EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 00:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-05-00004		Air volume:	10800	Liters
EMSL Sample Number:	041423333-0001		Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD		Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX				
Magnification used for fiber counting:	10,000				
Aspect ratio for fiber definition:	3:1				
Min Length/ Width to be counted (µm):	>5 / 0.25-none				
Area of collection filter (mm²):	385		Analysis Date:	08/12/2014	
Result of Chi² Test:	67.00	Random	Analyst:	P. Harrison	

Analytical Sensitivity: 0.000040 Structure/cc **Limit of Detection: 0.000119 Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	1	-	1.11	0.000040	0.000000 -	0.000188
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**1**	**-**	**1.11**	**0.000040**	**0.000000 -**	**0.000188**
Total PCMe Structures (All)	**CD/ADX**	**1**	**-**	**1.11**	**0.000040**	**0.000000 -**	**0.000188**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	1	1.11	0.000040	0.000000 -	0.000188
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**1**	**1.11**	**0.000040**	**0.000000 -**	**0.000188**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**1**	**1.11**	**0.000040**	**0.000000 -**	**0.000188**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *Actinolite*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	JEOL-1200-EX (04-03)
EMSL Sample ID:	041423333-0001	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-05-00004	Grid Box :	0414-Tetra Tech-07: K	Analyst(s):	P. Harrison
Chi² Test for Uniformity:	67.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/14/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
K1	J1	None Detected								
K1	J3	None Detected								
K1	J5	None Detected								
K1	J7	None Detected								
K1	J9	None Detected								
K1	I8	None Detected								
K1	I6	None Detected								
K1	I2	None Detected								
K1	H1	None Detected								
K1	H3	None Detected								
K1	H5	None Detected								
K1	G8	None Detected								
K1	G4	None Detected								
K1	G2	None Detected								
K1	F1	None Detected								
K1	F3	None Detected								
K1	F5	None Detected								
K1	F9	None Detected								
K1	E6	None Detected								
K1	E2	None Detected								
K1	D3	None Detected								
K1	D5	None Detected								
K1	D7	None Detected								
K2	A1	None Detected								
K2	A3	None Detected								
K2	A5	None Detected								
K2	A7	None Detected								
K2	A9	None Detected								
K2	B10	None Detected								
K2	B8	None Detected								
K2	B6	None Detected								
K2	B4	None Detected								
K2	B2	None Detected								
K2	C1	None Detected								
K2	C3	None Detected								
K2	C5	None Detected								
K2	C7	None Detected								
K2	C9	None Detected								

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Bench Sheet Data

Client:	Tetra Tech			Scope:	JEOL-1200-EX (04-03)
EMSL Sample ID:	041423333-0001	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-05-00004	Grid Box :	0414-Tetra Tech-07: K	Analyst(s):	P. Harrison
Chi² Test for Uniformity:	67.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/14/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
K2	D10	None Detected								
K2	D8	None Detected								
K2	D6	None Detected								
K2	D4	None Detected								
K2	D2	None Detected								
K2	E1	None Detected								
K2	E3	None Detected								
K2	E5	None Detected								
K2	E7	None Detected								
K2	E9	None Detected								
K2	F10	None Detected								
K2	F8	None Detected								
K2	F6	None Detected								
K2	F4	None Detected								
K2	F2	None Detected								
K2	G3	None Detected								
K2	G5	None Detected								
K2	G7	None Detected								
K2	G9	None Detected								
K2	H10	None Detected								
K2	H8	None Detected								
K2	H6	None Detected								
K2	H4	None Detected								
K2	H2	None Detected								
K2	I1	None Detected								
K2	I3	None Detected								
K2	I5	F	1	1	7.5	1.1	ADX	Actinolite	4457	
K2	I7	None Detected								
K2	I9	None Detected								
K2	J6	None Detected								

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Structure Sketch Sheet for Direct Data Entry

EMSL Order ID: 041423333-0001 **Client:** Tetra Tech

Client Sample: *BC-AA-05-00004* Page 1 of

Primary Structure # 1 	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Structure #	Structure #	Structure #	Structure #

Analyst: Date: 8/14/14 Scope: 04-03

200 Route 130 North Cinnaminson, NJ 08077
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Energy Dispersive X-Ray Analysis
Quantitative Spectra & Data

EMSL ANALYTICAL, INC.

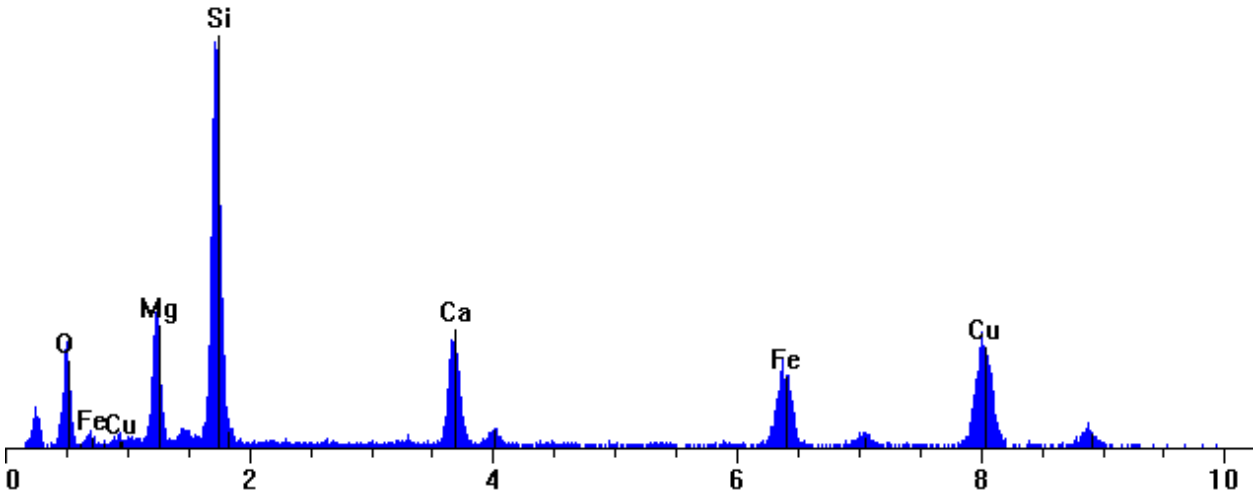
File: L:\EDS Spe...Spectra\Scope 04-03\2014\041423333-0001 K2 I5 1 AC.pgt
Collected: August 14, 2014 09:58:08

Report: Thursday, August 14, 2014

Live Time:	155.71	Count Rate:	422	Dead Time:	4.24 %
Beam Voltage:	20.00	Beam Current:	2.00	Takeoff Angle:	31.00
Thickness limit:	27058.25				

041423333-0001 K2 I5 1 AC.pgt

FS: 1100



Element	Line	keV	CL Ratio	Wt%	At%	At Prop	Compound	Cmpd Wt%
Mg	KA1	1.254	1.4000	11.93	11.74	5.4	MgO	19.78
Si	KA1	1.740	1.0000	30.62	26.09	12.0	SiO	48.06
Ca	KA1	3.691	1.1000	11.07	6.61	3.0	CaO	15.49
Fe	KA1	6.403	1.3900	12.96	5.55	2.6	FeO	16.67
Cu	KA1	8.046	0.0000	0.00	0.00	0.0		
O	KA1	0.523	0.0000	33.42	50.00	23.0		
Total			**0.0000**	**100.00**	**100.00**	**46.0**	**Total**	**100.00**

Element	Line	Gross (cps)	BKG (cps)	Net (cps)	P:B Ratio
Mg	KA1	28.0	2.3	25.7	11.2
Si	KA1	94.8	2.4	92.4	38.7
Ca	KA1	32.4	2.0	30.4	15.2
Fe	KA1	29.4	1.3	28.2	22.1
Cu	KA1	42.8	1.4	41.4	30.4
O	KA1	17.2	0.9	16.3	17.7

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number: 041423333 **Date:** Aug 14, 2014

Image Number: 04457

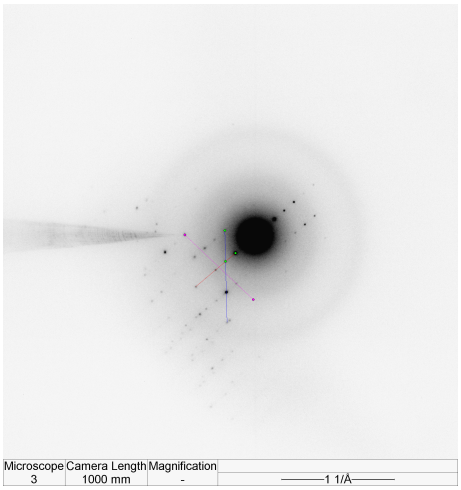
Reference / Sample Number: 0001

Preliminary ID: ACTINOLITE

Camera Constant: 1.965e-003 **1/A Pixels**

Calibration Reference: 081114-04-03-04452_C

	Measured	Reference	-5%	+5%
Inter-row Spacing:	**5.104**	5.278	**5.014**	**5.542**
d2 or hk0 (Camera K/zero row dist.):	**8.693**	9.040	**8.588**	**9.492**
d1 or hkl (Camera K/slant vector dist.):	**3.696**	3.880	**3.686**	**4.074**
Ratio of hk0/hkl:	**2.352**	2.330	**2.213**	**2.447**
Vector Angle:	**51.2**	49.790	**47.301**	**52.279**



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

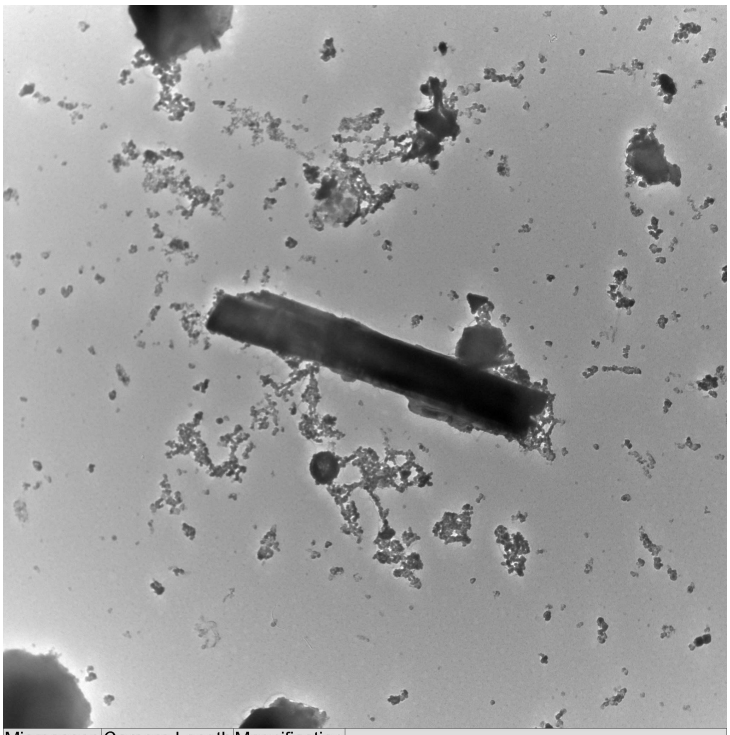
With a Zone Axis of: [**101**]

Preliminary Identification was:

X	CORRECT
	INCORRECT

EMSL Analytical, Inc.

Photomicrograph Report



Microscope	Camera Length	Magnification	
3	-	10000 x	—2 µm—
Microscope	Camera Length	Magnification	
-	-	-	———500 Pixel———

Micrograph Information

Sample ID:	0001
Order ID:	041423333
Image Number:	04458
Mineral Type:	ACTINOLITE
Date:	8/14/2014
Magnification:	10,000
Microscope:	3

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Customer ID: MAXI57
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Received: 8/12/2014 9:30
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EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-06-00004	Air volume:	10620	Liters
EMSL Sample Number:	041423333-0002	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	69	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	P. Harrison	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	-	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

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Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	JEOL-1200-EX (04-03)
EMSL Sample ID:	041423333-0002	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-06-00004	Grid Box :	0414-Tetra-Tech-07: K	Analyst(s):	P. Harrison
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/15/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
K5	J10	None Detected								
K5	J8	None Detected								
K5	J6	None Detected								
K5	J4	None Detected								
K5	J2	None Detected								
K5	I1	None Detected								
K5	I3	None Detected								
K5	I7	None Detected								
K5	I9	None Detected								
K5	H10	None Detected								
K5	H8	None Detected								
K5	H6	None Detected								
K5	H4	None Detected								
K5	H2	None Detected								
K5	G1	None Detected								
K5	G3	None Detected								
K5	G5	None Detected								
K5	G7	None Detected								
K5	G9	None Detected								
K5	F10	None Detected								
K5	F6	None Detected								
K5	F4	None Detected								
K5	F2	None Detected								
K5	E3	None Detected								
K5	E5	None Detected								
K5	E7	None Detected								
K5	E9	None Detected								
K5	D10	None Detected								
K5	D8	None Detected								
K5	D6	None Detected								
K5	D4	None Detected								
K5	D2	None Detected								
K5	C1	None Detected								
K5	C3	None Detected								
K5	C9	None Detected								
K5	B10	None Detected								
K5	B8	None Detected								
K5	B6	None Detected								

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Bench Sheet Data

Client:	Tetra Tech			Scope:	JEOL-1200-EX (04-03)
EMSL Sample ID:	041423333-0002	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-06-00004	Grid Box :	0414-Tetra-Tech-07: K	Analyst(s):	P. Harrison
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/15/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
K5	A1	None Detected								
K5	A3	None Detected								
K5	A5	None Detected								
K5	A7	None Detected								
K5	A9	None Detected								
K6	A1	None Detected								
K6	A3	None Detected								
K6	A5	None Detected								
K6	A7	None Detected								
K6	A9	None Detected								
K6	B8	None Detected								
K6	B6	None Detected								
K6	C3	None Detected								
K6	C5	None Detected								
K6	C7	None Detected								
K6	D8	None Detected								
K6	D6	None Detected								
K6	D2	None Detected								
K6	E3	None Detected								
K6	E9	None Detected								
K6	F8	None Detected								
K6	F4	None Detected								
K6	F2	None Detected								
K6	G1	None Detected								
K6	G3	None Detected								
K6	G7	None Detected								
K6	G9	None Detected								
K6	H8	None Detected								
K6	H6	None Detected								
K6	H4	None Detected								
K6	H2	None Detected								

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Customer Sample Number:	BC-AA-07-00004	Air volume:	10440	Liters
EMSL Sample Number:	041423333-0003	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	70	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
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PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

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Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0003	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-07-00004	Grid Box :	0414-TetraTech-07: L	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/14/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
L3	I3	None Detected								
L3	I5	None Detected								
L3	I7	None Detected								
L3	I9	None Detected								
L3	H10	None Detected								
L3	H8	None Detected								
L3	H6	None Detected								
L3	H4	None Detected								
L3	H2	None Detected								
L3	G1	None Detected								
L3	G3	None Detected								
L3	G5	None Detected								
L3	G7	None Detected								
L3	G9	None Detected								
L3	F10	None Detected								
L3	F8	None Detected								
L3	F6	None Detected								
L3	F4	None Detected								
L3	F2	None Detected								
L3	E1	None Detected								
L3	E3	None Detected								
L3	E5	None Detected								
L3	E7	None Detected								
L3	E9	None Detected								
L3	D10	None Detected								
L3	D8	None Detected								
L3	D6	None Detected								
L3	D2	None Detected								
L3	C1	None Detected								
L3	C3	None Detected								
L3	C5	None Detected								
L3	C7	None Detected								
L3	C9	None Detected								
L3	B10	None Detected								
L3	B8	None Detected								
L3	B6	None Detected								
L3	B4	None Detected								
L3	B2	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0003	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-07-00004	Grid Box :	0414-TetraTech-07: L	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/14/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
L1	B2	None Detected								
L1	B4	None Detected								
L1	B6	None Detected								
L1	B8	None Detected								
L1	B10	None Detected								
L1	C9	None Detected								
L1	C7	None Detected								
L1	C5	None Detected								
L1	C3	None Detected								
L1	D2	None Detected								
L1	D4	None Detected								
L1	D6	None Detected								
L1	D8	None Detected								
L1	D10	None Detected								
L1	E9	None Detected								
L1	E7	None Detected								
L1	E5	None Detected								
L1	E3	None Detected								
L1	F2	None Detected								
L1	F4	None Detected								
L1	F6	None Detected								
L1	F8	None Detected								
L1	F10	None Detected								
L1	G9	None Detected								
L1	G7	None Detected								
L1	G5	None Detected								
L1	G3	None Detected								
L1	H2	None Detected								
L1	H4	None Detected								
L1	H6	None Detected								
L1	H8	None Detected								
L1	H10	None Detected								

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856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 00:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-08-00004	Air volume:	10800	Liters
EMSL Sample Number:	041423333-0004	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0004	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-08-00004	Grid Box :	0414-TetraTech: L	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/16/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
L5	B10	None Detected								
L5	B8	None Detected								
L5	B6	None Detected								
L5	B4	None Detected								
L5	B2	None Detected								
L5	C1	None Detected								
L5	C3	None Detected								
L5	C5	None Detected								
L5	C7	None Detected								
L5	C9	None Detected								
L5	D10	None Detected								
L5	D8	None Detected								
L5	D6	None Detected								
L5	D4	None Detected								
L5	D2	None Detected								
L5	E1	None Detected								
L5	E3	None Detected								
L5	E5	None Detected								
L5	E7	None Detected								
L5	E9	None Detected								
L5	F10	None Detected								
L5	F8	None Detected								
L5	F6	None Detected								
L5	F4	None Detected								
L5	F2	None Detected								
L5	G1	None Detected								
L5	G3	None Detected								
L5	G5	None Detected								
L5	G7	None Detected								
L5	G9	None Detected								
L5	H8	None Detected								
L5	H6	None Detected								
L5	H4	None Detected								
L5	H2	None Detected								
L6	I9	None Detected								
L6	I7	None Detected								
L6	I5	None Detected								
L6	I3	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0004	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-08-00004	Grid Box :	0414-TetraTech: L	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/16/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
L6	I1	None Detected								
L6	H2	None Detected								
L6	H4	None Detected								
L6	H6	None Detected								
L6	H8	None Detected								
L6	G9	None Detected								
L6	G7	None Detected								
L6	G5	None Detected								
L6	G3	None Detected								
L6	G1	None Detected								
L6	F2	None Detected								
L6	F4	None Detected								
L6	F6	None Detected								
L6	F8	None Detected								
L6	E7	None Detected								
L6	E5	None Detected								
L6	E3	None Detected								
L8	I1	None Detected								
L8	I3	None Detected								
L8	I5	None Detected								
L8	I7	None Detected								
L8	I9	None Detected								
L8	H10	None Detected								
L8	H8	None Detected								
L8	H6	None Detected								
L8	H4	None Detected								
L8	H2	None Detected								
L8	G1	None Detected								
L8	G3	None Detected								
L8	G5	None Detected								

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856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 00:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-09-00004		Air volume:	10440	Liters
EMSL Sample Number:	041423333-0005		Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD		Grid Openings Analyzed:	70	
Minimum Level of analysis (amphibole):	ADX				
Magnification used for fiber counting:	10,000				
Aspect ratio for fiber definition:	3:1				
Min Length/ Width to be counted (µm):	>5 / 0.25-none				
Area of collection filter (mm²):	385		Analysis Date:	08/12/2014	
Result of Chi² Test:	68.00	Random	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	2	-	2.16	0.000080	0.000000 -	0.000251
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**2**	**-**	**2.16**	**0.000080**	**0.000000 -**	**0.000251**
Total PCMe Structures (All)	**CD/ADX**	**2**	**-**	**2.16**	**0.000080**	**0.000000 -**	**0.000251**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	2	2.16	0.000080	0.000000 -	0.000251
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**2**	**2.16**	**0.000080**	**0.000000 -**	**0.000251**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**2**	**2.16**	**0.000080**	**0.000000 -**	**0.000251**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *Anthophyllite, Actinolite*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

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Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0005	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-09-00004	Grid Box :	0414-TetraTech-01: T	Analyst(s):	F. Craig
Chi² Test for Uniformity:	68.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/26/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
T1	C9	None Detected								
T1	C7	None Detected								
T1	C5	None Detected								
T1	C3	None Detected								
T1	D2	None Detected								
T1	D4	None Detected								
T1	D6	None Detected								
T1	D8	None Detected								
T1	D10	None Detected								
T1	E9	None Detected								
T1	E7	None Detected								
T1	E5	None Detected								
T1	E3	None Detected								
T1	F2	None Detected								
T1	F4	None Detected								
T1	F6	None Detected								
T1	F8	None Detected								
T1	F10	None Detected								
T1	G9	None Detected								
T1	G7	None Detected								
T1	G5	None Detected								
T1	G3	None Detected								
T1	H2	None Detected								
T1	H4	None Detected								
T1	H6	MD11	1		33	30	ADX	Actinolite		
T1	H6	MF		1	17.9	1	ADX	Actinolite	010507D	
T1	H8	None Detected								
T1	H10	None Detected								
T1	I9	None Detected								
T1	I7	None Detected								
T1	I5	None Detected								
T1	I3	None Detected								
T1	I1	None Detected								
T2	I1	None Detected								
T2	I3	None Detected								
T2	I5	None Detected								
T2	I7	None Detected								
T2	I9	None Detected								

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International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0005	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-09-00004	Grid Box :	0414-TetraTech-01: T	Analyst(s):	F. Craig
Chi² Test for Uniformity:	68.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/26/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
T2	H10	None Detected								
T2	H8	None Detected								
T2	H6	None Detected								
T2	H4	None Detected								
T2	H2	None Detected								
T2	G1	None Detected								
T2	G3	None Detected								
T2	G5	None Detected								
T2	G7	None Detected								
T2	G9	None Detected								
T2	F10	None Detected								
T2	F8	None Detected								
T2	F6	None Detected								
T2	F4	None Detected								
T2	F2	None Detected								
T2	E1	None Detected								
T2	E3	None Detected								
T2	E5	None Detected								
T2	E7	None Detected								
T2	E9	None Detected								
T2	D10	None Detected								
T2	D8	None Detected								
T2	D6	None Detected								
T2	D4	None Detected								
T2	D2	None Detected								
T2	C1	None Detected								
T2	C3	None Detected								
T2	C5	None Detected								
T2	C7	None Detected								
T2	C9	None Detected								
T2	B10	None Detected								
T2	B8	MD11	2		22	11.8	ADX	Anthophyllite		
T2	B8	MF		2	13.68	1.2	ADX	Anthophyllite	10509	
T2	B6	None Detected								

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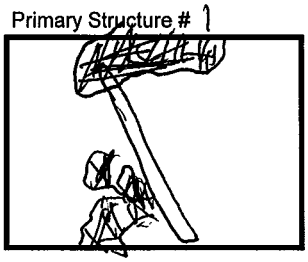
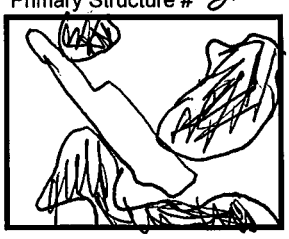
International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

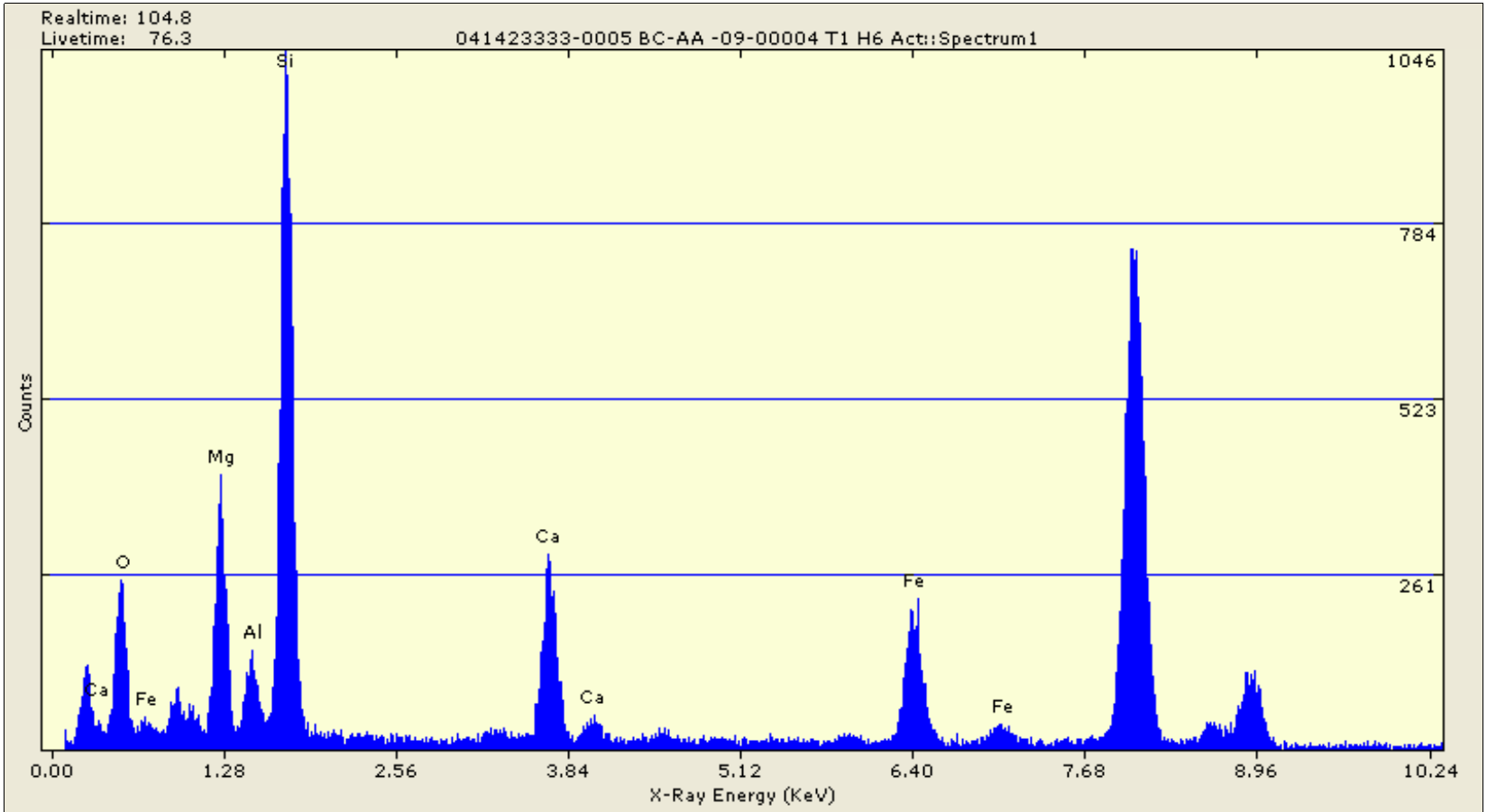
Structure Sketch Sheet for Direct Data Entry

EMSL Order ID: 041423333-0005 **Client:** Tetra Tech

Client Sample: *BC-AA-09-00004* Page 1 of 1

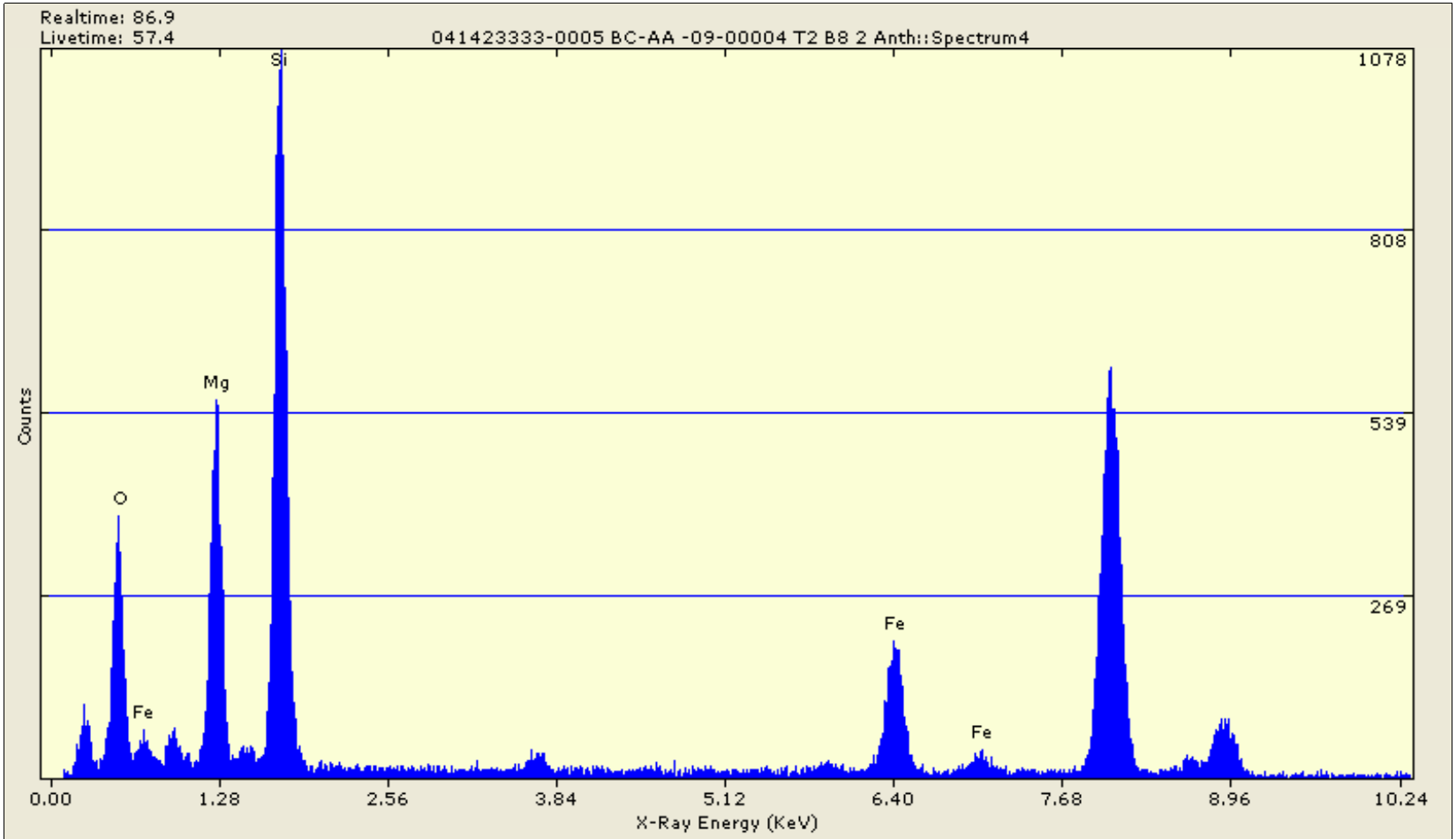
Primary Structure # 1 	Primary Structure # 2 	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Structure #	Structure #	Structure #	Structure #

Analyst: FC Date: 8/26/14 Scope: 04 01



Quantitative Results for Spectrum1
Analysis: Thin Film Method: Standardless
Acquired 26-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	44.63	1.16	60.73	0.00		0.0000	0.0000	0.0	81.2	1999.67
Magnesium	10.15	0.11	9.09	16.83	(MgO)	3.4433	0.1840	2789.4	91.4	2843.13
Aluminum	3.12	0.03	2.52	5.89	(Al2O3)	0.9530	0.0566	945.7	94.4	1045.48
Silicon	26.06	0.28	20.20	55.76	(SiO2)	7.6514	0.4400	8371.0	97.6	8602.94
Calcium	7.84	0.09	4.26	10.97	(CaO)	1.6131	0.0753	2614.2	119.0	2682.54
Iron	8.20	0.09	3.19	10.54	(FeO)	1.2099	0.0637	2170.1	143.5	2275.43
Total	100.00			100.00		14.8707				



Quantitative Results for Spectrum4
Analysis: Thin Film Method: Standardless
Acquired 26-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	46.22	0.49	60.95	0.00		0.0000	0.0000	0.0	81.2	2758.82
Magnesium	15.98	0.17	13.87	26.50	(MgO)	5.2344	0.2532	4178.5	91.4	4218.55
Silicon	29.16	0.31	21.91	62.38	(SiO2)	8.2658	0.4319	8911.4	97.6	8966.83
Iron	8.65	0.09	3.27	11.12	(FeO)	1.2326	0.0597	2178.4	143.5	2265.10
Total	100.00			100.00		14.7328				

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041423333	**Date:**	Aug 26, 2014
Indexing of Image Number:	010507	**Scope #:**	04 - 01
Reference / Sample No:	0005-04-01	**By:**	F Craig
Preliminary ID:	ACTINOLITE		
Using Camera Constant of:	2.958e-003 **1/A Pixels**		
Determined from Reference:	AuCal-082614_10506		

Measured Inter-Row Spacing:	**62.93**	Pixels
Mean Distance between spots on Center row (d2):	**98.81**	Pixels
Mean Distance between spots on slant vector (d1):	**66.81**	Pixels

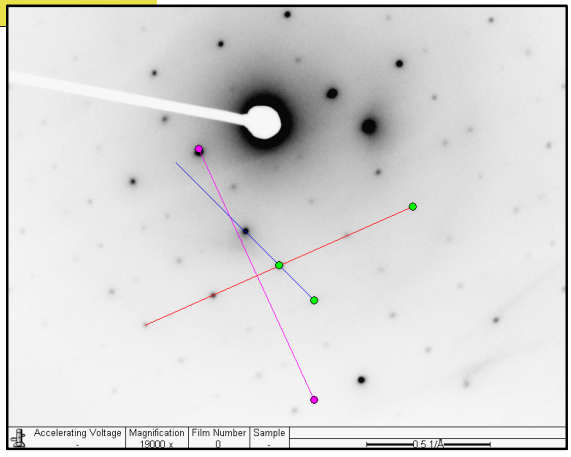
	Calculated	Ref	-5%	+5%
Inter-row Spacing (Angstroms):	5.372	**5.278**	*5.014*	*5.542*
d2 or hk0 (Camera K/zero row dist.):	3.387	**3.385**	*3.216*	*3.554*
d1 or hk1 (Camera K/slant vector dist.):	5.060	**5.065**	*4.812*	*5.318*
Ratio of hk0/hkl:	0.669	**0.668**	*0.635*	*0.701*
Angle of Slant Vector (Measured):	68.8	**68.730**	*65.293*	*72.167*

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Actinolite **By:** F Craig

Miller Indice hk0: (**1 5 0**)

Miller Indice hkl: (**1 1 -1**)

With a Zone Axis of: [**-5 1 -4**]



Preliminary Identification was: X CORRECT

INCORRECT

Percent accuracy to date: 100 %

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041423333	**Date:**	Aug 26, 2014
Indexing of Image Number:	010509	**Scope #:**	04 - 01
Reference / Sample No:	0005-04-01	**By:**	F Craig
Preliminary ID:	NRA		
Using Camera Constant of:	2.958e-003 **1/A Pixels**		
Determined from Reference:	AuCal-082614_10506		

Measured Inter-Row Spacing: _____ Pixels

Mean Distance between spots on Center row (d2): _____ Pixels

Mean Distance between spots on slant vector (d1): _____ Pixels

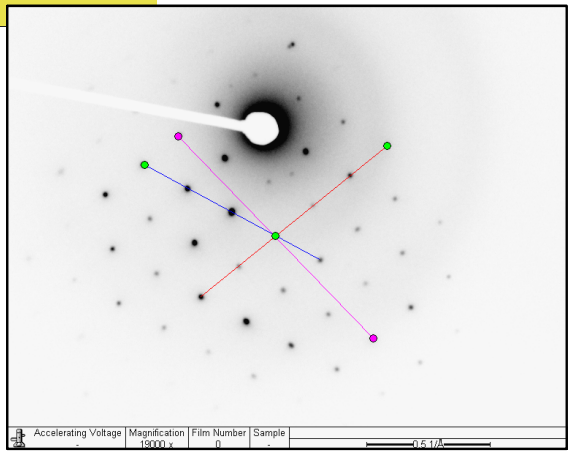
	Calculated	Ref	-5%	+5%
Inter-row Spacing (Angstroms):	5.284	**5.280**	*5.016*	*5.544*
d2 or hk0 (Camera K/zero row dist.):	5.105	**5.102**	*4.847*	*5.357*
d1 or hk1 (Camera K/slant vector dist.):	4.980	**5.065**	*4.812*	*5.318*
Ratio of hk0/hkl:	1.025	**1.007**	*0.957*	*1.057*
Angle of Slant Vector (Measured):	67.3	**67.160**	*63.802*	*70.518*

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Anthophyllite **By:** F Craig

Miller Indice hk0: (1 3 0)

Miller Indice hkl: (1 1 -1)

With a Zone Axis of: [-3 1 -2]



Preliminary Identification was: X CORRECT

_____ INCORRECT

Percent accuracy to date: 100 %

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 00:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-10-00004	Air volume:	10440	Liters
EMSL Sample Number:	041423333-0006	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	70	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0006	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-10-00004	Grid Box :	0414-TeraTech-07: T	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/26/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
T5	B10	None Detected								
T5	B8	None Detected								
T5	B6	None Detected								
T5	B4	None Detected								
T5	B2	None Detected								
T5	C1	None Detected								
T5	C3	None Detected								
T5	C5	None Detected								
T5	C7	None Detected								
T5	C9	None Detected								
T5	D10	None Detected								
T5	D8	None Detected								
T5	D6	None Detected								
T5	D4	None Detected								
T5	D2	None Detected								
T5	E1	None Detected								
T5	E3	None Detected								
T5	E5	None Detected								
T5	E7	None Detected								
T5	E9	None Detected								
T5	F10	None Detected								
T5	F8	None Detected								
T5	F6	None Detected								
T5	F4	None Detected								
T5	F2	None Detected								
T5	G1	None Detected								
T5	G3	None Detected								
T5	G5	None Detected								
T5	G7	None Detected								
T5	G9	None Detected								
T5	H10	None Detected								
T5	H8	None Detected								
T5	H6	None Detected								
T5	H4	None Detected								
T5	H2	None Detected								
T5	I1	None Detected								
T5	I3	None Detected								
T5	I5	None Detected								

200 Route 130 North
Cinnaminson, NJ 08077

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0006	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-10-00004	Grid Box :	0414-TeraTech-07: T	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/26/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
T6	B2	None Detected								
T6	B4	None Detected								
T6	B6	None Detected								
T6	B8	None Detected								
T6	B10	None Detected								
T6	C9	None Detected								
T6	C7	None Detected								
T6	C5	None Detected								
T6	C3	None Detected								
T6	C1	None Detected								
T6	D2	None Detected								
T6	D4	None Detected								
T6	D6	None Detected								
T6	D8	None Detected								
T6	D10	None Detected								
T6	E9	None Detected								
T6	E7	None Detected								
T6	E5	None Detected								
T6	E3	None Detected								
T6	E1	None Detected								
T6	F2	None Detected								
T6	F4	None Detected								
T6	F6	None Detected								
T6	F8	None Detected								
T6	F10	None Detected								
T6	G9	None Detected								
T6	G7	None Detected								
T6	G5	None Detected								
T6	G3	None Detected								
T6	G1	None Detected								
T6	H2	None Detected								
T6	H4	None Detected								

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Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 00:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-11-00004		Air volume:	10440	Liters
EMSL Sample Number:	041423333-0007		Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD		Grid Openings Analyzed:	70	
Minimum Level of analysis (amphibole):	ADX				
Magnification used for fiber counting:	10,000				
Aspect ratio for fiber definition:	3:1				
Min Length/ Width to be counted (µm):	>5 / 0.25-none				
Area of collection filter (mm²):	385		Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A	N/A	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

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Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04 01
EMSL Sample ID:	041423333-0007	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-11-00004	Grid Box :	0414-TetraTech-07: T	Analyst(s):	F Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/26/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
T10	I1	None Detected								
T10	I3	None Detected								
T10	I5	None Detected								
T10	I7	None Detected								
T10	I9	None Detected								
T10	H10	None Detected								
T10	8	None Detected								
T10	H6	None Detected								
T10	H4	None Detected								
T10	H2	None Detected								
T10	G1	None Detected								
T10	G3	None Detected								
T10	G5	None Detected								
T10	G7	None Detected								
T10	G9	None Detected								
T10	F10	None Detected								
T10	F8	None Detected								
T10	F6	None Detected								
T10	F4	None Detected								
T10	F2	None Detected								
T10	E1	None Detected								
T10	E3	None Detected								
T10	E5	None Detected								
T10	E7	None Detected								
T10	E9	None Detected								
T10	D10	None Detected								
T10	D8	None Detected								
T10	D6	None Detected								
T10	D4	None Detected								
T10	D2	None Detected								
T10	C1	None Detected								
T10	C3	None Detected								
T10	C5	None Detected								
T10	C7	None Detected								
T10	C9	None Detected								
T11	B10	None Detected								
T11	B8	None Detected								
T11	B6	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04 01
EMSL Sample ID:	041423333-0007	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-11-00004	Grid Box :	0414-TetraTech-07: T	Analyst(s):	F Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/26/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
T11	B2	None Detected								
T11	C1	None Detected								
T11	C3	None Detected								
T11	C5	None Detected								
T11	C7	None Detected								
T11	C9	None Detected								
T11	D10	None Detected								
T11	D8	None Detected								
T11	D6	None Detected								
T11	D4	None Detected								
T11	D2	None Detected								
T11	E1	None Detected								
T11	E3	None Detected								
T11	E5	None Detected								
T11	E7	None Detected								
T11	E9	None Detected								
T11	F10	None Detected								
T11	F8	None Detected								
T11	F6	None Detected								
T11	F4	None Detected								
T11	F2	None Detected								
T11	G1	None Detected								
T11	G3	None Detected								
T11	G5	None Detected								
T11	G7	None Detected								
T11	G9	None Detected								
T11	H10	None Detected								
T11	H8	None Detected								
T11	H6	None Detected								
T11	H4	None Detected								
T11	H2	None Detected								
T11	I1	None Detected								

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Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 00:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-12-00004	Air volume:	10800	Liters
EMSL Sample Number:	041423333-0008	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0008	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-12-00004	Grid Box :	0414-TetraTech-07: U	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/22/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
U1	I1	None Detected								
U1	I3	None Detected								
U1	I5	None Detected								
U1	I7	None Detected								
U1	H8	None Detected								
U1	H6	None Detected								
U1	H4	None Detected								
U1	H2	None Detected								
U1	G1	None Detected								
U1	G3	None Detected								
U1	G5	None Detected								
U1	7	None Detected								
U1	G9	None Detected								
U1	F8	None Detected								
U1	F6	None Detected								
U1	F4	None Detected								
U1	F2	None Detected								
U1	E1	None Detected								
U1	E3	None Detected								
U1	E5	None Detected								
U1	E7	None Detected								
U1	E9	None Detected								
U1	D8	None Detected								
U1	D6	None Detected								
U1	D4	None Detected								
U1	D2	None Detected								
U1	C1	None Detected								
U1	C3	None Detected								
U1	C5	None Detected								
U1	C7	None Detected								
U1	C9	None Detected								
U1	B10	None Detected								
U1	B8	None Detected								
U1	B6	None Detected								
U1	B4	None Detected								
U3	I9	None Detected								
U3	I7	None Detected								
U3	I5	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0008	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-12-00004	Grid Box :	0414-TetraTech-07: U	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/22/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	5%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
U3	I3	None Detected								
U3	I1	None Detected								
U3	H2	None Detected								
U3	H4	None Detected								
U3	H6	None Detected								
U3	H8	None Detected								
U3	H10	None Detected								
U3	G9	None Detected								
U3	G7	None Detected								
U3	G5	None Detected								
U3	G3	None Detected								
U3	G1	None Detected								
U3	F2	None Detected								
U3	F4	None Detected								
U3	F6	None Detected								
U3	F8	None Detected								
U3	F10	None Detected								
U3	E9	None Detected								
U3	E7	None Detected								
U3	E5	None Detected								
U3	E3	None Detected								
U3	E1	None Detected								
U3	D2	None Detected								
U3	D4	None Detected								
U3	D6	None Detected								
U3	D8	None Detected								
U3	D10	None Detected								
U3	C9	None Detected								
U3	C78	None Detected								
U3	C5	None Detected								

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Cinnaminson, NJ 08077

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 06:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-01-00009	Air volume:	10800	Liters
EMSL Sample Number:	041423333-0009	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	67.00 Random	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040 Structure/cc** **Limit of Detection:** **0.000119 Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	1	-	1.11	0.000040	0.000000 -	0.000188
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**1**	**-**	**1.11**	**0.000040**	**0.000000 -**	**0.000188**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	1	1.11	0.000040	0.000000 -	0.000188
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**1**	**1.11**	**0.000040**	**0.000000 -**	**0.000188**
Non Asbestos Mineral Structures	NAM	1	1	-	-	- -	-

Asbestiform Minerals Present: *Non-Regulated, Amphibole*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

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Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0009	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-01-00009	Grid Box :	0414-TetraTech-07: O	Analyst(s):	F. Craig
Chi² Test for Uniformity:	67.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/17/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	20%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
O2	I1	None Detected								
O2	I3	None Detected								
O2	I5	None Detected								
O2	I7	MD41	1		30.6	21.38	NAM	Non Asb. Mineral		
O2	I7	MF		1	8.3	0.5	NAM	Non Asb. Mineral		
O2	I7	MF		0	4.8	0.24	NAM	Non Asb. Mineral		
O2	I7	MF		0	3.3	0.1	NAM	Non Asb. Mineral		
O2	I7	MF		0	1.1	0.1	NAM	Non Asb. Mineral		
O2	I9	None Detected								
O2	H10	None Detected								
O2	H8	None Detected								
O2	H6	None Detected								
O2	H4	None Detected								
O2	H2	None Detected								
O2	G1	None Detected								
O2	G3	None Detected								
O2	G5	None Detected								
O2	G7	None Detected								
O2	G9	MD11	2		8.6	3.56	ADX	Non Reg.Amph.		
O2	G9	MF		2	7.6	0.5	ADX	Non Reg.Amph.	010483D	
O2	F10	None Detected								
O2	F8	None Detected								
O2	F6	None Detected								
O2	F4	None Detected								
O2	F2	None Detected								
O2	E3	None Detected								
O2	E5	None Detected								
O2	E7	None Detected								
O2	E9	None Detected								
O2	D10	None Detected								
O2	D8	None Detected								
O2	D6	None Detected								
O2	D4	None Detected								
O2	D2	None Detected								
O2	C1	None Detected								
O2	C3	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0009	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-01-00009	Grid Box :	0414-TetraTech-07: O	Analyst(s):	F. Craig
Chi² Test for Uniformity:	67.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/17/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	20%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
O2	C7	None Detected								
O2	C9	None Detected								
O2	B10	None Detected								
O2	B8	None Detected								
O2	B6	None Detected								
O2	B4	None Detected								
O2	B2	None Detected								
O3	G7	None Detected								
O3	G5	None Detected								
O3	G3	None Detected								
O3	F6	None Detected								
O3	F8	None Detected								
O3	F10	None Detected								
O3	E9	None Detected								
O3	E7	None Detected								
O3	E5	None Detected								
O3	E3	None Detected								
O3	D4	None Detected								
O3	D6	None Detected								
O3	D8	None Detected								
O3	D10	None Detected								
O3	C9	None Detected								
O3	C7	None Detected								
O3	C5	None Detected								
O3	C3	None Detected								
O3	B4	None Detected								
O3	B6	None Detected								
O3	B8	None Detected								
O3	B10	None Detected								
O4	E9	None Detected								
O4	E7	None Detected								
O4	5	None Detected								
O4	E3	None Detected								
O4	F2	None Detected								
O4	F4	None Detected								
O4	F6	None Detected								
O4	F8	None Detected								

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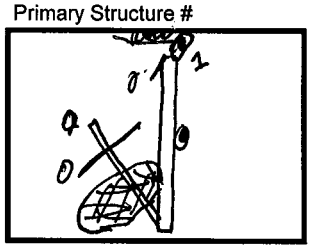
International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Structure Sketch Sheet for Direct Data Entry

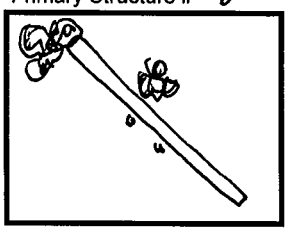
EMSL Order ID: 041423333-0009 **Client:** Tetra Tech

Client Sample: *BC-AA-01-00009* Page 1 of 1

Primary Structure #



Primary Structure # 2



Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

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Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

Primary Structure #

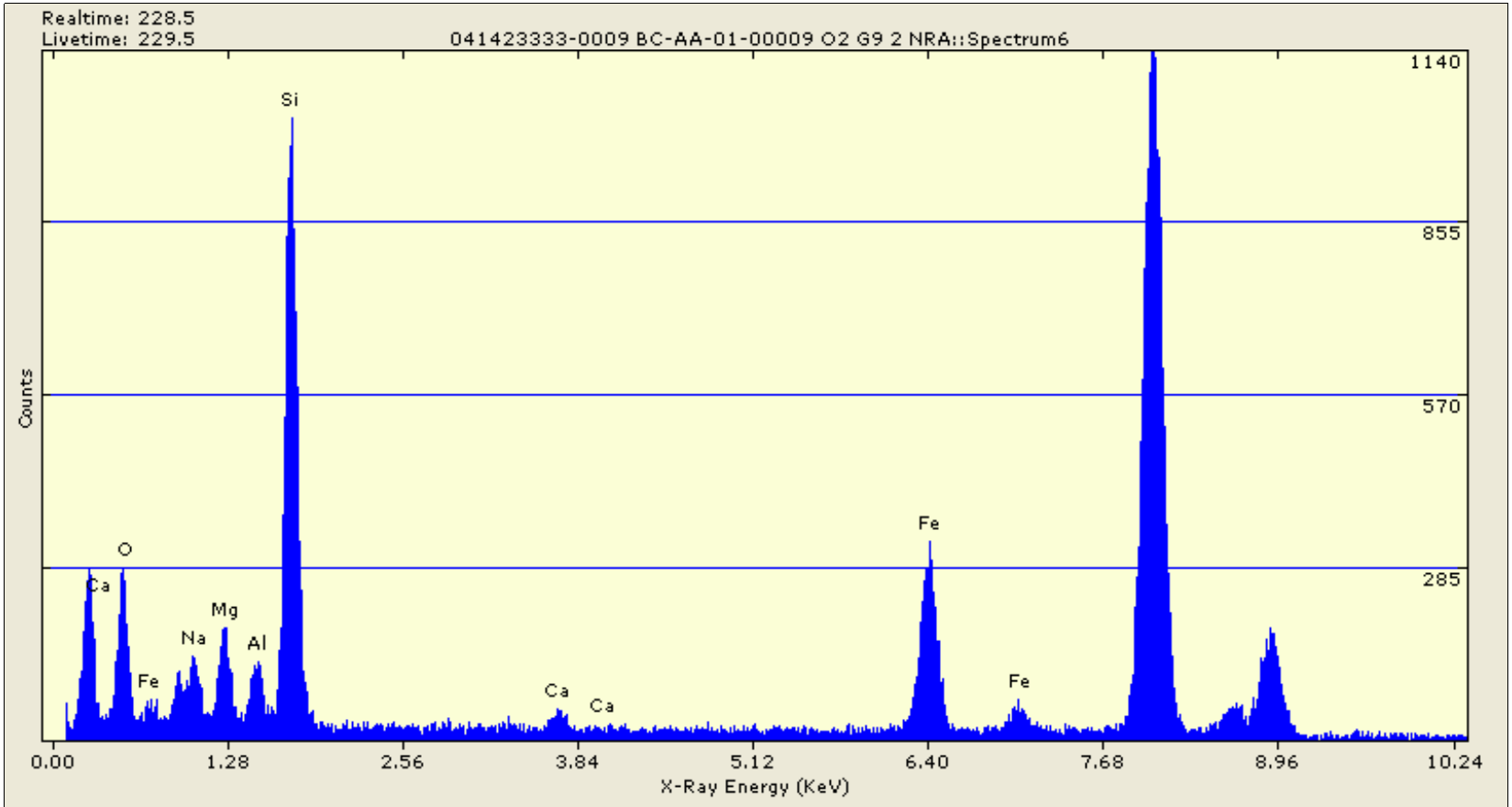
Structure #

Structure #

Structure #

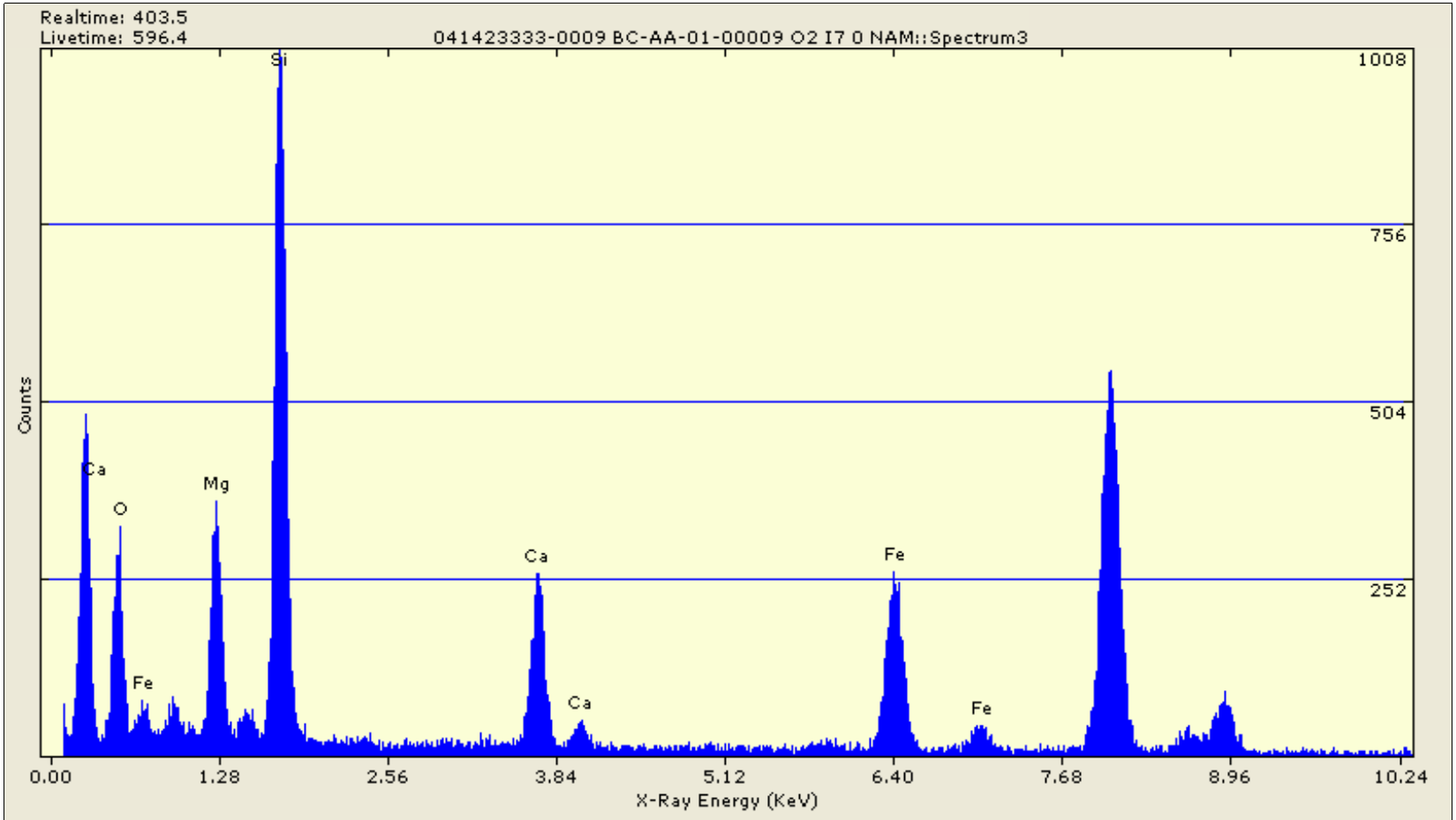
Structure #

Analyst: FC Date: 6/17/14 Scope: 04 61



Quantitative Results for Spectrum6
Analysis: Thin Film Method: Standardless
Acquired 17-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	44.18	1.14	60.80	0.00		0.0000	0.0000	0.0	95.9	2113.44
Sodium	4.05	0.05	3.88	5.46	(Na2O)	1.4686	0.0701	718.2	101.9	1081.50
Magnesium	4.74	0.05	4.29	7.86	(MgO)	1.6244	0.0864	1059.5	104.7	1524.55
Aluminum	2.89	0.03	2.36	5.45	(Al2O3)	0.8911	0.0541	712.0	107.3	1036.60
Silicon	28.52	0.33	22.36	61.02	(SiO2)	8.4587	0.4595	7451.5	110.1	8723.80
Calcium	0.97	0.01	0.53	1.36	(CaO)	0.2023	0.0103	264.0	129.5	347.87
Iron	14.64	0.17	5.77	18.84	(FeO)	2.1836	0.1144	3153.5	152.3	3452.98
Total	100.00			100.00		14.8287				



Quantitative Results for Spectrum3
Analysis: Thin Film Method: Standardless
Acquired 17-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	43.43	0.50	60.58	0.00		0.0000	0.0000	0.0	95.8	2307.26
Magnesium	9.77	0.11	8.97	16.20	(MgO)	3.4054	0.1751	2405.3	104.7	2971.72
Silicon	26.64	0.30	21.17	56.99	(SiO2)	8.0352	0.4464	7664.9	110.1	8829.16
Calcium	7.79	0.09	4.34	10.90	(CaO)	1.6462	0.0742	2326.0	129.5	2582.44
Iron	12.37	0.14	4.94	15.91	(FeO)	1.8765	0.0958	2934.4	152.3	2992.72
Total	100.00			100.00		14.9633				

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041423333	**Date:**	Aug 17, 2014
Indexing of Image Number:	010483	**Scope #:**	04 - 01
Reference / Sample No:	0009-04-01	**By:**	F Craig
Preliminary ID:	NRA		
Using Camera Constant of:	2.950e-003 **1/A Pixels**		
Determined from Reference:	AuCal-081214_10469		

Measured Inter-Row Spacing:	**63.72**	Pixels
Mean Distance between spots on Center row (d2):	**172.07**	Pixels
Mean Distance between spots on slant vector (d1):	**98.71**	Pixels

	Calculated	Ref	-5%	+5%
Inter-row Spacing (Angstroms):	5.320	**5.300**	*5.035*	*5.565*
d2 or hk0 (Camera K/zero row dist.):	1.970	**1.961**	*1.863*	*2.059*
d1 or hk1 (Camera K/slant vector dist.):	3.434	**3.380**	*3.211*	*3.549*
Ratio of hk0/hkl:	0.574	**0.580**	*0.551*	*0.609*
Angle of Slant Vector (Measured):	40.0	**41.770**	*39.682*	*43.859*

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Ferroglaucophane **By:** F Craig

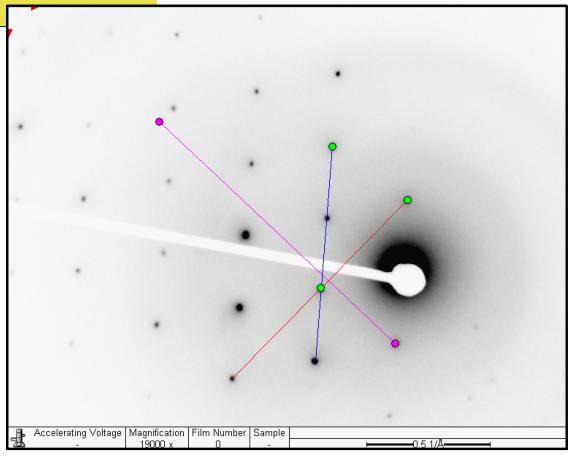
Miller Indice hk0: (**3 7 0**)

Miller Indice hkl: (**1 3 1**)

With a Zone Axis of: [**7 -3 2**]

Preliminary Identification was: X CORRECT

INCORRECT



Percent accuracy to date: 100 %

EMSL Analytical, Inc.
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Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 07:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-03-00009	Air volume:	10800	Liters
EMSL Sample Number:	041423333-0010	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040** **Structure/cc** **Limit of Detection:** **0.000119** **Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**0.000000**	**0.000000 -**	**0.000119**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

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Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0010	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-03-00009	Grid Box :	0414-TetraTech-07: R	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/20/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
R1	B8	None Detected								
R1	B6	None Detected								
R1	B4	None Detected								
R1	B2	None Detected								
R1	C1	None Detected								
R1	C3	None Detected								
R1	C5	None Detected								
R1	C7	None Detected								
R1	C9	None Detected								
R1	D10	None Detected								
R1	D8	None Detected								
R1	D6	None Detected								
R1	D4	None Detected								
R1	D2	None Detected								
R1	E1	None Detected								
R1	E3	None Detected								
R1	E5	None Detected								
R1	E7	None Detected								
R1	E9	None Detected								
R1	F10	None Detected								
R1	F8	None Detected								
R1	F6	None Detected								
R1	F4	None Detected								
R1	F2	None Detected								
R1	G1	None Detected								
R1	G3	None Detected								
R1	G5	None Detected								
R1	G7	None Detected								
R1	G9	None Detected								
R1	H10	None Detected								
R1	H8	None Detected								
R1	H6	None Detected								
R1	H4	None Detected								
R1	H2	None Detected								
R2	I9	None Detected								
R2	I7	None Detected								
R2	I5	None Detected								
R2	I3	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0010	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-03-00009	Grid Box :	0414-TetraTech-07: R	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/20/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
R2	I1	None Detected								
R2	H2	None Detected								
R2	H4	None Detected								
R2	H6	None Detected								
R2	H8	None Detected								
R2	H10	None Detected								
R2	G9	None Detected								
R2	G7	None Detected								
R2	G5	None Detected								
R2	G3	None Detected								
R2	G1	None Detected								
R2	F2	None Detected								
R2	F4	None Detected								
R2	F6	None Detected								
R2	F8	None Detected								
R2	F10	None Detected								
R2	E9	None Detected								
R2	E7	None Detected								
R2	E5	None Detected								
R2	E3	None Detected								
R2	E1	None Detected								
R2	D2	None Detected								
R2	D4	None Detected								
R2	D6	None Detected								
R2	D8	None Detected								
R2	D10	None Detected								
R2	C9	None Detected								
R2	C7	None Detected								
R2	C5	None Detected								
R2	C3	None Detected								

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EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 07:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-04-00009	Air volume:	10800	Liters
EMSL Sample Number:	041423333-0011	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	57.56 Random	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040 Structure/cc** **Limit of Detection:** **0.000119 Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	16	-	17.83	0.000635	0.000363 -	0.001032
PCMe Structures (NRA)	ADX	2	-	2.23	0.000079	0.000000 -	0.000250
Total PCMe Structures (Regulated)	**CD/ADX**	**16**	**-**	**17.83**	**0.000635**	**0.000363 -**	**0.001032**
Total PCMe Structures (All)	**CD/ADX**	**18**	**-**	**20.05**	**0.000715**	**0.000424 -**	**0.001130**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	15	16.71	0.000596	0.000333 -	0.000983
PCMe Fibers and Bundles (NRA)	ADX	-	2	2.23	0.000079	0.000000 -	0.000250
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**15**	**16.71**	**0.000596**	**0.000333 -**	**0.000983**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**17**	**18.94**	**0.000675**	**0.000393 -**	**0.001081**
Non Asbestos Mineral Structures	NAM	3	3	-	-	- -	-

Asbestiform Minerals Present: *Actinolite, Non-Regulated, Amphibole*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0011	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-04-00009	Grid Box :	0414-TetraTech-07: P	Analyst(s):	F. Craig
Chi² Test for Uniformity:	57.56-Random	Pore Size (micron):	0.8	Analysis Date:	08/18/2014 & 08/19/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	15%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
P2	B8	None Detected								
P2	B6	None Detected								
P2	B4	None Detected								
P2	B2	None Detected								
P2	C1	None Detected								
P2	C3	None Detected								
P2	C5	None Detected								
P2	C7	None Detected								
P2	C9	None Detected								
P2	D10	None Detected								
P2	D8	None Detected								
P2	D6	MD11	1		17.8	11.88	ADX	Actinolite		
P2	D6	MF		1	10	2.6	ADX	Actinolite	010485D	
P2	D4	None Detected								
P2	D2	None Detected								
P2	E1	None Detected								
P2	E3	None Detected								
P2	E5	None Detected								
P2	E7	MD11	2		9.5	2.38	ADX	Actinolite		
P2	E7	MF		2	7.6	0.72	ADX	Actinolite	010487D	
P2	E9	None Detected								
P2	F10	MD11	3		5.7	1.3	ADX	Non Reg.Amph.		
P2	F10	MF		3	5.7	0.72	ADX	Non Reg.Amph.	010489D	
P2	F8	MD11	4		21.2	15.6	ADX	Actinolite		
P2	F8	MF		4	10.7	1.8	ADX	Actinolite		
P2	F6	None Detected								
P2	F4	None Detected								
P2	F2	F	5	5	6.6	0.72	ADX	Actinolite	010491D	
P2	G3	MD11	6		8.3	4.75	NAM	Non Asb. Mineral		
P2	G3	MF		6	7.4	1.44	NAM	Non Asb. Mineral		
P2	G7	MD11	7		30.9	10.69	ADX	Actinolite		
P2	G7	MF		7	29	2.62	ADX	Actinolite	010493D	
P2	G9	None Detected								
P2	H10	None Detected								
P2	H8	None Detected								
P2	H6	None Detected								
P2	H4	MD11	8		20	18	ADX	Actinolite		
P2	H4	MF		8	10	1.32	ADX	Actinolite		

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0011	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-04-00009	Grid Box :	0414-TetraTech-07: P	Analyst(s):	F. Craig
Chi² Test for Uniformity:	57.56-Random	Pore Size (micron):	0.8	Analysis Date:	08/18/2014 & 08/19/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	15%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
P2	I1	None Detected								
P2	I5	None Detected								
P2	I7	MD11	9		10.9	4.75	ADX	Actinolite		
P2	I7	MB		9	7.1	1	ADX	Actinolite		
P2	I9	None Detected								
P3	I9	None Detected								
P3	I5	MC11	10	10	27.1	20.9	ADX	Actinolite		
P3	I3	MD11	11		13.1	2.38	ADX	Actinolite		
P3	I3	MF		11	13.1	0.72	ADX	Actinolite		
P3	I1	None Detected								
P3	H4	MD11	12		14.5	7.61	ADX	Actinolite		
P3	H4	MF		12	12.1	1.02	ADX	Actinolite		
P3	H8	MD11	13		10.5	8.3	ADX	Actinolite		
P3	H8	MF		13	6.9	0.72	ADX	Actinolite		
P3	H8	MD11	14		11.9	5.65	NAM	Non Asb. Mineral		
P3	H8	MF		14	10.9	1.25	NAM	Non Asb. Mineral		
P3	H10	None Detected								
P3	G9	None Detected								
P3	G7	None Detected								
P3	G3	None Detected								
P3	F2	MD11	15		29.7	17.1	ADX	Actinolite		
P3	F2	MF		15	6.4	1.44	ADX	Actinolite		
P3	F2	MD11	16		21.4	1.68	ADX	Non Reg.Amph.		
P3	F2	MF		16	21.4	0.5	ADX	Non Reg.Amph.	010498D	
P3	F4	None Detected								
P3	F6	None Detected								
P3	F8	MD11	17		7.4	3.58	ADX	Actinolite		
P3	F8	MF		17	6.2	1.44	ADX	Actinolite		
P3	F10	None Detected								
P3	E7	None Detected								
P3	EE	None Detected								
P3	E1	MD11	18		5.9	2.16	ADX	Actinolite		
P3	E1	MF		18	5.2	1.44	ADX	Actinolite		
P3	D2	None Detected								
P3	D4	F	0	0	21.9	2.86	ADX	Actinolite		
P3	D6	None Detected								
P3	D8	MD11	19		9.5	1.44	ADX	Actinolite		
P3	D8	MF		19	8.3	1	ADX	Actinolite		
P3	C9	MD11	20		11.6	3.54	ADX	Actinolite		

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0011	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-04-00009	Grid Box :	0414-TetraTech-07: P	Analyst(s):	F. Craig
Chi² Test for Uniformity:	57.56-Random	Pore Size (micron):	0.8	Analysis Date:	08/18/2014 & 08/19/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	15%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
P3	C9	MF		20	11.6	1.68	ADX	Actinolite		
P3	C5	None Detected								
P3	C7	MD11	21		9	3.32	NAM	Non Asb. Mineral		
P3	C7	MF		21	9	1.2	NAM	Non Asb. Mineral		
P3	C3	None Detected								
P3	B4	None Detected								
P3	B6	None Detected								
P3	B8	None Detected								
P3	B10	None Detected								
P3	A7	None Detected								
P3	A5	None Detected								
P3	A3	MD11	0		19.9	4.24	ADX	Non Reg.Amph.		
P3	A3	MB		0	19.9	1.2	ADX	Non Reg.Amph.		

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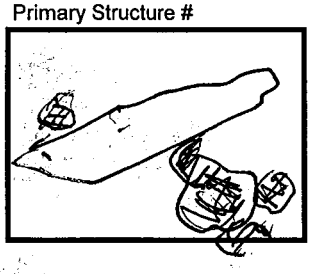
International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Structure Sketch Sheet for Direct Data Entry

EMSL Order ID: 041423333-0011 **Client:** Tetra Tech

Client Sample: *BC-AA-04-00009* Page 1 of 2

Primary Structure #



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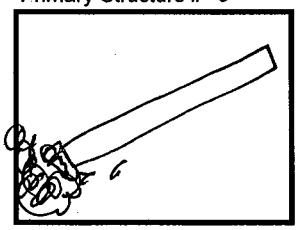

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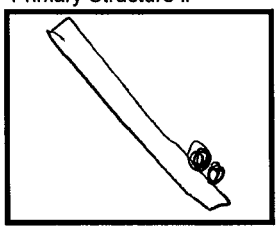

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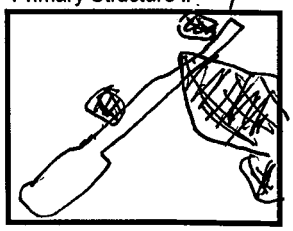

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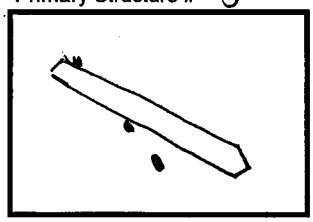

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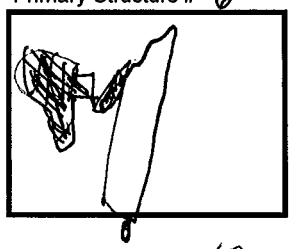

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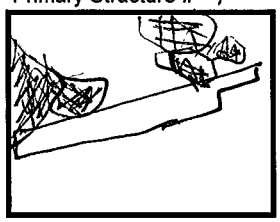

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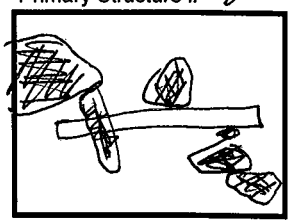

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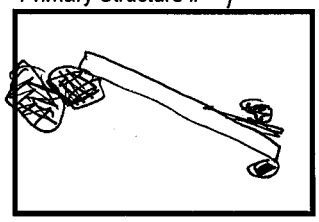

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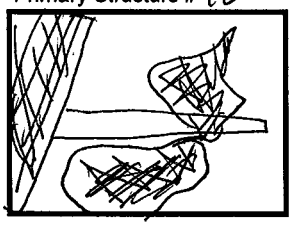

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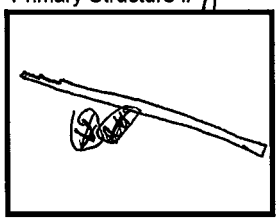

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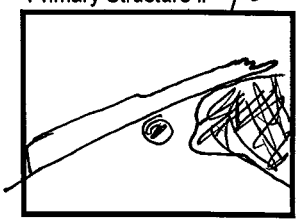

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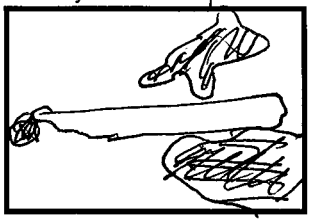
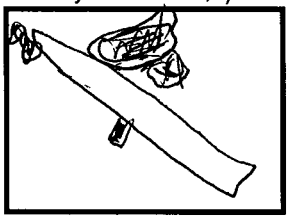


Primary Structure # 14



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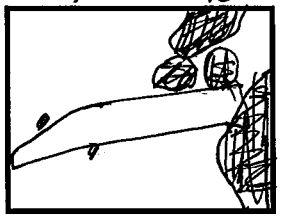
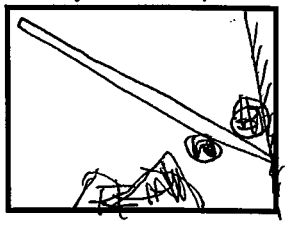
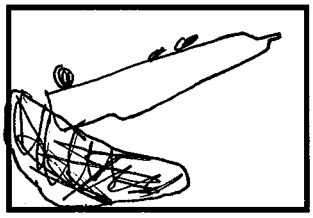


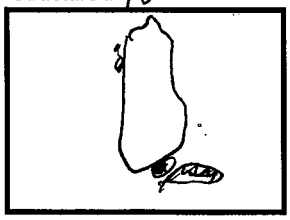
Primary Structure # 16



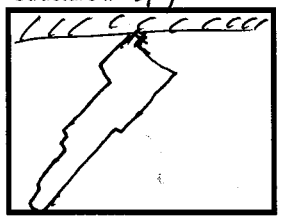
Structure # 17

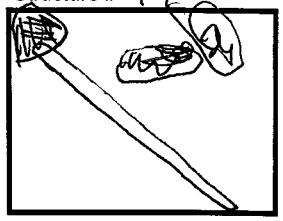


Structure # 18



Structure # 19





Analyst: FC Date: 8/20/14 Scope: 04 01

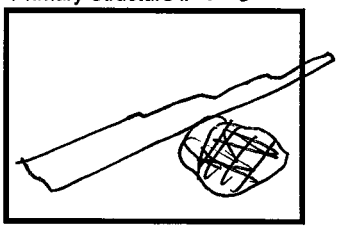
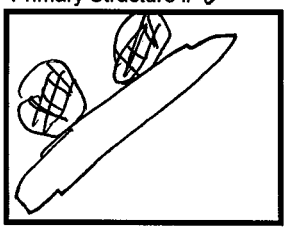
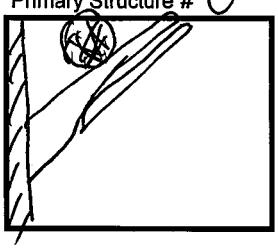
ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

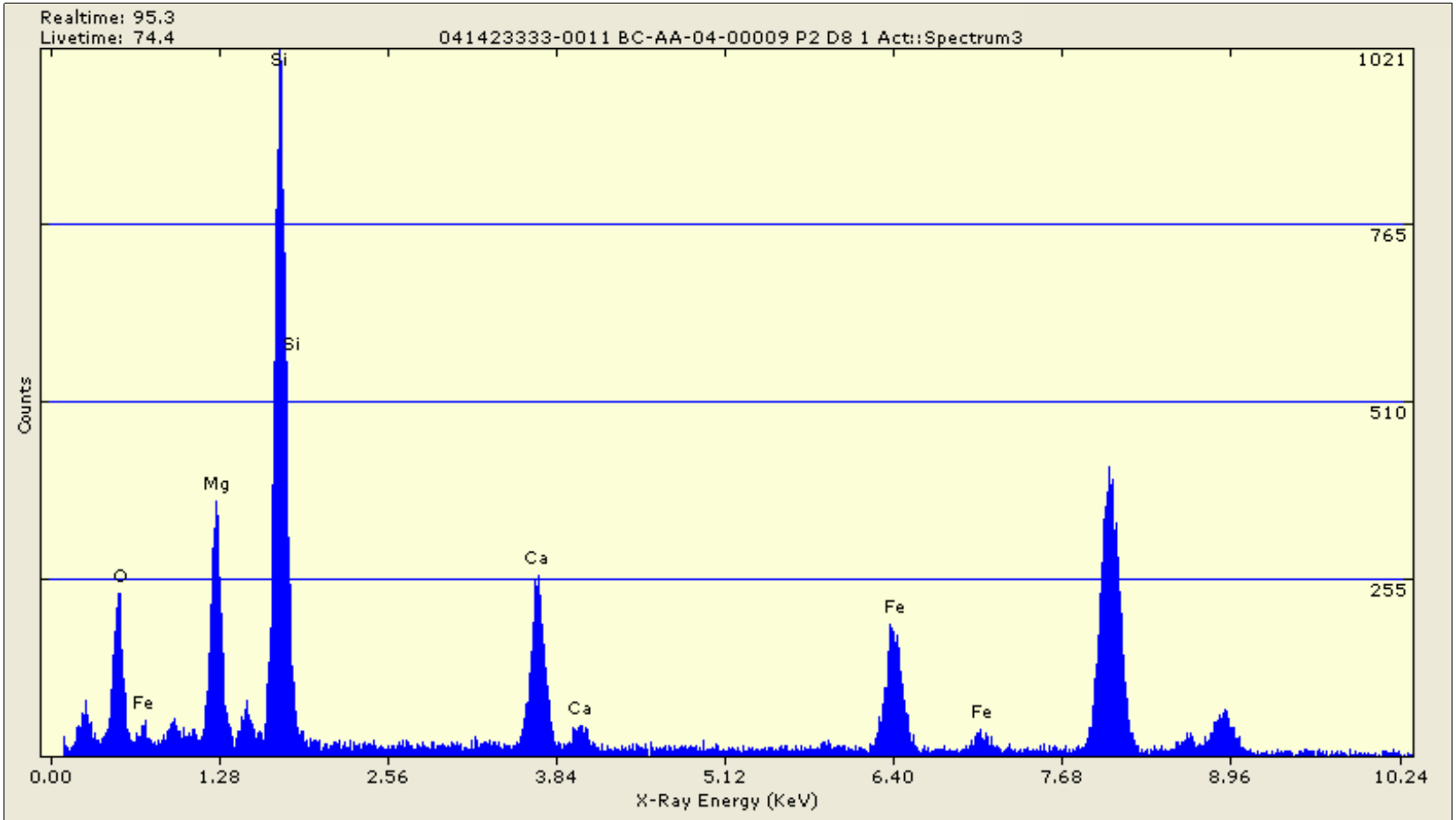
Structure Sketch Sheet for Direct Data Entry

EMSL Order ID: 041423333-0011 **Client:** Tetra Tech

Client Sample: *BC-AA-04-00009* Page 2 of 2

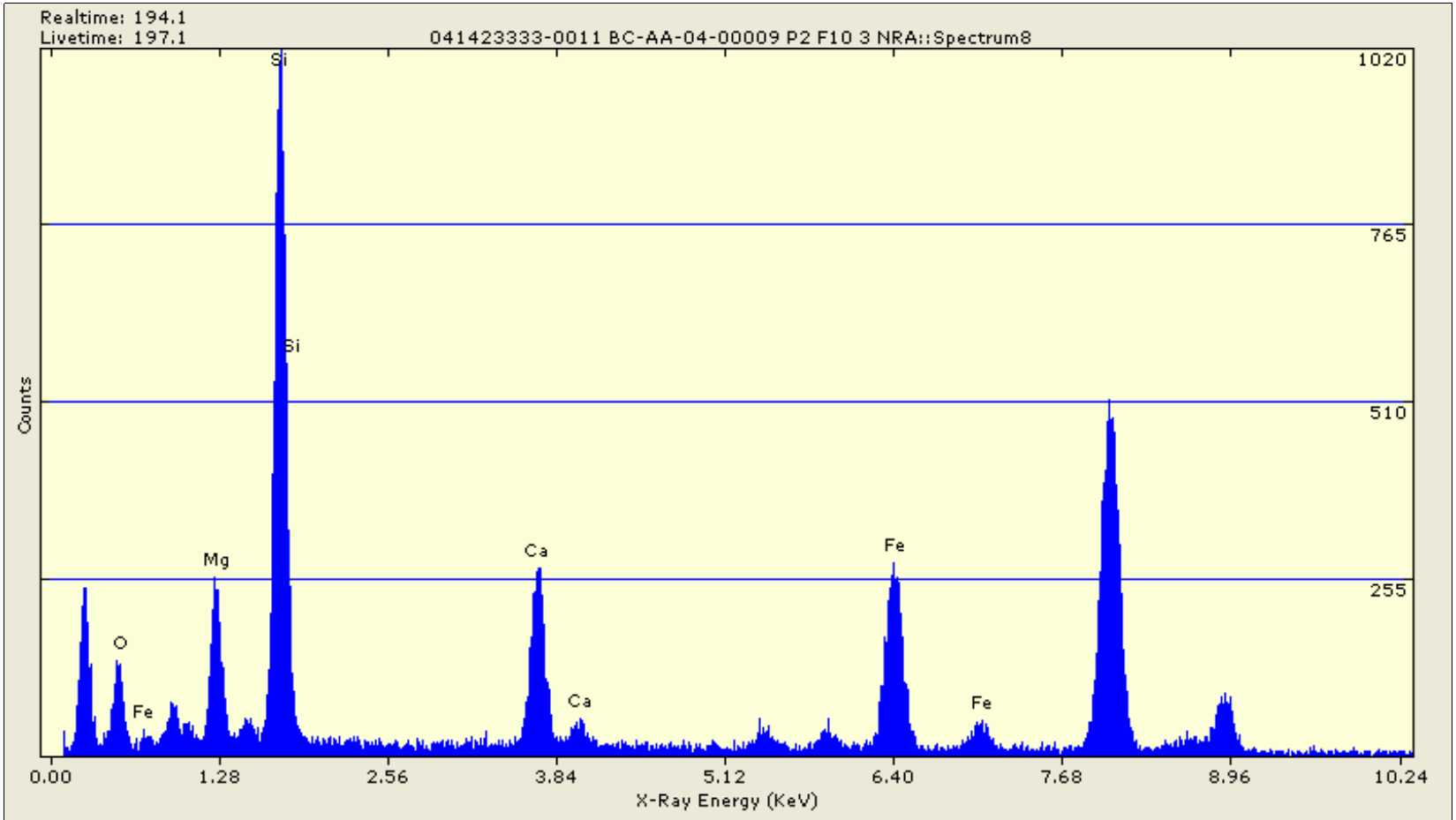
Primary Structure # 20 	Primary Structure # 21 	Primary Structure # 0 	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Structure #	Structure #	Structure #	Structure #

Analyst: FC Date: 8/20/14 Scope: 04 01



Quantitative Results for Spectrum3
Analysis: Thin Film Method: Standardless
Acquired 18-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	44.58	0.52	60.91	0.00		0.0000	0.0000	0.0	66.9	1483.40
Magnesium	10.53	0.12	9.47	17.47	(MgO)	3.5767	0.1924	2396.0	79.0	2508.44
Silicon	28.02	0.32	21.81	59.95	(SiO2)	8.2349	0.4813	7450.2	86.0	7384.02
Calcium	7.90	0.09	4.31	11.06	(CaO)	1.6276	0.0772	2181.2	109.7	2349.05
Iron	8.96	0.10	3.51	11.53	(FeO)	1.3246	0.0717	1964.6	135.9	1909.50
Total	100.00			100.00		14.7637				



Quantitative Results for Spectrum8
Analysis: Thin Film Method: Standardless
Acquired 18-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	43.20	0.50	61.06	0.00		0.0000	0.0000	0.0	66.9	940.27
Magnesium	6.94	0.08	6.45	11.50	(MgO)	2.4307	0.1450	1617.8	79.0	1744.88
Silicon	27.48	0.32	22.12	58.78	(SiO2)	8.3326	0.5376	7489.9	86.0	7483.21
Calcium	8.15	0.09	4.60	11.40	(CaO)	1.7320	0.0911	2306.2	109.7	2578.89
Iron	14.23	0.16	5.76	18.31	(FeO)	2.1707	0.1260	3198.7	135.9	3044.53
Total	100.00			100.00		14.6660				

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041423333	**Date:**	Aug 18, 2014
Indexing of Image Number:	010485	**Scope #:**	04 - 01
Reference / Sample No:	0011-04-01	**By:**	F Craig
Preliminary ID:	ACTINOLITE		
Using Camera Constant of:	2.950e-003 **1/A Pixels**		
Determined from Reference:	AuCal-081214_10469		

Measured Inter-Row Spacing:	**192.6**	Pixels
Mean Distance between spots on Center row (d2):	**74.47**	Pixels
Mean Distance between spots on slant vector (d1):	**196.63**	Pixels

	Calculated	Ref	-5%	+5%
Inter-row Spacing (Angstroms):	1.760	**1.759**	*1.671*	*1.847*
d2 or hk0 (Camera K/zero row dist.):	4.552	**4.520**	*4.294*	*4.746*
d1 or hk1 (Camera K/slant vector dist.):	1.724	**1.718**	*1.632*	*1.804*
Ratio of hk0/hkl:	2.640	**2.631**	*2.499*	*2.763*
Angle of Slant Vector (Measured):	79.6	**79.010**	*75.060*	*82.961*

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Actinolite **By:** F Craig

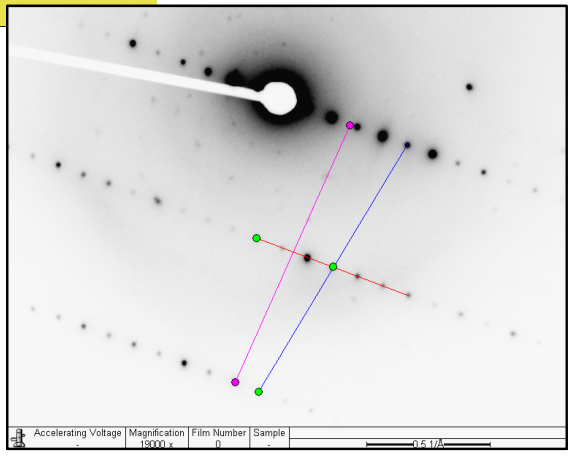
Miller Indice hk0: (**0 4 0**)

Miller Indice hkl: (**-2 2 3**)

With a Zone Axis of: [**3 0 2**]

Preliminary Identification was: X CORRECT

INCORRECT



Percent accuracy to date: 100 %

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 08:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	BC-AA-02-00009	Air volume:	10800	Liters
EMSL Sample Number:	041423333-0012	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	68	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	66.00 Random	Analyst:	F. Craig	

Analytical Sensitivity: **0.000040 Structure/cc** **Limit of Detection:** **0.000119 Structure/cc**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration (Str/cc)	Poisson 95 % Confidence Interval LCL (Str/cc)	UCL (Str/cc)
PCMe Structures (Chrys)	CD	0	-	0.00	0.000000	0.000000 -	0.000119
PCMe Structures (Amph)	ADX	2	-	2.23	0.000079	0.000000 -	0.000250
PCMe Structures (NRA)	ADX	0	-	0.00	0.000000	0.000000 -	0.000119
Total PCMe Structures (Regulated)	**CD/ADX**	**2**	**-**	**2.23**	**0.000079**	**0.000000 -**	**0.000250**
Total PCMe Structures (All)	**CD/ADX**	**2**	**-**	**2.23**	**0.000079**	**0.000000 -**	**0.000250**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	0.000000	0.000000 -	0.000119
PCMe Fibers and Bundles (Amph)	ADX	-	2	2.23	0.000079	0.000000 -	0.000250
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	0.000000	0.000000 -	0.000119
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**2**	**2.23**	**0.000079**	**0.000000 -**	**0.000250**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**2**	**2.23**	**0.000079**	**0.000000 -**	**0.000250**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *Actinolite*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0012	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-02-00009	Grid Box :	0414-TetraTech-07: S	Analyst(s):	F. Craig
Chi² Test for Uniformity:	66.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/21/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
S2	B8	None Detected								
S2	B6	None Detected								
S2	B4	None Detected								
S2	B2	None Detected								
S2	C3	None Detected								
S2	C5	None Detected								
S2	C7	None Detected								
S2	C9	None Detected								
S2	D10	None Detected								
S2	D8	None Detected								
S2	D6	None Detected								
S2	D4	None Detected								
S2	D2	None Detected								
S2	E3	None Detected								
S2	E5	None Detected								
S2	E7	None Detected								
S2	E9	None Detected								
S2	F10	None Detected								
S2	F8	None Detected								
S2	F6	F	1	1	5.2	0.6	ADX	Actinolite	010500D	
S2	F4	None Detected								
S2	G3	None Detected								
S2	G5	None Detected								
S2	G7	None Detected								
S2	G9	None Detected								
S2	H10	None Detected								
S2	H8	None Detected								
S2	H6	None Detected								
S2	H4	None Detected								
S2	I3	None Detected								
S2	I5	None Detected								
S2	I7	F	2	2	6.2	0.9	ADX	Actinolite		
S2	I9	None Detected								
S3	J10	None Detected								
S3	J8	None Detected								
S3	J6	None Detected								
S3	J4	None Detected								
S3	I3	None Detected								

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Cinnaminson, NJ 08077

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0012	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	BC-AA-02-00009	Grid Box :	0414-TetraTech-07: S	Analyst(s):	F. Craig
Chi² Test for Uniformity:	66.00-Random	Pore Size (micron):	0.8	Analysis Date:	08/21/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	10%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
S3	I5	None Detected								
S3	I7	None Detected								
S3	I9	None Detected								
S3	H10	None Detected								
S3	H8	None Detected								
S3	H6	None Detected								
S3	H4	None Detected								
S3	G3	None Detected								
S3	G5	None Detected								
S3	G7	None Detected								
S3	G9	None Detected								
S3	G10	None Detected								
S3	F8	None Detected								
S3	F6	None Detected								
S3	F4	None Detected								
S3	E3	None Detected								
S3	E5	None Detected								
S3	E7	None Detected								
S3	E9	None Detected								
S3	D10	None Detected								
S3	D8	None Detected								
S3	D6	None Detected								
S3	D4	None Detected								
S3	C3	None Detected								
S3	C5	None Detected								
S3	C7	None Detected								
S3	C9	None Detected								
S3	B10	None Detected								
S3	B8	None Detected								
S3	B6	None Detected								

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ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

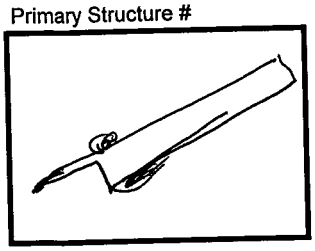
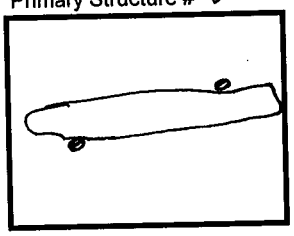
Structure Sketch Sheet for Direct Data Entry

EMSL Order ID: 041423333-0012

Client: Tetra Tech

Client Sample: *BC-AA-02-00009*

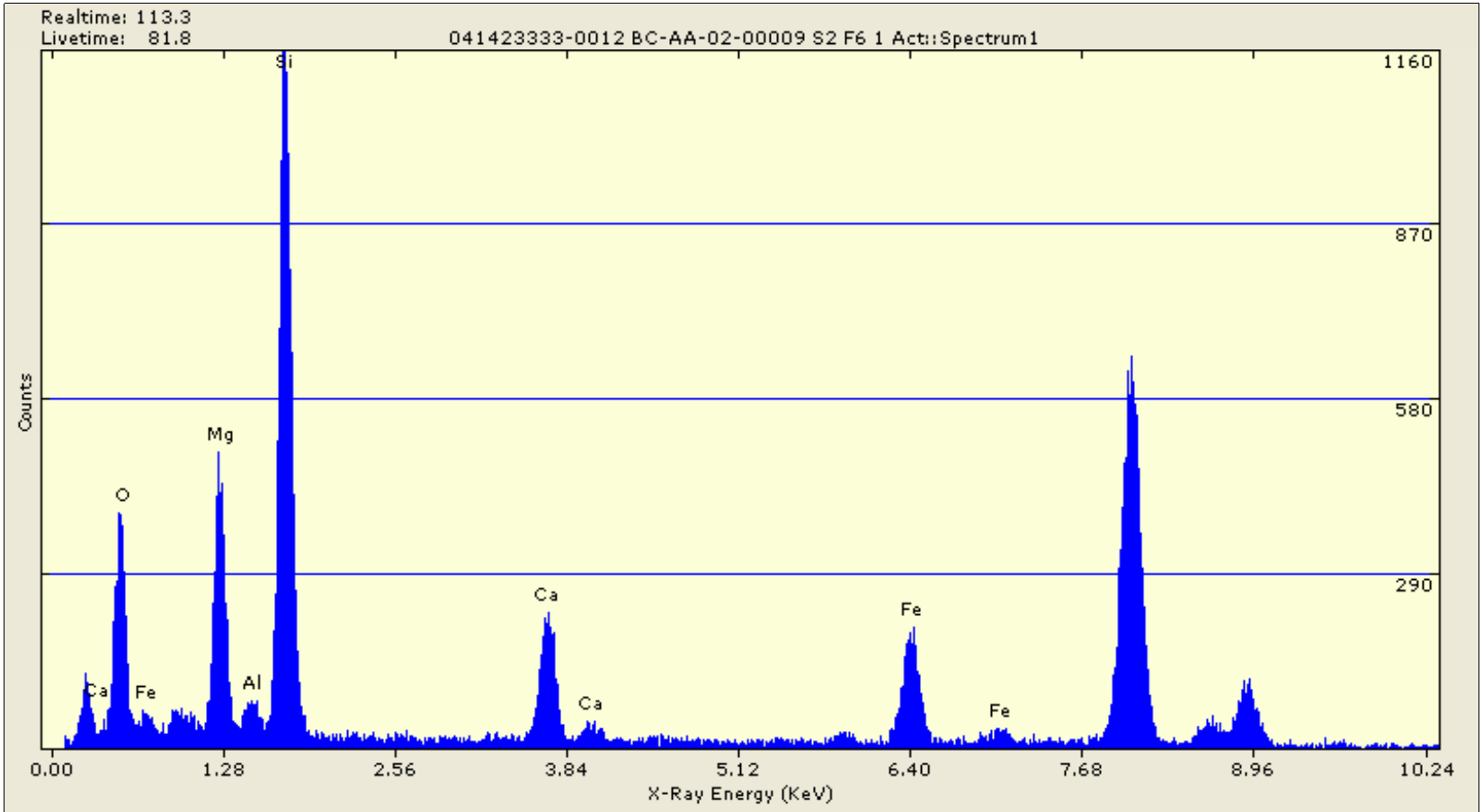
Page 1 of 1

Primary Structure # 	Primary Structure # 2 	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Primary Structure #	Primary Structure #	Primary Structure #	Primary Structure #
Structure #	Structure #	Structure #	Structure #

Analyst: FZ

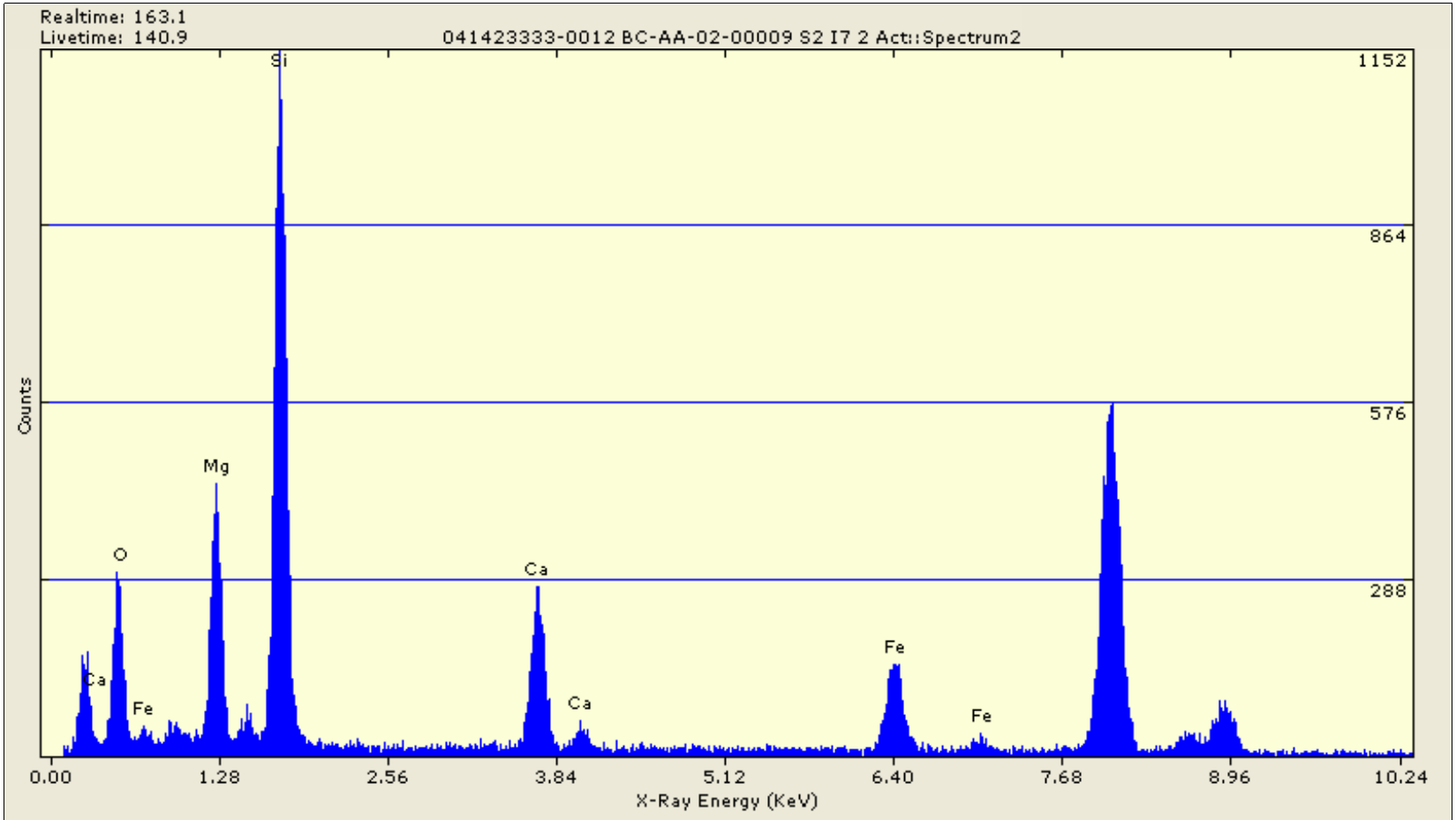
Date: 8/21/14

Scope: 04 01



Quantitative Results for Spectrum1
Analysis: Thin Film Method: Standardless
Acquired 21-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	45.56	0.46	61.03	0.00		0.0000	0.0000	0.0	81.2	2999.43
Magnesium	11.80	0.12	10.41	19.57	(MgO)	3.9223	0.1938	3520.9	91.4	3614.51
Aluminum	1.35	0.01	1.07	2.54	(Al2O3)	0.4030	0.0221	443.1	94.4	619.23
Silicon	28.21	0.28	21.53	60.35	(SiO2)	8.1132	0.4316	9813.7	97.5	9913.19
Calcium	6.21	0.06	3.32	8.69	(CaO)	1.2515	0.0535	2247.5	119.0	2247.68
Iron	6.87	0.07	2.64	8.84	(FeO)	0.9938	0.0499	1975.2	143.5	2088.80
Total	100.00			100.00		14.6838				



Quantitative Results for Spectrum2
Analysis: Thin Film Method: Standardless
Acquired 21-Aug-2014, 100.0 KeV @10 eV/channel

Element	Weight %	Std. Dev.	Atomic %	Oxide %		Cations	k-Ratio	Intensities	FWHM (eV)	ROI (gross)
Oxygen	45.61	0.48	61.11	0.00		0.0000	0.0000	0.0	81.2	2221.59
Magnesium	11.66	0.12	10.29	19.34	(MgO)	3.8714	0.2025	3067.4	91.4	3258.20
Silicon	29.11	0.31	22.22	62.28	(SiO2)	8.3625	0.4708	8948.5	97.6	9158.21
Calcium	7.67	0.08	4.10	10.74	(CaO)	1.5444	0.0716	2448.1	119.0	2527.96
Iron	5.94	0.06	2.28	7.64	(FeO)	0.8577	0.0474	1504.6	143.5	1663.69
Total	100.00			100.00		14.6361				

AMPHIBOLE SAED INDEXING FORM

EMSL Order Number:	041423333	**Date:**	Aug 21, 2014
Indexing of Image Number:	010500	**Scope #:**	04 - 01
Reference / Sample No:	0012-04-01	**By:**	F Craig
Preliminary ID:	ACTINOLITE		
Using Camera Constant of:	2.953e-003 **1/A Pixels**		
Determined from Reference:	AuCal-081914_10497		

Measured Inter-Row Spacing: **63.94** Pixels

Mean Distance between spots on Center row (d2): Pixels

Mean Distance between spots on slant vector (d1): Pixels

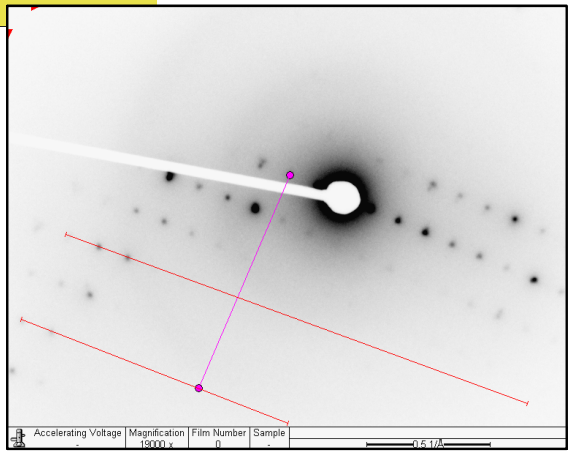
	Calculated	Ref	-5%	+5%
Inter-row Spacing (Angstroms):	5.296	**5.300**	*5.035*	*5.565*
d2 or hk0 (Camera K/zero row dist.):	N/A	**N/A**	-	-
d1 or hk1 (Camera K/slant vector dist.):	N/A	**N/A**	-	-
Ratio of hk0/hkl:	N/A	**N/A**	-	-
Angle of Slant Vector (Measured):	N/A	**N/A**	-	-

From SAED Reference Book, "unknown" diffraction pattern was found to be that of: Actinolite **By:** F Craig

Miller Indice hk0: ( )

Miller Indice hkl: ( )

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



Preliminary Identification was: X CORRECT

INCORRECT

Percent accuracy to date: 100 %

EMSL Analytical, Inc.
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Cinnaminson, NJ 08077
856-303-2500
www.EMSL.com

Edward Surbrugg
Tetra Tech
303 Irene Street
Helena, MT 59601
Phone: 406-442-5588

Customer ID: MAXI57
Customer PO: NA
Received: 8/12/2014 9:30
Date Sampled: 08/10/2014 09:00
EMSL Order: 041423333
Report Date: 08/26/14

Project: NDOT NOA / 10353259.02

ISO 10312
International Standard for the Determination of Asbestos Fibers - Direct Transfer TEM - Modified for PCMe Analysis

Customer Sample Number:	FIELD BLANK 081014	Air volume:	0	Liters
EMSL Sample Number:	041423333-0013	Grid Opening Area:	0.0132	mm²
Minimum Level of analysis (chrysotile):	CD	Grid Openings Analyzed:	10	
Minimum Level of analysis (amphibole):	ADX			
Magnification used for fiber counting:	10,000			
Aspect ratio for fiber definition:	3:1			
Min Length/ Width to be counted (µm):	>5 / 0.25-none			
Area of collection filter (mm²):	385	Analysis Date:	08/12/2014	
Result of Chi² Test:	N/A N/A	Analyst:	F. Craig	

Analytical Sensitivity: **7.575758** **Structure/ mm²** **Limit of Detection:** **22.651515** **Structure/ mm²**

Structure Class	Min ID Level	Primary Str.	Total Str.	Density Str/mm²	Concentration Str/ mm²	Poisson 95 % Confidence Interval LCL Str/ mm²	UCL Str/ mm²
PCMe Structures (Chrys)	CD	0	-	0.00	NA	0.000000 -	22.651515
PCMe Structures (Amph)	ADX	0	-	0.00	NA	0.000000 -	22.651515
PCMe Structures (NRA)	ADX	0	-	0.00	NA	0.000000 -	22.651515
Total PCMe Structures (Regulated)	**CD/ADX**	**0**	**-**	**0.00**	**NA**	**0.000000 -**	**22.651515**
Total PCMe Structures (All)	**CD/ADX**	**0**	**-**	**0.00**	**NA**	**0.000000 -**	**22.651515**
PCMe Fibers and Bundles (Chrys)	CD	-	0	0.00	NA	0.000000 -	22.651515
PCMe Fibers and Bundles (Amph)	ADX	-	0	0.00	NA	0.000000 -	22.651515
PCMe Fibers and Bundles (NRA)	ADX	-	0	0.00	NA	0.000000 -	22.651515
Total PCMe Fibers and Bundles (Regulated)	**CD/ADX**	**-**	**0**	**0.00**	**NA**	**0.000000 -**	**22.651515**
Total PCMe Fibers and Bundles (All)	**CD/ADX**	**-**	**0**	**0.00**	**NA**	**0.000000 -**	**22.651515**
Non Asbestos Mineral Structures	NAM	0	0	-	-	- -	-

Asbestiform Minerals Present: *None Detected*

Explanation of Results

NRA = Non-Regulated Amphibole. A suspected mineral fiber that is a member of the Amphibole group, but is currently not regulated by the Federal governement as asbestos.

PCMe structure (modified)= A fibrous structure of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 um with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

PCMe Fiber or Bundle (modified) = A Fiber or Bundle of of aspect ratio > 3:1, longer than 5 um, and which has a diameter ≥ 0.25 microns with no upper width boundary. This definition has been modified from the method to meet the client's project requirements.

Concentration (Reg) = include all federally regulated asbestos types. Currently Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite

Concentration (all) = include all federally regulated asbestos types (Chrysotile, Amosite, Actinolite, Tremolite, Anthophyllite and Crocidolite) and any Non-regulated Amphiboles

Min ID Level = the minimum level of analysis that must have been met to be included in the reportable structure count. If any fibrous structure did not meet the minimum ID level, it would not be included in the concentration.

NAM = Non Asbestos Mineral. A mineral fiber that has been rejected from being either Amphibole or Chrysotile

Concentrations and 95% Confidence Intervals are based on a Poissonian distribution. Structure counts above 31 may be better expressed with a Gaussian distribution. EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced except in full without written approval of EMSL. EMSL is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client.

Comment: Samples collected on 0.8 um filters.

Robyn Denton
Approved Signatory

ISO 10312

International Standard for the Determination of Asbestos Fibers-Direct Transfer Transmission Electron Microscopy

Bench Sheet Data

Client:	Tetra Tech			Scope:	04-01
EMSL Sample ID:	041423333-0013	GO area (mm²):	0.0132	Mag.	10,000
Customer Sample:	FIELD BLANK 081014	Grid Box :	0414-TetraTech-07: Q	Analyst(s):	F. Craig
Chi² Test for Uniformity:	N/A	Pore Size (micron):	0.8	Analysis Date:	08/14/2014
Project ID:	NDOT NOA / 10353259.02			Particulate Loading:	1%

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Length	Width				
Q1	B8	None Detected								
Q1	D9	None Detected								
Q1	E5	None Detected								
Q1	G3	None Detected								
Q1	I5	None Detected								
Q2	A2	None Detected								
Q2	C3	None Detected								
Q2	F7	None Detected								
Q2	H6	None Detected								
Q2	J4	None Detected								

OrderID: 041423333

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number (*Lab Use Only*): 041423333

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX: (856) 786-5974

Company: Tetra Tech	**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments**
Street: 7 West 6th Avenue, Suite 412	*Third Party Billing requires written authorization from third party*
City: Helena **State/Province:** MT	**Zip/Postal Code:** 59601 **Country:** USA
Report To (Name): Ed Surbrugg	**Telephone #:** 406 441 3296
Email Address: Edward.Surbrugg@tetratech.com	**Fax #:** 406 442 7182 **Purchase Order:**
Project Name/Number: 103S3259.02	**Please Provide Results:** ☐ Fax ☒ Email ☐ Mail
U.S. State Samples Taken: —	**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

**For TEM Air 3 hr through 6 hr, please call ahead to schedule.*There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

PCM - Air ☐ Check if samples are from NY
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- ☐ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NIOSH 9002 (<1%)

TEM – Air ☐ 4-4.5hr TAT (AHERA only)
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☒ ISO 10312 Sensitivity to 0.00004

TEM - Bulk
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm ☐ Waste ☐ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- ☐ PLM CARB 435 - A (0.25% sensitivity)
- ☐ PLM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - C (0.01% sensitivity)
- ☐ TEM Qual. via Filtration Technique
- ☐ TEM Qual. via Drop-Mount Technique

Other:
- ☐

☐ **Check For Positive Stop – Clearly Identify Homogenous Group** | **Filter Pore Size (Air Samples):** ☒ 0.8µm ☐ 0.45µm

Samplers Name: BECK DAND **Samplers Signature:**

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
BC-AA-05-00004	Site 5	10,800 L	8-10-14 0000
BC-AA-06-00004	Site 6	10,620 L	8-10-14 0000
BC-AA-07-00004	Site 7	10,440 L	8-10-14 0000
BC-AA-08-00004	Site 8	10,800 L	8-10-14 0000
BC-AA-09-00004	Site 9	10,440 L	8-10-14 0000
BC-AA-10-00004	Site 10	10,440 L	8-10-14 0000
BC-AA-11-00004	Site 11	10,440 L	8-10-14 0000
BC-AA-12-00004	Site 12	10,800 L	8-10-14 0000

Client Sample # (s): **Total # of Samples:** 13

Relinquished (Client): **Date:** 8-11-14 **Time:** 1400

Received (Lab): FF FX **Date:** 8/12/14 **Time:** 9:30

Comments/Special Instructions:

EMSL ANALYTICAL, INC.
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Asbestos Chain of Custody

EMSL Order Number (*Lab Use Only*):

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Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
BC-AA-01-000009	Site 1	10,800 L	8-10-14 0605
BC-AA-03-000009	Site 3	10,800 L	8-10-14 0715
BC-AA-04-000009	Site 4	10,800 L	8-10-14 0735
BC-AA-02-000009	Site 2	10,800 L	8-10-14 0800
FieldBlank-081014	Field Blank	—	8-10-14 0930

***Comments/Special Instructions:**

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