson

Scope: 04-03

Detector: PGT Avalon

Magnification Calibrations
(Monthly)

20,000x - Negative

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
2/17/2011	CG	20848	21330	PASS
3/18/2011	CG	20848	21330	PASS
4/15/2011	CG	20848	21330	PASS
5/20/2011	CG	20848	20790	PASS
6/13/2011	CG	20848	20304	PASS
7/12/2011	CG	20848	20790	PASS
8/11/2011	CG	20848	21276	PASS
9/15/2011	CG	20848	20385	PASS
10/12/2011	CG	20848	20925	PASS
11/4/2011	CG	20848	21060	PASS
12/4/2011	CG	20848	20925	PASS
1/4/2012	CG	20848	21060	PASS
2/7/2012	RD	20848	19764	PASS
3/2/2012	PH	20848	20844	PASS
3/30/2012	PH	20848	20628	PASS
4/27/2012	PH	20848	20412	PASS
5/25/2012	PH	20848	21060	PASS
6/18/2012	PH	20848	20952	PASS
7/13/2012	PH	20848	20952	PASS
8/6/2012	PH	20848	20628	PASS
Comments:				

20,000x - Screen

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
2/17/2011	CG	14408	14521	PASS
3/18/2011	CG	14408	14644	PASS
4/15/2011	CG	14408	14644	PASS
5/20/2011	CG	14408	14400	PASS
6/13/2011	CG	14408	14521	PASS
7/12/2011	CG	14408	14400	PASS
8/11/2011	CG	14408	14521	PASS
9/15/2011	CG	14408	14521	PASS
10/11/2011	CG	14408	14281	PASS
11/4/2011	CG	14408	14400	PASS
12/4/2011	CG	14408	14281	PASS
1/4/2012	CG	14408	14281	PASS
2/7/2012	RD	14408	14281	PASS
3/2/2012	PH	14408	14400	PASS
3/30/2012	PH	14408	14164	PASS
4/27/2012	PH	14408	14281	PASS
5/25/2012	PH	14408	14281	PASS
6/18/2012	PH	14408	14521	PASS
7/13/2012	PH	14408	14400	PASS
8/6/2012	PH	14408	14281	PASS
Comments:				

10,000x - Negative

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
2/17/2011	CG	10486	10584	PASS
3/18/2011	CG	10486	10843	PASS
4/15/2011	CG	10486	10692	PASS
5/20/2011	CG	10486	10584	PASS
6/13/2011	CG	10486	10303	PASS
7/12/2011	CG	10486	10368	PASS
8/11/2011	CG	10486	10627	PASS
9/15/2011	CG	10486	10152	PASS
10/12/2011	CG	10486	10584	PASS
11/4/2011	CG	10486	10541	PASS
12/4/2011	CG	10486	10476	PASS
1/4/2012	CG	10486	10584	PASS
2/7/2012	RD	10486	9936	PASS
3/2/2012	PH	10486	10584	PASS
3/30/2012	PH	10486	10476	PASS
4/27/2012	PH	10486	10476	PASS
5/25/2012	PH	10486	10368	PASS
6/18/2012	PH	10486	10476	PASS
7/13/2012	PH	10486	10584	PASS
8/6/2012	PH	10486	10476	PASS
Comments:				

10,000x - Screen

Date	Initials	Target Mag	Actual Mag	Is 2 SD <5% of Mean?
2/17/2011	CG	7249	7261	PASS
3/18/2011	CG	7249	7448	PASS
4/15/2011	CG	7249	7448	PASS
5/20/2011	CG	7249	7291	PASS
6/13/2011	CG	7249	7353	PASS
7/12/2011	CG	7249	7291	PASS
8/11/2011	CG	7249	7322	PASS
9/15/2011	CG	7249	7200	PASS
10/11/2011	CG	7249	7140	PASS
11/4/2011	CG	7249	7140	PASS
12/4/2011	CG	7249	7170	PASS
1/4/2012	CG	7249	7170	PASS
2/7/2012	RD	7249	7170	PASS
3/2/2012	PH	7249	7261	PASS
3/30/2012	PH	7249	7111	PASS
4/27/2012	PH	7249	7200	PASS
5/25/2012	PH	7249	7230	PASS
6/18/2012	PH	7249	7291	PASS
7/13/2012	PH	7249	7230	PASS
8/6/2012	PH	7249	7200	PASS
Comments:				

Monthly Report for TEM Calibrations

Laboratory: Cinnaminson

Scope: 04-03

Detector: PGT Avalon

Calibration of On Screen 0.5 and 5µm

Measuring Aids at EPA AHERA Magnification

(Monthly)

Date	Initials	Small Circle microns	Large Circle microns
2/17/2011	CG	0.55	5.51
3/18/2011	CG	0.55	5.46
4/15/2011	CG	0.55	5.46
5/20/2011	CG	0.56	5.56
6/13/2011	CG	0.55	5.51
7/12/2011	CG	0.56	5.56
8/11/2011	CG	0.55	5.51
9/15/2011	CG	0.55	5.51
10/11/2011	CG	0.56	5.60
11/4/2011	CG	0.56	5.56
12/4/2011	CG	0.56	5.60
1/4/2012	CG	0.56	5.60
2/7/2012	RD	0.56	5.60
3/2/2012	PH	0.56	5.56
3/30/2012	PH	0.56	5.65
4/27/2012	PH	0.56	5.60
5/25/2012	PH	0.56	5.60
6/18/2012	PH	0.55	5.51
7/13/2012	PH	0.56	5.56
8/6/2012	PH	0.56	5.60
Comments:			

Calibration of On Screen 1.0 and 10µm

Measuring Aids at EPA 100.2 Magnification

(Monthly)

Date	Initials	Small Circle microns	Large Circle microns
2/17/2011	CG	1.10	11.02
3/18/2011	CG	1.07	10.74
4/15/2011	CG	1.07	10.74
5/20/2011	CG	1.10	10.97
6/13/2011	CG	1.09	10.88
7/12/2011	CG	1.10	10.97
8/11/2011	CG	1.09	10.93
9/15/2011	CG	1.11	11.11
10/11/2011	CG	1.12	11.20
11/4/2011	CG	1.12	11.20
12/4/2011	CG	1.12	11.16
1/4/2012	CG	1.12	11.16
2/7/2012	RD	1.12	11.16
3/2/2012	PH	1.10	11.02
3/30/2012	PH	1.13	11.25
4/27/2012	PH	1.11	11.11
5/25/2012	PH	1.11	11.06
6/18/2012	PH	1.10	10.97
7/13/2012	PH	1.11	11.06
8/6/2012	PH	1.11	11.11
Comments:			

Spot Size Measurements

(Quarterly)

Date	Initials	Actual Spot	Target Spot Size	FAIL ≤250nm =	Is 2 SD <25% of
3/8/2011	CG	216.38	≤ 250 nm	PASS	PASS
3/18/2011	CG	192.34	≤ 250 nm	PASS	PASS
4/15/2011	CG	201.95	≤ 250 nm	PASS	PASS
5/20/2011	CG	240.42	≤ 250 nm	PASS	PASS
6/13/2011	CG	231.48	≤ 250 nm	PASS	PASS
7/12/2011	CG	216.45	≤ 250 nm	PASS	PASS
8/11/2011	CG	197.41	≤ 250 nm	PASS	PASS
9/15/2011	CG	245.28	< 250 nm	PASS	PASS
10/12/2011	CG	215.05	≤ 250 nm	PASS	PASS
11/4/2011	CG	223.17	≤ 250 nm	PASS	PASS
12/4/2011	CG	219.83	≤ 250 nm	PASS	PASS
1/4/2012	CG	213.68	≤ 250 nm	PASS	PASS
2/7/2012	RD	207.45	≤ 250 nm	PASS	PASS
3/2/2012	PH	191.90	≤ 250 nm	PASS	PASS
3/30/2012	PH	184.22	≤ 250 nm	PASS	PASS
4/27/2012	PH	195.96	≤ 250 nm	PASS	PASS
5/25/2012	PH	189.93	≤ 250 nm	PASS	PASS
6/18/2012	PH	167.05	≤ 250 nm	PASS	PASS
7/13/2012	PH	181.37	≤ 250 nm	PASS	PASS
8/6/2012	PH	169.67	≤ 250 nm	PASS	PASS
Comments:					

Monthly Report for TEM Calibrations

Laboratory: Cinnaminson

Scope: 04-03

Detector: PGT Avalon

K Factors

(Semi-Annually)

Test Dates	Initials	Mean K Factor	Pass Criteria	Actual	PASS FAIL	Acceptance Criteria	PASS/FAIL
5/21/2012	PH	Mg:Si	1.0 - 2.0	1.72	PASS	2SD < 10% Mean	PASS
5/21/2012	PH	Ca:Si	1.0 - 1.75	1.14	PASS	2SD < 10% Mean	PASS
----		Fe:Si	1.0 - 2.0	1.53	PASS	2SD < 10% Mean	PASS
----		Mg:Fe	1.5 or less	1.13	PASS	N / A	N / A
11/25/2011	CG	Na:Si	1.0 - 4.0	2.81	PASS	2SD < 20% Mean	PASS
5/21/2012	PH	Al:Si	1.0 - 1.75	1.15	PASS	2SD < 10% Mean	PASS

Comments:

Detector Resolution

(Semi-Annually / Quarterly when necessary to meet TNI Standard)

Date	@Mn Kα Peak Initials	Resolution	<175?	Resolution + 2(s) <180?
11/3/2009	KLB	141.0	Pass	Pass
4/28/2010	DY	131.0	Pass	Pass
11/4/2010	CG	120.0	Pass	Pass
5/20/2011	CG	135.0	Pass	Pass
8/18/2011	CG	125.0	Pass	Pass
11/4/2011	CG	135.0	Pass	Pass
2/7/2012	GPA	134.8	Pass	Pass
2/7/2012	RD	117.3	Pass	Pass
4/30/2012	PH	127.7	Pass	Pass
7/23/2012	PH	124.4	Pass	Pass

Comments:

Significant Na and Resolvable Mg-Si Peaks

(Quarterly)

Date	Initials	Significant Na		Date	Initials	Resolvable Mg	Resolvable Si
4/28/2010	DY	Pass		4/28/10	DY	Yes	Yes
7/28/2010	DY	Pass		7/28/10	DY	Yes	Yes
11/5/2010	CG	Pass		11/4/10	CG	Yes	Yes
2/18/2011	CG	Pass		2/18/11	CG	Yes	Yes
5/20/2011	CG	Pass		5/20/11	CG	Yes	Yes
8/18/2011	CG	Pass		8/18/11	CG	Yes	Yes
11/4/2011	CG	Pass		11/4/11	CG	Yes	Yes
2/7/2012	RD	Pass		2/7/12	RD	Yes	Yes
4/30/2012	PH	Pass		4/30/12	PH	Yes	Yes
7/23/2012	PH	Pass		7/23/12	PH	Yes	Yes

Comments:

7. NVLAP/AIHA Certifications

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101048-0

EMSL Analytical, Inc.

Cinnaminson, NJ

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

AIRBORNE ASBESTOS FIBER ANALYSIS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2012-07-01 through 2013-06-30

Effective dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
Mr. Stephen Siegel, CIH
Phone: 800-220-3675 Fax: 856-786-5973
E-Mail: ssiegel@emsl.com
URL: http://www.emsl.com

AIRBORNE ASBESTOS FIBER ANALYSIS (TEM) **NVLAP LAB CODE 101048-0**

NVLAP Code	*Designation / Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

2012-07-01 through 2013-06-30
Effective dates

For the National Institute of Standards and Technology

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101048-0

EMSL Analytical, Inc.

Cinnaminson, NJ

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

BULK ASBESTOS FIBER ANALYSIS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2012-07-01 through 2013-06-30

Effective dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
Mr. Stephen Siegel, CIH
Phone: 800-220-3675 Fax: 856-786-5973
E-Mail: ssiegel@emsl.com
URL: http://www.emsl.com

BULK ASBESTOS FIBER ANALYSIS (PLM) **NVLAP LAB CODE 101048-0**

NVLAP Code	*Designation / Description*
18/A01	EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

2012-07-01 through 2013-06-30
Effective dates

For the National Institute of Standards and Technology

AIHA

Laboratory Accreditation Programs, LLC

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

EMSL Analytical Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Laboratory ID: 100194

has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC thereby conforming to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories.* The above named laboratory, along with all premises from which key activities are performed, as listed above, have been accredited by AIHA-LAP, LLC in the following:

LABORATORY ACCREDITATION PROGRAMS

√	**INDUSTRIAL HYGIENE**	Accreditation Expires: July 01, 2012
√	**ENVIRONMENTAL LEAD**	Accreditation Expires: July 01, 2012
√	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: July 01, 2012
☐	**FOOD**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation.** Continued accreditation is contingent upon successful on-going compliance with AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation.** Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current scope of accreditation.

Dave Sandusky

Dave Sandusky, CIH
Chairperson, Analytical Accreditation Board

Date Issued: 07/01/2010

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

EMSL Analytical, Inc.
107 Haddon Avenue, Westmont, NJ 08108

Laboratory ID: 100194
Issue Date: 07/01/2010

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or revocation. A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 02/01/1989

IHLAP Category	Field of Testing (FoT)	Method	Method Description *(for internal methods only)*
Core Program Testing	Gas Chromatography	NIOSH 1003	
		NIOSH 1005	
		NIOSH 1400	
		NIOSH 1500	
		NIOSH 1550	
		NIOSH 1603	
		NIOSH 2000	
		NIOSH 2551	
		NIOSH 5502	
		NIOSH 5503	
		NIOSH 5510	
		OSHA 1010	
	GC (Diffusive Samplers)	NIOSH 1003	
		NIOSH 1005	
		NIOSH 1501	
	GC/MS	EPA TO-15	
	HPLC	NIOSH 2016	
		NIOSH 5506	
		OSHA 47	
		OSHA 58	
	AA	NIOSH 6009	
		NIOSH 7105	
		OSHA ID-140	
		OSHA ID-145	
	ICP	NIOSH 7300	
	XRD	NIOSH 7500	
	Ion Chromatography	NIOSH 6004	
		NIOSH 6011	
		NIOSH 7903	

AIHA
Laboratory Accreditation Programs, LLC

IHLAP Category	Field of Testing (FoT)	Method	Method Description *(for internal methods only)*
Core Program Testing	Ion Chromatography	OSHA ID-214	
		OSHA ID-215	
	Gravimetric	NIOSH 0500	
		NIOSH 0600	
	UV/VIS (Colorimetric)	NIOSH 6010	
	Thermal Optical Analyzer	NIOSH 5040	
	Polarized Light Microscopy (PLM)	EPA 600/R-93/116	
	Phase Contrast Microscopy (PCM)	NIOSH 7400	
	Transmission Electron Microscopy (TEM)	EPA AHERA - 40 CFR Part 763	
		NIOSH 7402	

The laboratory participates in the following AIHA-LAP, LLC-approved proficiency testing programs:

- ✓ Metals*
- ✓ Silica*
- ✓ Asbestos*
- ☐ Bulk Asbestos*
- ✓ Beryllium
- ✓ Organic Solvents*
- ✓ Diffusive Sampler (3M)*
- ☐ Diffusive Sampler (SKC)*
- ☐ Diffusive Sampler (AT)
- ✓ WASP[1] (Formaldehyde)
- ☐ WASP[1] (Thermal Desorption Tubes)
- ☐ Pharmaceutical Round Robin
- ☐ Compressed/Breathing Air Round Robin
- ☐ NVLAP (determined at the time of site assessment)

[1] Workplace Analytical Scheme for Proficiency

8. Customer Correspondence

McDaniel, Debrah

Subject: FW: Phillips Mine SAP

From: Samantha Caruthers-Knight [mailto:Samantha.Caruthers-Knight@errg.com]
Sent: Thursday, June 21, 2012 5:06 PM
To: Denton, Robyn
Subject: RE: Phillips Mine SAP

Samples designated with AA are ambient air and samples with AM are activity based (air monitoring).

From: Denton, Robyn [mailto:rdenton@EMSL.com]
Sent: Thursday, June 21, 2012 2:01 PM
To: Samantha Caruthers-Knight
Subject: RE: Phillips Mine SAP

Hi Samantha, Just one final Question so I can get this cost quote out to you.

The cost quote will be determined by the type of sample, Ambient Air or Activity Based, since they have different analytical sensitivities.

These aren't denoted on your COC, can you tell me which samples are activity based and which are ambient air?
Thanks

Robyn Denton | *Laboratory Manager*
EMSL Analytical, Inc. | 200 Route 130 North | Cinnaminson, NJ 08077
Phone: 856-303-2556 | Fax: 856-786-5974 | Toll Free: 800-220-3675
Lab Hours: Mon-Friday 7AM-10PM, Saturday 8AM-5PM, Sunday On-Call

---

From: Samantha Caruthers-Knight [mailto:Samantha.Caruthers-Knight@errg.com]
Sent: Thursday, June 21, 2012 3:05 PM
To: Denton, Robyn
Subject: Phillips Mine SAP

Here is our workplan/SAP for the Phillips project. Please have a look and then we can discuss the proper sampling methods etc.

Samantha

McDaniel, Debrah

Subject: FW: ISO

From: Cahill, Ed
Sent: Friday, June 22, 2012 4:36 PM
To: 'Samantha Caruthers-Knight'
Cc: Denton, Robyn; Murdock, Ian
Subject: ISO

Samantha:
I have instructed the lab to begin prep and analysis of 3 ABS samples (3,5,45 from the cost estimate spreadsheet).
By close of business Monday or early Tuesday we should be able to give you at least a verbal estimation of fiber loading.
Hopefully that information will help us to chart a course forward.
If you have any questions my direct number is below.

Ed Cahill | Vice President, Asbestos Division
200 Route 130 North | Cinnaminson, NJ 08077
Phone: 856-303-2565

From: Samantha Caruthers-Knight [mailto:Samantha.Caruthers-Knight@errg.com]
Sent: Friday, June 22, 2012 3:14 PM
To: Cahill, Ed
Subject: RE:

Ok, so I'm working on figuring out what the sensitivity level we need for these samples is. According to our work plan (attached for your reference) we are trying to determine if there is either >1%, between 1% and 0.25% or less than 0.25% (see section 5). I'm not sure how that translates to the sensitivity levels or the number of grid openings. I would assume if we do see anything over 1% we could quit counting and minimize the number of grid openings that need to be counted. Perhaps this gives you something to go off of? I think the best plan might be for me to flag a few of the samples which I expect to have either the highest or lowest concentrations and see where we are, and go from there? A I mentioned on the phone yesterday, I'm not really sure how all this works so maybe we can talk things over on the phone this afternoon. Once you have had a change to look over the work plan and think a bit please give me a call on my cell at : 510-851-3279

Thanks,
Samantha

From: Cahill, Ed [mailto:ECahill@EMSL.com]
Sent: Thursday, June 21, 2012 3:39 PM
To: Samantha Caruthers-Knight
Subject: FW:

Hi Samantha:
As discussed, ISO Analysis cost estimate attached

Ed Cahill | Vice President, Asbestos Division
200 Route 130 North | Cinnaminson, NJ 08077
Phone: 856-303-2565

EMSL Analytical, Inc.

200North, Route 130, Cinnaminson, NJ. 08077
Phone: (800) 220-3675

Attn.: *Samantha Caruthers-Knight*
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA. 94553
Phone: 925-969-0750 Fax: 925-969-0751 Email: Samanth.knight@errg.com

EMSL Case No.: 361201904
Sample(s) Received: 6/22/2012
Date of Analysis: 7/10/2012
Date Printed: 7/10/2012
Reported By: J.Newton

- Laboratory Report -

Project: 2011-149

Conclusions:

- No Asbestiform minerals were observed in the samples.

Procurement of Samples and Analytical Overview:

The material for analysis arrived at EMSL Analytical (Cinnaminson, NJ) on 6/22/2012. The package arrived in satisfactory condition with no evidence of damage to the contents. The samples reported herein have been analyzed for Asbestos Fibers per the following equipment and methodologies.

Instruments/Methods:	Scanning Electron Microscope, JEOL 6400 Energy Dispersive X-Ray Spectrometer, EVEX Nano
Definitions:	Asbestos: Any of a group of six regulated naturally occurring, fibrous minerals. ND: None Detected LOQ: Limit of Quantitation str/L: Structures per liter

Analyzed by: *John Newton*, *Senior Materials Scientist* — 10 July 2012 (*Date*)

Reviewed/Approved by : *Shannon Kauffman*, *Approved Signatory* — 10 July 2012 (*Date*)

EMSL Analytical, Inc.

200North, Route 130, Cinnaminson, NJ. 08077
Phone: (800) 220-3675

Attn.: Samantha Caruthers-Knight
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA. 94553
Phone: 925-969-0750 Fax: 925-969-0751 Email: Samanth.knight@errg.com

EMSL Case No.: 361201904
Sample(s) Received: 6/22/2012
Date of Analysis: 7/10/2012
Date Printed: 7/10/2012
Reported By: J.Newton

Summary of Results:

Sample ID	*Description*	*Fiber Type*	*Number of Structures*	*Concentration (str/cc)*	*Limits (LOQ/LOD)*
PA-ATVI-AA-01	Phillips Mine	Chrysotile	0	<LOQ	LOQ (str/cc)
		Amphibole	0	<LOQ	*0.0056*
Volume (L)=	791.1	Cleavage Frag.	0	<LOQ	
Area Analyzed (mm^2)=	0.216	Other	0	<LOQ	LOD (str/mm^2)
		Total	0	<LOQ	*4.63*
PA-ATVI-AM-02	Phillips Mine	Chrysotile	0	<LOQ	LOQ (str/cc)
		Amphibole	0	<LOQ	*0.0090*
Volume (L)=	396.1	Cleavage Frag.	0	<LOQ	
Area Analyzed (mm^2)=	0.270	Other	2 (A)	0.018	LOD (str/mm^2)
		Total	2	0.018	*3.70*
PA-UW-AM-04	Phillips Mine	Chrysotile	0	<LOQ	LOQ (str/cc)
		Amphibole	0	<LOQ	*0.0098*
Volume (L)=	456.7	Cleavage Frag.	0	<LOQ	
Area Analyzed (mm^2)=	0.216 (C)	Other	11 (A,B)	0.107	LOD (str/mm^2)
		Total	11	0.107	*4.63*
PA-ATV2-AA-05	Phillips Mine	Chrysotile	0	<LOQ	LOQ (str/cc)
		Amphibole	0	<LOQ	*0.0087*
Volume (L)=	513.4	Cleavage Frag.	0	<LOQ	
Area Analyzed (mm^2)=	0.216	Other	1 (A)	0.0087	LOD (str/mm^2)
		Total	1	0.0087	*4.63*
PA-BG-AA-02	Phillips Mine	Chrysotile	0	<LOQ	LOQ (str/cc)
		Amphibole	0	<LOQ	*0.0090*
Volume (L)=	492.5	Cleavage Frag.	0	<LOQ	
Area Analyzed (mm^2)=	0.216	Other	0	<LOQ	LOD (str/mm^2)
		Total	0	<LOQ	*4.63*

A. Organic fibers consistent with plant matter.
B. One fiber consisting of iron oxide
C. Additional field area was analyzed to compensate for the low sample volume.

EMSL Analytical, Inc.

200North, Route 130, Cinnaminson, NJ. 08077
Phone: (800) 220-3675

Attn.: *Samantha Caruthers-Knight*
Engineering/Remediation Resources Group
4585 Pacheco Blvd
Suite 200
Martinez, CA. 94553
Phone: 925-969-0750 Fax: 925-969-0751 Email: Samanth.knight@errg.com

EMSL Case No.: 361201904
Sample(s) Received: 6/22/2012
Date of Analysis: 7/10/2012
Date Printed: 7/10/2012
Reported By: J.Newton

Important Terms, Conditions, and Limitations:

Sample Retention: Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling may be returned to the client immediately. EMSL reserves the right to charge a sample disposal or return shipping fee.

Change Orders and Cancellation: All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

Warranty: EMSL warrants to its clients that all services provided hereunder shall be performed in accordance with established and recognized analytical testing procedures and with reasonable care in accordance with applicable federal, state and local laws. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. EMSL disclaims any other warranties, express or implied, including a warranty of fitness for particular purpose and warranty of merchantability.

Limits of Liability: In no event shall EMSL be liable for indirect, special, consequential, or incidental damages, including, but not limited to, damages for loss of profit or goodwill regardless of the negligence (either sole or concurrent) of EMSL and whether EMSL has been informed of the possibility of such damages, arising out of or in connection with EMSL's services thereunder or the delivery, use, reliance upon or interpretation of test results by client or any third party. We accept no legal responsibility for the purposes for which the client uses the test results. EMSL will not be held responsible for the improper selection of sampling devices even if we supply the device to the user. The user of the sampling device has the sole responsibility to select the proper sampler and sampling conditions to insure that a valid sample is taken for analysis. Any resampling performed will be at the sole discretion of EMSL, the cost of which shall be limited to the reasonable value of the original sample delivery group (SDG) samples. In no event shall EMSL be liable to a client or any third party, whether based upon theories of tort, contract or any other legal or equitable theory, in excess of the amount paid to EMSL by client thereunder.

The data and other information contained in this report, as well as any accompanying documents, represent only the samples analyzed. They are reported upon the condition that they are not to be reproduced wholly or in part for advertising or other purposes without the written approval from the laboratory.

Appendix D. Alternative Cost Estimate Summary

Table D-1. Alternatives Cost Estimate Summary

Site: Phillips Asbestos Mine Site
Location: Tonto National Forest, Gila County, Arizona
Phase: EE/CA (-30% / +50%)

Remedial Alternative	Total Capital Cost	Total O&M Cost (30 Years)	Total Periodic Cost	Period of Analysis[2]	Total Cost[3]	Present Worth Cost[4]	Range for -30% / +50%
1	$ -	$ -	$ -	30 years	$ -	$ -	$ - to $ -
2	$ 797,852	$ 319,200	$ 105,000	30 years	$ 1,222,052	$ 1,110,932	$ 777,653 to $ 1,666,398
3A	$ 1,289,593	$ 478,800	$ 234,000	30 years	$ 2,002,393	$ 1,896,628	$ 1,327,640 to $ 2,844,942
3B	$ 1,210,465	$ 547,200	$ 279,000	30 years	$ 2,036,665	$ 1,817,501	$ 1,272,250 to $ 2,726,251
4	$ 13,580,792	$ 478,800	$ 210,000	30 years	$ 14,269,592	$ 14,088,016	$ 9,861,611 to $ 21,132,024

Notes:

[1] Appended tables summarize backup calculations for all cost estimates provided.

[2] Period of analysis assumes the base year is 2012.

[3] Total cost includes a 25 percent contingency factor to account for changes in scope, changes to bid quantites, and inflation.

[4] Based on a 2.0 percent discount factor for projects with a 30-year (or greater) duration, as specified for federal facility sites in Appendix C of Office of Management and Budget Circular A-94 (effective December 2011) at http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html.

Table D-2. Alternative 2 - Cost Summary

CAPITAL COSTS: DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Implementation Plans/Setup	1	LS	$25,000	$25,000	Includes pre-mobilization archeological survey, to be conducted prior to other planning documents. Includes 10 days for Technical Staff to complete pre-mobilization plans (including Work Plan and HASP with graphics, review, and production).
Design	1	LS	$8,500	$8,500	Includes 4 days for Technical Staff to complete the design of institutional controls, including a preconstruction survey.
Mobilization and demobilization	1	LS	$35,000	$35,000	Mobilization and demobilization of crew, materials, and equipment. Craft trade crew of four plus one technical person for 2 days. Includes airfare and hotel costs for the duration of work.
Site Work					
Purchase of road closure gates	4	EA	$73.18	$292.71	RS Means Heavy Construction Cost Data 2012, 32 31 13.20 Gate, 4' wide, 5' high, 2" frame, galvanized steel, in concrete, material bare cost.
Purchase of post mounted signs	5	EA	$82.05	$410.24	RS Means Heavy Construction Cost Data 2012, 10 14 0600 Guide and directional signs, 18" x 24" reflectorized, high intensity, material bare cost + 10 14 1500 Steel posts, galvanized, material bare cost.
Purchase of fencing	2,500	LF	$20.40	$51,002.50	RS Means Heavy Construction Cost Data 2012, 32 31 13.20 0600 Fence, chain link industrial, 3 strands barb wire, 2" post @ 10' O.C., set in concrete, 6' H, 6 ga. wire, galv. aluminized steel, material bare cost.
Scarify roads and block access	1	LS	$95,000.00	$95,000.00	10 days of work using a dozer, tracked skidsteer with grapple bucket, backhoe, water truck, and hand tools. Includes installation of fence, road gates and signage.
Adit Closure	1	LS	$280,000.00	$280,000.00	Bat survey of 16 adits, bat gates at 8 adits, safety closures at 8 adits. Backfill safety closures with native soil.
After Action Report	1	LS	$20,000	$20,000	Includes 10 days for Technical Staff to write a completion report, including graphics, review, and production.
SUBTOTAL				**$515,205**	
Contingency	25%			$128,801	15% scope + 10% bid
SUBTOTAL				**$644,007**	
Project Management	10%			$51,520.54	Includes project management during all phases of construction, regulatory interface, permitting, and crew per diems.
Construction Management	12%			$61,824.65	Includes construction management, quality control, surveying, geotechnical testing, and quality control testing.
SUBTOTAL					
Institutional Controls	1	LS	$40,500	$40,500	Forest Plan amendment, legal description for ARIC, and legal fees. Includes reproduction.
	TOTAL CAPITAL CONSTRUCTION COSTS:			**$797,852**	

Table D-2. Alternative 2 - Cost Summary

CAPITAL COSTS: DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Inspections and Maintenance					
Biannual Inspections	2	LS	$ 2,000	$ 4,000	Biannual inspections to evaluate the integrity of all instutional control elements and stormwater BMPs.
Minor Repairs	1	LS	$ 3,000	$ 3,000	Replacement fence, gates and/or signs
SUBTOTAL				**$7,000**	
Contingency	25%			$ 1,750	10% scope + 15% bid
SUBTOTAL				**$8,750**	
Project Management	10%			$700	
Contractor Overhead	7%			$490	
Profit	10%			$700	
			TOTAL ANNUAL O&M COSTS:	**$10,640**	per year
			TOTAL ANNUAL O&M COSTS:	**$319,200**	Years 1-30

PERIODIC COSTS	Year					
Five-Year Review Report	5	1	LS	$10,000	$10,000.00	Preparation of one report at the end of Year 5
Significant Repairs	5	1	LS	$5,000	$5,000.00	Costs for replacement of fence, gates and signs
SUBTOTAL (YEAR 5)					**$15,000.00**	
Five-Year Review Report	10	1	LS	$10,000	$10,000.00	Preparation of one report at the end of Year 10
Major Repairs	10	1	LS	$10,000	$10,000.00	Costs for Major Replacement of fence, gates and signs
SUBTOTAL (YEAR 10)					**$20,000.00**	
Five-Year Review Report	15	1	LS	$10,000	$10,000.00	Preparation of one report at the end of Year 15
Significant Repairs	15	1	LS	$5,000	$5,000.00	Costs for replacement of fence, gates and signs
SUBTOTAL (YEAR 15)					**$15,000.00**	
Five-Year Review Report	20	1	LS	$10,000	$10,000.00	Preparation of one report at the end of Year 20
Major Repairs	20	1	LS	$10,000	$10,000.00	Costs for Major Replacement of fence, gates and signs
SUBTOTAL (YEAR 20)					**$20,000.00**	
Five-Year Review Report	15	1	LS	$10,000	$10,000.00	Preparation of one report at the end of Year 25
Significant Repairs	15	1	LS	$5,000	$5,000.00	Costs for replacement of fence, gates and signs
SUBTOTAL (YEAR 25)					**$15,000.00**	
Five-Year Review Report	20	1	LS	$10,000	$10,000.00	Preparation of one report at the end of Year 30
Major Repairs	20	1	LS	$10,000	$10,000.00	Costs for Major Replacement of fence, gates and signs
SUBTOTAL (YEAR 30)					**$20,000.00**	

Table D-2. Alternative 2 - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES

PRESENT VALUE ANALYSIS:

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (2.0%)	PRESENT VALUE
Capital Cost	0	$ 797,852	$ 797,852	1.000	$ 797,852
Annual O&M Cost	1-30	$ 319,200	$10,640	0.747	$238,298.29
Periodic Cost	5	$15,000.00	$ 15,000	0.906	$ 13,586
Periodic Cost	10	$20,000.00	$ 20,000	0.820	$ 16,407
Periodic Cost	15	$15,000.00	$ 15,000	0.743	$ 11,145
Periodic Cost	20	$20,000.00	$ 20,000	0.673	$ 13,459
Periodic Cost	25	$15,000.00	$ 15,000	0.610	$ 9,143
Periodic Cost	30	$20,000.00	$ 20,000	0.552	$ 11,041
		$1,222,052			$ 1,110,932
TOTAL PRESENT VALUE OF SELECTED REMEDY				$1,110,932	

Notes:

1. Source: Office of Management and Budget, 2008. OMB Circular No. A-94. January. Online at: <http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html>.
2. Source: RS Means Heavy Construction Cost Data 2012
3. RS Means Costs were multiplied by a factor of .887 to account for a Flagstaff, AZ localization factor. (p. 588)
4. Based on a 2.0 percent discount factor for projects with a 30-year (or greater) duration, as specified for federal facility sites in Appendix C of Office of Management and Budget Circular A-94 (effective December 2012)

AC= Acre

BCY= Bank Cubic Yard

CY = cubic yards

ea = each

LCY= Loose Cubic Yard

LF = linear feet

LS = lump sum

LUC = land use control

O&M = operation and maintenance

SF = square feet

SY = square yard

TN= Ton

Table D-3. Alternative 2 - Cash Flow Analysis

Year	Periodic Cost	Annual Cost	Discount Factor	Actual Periodic Cost	Actual Annual Cost
1		$10,640	0.980392157		$10,431.37
2		$10,640	0.961168781		$10,226.84
3		$10,640	0.942322335		$10,026.31
4		$10,640	0.923845426		$9,829.72
5	$15,000	$10,640	0.90573081	$13,585.96	$9,636.98
6		$10,640	0.887971382		$9,448.02
7		$10,640	0.870560179		$9,262.76
8		$10,640	0.853490371		$9,081.14
9		$10,640	0.836755266		$8,903.08
10	$20,000	$10,640	0.8203483	$16,406.97	$8,728.51
11		$10,640	0.804263039		$8,557.36
12		$10,640	0.788493176		$8,389.57
13		$10,640	0.773032525		$8,225.07
14		$10,640	0.757875025		$8,063.79
15	$15,000	$10,640	0.74301473	$11,145.22	$7,905.68
16		$10,640	0.728445814		$7,750.66
17		$10,640	0.714162562		$7,598.69
18		$10,640	0.700159375		$7,449.70
19		$10,640	0.68643076		$7,303.62
20	$20,000	$10,640	0.672971333	$13,459.43	$7,160.41
21		$10,640	0.659775817		$7,020.01
22		$10,640	0.646839036		$6,882.37
23		$10,640	0.634155918		$6,747.42
24		$10,640	0.621721488		$6,615.12
25	$15,000	$10,640	0.609530871	$9,142.96	$6,485.41
26		$10,640	0.597579285		$6,358.24
27		$10,640	0.585862044		$6,233.57
28		$10,640	0.574374553		$6,111.35
29		$10,640	0.563112307		$5,991.51
30	$20,000	$10,640	0.552070889	$11,041.42	$5,874.03

Table D-4. Alternative 3A - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Implementation Plans/Setup	1	LS	$75,000	$75,000.00	Includes pre-mobilization archeological survey, to be conducted prior to other planning documents. Includes 10 days for Technical Staff to complete pre-mobilization plans (including Work Plan and HASP with graphics, review, and production).
Design	1	LS	$50,000	$50,000.00	Includes 20 days for Technical Staff to complete the design of road grades, repository, and restored grades. Includes surveys.
Mobilization and demobilization	1	LS	$100,000	$100,000.00	Mobilization and demobilization of crew, materials, and equipment. Craft trade crew of nine plus one technical person for 4 days. Includes airfare and hotel costs for the duration of work.
Site Work					
Road grading	1	LS	$105,000.00	$105,000.00	8 days of work, Includes use of an excavator, dozer, and backhoe.
Excavation of repository	14,000	BCY	$2.18	$30,548.28	RS Means Heavy Construction Cost Data 2012, 31 23 16.13 1030 Excavating, trench, 10' to 14' deep, 3 cy excavator.
Hauling clean spoils	12,000	BCY	$2.74	$32,889.96	RS Means Heavy Construction Cost Data 2012, 31 23 23.20 5170 Hauling, 22 cy off-road, 15 min wait, 15 mph, cycle 1 mile. Clean spoils hauled for use as borrow material for road repairs and restoration.
Load and haul waste to repository	11,500	BCY	$8.08	$92,875.55	RS Means Heavy Construction Cost Data 2012, G1030 140 3400 Load and haul common earth, 3.5 cy track loader, four 20 cy dump trailers, 1 mi round trip. Multiply by 1.5 for grade at Upper Workings Area.
Encapsulation of repository	5,500	BCY	$1.96	$10,781.49	RS Means Heavy Construction Cost Data 2012, 31 23 23.13 4220 Backfill, structural, 200 HP dozer, 150' haul, common earth + 31 23 23.23 5060 Compaction, riding, vibrating roller, 12" lifts, two passes.
Demarcation fabric	3,000	SY	$1.52	$4,560.00	Quote from Eagle Environmental Products, Inc., Mesa, AZ.
Grading disturbed waste removal areas	8,000	SY	$0.51	$4,044.72	RS Means Heavy Construction Cost Data 2012, 31 22 16.10 3300 Finish Grading slopes, gentle. Multiply by 3 for grade.
Erosion control fabric	11,000	SY	$1.17	$12,879.24	RS Means Heavy Construction Cost Data 2012, 31 25 14.16 0020 Rolled erosion control mats and blankets, jute mesh, 100 sy per roll, 4' wide, stapled.
Hydroseeding with native plants	99	MSF	$71.40	$7,068.95	RS Means Heavy Construction Cost Data 2012, 32 92 19.14 4600 Seeding, slope mix, 6#/MSF, hydro or air seeding, with mulch and fertilizer.
Adit Closure	1	LS	$280,000.00	$280,000.00	Bat survey of 16 adits, bat gates at 8 adits, safety closures at 8 adits. Backfill safety closures with native soil.
4,000 gallon water truck	15	WK	$1,605.00	$24,075.00	Water truck use for dust suppression during all construction activities.
After Action Report	1	LS	$20,000	$20,000.00	Includes 10 Days for Technical Staff to write a completion report, including graphics, review, and production.
SUBTOTAL				**$849,723**	
Contingency	25%			$212,431	15% scope + 10% bid
SUBTOTAL				**$1,062,154**	
Project Management	10%			$84,972.32	Includes project management during all phases of construction, regulatory interface, permitting, and crew per diems.
Construction Management	12%			$101,966.78	Includes construction management, quality control, geotechnical testing, and quality control testing.
SUBTOTAL					
Institutional Controls	1	LS	$40,500	$40,500	Forest Plan amendment, legal description for ARIC, and legal fees. Includes reproduction.
	TOTAL CAPITAL CONSTRUCTION COSTS:			**$1,289,593**	

Table D-4. Alternative 3A - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Inspections and Maintenance					
Biannual Inspections	2	LS	$ 2,000	$ 4,000	Biannual inspections to evaluate the integrity of all cover elements and stormwater BMPs.
Minor Repairs	1	LS	$ 6,500	$ 6,500	Replace erosion control fabric or other BMPs
SUBTOTAL				**$10,500**	
Contingency	25%			$ 2,625	10% scope + 15% bid
SUBTOTAL				**$13,125**	
Project Management	10%			$1,050	
Contractor Overhead	7%			$735	
Profit	10%			$1,050	
		TOTAL ANNUAL O&M COSTS:		**$15,960**	per year
		TOTAL ANNUAL O&M COSTS:		**$478,800**	Years 1-30

PERIODIC COSTS	Year					
Five-Year Review Report	5	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 5
Significant Repairs	5	1	LS	$15,000	$15,000.00	Costs for significant repairs and encapsulation BMPs
SUBTOTAL (YEAR 5)					**$34,000.00**	
Five-Year Review Report	10	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 10
Major Repairs	10	1	LS	$25,000	$25,000.00	Costs for major repairs to encapsulation
SUBTOTAL (YEAR 10)					**$44,000.00**	
Five-Year Review Report	15	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 15
Significant Repairs	15	1	LS	$15,000	$15,000.00	Costs for significant repairs and encapsulation BMPs
SUBTOTAL (YEAR 15)					**$34,000.00**	
Five-Year Review Report	20	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 20
Major Repairs	20	1	LS	$25,000	$25,000.00	Costs for major repairs to encapsulation
SUBTOTAL (YEAR 20)					**$44,000.00**	
Five-Year Review Report	15	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 25
Significant Repairs	15	1	LS	$15,000	$15,000.00	Costs for significant repairs and encapsulation BMPs
SUBTOTAL (YEAR 25)					**$34,000.00**	
Five-Year Review Report	20	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 30
Major Repairs	20	1	LS	$25,000	$25,000.00	Costs for major repairs to encapsulation
SUBTOTAL (YEAR 30)					**$44,000.00**	

Table D-4. Alternative 3A - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES

PRESENT VALUE ANALYSIS:

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (2.0%)	PRESENT VALUE
Capital Cost	0	$ 1,289,593	$ 1,289,593	1.000	$ 1,289,593
Annual O&M Cost	1-30	$ 478,800	$15,960	0.747	$408,511.35
Periodic Cost	5	$34,000.00	$ 34,000	0.906	$ 35,324
Periodic Cost	10	$44,000.00	$ 44,000	0.820	$ 44,299
Periodic Cost	15	$34,000.00	$ 34,000	0.743	$ 28,978
Periodic Cost	20	$44,000.00	$ 44,000	0.673	$ 36,340
Periodic Cost	25	$34,000.00	$ 34,000	0.610	$ 23,772
Periodic Cost	30	$44,000.00	$ 44,000	0.552	$ 29,812
		$2,002,393			$1,896,628

TOTAL PRESENT VALUE OF SELECTED REMEDY **$1,896,628**

Notes:

1. Source: Office of Management and Budget, 2008. OMB Circular No. A-94. January. Online at: <http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html>.
2. Source: RS Means Heavy Construction Cost Data 2012
3. RS Means Costs were multiplied by a factor of .887 to account for a Flagstaff, AZ localization factor. (p. 588)
4. Based on a 2.0 percent discount factor for projects with a 30-year (or greater) duration, as specified for federal facility sites in Appendix C of Office of Management and Budget Circular A-94 (effective December 2012)

AC= Acre
BCY= Bank Cubic Yard
CY = cubic yards
ea = each
LCY= Loose Cubic Yard
LF = linear feet
LS = lump sum
LUC = land use control
O&M = operation and maintenance
SF = square feet
SY = square yard
TN= Ton

Table D-5. Alternative 3A - Cash Flow Analysis

Year	Periodic Cost	Annual Cost	Discount Factor	Actual Periodic Cost	Actual Annual Cost
1		$18,240	0.980392157		$17,882.35
2		$18,240	0.961168781		$17,531.72
3		$18,240	0.942322335		$17,187.96
4		$18,240	0.923845426		$16,850.94
5	$39,000	$18,240	0.90573081	$35,323.50	$16,520.53
6		$18,240	0.887971382		$16,196.60
7		$18,240	0.870560179		$15,879.02
8		$18,240	0.853490371		$15,567.66
9		$18,240	0.836755266		$15,262.42
10	$54,000	$18,240	0.8203483	$44,298.81	$14,963.15
11		$18,240	0.804263039		$14,669.76
12		$18,240	0.788493176		$14,382.12
13		$18,240	0.773032525		$14,100.11
14		$18,240	0.757875025		$13,823.64
15	$39,000	$18,240	0.74301473	$28,977.57	$13,552.59
16		$18,240	0.728445814		$13,286.85
17		$18,240	0.714162562		$13,026.33
18		$18,240	0.700159375		$12,770.91
19		$18,240	0.68643076		$12,520.50
20	$54,000	$18,240	0.672971333	$36,340.45	$12,275.00
21		$18,240	0.659775817		$12,034.31
22		$18,240	0.646839036		$11,798.34
23		$18,240	0.634155918		$11,567.00
24		$18,240	0.621721488		$11,340.20
25	$39,000	$18,240	0.609530871	$23,771.70	$11,117.84
26		$18,240	0.597579285		$10,899.85
27		$18,240	0.585862044		$10,686.12
28		$18,240	0.574374553		$10,476.59
29		$18,240	0.563112307		$10,271.17
30	$54,000	$18,240	0.552070889	$29,811.83	$10,069.77

Table D-6. Alternative 3B - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Implementation Plans/Setup	1	LS	$75,000	$75,000.00	Includes pre-mobilization archeological survey, to be conducted prior to other planning documents. Includes 10 days for Technical Staff to complete pre-mobilization plans (including Work Plan and HASP with graphics, review, and production).
Design	1	LS	$75,000	$75,000.00	Includes 30 days for Technical Staff to complete the design of road grades, repository and Mill Area cap, and restored grades. Includes surveys.
Mobilization and demobilization	1	LS	$90,000	$90,000.00	Mobilization and demobilization of crew, materials, and equipment. Craft trade crew of nine plus one technical person for 4 days. Includes airfare and hotel costs for the duration of work.
Site Work					
Road grading	1	LS	$105,000.00	$105,000.00	8 days of work, includes use of an excavator, dozer, and backhoe.
Excavation of repository	7,500	BCY	$2.18	$16,365.15	RS Means Heavy Construction Cost Data 2012, 31 23 16.13 1030 Excavating, trench, 10' to 14' deep, 3 cy excavator.
Hauling clean spoils	6,000	BCY	$3.01	$18,041.58	RS Means Heavy Construction Cost Data 2012, 31 23 23.20 5170/5180 Hauling, 22 cy off-road, 15 min wait, 15 mph, cycle 1.5 mile. Clean spoils hauled for use as borrow material for road repairs and clean cover at Mill Area.
Load and haul waste to repository/cap area	6,300	BCY	$8.08	$50,879.65	RS Means Heavy Construction Cost Data 2012, G1030 140 3400 Load and haul common earth, 3.5 cy track loader, four 20 cy dump trailers, 1 mi round trip. Multiply by 1.5 for grade at Upper Workings Area.
Encapsulation of repository and Mill Area cap	5,500	BCY	$1.96	$10,781.49	RS Means Heavy Construction Cost Data 2012, 31 23 23.13 4220 Backfill, structural, 200 HP dozer, 150' haul, common earth + 31 23 23.23 5060 Compaction, riding, vibrating roller, 12" lifts, two passes.
Demarcation fabric	9,000	SY	$1.52	$13,680.00	Quote from Eagle Environmental Products, Inc., Mesa, AZ.
Grading disturbed waste removal areas	2,400	SY	$0.51	$1,213.42	RS Means Heavy Construction Cost Data 2012, 31 22 16.10 3300 Finish Grading slopes, gentle. Multiply by 3 for grade.
Erosion control fabric	11,400	SY	$1.17	$13,347.58	RS Means Heavy Construction Cost Data 2012, 31 25 14.16 0020 Rolled erosion control mats and blankets, jute mesh, 100 sy per roll, 4' wide, stapled.
Hydroseeding with native plants	103	MSF	$71.40	$7,326.00	RS Means Heavy Construction Cost Data 2012, 32 92 19.14 4600 Seeding, slope mix, 6"/MSF, hydro or air seeding, with mulch and fertilizer.
Adit Closure	1	LS	$280,000.00	$280,000.00	Bat survey of 16 adits, bat gates at 8 adits, safety closures at 8 adits. Backfill safety closures with native soil.
4,000 gallon water truck	12	WK	$1,605.00	$19,260.00	Water truck use for dust suppression during all construction activities.
After Action Report	1	LS	$20,000	$20,000.00	Includes 10 Days for Technical Staff to write a completion report, including graphics, review, and production.
SUBTOTAL				**$795,896**	
Contingency	25%			$198,974	15% scope + 10% bid
SUBTOTAL				**$994,869**	
Project Management	10%			$79,589.49	Includes project management during all phases of construction, regulatory interface, permitting, and crew per diems.
Construction Management	12%			$95,507.38	Includes construction management, quality control, geotechnical testing, and quality control testing.
SUBTOTAL					
Institutional Controls	1	LS	$40,500	$40,500	Forest Plan amendment, legal description for ARIC, and legal fees. Includes reproduction.
			TOTAL CAPITAL CONSTRUCTION COSTS:	**$1,210,465**	

Table D-6. Alternative 3B - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Inspections and Maintenance					
Biannual Inspections	2	LS	$ 2,000	$ 4,000	Biannual inspections to evaluate the integrity of all cover elements and stormwater BMPs.
Minor Repairs	1	LS	$ 8,000	$ 8,000	Replace erosion control fabric or other BMPs
SUBTOTAL				**$12,000**	
Contingency	25%			$ 3,000	10% scope + 15% bid
SUBTOTAL				**$15,000**	
Project Management	10%			$1,200	
Contractor Overhead	7%			$840	
Profit	10%			$1,200	
			TOTAL ANNUAL O&M COSTS:	**$18,240**	per year
			TOTAL ANNUAL O&M COSTS:	**$547,200**	Years 1-30

PERIODIC COSTS	Year					
Five-Year Review Report	5	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 5
Significant Repairs	5	1	LS	$20,000	$20,000.00	Costs for significant repairs and encapsulation BMPs
SUBTOTAL (YEAR 5)					**$39,000.00**	
Five-Year Review Report	10	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 10
Major Repairs	10	1	LS	$35,000	$35,000.00	Costs for major repairs to encapsulations
SUBTOTAL (YEAR 10)					**$54,000.00**	
Five-Year Review Report	15	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 15
Significant Repairs	15	1	LS	$20,000	$20,000.00	Costs for significant repairs and encapsulation BMPs
SUBTOTAL (YEAR 15)					**$39,000.00**	
Five-Year Review Report	20	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 20
Major Repairs	20	1	LS	$35,000	$35,000.00	Costs for major repairs to encapsulations
SUBTOTAL (YEAR 20)					**$54,000.00**	
Five-Year Review Report	15	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 25
Significant Repairs	15	1	LS	$20,000	$20,000.00	Costs for significant repairs and encapsulation BMPs
SUBTOTAL (YEAR 25)					**$39,000.00**	
Five-Year Review Report	20	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 30
Major Repairs	20	1	LS	$35,000	$35,000.00	Costs for major repairs to encapsulations
SUBTOTAL (YEAR 30)					**$54,000.00**	

Table D-6. Alternative 3B - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES

PRESENT VALUE ANALYSIS:

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (2.0%)	PRESENT VALUE
Capital Cost	0	$ 1,210,465	$ 1,210,465	1.000	$ 1,210,465
Annual O&M Cost	1-30	$ 547,200	$18,240	0.747	$408,511.35
Periodic Cost	5	$39,000.00	$ 39,000	0.906	$ 35,324
Periodic Cost	10	$54,000.00	$ 54,000	0.820	$ 44,299
Periodic Cost	15	$39,000.00	$ 39,000	0.743	$ 28,978
Periodic Cost	20	$54,000.00	$ 54,000	0.673	$ 36,340
Periodic Cost	25	$39,000.00	$ 39,000	0.610	$ 23,772
Periodic Cost	30	$54,000.00	$ 54,000	0.552	$ 29,812
		$2,036,665			$1,817,501

TOTAL PRESENT VALUE OF SELECTED REMEDY **$1,817,501**

Notes:

1. Source: Office of Management and Budget, 2008. OMB Circular No. A-94. January. Online at: <http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html>.
2. Source: RS Means Heavy Construction Cost Data 2012
3. RS Means Costs were multiplied by a factor of .887 to account for a Flagstaff, AZ localization factor. (p. 588)
4. Based on a 2.0 percent discount factor for projects with a 30-year (or greater) duration, as specified for federal facility sites in Appendix C of Office of Management and Budget Circular A-94 (effective December 2012)

AC= Acre
BCY= Bank Cubic Yard
CY = cubic yards
ea = each
LCY= Loose Cubic Yard
LF = linear feet
LS = lump sum
LUC = land use control
O&M = operation and maintenance
SF = square feet
SY = square yard
TN= Ton

Table D-7. Alternative 3B - Cash Flow Analysis

Year	Periodic Cost	Annual Cost	Discount Factor	Actual Periodic Cost	Actual Annual Cost
1		$18,240	0.980392157		$17,882.35
2		$18,240	0.961168781		$17,531.72
3		$18,240	0.942322335		$17,187.96
4		$18,240	0.923845426		$16,850.94
5	$39,000	$18,240	0.90573081	$35,323.50	$16,520.53
6		$18,240	0.887971382		$16,196.60
7		$18,240	0.870560179		$15,879.02
8		$18,240	0.853490371		$15,567.66
9		$18,240	0.836755266		$15,262.42
10	$54,000	$18,240	0.8203483	$44,298.81	$14,963.15
11		$18,240	0.804263039		$14,669.76
12		$18,240	0.788493176		$14,382.12
13		$18,240	0.773032525		$14,100.11
14		$18,240	0.757875025		$13,823.64
15	$39,000	$18,240	0.74301473	$28,977.57	$13,552.59
16		$18,240	0.728445814		$13,286.85
17		$18,240	0.714162562		$13,026.33
18		$18,240	0.700159375		$12,770.91
19		$18,240	0.68643076		$12,520.50
20	$54,000	$18,240	0.672971333	$36,340.45	$12,275.00
21		$18,240	0.659775817		$12,034.31
22		$18,240	0.646839036		$11,798.34
23		$18,240	0.634155918		$11,567.00
24		$18,240	0.621721488		$11,340.20
25	$39,000	$18,240	0.609530871	$23,771.70	$11,117.84
26		$18,240	0.597579285		$10,899.85
27		$18,240	0.585862044		$10,686.12
28		$18,240	0.574374553		$10,476.59
29		$18,240	0.563112307		$10,271.17
30	$54,000	$18,240	0.552070889	$29,811.83	$10,069.77

Table D-8. Alternative 4 - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Implementation Plans/Setup	1	LS	$75,000	$75,000.00	Includes pre-mobilization archeological survey, to be conducted prior to other planning documents. Includes 10 days for Technical Staff to complete pre-mobilization plans (including Work Plan and HASP with graphics, review, and production).
Design	1	LS	$37,500	$37,500.00	Includes 15 days for Technical Staff to complete the design of road grades and restored grades. Includes surveys.
Mobilization and demobilization	1	LS	$160,000	$160,000.00	Mobilization and demobilization of crew, materials, and equipment. Craft trade crew of nine plus one technical person for 4 days. Includes airfare and hotel costs for the duration of work.
Site Work					
Road grading	1	LS	$105,000.00	$105,000.00	8 days of work, includes use of an excavator, dozer, and backhoe.
Load and haul waste to stockpile area	11,500	BCY	$8.08	$92,875.55	RS Means Heavy Construction Cost Data 2012, G1030 140 3400 Load and haul common earth, 3.5 cy track loader, four 20 cy dump trailers, 1 mi round trip. Multiply by 1.5 for grade at Upper Workings Area.
Load waste into end dumps	18,400	Ton	$320.00	$5,888,000.00	Estimated rate of 10 loads per day. Includes crew and material costs for wrapping waste in plastic and glueing shut for transport as asbestos-containing material.
Waste disposal	18,400	Ton	$46.00	$846,400.00	Apache Junction Landfill in Apache Junction, AZ.
Waste transport	840	Load	$1,950.00	$1,638,000.00	Written quote from MP Environmental, Phoenix, AZ.
Grading disturbed waste removal areas	8,000	SY	$0.51	$4,044.72	RS Means Heavy Construction Cost Data 2012, 31 22 16.10 3300 Finish Grading slopes, gentle. Multiply by 3 for grade.
Erosion control fabric	8,000	SY	$1.17	$9,366.72	RS Means Heavy Construction Cost Data 2012, 31 25 14.16 0020 Rolled erosion control mats and blankets, jute mesh, 100 sy per roll, 4' wide, stapled.
Hydroseeding with native plants	72	MSF	$71.40	$5,141.05	RS Means Heavy Construction Cost Data 2012, 32 92 19.14 4600 Seeding, slope mix, 6"/MSF, hydro or air seeding, with mulch and fertilizer.
Adit Closure	1	LS	$280,000.00	$280,000.00	Bat survey of 16 adits, bat gates at 8 adits, safety closures at 8 adits. Backfill safety closures with native soil.
4,000 gallon water truck	31	WK	$1,605.00	$49,755.00	Water truck use for dust suppression during all construction activities.
After Action Report	1	LS	$20,000	$20,000.00	Includes 10 days for Technical Staff to write a completion report, including graphics, review, and production.
SUBTOTAL				**$9,211,083**	
Contingency	25%			$2,302,771	15% scope + 10% bid
SUBTOTAL				**$11,513,854**	
Project Management	10%			$921,108.30	Includes project management during all phases of construction, regulatory interface, permitting, and crew per diems.
Construction Management	12%			$1,105,329.97	Includes construction management, quality control, geotechnical testing, and quality control testing.
SUBTOTAL					
Institutional Controls	1	LS	$40,500	$40,500	Forest Plan amendment, legal description for ARIC, and legal fees. Includes reproduction.
		TOTAL CAPITAL CONSTRUCTION COSTS:		**$13,580,792**	

Table D-8. Alternative 4 - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES
Inspections and Maintenance					
Biannual Inspections	2	LS	$ 2,000	$ 4,000	Biannual inspections to evaluate the integrity of all graded areas and stormwater BMPs.
Minor Repairs	1	LS	$ 6,500	$ 6,500	Replace erosion control fabric or other BMPs
SUBTOTAL				**$10,500**	
Contingency	25%			$ 2,625	10% scope + 15% bid
SUBTOTAL				**$13,125**	
Project Management	10%			$1,050	
Contractor Overhead	7%			$735	
Profit	10%			$1,050	
		TOTAL ANNUAL O&M COSTS:		**$15,960**	per year
		TOTAL ANNUAL O&M COSTS:		**$478,800**	Years 1-30

PERIODIC COSTS	Year					
Five-Year Review Report	5	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 5
Significant Repairs	5	1	LS	$12,000	$12,000.00	Costs for significant repairs to graded areas and gabions
SUBTOTAL (YEAR 5)					**$31,000.00**	
Five-Year Review Report	10	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 10
Major Repairs	10	1	LS	$20,000	$20,000.00	Costs for major repairs to graded areas and gabions
SUBTOTAL (YEAR 10)					**$39,000.00**	
Five-Year Review Report	15	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 15
Significant Repairs	15	1	LS	$12,000	$12,000.00	Costs for significant repairs to graded areas and gabions
SUBTOTAL (YEAR 15)					**$31,000.00**	
Five-Year Review Report	20	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 20
Major Repairs	20	1	LS	$20,000	$20,000.00	Costs for major repairs to graded areas and gabions
SUBTOTAL (YEAR 20)					**$39,000.00**	
Five-Year Review Report	15	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 25
Significant Repairs	15	1	LS	$12,000	$12,000.00	Costs for significant repairs to graded areas and gabions
SUBTOTAL (YEAR 25)					**$31,000.00**	
Five-Year Review Report	20	1	LS	$19,000	$19,000.00	Preparation of one report at the end of Year 30
Major Repairs	20	1	LS	$20,000	$20,000.00	Costs for major repairs to graded areas and gabions
SUBTOTAL (YEAR 30)					**$39,000.00**	

Table D-8. Alternative 4 - Cost Summary

CAPITAL COSTS:

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL	SOURCE/NOTES

PRESENT VALUE ANALYSIS:

COST TYPE	YEAR	TOTAL COST	TOTAL COST PER YEAR	DISCOUNT FACTOR (2.0%)	PRESENT VALUE
Capital Cost	0	$ 13,580,792	$ 13,580,792	1.000	$ 13,580,792
Annual O&M Cost	1-30	$ 478,800	$15,960	0.747	$357,447.43
Periodic Cost	5	$31,000.00	$ 31,000	0.906	$ 28,078
Periodic Cost	10	$39,000.00	$ 39,000	0.820	$ 31,994
Periodic Cost	15	$31,000.00	$ 31,000	0.743	$ 23,033
Periodic Cost	20	$39,000.00	$ 39,000	0.673	$ 26,246
Periodic Cost	25	$31,000.00	$ 31,000	0.610	$ 18,895
Periodic Cost	30	$39,000.00	$ 39,000	0.552	$ 21,531
		$14,269,592			$14,088,016

TOTAL PRESENT VALUE OF SELECTED REMEDY **$14,088,016**

Notes:

1. Source: Office of Management and Budget, 2008. OMB Circular No. A-94. January. Online at: <http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html>.
2. Source: RS Means Heavy Construction Cost Data 2012
3. RS Means Costs were multiplied by a factor of .897 to account for a Flagstaff, AZ localization factor. (p. 588)
4. Based on a 2.0 percent discount factor for projects with a 30-year (or greater) duration, as specified for federal facility sites in Appendix C of Office of Management and Budget Circular A-94 (effective December 2012)

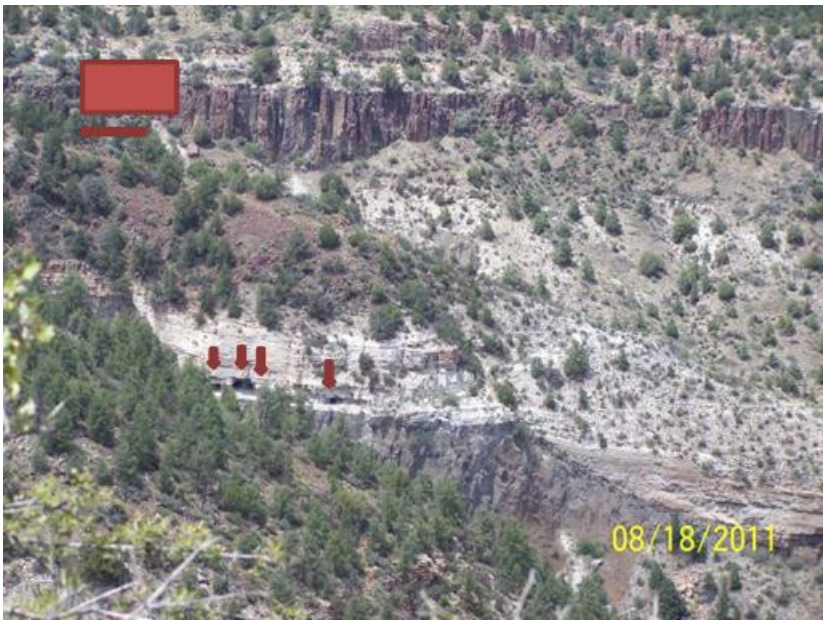
AC= Acre
BCY= Bank Cubic Yard
CY = cubic yards
ea = each
LCY= Loose Cubic Yard
LF = linear feet
LS = lump sum
LUC = land use control
O&M = operation and maintenance
SF = square feet
SY = square yard
TN= Ton

Table D-9. Alternative 4 - Cash Flow Analysis

Year	Periodic Cost	Annual Cost	Discount Factor	Actual Periodic Cost	Actual Annual Cost
1		$15,960	0.980392157		$15,647.06
2		$15,960	0.961168781		$15,340.25
3		$15,960	0.942322335		$15,039.46
4		$15,960	0.923845426		$14,744.57
5	$31,000	$15,960	0.90573081	$28,077.66	$14,455.46
6		$15,960	0.887971382		$14,172.02
7		$15,960	0.870560179		$13,894.14
8		$15,960	0.853490371		$13,621.71
9		$15,960	0.836755266		$13,354.61
10	$39,000	$15,960	0.8203483	$31,993.58	$13,092.76
11		$15,960	0.804263039		$12,836.04
12		$15,960	0.788493176		$12,584.35
13		$15,960	0.773032525		$12,337.60
14		$15,960	0.757875025		$12,095.69
15	$31,000	$15,960	0.74301473	$23,033.46	$11,858.52
16		$15,960	0.728445814		$11,626.00
17		$15,960	0.714162562		$11,398.03
18		$15,960	0.700159375		$11,174.54
19		$15,960	0.68643076		$10,955.43
20	$39,000	$15,960	0.672971333	$26,245.88	$10,740.62
21		$15,960	0.659775817		$10,530.02
22		$15,960	0.646839036		$10,323.55
23		$15,960	0.634155918		$10,121.13
24		$15,960	0.621721488		$9,922.67
25	$31,000	$15,960	0.609530871	$18,895.46	$9,728.11
26		$15,960	0.597579285		$9,537.37
27		$15,960	0.585862044		$9,350.36
28		$15,960	0.574374553		$9,167.02
29		$15,960	0.563112307		$8,987.27
30	$39,000	$15,960	0.552070889	$21,530.76	$8,811.05

Attachment 1. 2011 Forest Service Photographs of Lower Workings Adits

Attachment 1. 2011 Forest Service Photographs of Lower Workings Adits



Lower Workings in the Mill Tributary as seen from Phillips Canyon at pulley building

Same as above photo as seen from the Mill site. Ledge was carved out. There is waste rock below this. Metal is visible on ledge.

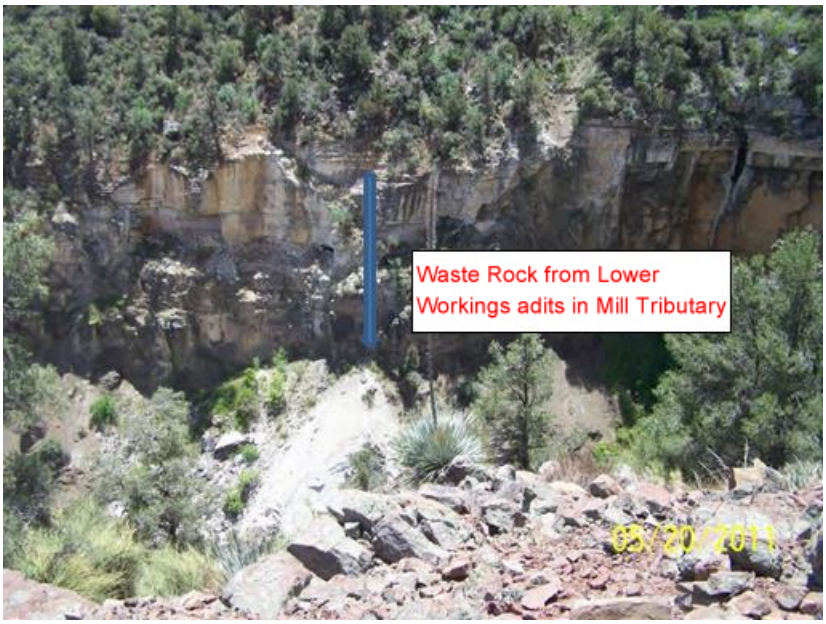
Attachment 1. 2011 Forest Service Photographs of Lower Workings Adits

Mill Tributary with waste rock in bottom of drainage.

Lower Workings across the Mill Tributary from Mill site

Attachment 1. 2011 Forest Service Photographs of Lower Workings Adits

Some of the Lower Workings adits across from the Mill in the Mill trib. Access is an issue but they are adits that are visible from the Mill.



Attachment 1. 2011 Forest Service Photographs of Lower Workings Adits