



## **Asbestos & Lead Based Paint Assessment**

City of Spartanburg  
255 Caulder Circle  
Spartanburg, South Carolina

***Prepared for:***

The City of Spartanburg  
201 Caulder Avenue  
Spartanburg, South Carolina

***Prepared by:***

Apex Environmental Management, Inc.  
7 Winchester Court  
Mauldin, South Carolina 29662

Project Number: 0815-163

January 1, 2017





Apex Project Number 0815-163

January 1, 2017

7 Winchester Court  
Mauldin, SC 29662  
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[www.apex-ehs.com](http://www.apex-ehs.com)

Mr. Lynn Coggins  
City of Spartanburg  
P.O. Box 1749  
Spartanburg, South Carolina 29304

Reference: Asbestos and Lead-Based Paint Assessment Services  
255 Caulder Circle  
Spartanburg, South Carolina

### SERVICES

Indoor Air Quality  
Mold Remediation  
Asbestos & Lead  
Industrial Hygiene  
Worker Health & Safety  
Mold Consulting  
Moisture Management Plans  
Safety Assessment  
Environmental Site Assessments  
Hazard Communication

Dear Mr. Coggins:

Apex Environmental Management, Inc. (Apex) is pleased to provide the results of our assessment services for the referenced property.

This report and the associated attachments summarize our evaluation of the conditions observed at the project site. The findings presented by Apex are based upon sampling performed in the subject building. There is a chance that undetected ACM may exist in the building between walls or in other areas that would only be exposed during demolition or structural renovations. Should material be discovered that could potentially contain asbestos during the demolition process, additional samples of the material should be collected by a licensed asbestos inspector and submitted to an accredited laboratory for analytical interpretation. Our recommendations are based on the guidelines presented in EPA and/or OSHA regulations.

Please note that this document is not a specification for asbestos removal. It does not contain means and methods for abatement. Quantities are estimates and contractors must verify amounts prior to bidding or removal. If you are planning an abatement project, please contact Apex to discuss the requirements. Use of this document without the express written consent of Apex is at the sole risk of the user and or/abatement contractor.

The conclusions and/or recommendations contained in this report are based on our understanding of the applicable standards at the time this report was prepared. No warranty, expressed or implied, is made. If you have any questions please feel free to contact us at (864) 404-3210.

Respectfully submitted,  
**APEX ENVIRONMENTAL MANAGEMENT, INC.**

A handwritten signature in blue ink, appearing to read 'Ted Shultz'.

Ted Shultz  
Project Manager

A handwritten signature in blue ink, appearing to read 'Tom Oliver'.

Tom Oliver  
Director of Operations

Appendices

**ASBESTOS AND LEAD BASED PAINT ASSESSMENT**

**CITY OF SPARTANBURG  
255 CAULDER CIRCLE  
SPARTANBURG, SOUTH CAROLINA**

**APEX PROJECT NO. 0815-163**

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**SECTION I**

**Asbestos & Lead Evaluation Report**

<b>ASBESTOS/LEAD EVALUATION REPORT</b> <b>APEX PROJECT NUMBER: 0815-163</b>
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Date:	1/3/2017	Page Number:	1 of 4
Client:	City of Spartanburg	Client Contact:	Mr. Lynn Coggins
Client Address:	440 South Church St, Suite B, Spartanburg, SC 29306-5234	Client Phone Number:	(864) 596-2914
Project:	Asbestos and Lead Evaluation		
Property Address:	255 Caulder Circle Spartanburg, SC		
Assessor:	Ted Shultz	Date of Assessment:	11/23/2016
Company:	Apex Environmental Management 7 Winchester Court Mauldin, SC 29662	Phone Number:	(864) 404-3210
Purpose of Assessment:	Demolition	Age of Structure:	Approximately 50 years
Building Type:	Residential	Number of Stories:	1
Foundation:	Brick crawlspace	Approximate Square Footage:	1,080 SF

**EXTERIOR BUILDING MATERIALS**

- Pitched wooden roof with shingles & felt.
- Wooden framed windows with glazing.

**INTERIOR BUILDING MATERIALS**

- Multiple types of vinyl floors with mastics and felt.
- Wooden floors.
- Drywall with joint compound walls and ceilings.

## SCOPE OF THE SURVEY

The objectives of the asbestos and lead assessment included the following:

- Identification of suspect asbestos-containing material (ACM) and lead based paints (LBP) in readily observable locations. Limited demolition of building finishes was conducted.
- Asbestos survey with sample collection by a South Carolina accredited inspector.
- Suspect ACM analysis by polarized light microscopy (PLM) utilizing CEI Labs (CEI) as an NVLAP certified laboratory, their accreditation number is 101768-0.
- Transmission electron microscopy (TEM) analysis of non-friable organically bound materials suspected to contain asbestos and testing negatively by PLM analysis.
- Lead inspection by a lead inspector certified by the Environmental Protection Agency and licensed to conduct LBP surveys in South Carolina.
- In situ analysis of suspected lead based paints by X-ray fluorescence (XRF).
- Presenting the results in a report identifying confirmed ACMs and LBPs.

## METHODS

### Asbestos Containing Materials

In order to determine if the suspect materials observed during the visual survey contained asbestos, representative bulk samples were collected and placed in sealed packages. Twenty (20) bulk samples were collected during the survey and submitted to CEI in Cary, North Carolina for analysis using the EPA recommended method of Polarized Light Microscopy (PLM) coupled with dispersion staining (Method No. EPA 600/M4-82-020, Dec. 1982). CEI participates in the National Voluntary Laboratory Accreditation Program (NVLAP). Their NVLAP accreditation number is 101768-0. EPA regulations require that multiple samples of each homogeneous material be collected for laboratory analysis. In accordance with South Carolina Regulation 61-86.1, non-friable organically bound materials that are reported to be non-asbestos containing by PLM analysis must also be analyzed by Transmission Electron Microscopy (TEM). Ten (10) samples were analyzed using TEM.

### Lead-Based Paint

Lead painted surfaces were analyzed in place using X-ray fluorescence. Painted surfaces were selected based on color of topcoat, underlying layers and substrate on which it was painted.

## RESULTS

### Asbestos Containing Materials

The EPA defines an asbestos-containing material (ACM) as a material containing more than 1% asbestos. OSHA defines ACM as a material containing any amount of asbestos. The *Asbestos PLM & TEM Data Table* is provided in Appendix II.

Suspect asbestos containing materials that were identified to be asbestos containing include:

- Approximately 2,650 SF of drywall with joint compound throughout the walls and ceilings.

### Lead Based Paint

OSHA does not recognize a threshold level of lead for definition purposes, only the presence or absence of lead. The current OSHA regulations recognize an airborne action level of thirty micrograms per cubic meter ( $30 \mu\text{g}/\text{m}^3$ ) during an eight-hour workday and a permissible exposure level of fifty micrograms per cubic meter ( $50 \mu\text{g}/\text{m}^3$ ) for employees.

Currently, SCDHEC defines LBP as paint containing in excess of, or equal to,  $1.0 \text{ mg}/\text{cm}^3$ . The laboratory analytical results and chain-of-custody are included in the Lead Analysis Reports in Appendix A. The approximate locations of the paint samples collected and analytical results are presented in the Tables included with this report .

Several surfaces in the building tested positive for lead in excess of the regulatory definition:

- White exterior wooden door frames.
- Tan exterior wooden freeze board.
- White interior wooden door frames.

## **RECOMMENDATIONS AND DISCUSSION**

### Asbestos Containing Materials

If the above referenced asbestos materials are to be disturbed by renovations or demolition, the asbestos must be removed in accordance with EPA, State of South Carolina and OSHA asbestos regulations. The State of South Carolina, Department of Health and Environmental Control (DHEC) has specific regulations that must be adhered to during asbestos removal/abatement projects.

Apex recommends the following:

1. Abate the asbestos containing materials in the structure prior to renovation or demolition.
2. Follow applicable asbestos regulations during renovation or demolition of the structure. You should be aware that stringent requirements are imposed upon anyone renovating or demolishing a structure in which ACM will be disturbed. This work must be performed in accordance with OSHA asbestos regulations, 29 CFR 1910 & 1926, and NESHAP asbestos regulations 40 CFR 61, subpart M. South Carolina regulations require the accreditation of personnel who work in the asbestos field and notification and permitting fees for asbestos removal projects. There is a 10 working day notification period required prior to abatement of asbestos in a facility. Failure to take proper precautions and actions to protect human health and the environment can result in penalties, danger to personnel, and construction delays.

Lead Based Paint

Currently the South Carolina Department of Health and Environmental Control (SCDHEC) define LBP as paint containing greater than 1.0 milligrams per square centimeter ( $\text{mg}/\text{cm}^2$ ) lead or in excess of, or equal to, 0.5 percent lead. Building materials identified as being painted with LBP should be segregated from the other building materials and recycled or disposed of in a municipal lined landfill. The removed wastes would need to be containerized and further tested by Toxic Characteristic Leaching procedures (TCLP) to determine if the waste is classified as hazardous. The remaining building materials that are not painted with LBP may be disposed of in a construction and demolition landfill. However, the landfills should be contacted to determine their specific disposal requirements.

Occupational Safety and Health Administration Lead Regulations apply to actions initiated on lead containing materials. This regulation applies to lead concentrations greater than the analytical limit of detection. This regulation sets exposure levels on airborne lead and does not reference the percent lead in paint. Therefore, initial personal air monitoring should be conducted on workers performing work on surfaces which have a lead concentration of  $0.1 \text{ mg}/\text{cm}^2$  or above to satisfy the OSHA requirements. If a baseline exposure lower than the OSHA Action Level of 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) is established, personal air monitoring may be terminated. The full OSHA lead standard should be referenced for compliance.

**A copy of this report must be submitted to SCDHEC at least ten (10) working days prior to demolition when applying for a demolition permit.**



**SECTION II**

**Asbestos & Lead Tables**

# ASBESTOS SURVEY FIELD DATA SHEET

Project Name: COS 255 Caulder Circle ACM

Sampled By: Ted Shultz

Project Location: 255 Caulder Circle, Spartanburg SC

Project Manager: Ted Shultz

Project Number: 0815-163

Date: 11/23/2016

Sample No.	Location	Sample Description	Analytical Results	Friable/Non Friable	Condition	Quantity
1	Roof	Roof shingles (1 layer) & felt	PLM - NAD	Non-Friable	Good	1,115 SF
2			TEM - NAD			
3						
4	Exterior windows	Window glazing	PLM - NAD	Non-Friable	Good	9 EA
5			TEM - NAD			
6						
7	Master bathroom	Tan roll vinyl floor with mastic	PLM - NAD	Non-Friable	Good	40 SF
8			TEM - NAD			
9						
10	Kitchen	Roll vinyl with mastic and felt	PLM - NAD	Non-Friable	Good	130 SF
11			TEM - NAD			
12						
13	Hall bathroom	Roll yellow vinyl with mastic	PLM - NAD	Non-Friable	Good	40 SF
14			TEM - NAD			
15						
16	Throughout walls and ceilings	Drywall with joint compound	PLM - 2% Chrysotile	Friable	Good	2,650 SF
17						
18						
19						
20						

NAD = No Asbestos Detected

LF = Linear Feet

EA = Each

Amos = Amosite

**Bold = Positive For Asbestos**

SF = Square Feet

Chry = Chrysotile

**FIELD DATA SHEET  
LBP ANALYSIS**

Project Name: COS 255 Caulder Circle ACM/LBP

Sampled By: Ted Shultz

Project Location: 255 Caulder Circle, Spartanburg, SC

Project Manager: Ted Shultz

Project Number: 0815-163

Date: 12/7/2016

Sample No.	Sample Location	Component	Color	Substrate	Analytical Result (mg/m <sup>3</sup> )
79	Exterior	Post	White	Metal	0.00
<b>80</b>	<b>Exterior</b>	<b>Door frame</b>	<b>White</b>	<b>Wood</b>	<b>1.00</b>
81	Exterior	Carport	Tan	Wood	0.00
82	Exterior	Door	Tan	Wood	0.87
<b>83</b>	<b>Exterior</b>	<b>Freeze board</b>	<b>Tan</b>	<b>Wood</b>	<b>1.38</b>
<b>84</b>	<b>Kitchen</b>	<b>Door frame</b>	<b>White</b>	<b>Wood</b>	<b>1.12</b>
85	Kitchen	Wall	Tan	Drywall	0.04
86	Living room	Window frame	White	Wood	0.00
87	Living room	Wall	White	Drywall	0.00
88	Bed room	Door frame	White	Wood	0.00
89	Master bedroom	Ceiling	Tan	Drywall	0.00
90	Master bathroom	Wall	Tan	Drywall	0.00

**Bold is Lead Based Paint**

**SECTION III**

**Laboratory Analytical Results**



December 6, 2016

Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CLIENT PROJECT:** COS 255 Caulder Cir; 0815-163  
**CEI LAB CODE:** A16-10092

Dear Customer:

Enclosed are asbestos analysis results for PLM Bulk samples received at our laboratory on November 30, 2016. The samples were analyzed for asbestos using polarizing light microscopy (PLM) per the EPA 600 Method.

Sample results containing >1% asbestos are considered asbestos-containing materials (ACMs) per EPA regulatory requirements. The detection limit for the EPA 600 Method is <1% asbestos by weight as determined by visual estimation.

Thank you for your business and we look forward to continuing good relations. If you have any questions, please feel free to call our office at 919-481-1413.

Kind Regards,

A handwritten signature in black ink, appearing to read "Tianbao Bai".

Tianbao Bai, Ph.D., CIH  
Laboratory Director





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**ASBESTOS ANALYTICAL REPORT**  
**By: Polarized Light Microscopy**

Prepared for

**Apex Environmental Management**

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CLIENT PROJECT: COS 255 Caulder Cir; 0815-163

CEI LAB CODE: A16-10092

TEST METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

REPORT DATE: 12/06/16

TOTAL SAMPLES ANALYZED: 11

# SAMPLES >1% ASBESTOS: 1

**TEL: 866-481-1412**

*[www.ceilabs.com](http://www.ceilabs.com)*



# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

PROJECT: COS 255 Caulder Cir; 0815-163

CEI LAB CODE: A16-10092

METHOD: EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
1	Layer 1	A2273850	Black	Shingle	None Detected
	Layer 2	A2273850	Black	Felt	None Detected
2	Layer 1	A2273851	Black	Shingle	None Detected
	Layer 2	A2273851	Black	Felt	None Detected
3		A2273852		Sample Submitted for TEM Analysis	
4		A2273853	Off-white	Window Glaze	None Detected
5		A2273854	Off-white	Window Glaze	None Detected
6		A2273855		Sample Submitted for TEM Analysis	
7	Layer 1	A2273856	Tan	Rool Vinyl Floor	None Detected
	Layer 2	A2273856	Beige	Mastic	None Detected
8	Layer 1	A2273857	Tan	Rool Vinyl Floor	None Detected
	Layer 2	A2273857	Beige	Mastic	None Detected
9		A2273858		Sample Submitted for TEM Analysis	
10	Layer 1	A2273859	Gray	Rool Vinyl Floor	None Detected
	Layer 2	A2273859	Gray	Felt	None Detected
	Layer 3	A2273859	Brown	Mastic	None Detected
11	Layer 1	A2273860	Gray	Rool Vinyl Floor	None Detected
	Layer 2	A2273860	Gray	Felt	None Detected
	Layer 3	A2273860	Brown	Mastic	None Detected
12		A2273861		Sample Submitted for TEM Analysis	
13	Layer 1	A2273862	Yellow	Rool Vinyl Floor	None Detected
	Layer 2	A2273862	Tan	Mastic	None Detected
14	Layer 1	A2273863	Yellow	Rool Vinyl Floor	None Detected
	Layer 2	A2273863	Tan	Mastic	None Detected
15		A2273864		Sample Submitted for TEM Analysis	
16	Layer 1	A2273865	Off-white	Drywall	None Detected
	Layer 2	A2273865	Beige	Joint Compound	<b>Chrysotile 2%</b>



# Asbestos Report Summary

By: POLARIZING LIGHT MICROSCOPY

**PROJECT:** COS 255 Caulder Cir; 0815-163

**CEI LAB CODE:** A16-10092

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**METHOD:** EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

Client ID	Layer	Lab ID	Color	Sample Description	ASBESTOS %
17		A2273866		Sample Not Analyzed per COC	
18		A2273867		Sample Not Analyzed per COC	
19		A2273868		Sample Not Analyzed per COC	
20		A2273869		Sample Not Analyzed per COC	





# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A16-10092  
**Date Received:** 11-30-16  
**Date Analyzed:** 12-01-16  
**Date Reported:** 12-06-16

**Project:** COS 255 Caulder Cir; 0815-163

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
1 Layer 1 A2273850	Shingle	Heterogeneous Black Fibrous Bound	25%	Fiberglass	70%	Tar	None Detected
					5%	Gravel	
Layer 2 A2273850	Felt	Heterogeneous Black Fibrous Bound	75%	Cellulose	25%	Tar	None Detected
2 Layer 1 A2273851	Shingle	Heterogeneous Black Fibrous Bound	25%	Fiberglass	70%	Tar	None Detected
					5%	Gravel	
Layer 2 A2273851	Felt	Heterogeneous Black Fibrous Bound	75%	Cellulose	25%	Tar	None Detected
3 A2273852	Sample Submitted for TEM Analysis						
4 A2273853	Window Glaze	Heterogeneous Off-white Fibrous Bound	<1%	Cellulose	85%	Calc Carb	None Detected
					10%	Binder	
					5%	Paint	
5 A2273854	Window Glaze	Heterogeneous Off-white Fibrous Bound	<1%	Cellulose	85%	Calc Carb	None Detected
					10%	Binder	
					5%	Paint	
6 A2273855	Sample Submitted for TEM Analysis						



# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A16-10092  
**Date Received:** 11-30-16  
**Date Analyzed:** 12-01-16  
**Date Reported:** 12-06-16

**Project:** COS 255 Caulder Cir; 0815-163

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>7</b> Layer 1 A2273856	Roof Vinyl Floor	Heterogeneous	20%	Cellulose	50%	Vinyl	None Detected
		Tan Fibrous Bound	5%	Fiberglass	25%	Binder	
Layer 2 A2273856	Mastic	Heterogeneous	5%	Cellulose	90%	Mastic	None Detected
		Beige Fibrous Bound			5%	Binder	
					<1%	Non-Fibrous Debris	
		<b>8</b> Layer 1 A2273857	Roof Vinyl Floor	Heterogeneous	20%	Cellulose	50%
Tan Fibrous Bound	5%	Fiberglass		25%	Binder		
Layer 2 A2273857	Mastic	Heterogeneous	5%	Cellulose	90%	Mastic	None Detected
		Beige Fibrous Bound			5%	Binder	
					<1%	Non-Fibrous Debris	
		<b>9</b> A2273858	Sample Submitted for TEM Analysis				
<b>10</b> Layer 1 A2273859	Roof Vinyl Floor	Heterogeneous	20%	Cellulose	50%	Vinyl	None Detected
		Gray Fibrous Bound	5%	Fiberglass	25%	Binder	
Layer 2 A2273859	Felt	Heterogeneous	65%	Cellulose	15%	Binder	None Detected
		Gray Fibrous Bound	20%	Synthetic Fiber			
Layer 3 A2273859	Mastic	Heterogeneous	5%	Cellulose	85%	Mastic	None Detected
		Brown Fibrous Bound			10%	Binder	
					<1%	Non-Fibrous Debris	



# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A16-10092  
**Date Received:** 11-30-16  
**Date Analyzed:** 12-01-16  
**Date Reported:** 12-06-16

**Project:** COS 255 Caulder Cir; 0815-163

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
11 Layer 1 A2273860	Roof Vinyl Floor	Heterogeneous	20%	Cellulose	50%	Vinyl	None Detected
		Gray	5%	Fiberglass	25%	Binder	
		Fibrous Bound					
Layer 2 A2273860	Felt	Heterogeneous	65%	Cellulose	15%	Binder	None Detected
		Gray	20%	Synthetic Fiber			
		Fibrous Bound					
Layer 3 A2273860	Mastic	Heterogeneous	5%	Cellulose	85%	Mastic	None Detected
		Brown			10%	Binder	
		Fibrous			<1%	Non-Fibrous	
		Bound				Debris	
12 A2273861	Sample Submitted for TEM Analysis						
13 Layer 1 A2273862	Roof Vinyl Floor	Heterogeneous	20%	Cellulose	50%	Vinyl	None Detected
		Yellow	5%	Fiberglass	25%	Binder	
		Fibrous Bound					
Layer 2 A2273862	Mastic	Heterogeneous	5%	Cellulose	90%	Mastic	None Detected
		Tan			5%	Binder	
		Fibrous			<1%	Non-Fibrous	
		Bound				Debris	
14 Layer 1 A2273863	Roof Vinyl Floor	Heterogeneous	20%	Cellulose	50%	Vinyl	None Detected
		Yellow	5%	Fiberglass	25%	Binder	
		Fibrous Bound					
Layer 2 A2273863	Mastic	Heterogeneous	5%	Cellulose	90%	Mastic	None Detected
		Tan			5%	Binder	
		Fibrous			<1%	Non-Fibrous	
		Bound				Debris	



# ASBESTOS BULK ANALYSIS

By: POLARIZING LIGHT MICROSCOPY

**Client:** Apex Environmental Management  
 7 Winchester Court  
 Mauldin, SC 29662

**CEI Lab Code:** A16-10092  
**Date Received:** 11-30-16  
**Date Analyzed:** 12-01-16  
**Date Reported:** 12-06-16

**Project:** COS 255 Caulder Cir; 0815-163

## ASBESTOS BULK PLM, EPA 600 METHOD

Client ID Lab ID	Lab Description	Lab Attributes	NON-ASBESTOS COMPONENTS				ASBESTOS %
			Fibrous		Non-Fibrous		
<b>15</b> A2273864	Sample Submitted for TEM Analysis						
<b>16</b> Layer 1 A2273865	Drywall	Heterogeneous Off-white Fibrous Bound	15%	Cellulose	75%	Gypsum 10% Silicates	None Detected
Layer 2 A2273865	Joint Compound	Heterogeneous Beige Fibrous Bound	<1%	Cellulose	85%	Calc Carb 10% Binder 3% Paint	<b>2% Chrysotile</b>
<b>17</b> A2273866	Sample Not Analyzed per COC						
<b>18</b> A2273867	Sample Not Analyzed per COC						
<b>19</b> A2273868	Sample Not Analyzed per COC						
<b>20</b> A2273869	Sample Not Analyzed per COC						



**LEGEND:** Non-Anth = Non-Asbestiform Anthophyllite  
Non-Trem = Non-Asbestiform Tremolite  
Calc Carb = Calcium Carbonate

**METHOD:** EPA 600 / R93 / 116 and EPA 600 / M4-82 / 020

**LIMIT OF DETECTION:** <1% by visual estimation

**REGULATORY LIMIT:** >1% by weight

Due to the limitations of the EPA 600 method, nonfriable organically bound materials (NOBs) such as vinyl floor tiles can be difficult to analyze via polarized light microscopy (PLM). EPA recommends that all NOBs analyzed by PLM, and found not to contain asbestos, be further analyzed by Transmission Electron Microscopy (TEM). Please note that PLM analysis of dust and soil samples for asbestos is not covered under NVLAP accreditation.

This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by CEI Labs, Inc. CEI Labs makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.

**ANALYST:** Daniel Liguori  
Daniel Liguori

**APPROVED BY:** Tianbao Bai  
Tianbao Bai, Ph.D., CIH  
Laboratory Director



(20) ALG-10,092  
 A2273850 -  
 A2273869



107 New Edition Court, Cary, NC 27511  
 Tel: 866-481-1412; Fax: 919-481-1442

# CHAIN OF CUSTODY

LAB USE ONLY:
CEI Lab Code:
CEI Lab I.D. Range:

COMPANY CONTACT INFORMATION	
Company: Apex Environmental Management	Client #:
Address: 7 Winchester Court	Job Contact: <i>Ted Shultz</i>
Mauldin, SC 29662	Email: <i>tshultz@apex-ehs.com</i>
	Tel: 864-404-3210
Project Name: <i>COS 255 Caulder Cir</i>	Fax:
Project ID #: <i>0815-103</i>	P.O. #:

ASBESTOS	METHOD	4 HR*	8 HR*	24 HR	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TEM BULK	CHATFIELD		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAVIMETRIC	EPA 600		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

POSITIVE STOP ANALYSIS	<input checked="" type="checkbox"/>
SOUTH CAROLINA SAMPLES	<input checked="" type="checkbox"/>

TEM INSTRUCTIONS	
BEGIN TEM ANALYSIS AFTER NEGATIVE PLM	<input checked="" type="checkbox"/>
ANALYZE TEM SAMPLES SIMULTANEOUSLY WITH PLM	<input type="checkbox"/>

REMARKS: If needed, combine samples from the same group to achieve sufficient weight for TEM analysis.

Accept Samples  
 Reject Samples

Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i> 11:00am	11/28/2016	<i>AA</i>	11 30 16
			9:40

\*Call to confirm RUSH analysis. Samples will be disposed of 30 days after analysis



### SAMPLING FORM

COMPANY CONTACT INFORMATION	
Company: Apex Env. Mgmt.	Job Contact: <i>Ted Shultz</i>
Project Name: <del>0815-163</del> <i>COS 255 Camber Cir</i>	
Project ID #: <i>0815-163</i>	Tel:

SAMPLE ID#	DESCRIPTION / LOCATION	TEST		
		PLM	TEM	
<i>1</i>	<i>Roof</i>	<i>1 shingle</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>2</i>	<i> </i>	<i>1 felt</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>3</i>	<i> </i>		PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
<i>4</i>	<i>windows</i>	<i>window glaze</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>5</i>	<i> </i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>6</i>	<i> </i>		PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
<i>7</i>	<i>master</i>	<i>fan roll vinyl flr</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>8</i>	<i>bath</i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>9</i>	<i> </i>		PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
<i>10</i>	<i>kitchen</i>	<i>roll vinyl &amp; felt</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>11</i>	<i> </i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>12</i>	<i> </i>		PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
<i>13</i>	<i>Hall</i>	<i>yellow roll vinyl</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>14</i>	<i>bath</i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>15</i>	<i> </i>		PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
<i>16</i>	<i>ceiling</i>	<i>dry wall &amp; joint</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>17</i>	<i>&amp; walls</i>	<i>compound</i>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>18</i>	<i> </i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>19</i>	<i> </i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
<i>20</i>	<i> </i>		PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
			PLM <input type="checkbox"/>	TEM <input type="checkbox"/>
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			PLM <input type="checkbox"/>	TEM <input type="checkbox"/>



December 8, 2016

Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CLIENT PROJECT:** COS 255 Caulder Cir; 0815-163  
**CEI LAB CODE:** T16-1893

Dear Customer:

Enclosed are asbestos analysis results for TEM bulk samples received at our laboratory on December 2, 2016. The samples were analyzed for asbestos using transmission electron microscopy (TEM) per Chatfield Method.

Sample results containing > 1% asbestos are considered asbestos-containing materials (ACMs) per the EPA regulatory requirements. The detection limit for the TEM Chatfield method is <1% depending on the processed weight and constituents of the sample.

Thank you for your business and we look forward to continuing good relations. If you have any questions, please feel free to call our office at 919-481-1413.

Kind Regards,

A handwritten signature in black ink, appearing to read "Tianbao Bai".

Tianbao Bai, Ph.D., CIH  
Laboratory Director





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**ASBESTOS ANALYTICAL REPORT**  
**By: Transmission Electron Microscopy**

Prepared for

**Apex Environmental Management**

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CLIENT PROJECT: COS 255 Caulder Cir; 0815-163

CEI LAB CODE: T16-1893

TEST METHOD: Bulk Chatfield  
EPA 600 / R93 / 116

REPORT DATE: 12/08/16

**TEL: 866-481-1412**

*[www.ceilabs.com](http://www.ceilabs.com)*



# ASBESTOS BULK ANALYSIS

By: TRANSMISSION ELECTRON MICROSCOPY

**Client:** Apex Environmental Management  
7 Winchester Court  
Mauldin, SC 29662

**CEI Lab Code:** T16-1893  
**Date Received:** 12-02-16  
**Date Analyzed:** 12-06-16  
**Date Reported:** 12-08-16

**Project:** COS 255 Caulder Cir; 0815-163

## TEM BULK CHATFIELD / EPA 600 / R93 / 116

Client ID Lab ID	Material Description	Sample Weight (g)	Organic Material %	Acid Soluble Material %	Acid Insoluble Material %	Asbestos %
3 T55847	Shingle	01.118	21.2	38.6	40.2	None Detected
3 T55848	Felt Paper	01.187	95.3	2.4	2.3	None Detected
6 T55849	Window Glazing	0.532	10.9	87.6	1.5	None Detected
9 T55850	Tan Roll Vinyl Floor	0.252	68.7	15.1	16.2	None Detected
9 T55851	Beige Mastic	0.347	0	33.7	66.3	None Detected
12 T55852	Gray Roll Vinyl Floor	0.35	46	48.9	5.1	None Detected
12 T55853	Gray Felt	0.744	82.1	2.4	15.5	None Detected
12 T55854	Brown Mastic	0.435	83	2.3	14.7	None Detected
15 T55855	Yellow Roll Vinyl Floor	0.393	50.9	48.3	.8	None Detected
15 T55856	Tan Mastic	0.513	29	67.1	3.9	None Detected



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**LEGEND:** None

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**METHOD:** CHATFIELD & EPA/600/R-93/116

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**LIMIT OF DETECTION:** Varies with the weight and constituents of the sample (<1%)

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**REGULATORY LIMIT:** >1% by weight

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This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by CEI Labs, Inc. CEI Labs makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client.

**ANALYST:**

*Kamila Reichert*

Kamila Reichert

**APPROVED BY:**

*Tianbao Bai*

Tianbao Bai, Ph.D., CIH  
Laboratory Director

(20) AL6-10,092  
 A2273850  
 A2273869



TL6 1893  
 TSS 847-856  
 (10)

# CHAIN OF CUSTODY

107 New Edition Court, Cary, NC 27511  
 Tel: 866-481-1412; Fax: 919-481-1442

LAB USE ONLY:
CEI Lab Code:
CEI Lab I.D. Range:

COMPANY CONTACT INFORMATION	
Company: Apex Environmental Management	Client #:
Address: 7 Winchester Court	Job Contact: <i>Ted Shultz</i>
Mauldin, SC 29662	Email: <i>tshultz@apex-ehs.com</i>
	Tel: 864-404-3210
Project Name: <i>POS 255 Caulder Cr</i>	Fax:
Project ID #: <i>0815-163</i>	P.O. #:

ASBESTOS	METHOD	4 HR*	8 HR*	24 HR	2 DAY	3 DAY	5 DAY
PLM BULK	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
TEM BULK	CHATFIELD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PLM POINT COUNT (400)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM POINT COUNT (1000)	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAVIMETRIC	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PLM GRAV w POINT COUNT	EPA 600	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

POSITIVE STOP ANALYSIS	<input checked="" type="checkbox"/>
SOUTH CAROLINA SAMPLES	<input checked="" type="checkbox"/>

TEM INSTRUCTIONS	
BEGIN TEM ANALYSIS AFTER NEGATIVE PLM	<input checked="" type="checkbox"/>
ANALYZE TEM SAMPLES SIMULTANEOUSLY WITH PLM	<input type="checkbox"/>

REMARKS: If needed, combine samples from the same group to achieve sufficient weight for TEM analysis.

Accept Samples  
 Reject Samples

Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	11/28/2016 11:00am	<i>[Signature]</i>	11/30/16
<i>[Signature]</i>	12/1/16 4:30PM		9:40

Call to confirm RUSH analysis. Samples will be disposed of 30 days after analysis



**SAMPLING FORM**

T16-1893

COMPANY CONTACT INFORMATION	
Company: Apex Env. Mgmt.	Job Contact: <i>Ted Shultz</i>
Project Name: <del>2008</del> <i>COS 255 Campbell Cir</i>	
Project ID #: <i>0815-163</i>	Tel:

SAMPLE ID#	DESCRIPTION / LOCATION	TEST	
1	Roof 1 shingle	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
2	1 felt	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
3	1	PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
4	windows window glaze	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
5	1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
6	1	PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
7	master tan roll vinyl flr	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
8	bath 1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
9	1	PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
10	Kitchen roll vinyl & felt	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
11	1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
12	1	PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
13	Hall yellow roll vinyl <del>flr</del>	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
14	bath 1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
15	1	PLM <input type="checkbox"/>	TEM <input checked="" type="checkbox"/>
16	ceiling Drywall & Joint	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
17	& walls compound	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
18	1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
19	1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
20	1	PLM <input checked="" type="checkbox"/>	TEM <input type="checkbox"/>
		PLM <input type="checkbox"/>	TEM <input type="checkbox"/>
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**SECTION IV**  
**Photographic Log**



Photo 1 -- 255 Caulder Circle in Spartanburg, SC.



Photo 2 – Windows with glazing.

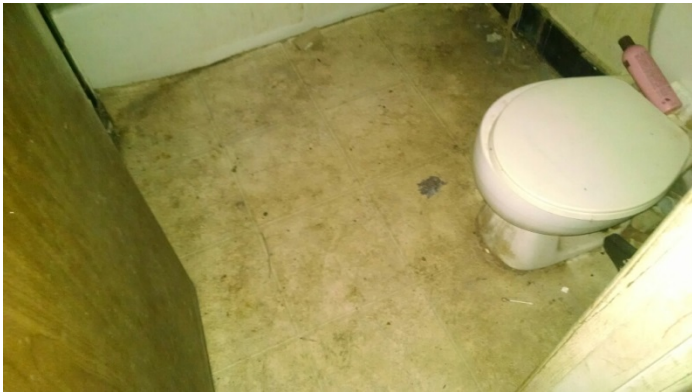


Photo 3 – Yellow vinyl floor in hall bathroom.



Photo 4 – Roll vinyl and felt in kitchen.

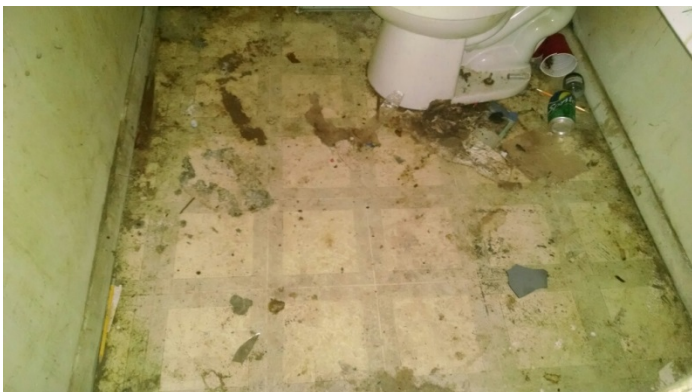


Photo 5 – Tan vinyl floor in master bathroom.



Photo 5 – Drywall with joint compound.

**SECTION V**

**SC DHEC Asbestos Inspector License**



**North Carolina  
Asbestos Accreditation**



Tedman K Shultz  
201 Cannon Circle  
Greenville, SC 29607

110723

EXPIRATION			
02-28-2017			
DOB	SEX	HT	WT
03-16-1972	M	5'10"	270
CLASS	#	EXP	
AIR MONITOR	80864	02-17	
INSPECTOR	12900	01-17	

**SCDHEC ISSUED**  
Asbestos ID Card

**Tedman K Shultz**

Expiration Date



**AIR SAMPLER AS-00355 02/02/17**  
**CONSULT BI-00971 01/20/17**