EMS Laboratories Inc.
117 West Bellevue Drive, Pasadena, CA 91105
Phone: 626-568-4065 Fax: 626-796-5282
Email: akolk@emslabs.com

Attn: Derrick Wills
Tronox-LLC-Henderson
PO Box 55
Henderson, NV 89009

Phone: (947) 375-7004

Project: Tronox LLX Henderson, 560 W. Lake Mead Dr., Henderson, NV/2027.001

Customer ID: TRNX26
Customer PO: 2027.001
Received: 8/27/2010 11:10AM
EMS LAB No: 139934
Date Prepared: 9/8/2010 12:23PM
Analysis Date: 9/15/2010 10AM

Report Date: September 20, 2010

Date Sampled: 8/24/2010 1:36PM

NIOSH 7402/ISO

DRAFT, MODIFIED ELUTRIATOR METHOD FOR THE DETERMINATION OF ASBESTOS IN SOILS AND BULK MATERIAL METHOD

EMS Laboratory Number:	139934		Mass of Respirable Dust on Filter:	116	µg
Customer Sample Number:	SSAP6-02-0.00BPC		Area of collection filter:	385	mm^2
Minimum Level of Analysis (chrysotile):	CD		Grid openings area:	0.0094	mm^2
Minimum Level of Analysis (amphibole):	ADX		Grid Openings Analyzed:	132	
Magnification used for fiber counting:	9,200	x	Min. Str. Length/Max Str. Diameter:	>5/<0.4	microns
Aspect ratio for fiber definition:	3:1				
			Analyst(s):	Radha Singh	

Dust Generator - Total Dried Sample Weight-79.3g		Soil % Moisture	2.5	%
		Air Flow Rate Through ME Opening of Dust Generator:	1370	
Not Used		Air Flow Rate Through IST Opening of Dust Generator:	100	
Used in Tumbler		Estimate Total Air Flow Through Elutriator:	1470	

Analytical Sensitivity: 2.67E+06 Structure /g PM 10 Limit of Detection: 8.01E+06 Structure /g PM 10

Test For Uniformity (Chi-Square results)

Structure Class	Min ID Level Required	Counts: Primary Str.	Counts: Total Str.	Poisson 95% Confidence Interval: Density St/mm²	Conc. Str/g PM10	Lower Limit Str/g PM10	Upper Limit Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	0	0	0	0	0	8.01E+06
Asbestos Structures>5um, ≤10um (Chrys)	CD	0	0	0	0	0	8.01E+06
Asbestos Structures>5um, ≤10um (Amph)	ADX	0	0	0	0	0	8.01E+06
Asbestos Structure >10um (Long)	ADX/CD	0	0	0	0	0	8.01E+06
Asbestos Structure >10um (Chrys)	CD	0	0	0	0	0	8.01E+06
Asbestos Structure >10um (Amph)	ADX	0	0	0	0	0	8.01E+06
Total Protocol Asbestos Structures	ADX/CD	0	0	0	0	0	8.01E+06
Protocol Asbestos Structures (Chrys)	CD	0	0	0	0	0	8.01E+06
Protocol Asbestos Structures (Amph)	ADX	0	0	0	0	0	8.01E+06
Total Protocol Non Asbestos Structures	NAM	0	0	0	0	0	8.01E+06

Approved by Technical Director

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm^2
Report number :	139934	**Magnification:**	9200
Sample number:	SSAP6-02-0.00BPC	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 9/8/2010 by Joel Paruli
Preparation Date: 9/10/2010 by Joel Paruli
Analysis Date: 9/15/2010 by Radha Singh

Asbestos Structures>5um, ≤10um (Chrys)	0
Asbestos Structures>5um, ≤10um (Amph)	0
Asbestos Structure >10um (Chrys)	0
Asbestos Structure >10um (Amph)	0
Protocol Asbestos Structures (Chrys)	0
Protocol Asbestos Structures (Amph)	0

Grid Openings	132
Mass - ug	116
Anlytical sensitivity	

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions - mm		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Width	Length	Width	Length				
1A	C23	None Detected										
	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	F23	None Detected										
	F26	None Detected										
	C34	None Detected										
	E31	None Detected										
	E34	None Detected,										
	F31	None Detected										
	F34	None Detected										
	G31	None Detected										
	G34	None Detected										
	C41	None Detected										
	C44	None Detected										
	E41	None Detected										
	E44	None Detected										
	F41	None Detected										
	F44	None Detected										
	E51	None Detected										
	E54	None Detected										
	F53	None Detected										
	F56	None Detected										
	G53	None Detected										
	G56	None Detected										
	F61	None Detected										
	F64	None Detected										
1B	C26	None Detected										
	E23	None Detected,										
	E26	None Detected										
	F23	None Detected										
	F26	None Detected										
	G23	None Detected										
	G26	None Detected										
	C34	None Detected										
	E31	None Detected										
	E34	None Detected										
	F31	None Detected										
	F34	None Detected										
	B44	None Detected										
	C41	None Detected										
	C44	None Detected										
	E41	None Detected										
	E44	None Detected										

EMS Laboratories

NIOSH 7402/ISO
117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total			Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
	B54	None Detected										
	C51	None Detected										
	C54	None Detected										
	E51	None Detected										
	E54	None Detected										
	F51	None Detected										
	F54	None Detected										
	G53	None Detected										
	G56	None Detected										
	F61	None Detected										
1C	C23	None Detected										
	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	F23	None Detected										
	F26	None Detected										
	C31	None Detected										
	C34	None Detected										
	E31	None Detected										
	E34	None Detected										
	F33	None Detected										
	F36	None Detected										
	C44	None Detected										
	F41	None Detected										
	G43	None Detected										
	G46	None Detected										
	H43	None Detected										
	H46	None Detected										
	C51	None Detected										
	C54	None Detected										
	E51	None Detected										
	E54	None Detected										
	F53	None Detected										
	F56	None Detected										
	F61	None Detected										
	F64	None Detected										
1D	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	F23	None Detected										
	F26	None Detected										
	E31	None Detected										
	E34	None Detected										
	F31	None Detected										
	F34	None Detected										
	G33	None Detected										
	G36	None Detected										
	C41	None Detected										
	C44	None Detected										
	E41	None Detected										
	E44	None Detected										
	F43	None Detected										
	F46	None Detected										
	G43	None Detected										
	G46	None Detected										
	E51	None Detected										
	E54	None Detected										

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total			Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
	F51	None Detected										
	F54	None Detected										
	H53	None Detected,										
	H56	None Detected										
	K53	None Detected										
1E	C23	None Detected										
	C26	None Detected										
	E23	None Detected										
	E26	None Detected										
	E31	None Detected										
	E34	None Detected										
	F31	None Detected										
	F34	None Detected										
	G31	None Detected										
	G36	None Detected										
	H33	None Detected										
	H36	None Detected										
	C44	None Detected										
	E41	None Detected										
	E44	None Detected										
	F41	None Detected										
	F46	None Detected										
	G43	None Detected										
	G46	None Detected										
	E51	None Detected										
	E54	None Detected.										
	F51	None Detected										
	G53	None Detected										
	G56	None Detected										
	F61	None Detected										
	F64	None Detected										

Copy

Count (Page of) NIOSH 7402/ISO

Prep Time: 6°° 8:30

Report number : 139934
Sample number: SSAP6-02-0.008PC
File name: Northgate
Sample Description: 116 : mg

Filter Type: PC 385 mm2
Date Sample was Run: 9/8/10

Magnification: 9,200 X

G.O. 132

Preparation date: 9/10/10 By JAP
Analysis date: 9/15/10 By
(A): ADX, ADQ

Grid opening dimension: 0.0094 mm²
Level of Analysis: (C): CD, CDX

Grid loading Moderate
Condition of Grid Good

Grid	Grid Opening	Number of structures Primary	Number of structures Total	Class	Type of Structure	Width mm	Length mm	Comments
1A	C2-3							
	C2-6							
	E2-3							
	E2-6							
	F2-3							
	F2-6							
	C3-1							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	G3-1							
	G3-4							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-1							
	F4-4							
	E5-1							
	E5-4							
	F5-3							
	F5-6							
	G5-3							
	G5-6							
	F6-1							
2	F6-4							
1B	C2-6							
	E2-3							
	E2-6							

EM-10A (2002)

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAP6-02-0.00 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
B	F2-3							
	F2-6							
	G2-3							
	G2-6							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	B4-4							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	B5-4							
	C5-1							
	C5-4							
	E5-1							
	E5-4							
	F5-1							
	F5-4							
	G5-3							
	G5-6							
	F6-1							
C	C2-3							
	C2-6							
	E2-3							
	E2-6							
	F2-3							
	F2-6							
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-3							

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAPG-02-0.008PC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
	E3-6							
	C4-4							
	F4-1							
	G4-3							
	G4-6							
	H4-3							
	H4-6							
	C5-1							
	C5-4							
	E5-1							
	E5-4							
	F5-3							
	F5-6							
	F6-1							
	F6-4							
ID	C2-6							
	E2-3							
	E2-6							
	F2-3							
	F2-6							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	G3-3							
	G3-6							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-3							
	F4-6							
	G4-3							
	G4-6							
	E3-1							

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAPG-02-0.008PC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
	F-4							
	F-1							
	F-4							
	H-3							
	H-6							
	K-3							
E	C2-3							
	C2-6							
	E2-3							
	E2-6							
	E3-1							
	E3-4							
	F-3-1							
	F-3-4							
	G3-1							
	G3-6							
	H3-3							
	H3-6							
	C4-4							
	E4-1							
	E4-4							
	F-4-1							
	F4-6							
	G4-3							
	G4-6							
	E-5-1							
	E5-4							
	F5-1							
	G5-3							
	G5-6							
	F-6-1							
H	F-6-4							

9-2-10 Moisture content

#139933 #SSAP7-03-0.00BPC		#139933 #SSAPC-03-0.00BPC	
dish wt.	19.24 init. wt		31.48
dish+S	120.82 (101.68g)		131.62 (100.14 - initial wt)
7:30-8:30	119.44 (100.20)		129.67 (98.19)
9:40-10:40	119.20 (99.96)		129.63 (98.15)
11:45-12:45	119.18 (99.94)		

$100 \times \frac{101.68 - 99.94}{99.44} = 1.7\%$

$100 \times \frac{100.14 - 98.15}{98.15} = 2.03\%$

#139934 #SSAP6-02-0.00BPC		#139934 #SSAP6-02-0.00BPC-FN	
dish wt.	31.44		35.11
dish+S.	131.41 (99.91 - in.wt)		135.68 (100.57 g - in.wt)
7:30-8:30	128.99 (97.55)		133.80 (98.69)
9:40-10:40	128.96 (97.52)		133.64 (98.53)
		11:45-12:45	133.62 (98.51)

$100 \times \frac{99.91 - 97.52}{97.52} = 2.5\%$

$100 \times \frac{100.57 - 98.51}{98.51} = 2.09\%$

9-3-10

#139934 #SSAP5-02-0.00BPC	
dish wt.	31.46 initial wt
dish+S.	131.76 (100.30g)
8:40-9:40	129.27 (97.81)
10:35-11:35	129.23 (97.77)

$100 \times \frac{100.3 - 97.77}{97.77} = 2.59\%$

Elutriator Data

Date: 9/8/10 Client: Northgate

Lab #: 139934

Sample ID: SSAPG-02-0.00BPC Sample weight (g): 79.3

Time air flow started: 8:00 Tumbler rpm: 30/45/60

IST Flowmeter (mL/min): 100 ME Flowmeter (mL/min): 1370

Filter No.	Start Time	Tested flow rate (mL/min)	Final Filter Wt (mg)	Initial Filter Wt (mg)	Dust Weight (mg)	Time Value (min)	Avg. rate of deposition (ug/min)	Optimal time (min)	
1	1000	180	0.02870	0.02521	3.49	30			70% loss
2	1030		0.02918	0.02517	4.01	15			OK
3	1045		0.03024	0.02514	5.10	35			40% loss
4	1120		0.03133	0.02488	6.45	30			3% loss
5	1150		0.03338	0.02425	9.13	35			~~20%~~ 5% OK
6	1225		0.03045	0.02424	6.21	25			20% loss
7	1250		0.03274	0.02423	8.51	40			OK
8	1330			~~0.02494~~					
	S.Time	End Time					Dep. Rate	Estiimate	
1	1100	1114	4.794	4.694	0.100	16			
2	1130	1145	4.737	4.626	0.106	15			
3	1205	1223	4.784	4.668	0.116	18			←
4	1255	1325	4.710	4.616	0.094	30			
5									
6									
7									
8									

* Raise RPM to 45 @ 1125

* Raise RPM to 60 @ 1200

EMS Laboratories Inc.
117 West Bellevue Drive, Pasadena, CA 91105
Phone: 626-568-4065 Fax: 626-796-5282
Email: akolk@emslabs.com

Attn: Derrick Wills
Tronox-LLC-Henderson
PO Box 55
Henderson, NV 89009

Phone: (947) 375-7004

Project: Tronox LLX Henderson, 560 W. Lake Mead Dr., Henderson, NV/2027.001

Customer ID: TRNX26
Customer PO: 2027.001
Received: 8/27/2010 11:10AM
EMS LAB No: 139934
Date Prepared: 9/22/2010 10:59AM
Analysis Date: 9/23/2010 10AM

Report Date: September 24, 2010

Date Sampled: 8/24/2010 3:13PM

NIOSH 7402/ISO

DRAFT, MODIFIED ELUTRIATOR METHOD FOR THE DETERMINATION OF ASBESTOS IN SOILS AND BULK MATERIAL METHOD

EMS Laboratory Number:	139934		Mass of Respirable Dust on Filter:	170	µg
Customer Sample Number:	SSAP5-02-0.00BPC		Area of collection filter:	385	mm^2
Minimum Level of Analysis (chrysotile):	CD		Grid openings area:	0.0094	mm^2
Minimum Level of Analysis (amphibole):	ADX		Grid Openings Analyzed:	92	
Magnification used for fiber counting:	9,200	x	Min. Str. Length/Max Str. Diameter:	>5/<0.4	microns
Aspect ratio for fiber definition:	3:1				
			Analyst(s):	Radha Singh	

Dust Generator - Total Dried Sample Weight-77.5g	Soil % Moisture	2.6	%
	Air Flow Rate Through ME Opening of Dust Generator:	1370	
Not Used	Air Flow Rate Through IST Opening of Dust Generator:	100	
Used in Tumbler	Estimate Total Air Flow Through Elutriator:	1470	

Analytical Sensitivity: 2.62E+06 Structure /g PM 10 Limit of Detection: 7.84E+06 Structure /g PM 10

Test For Uniformity (Chi-Square results)

Structure Class	Min ID Level Required	Counts Primary Str.	Counts Total Str.	Density St/mm²	Poisson 95% Confidence Interval Conc. Str/g PM10	Lower Limit Str/g PM10	Upper Limit Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	5	5	5.78	1.31E+07	4.25E+06	3.06E+07
Asbestos Structures>5um, ≤10um (Chrys)	CD	5	5	5.78	1.31E+07	4.25E+06	3.06E+07
Asbestos Structures>5um, ≤10um (Amph)	ADX	0	0	0	0	0	7.84E+06
Asbestos Structure >10um (Long)	ADX/CD	2	2	2.32	5.24E+06	6.34E+05	1.89E+07
Asbestos Structure >10um (Chrys)	CD	2	2	2.32	5.24E+06	6.34E+05	1.89E+07
Asbestos Structure >10um (Amph)	ADX	0	0	0	0	0	7.84E+06
Total Protocol Asbestos Structures	ADX/CD	7	7	8.09	1.83E+07	7.37E+06	3.78E+07
Protocol Asbestos Structures (Chrys)	CD	7	7	8.09	1.83E+07	7.37E+06	3.78E+07
Protocol Asbestos Structures (Amph)	ADX	0	0	0	0	0	7.84E+06
Total Protocol Non Asbestos Structures	**NAM**	1	1	1.16	2.62E+06	6.6E+04	1.46E+07

Approved by Technical Director

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm^2
Report number :	139934	**Magnification:**	9200
Sample number:	SSAP5-02-0.00BPC	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 9/22/2010 by Joel Paruli
Preparation Date: 9/22/2010 by Joel Paruli
Analysis Date: 9/23/2010 by Radha Singh

Asbestos Structures>5um. ≤10um (Chrys)	5
Asbestos Structures>5um. ≤10um (Amph)	0
Asbestos Structure >10um (Chrys)	2
Asbestos Structure >10um (Amph)	0
Protocol Asbestos Structures (Chrys)	7
Protocol Asbestos Structures (Amph)	0

Grid Openings	92
Mass - ug	170
Anlytical sensitivity	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total	Dimensions - mm Width	Dimensions - mm Length	Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
1A	C26	None Detected										
1A	E23	None Detected										
1A	E26	None Detected										
1A	F31	None Detected										
1A	F34	F			8	55	0.87	5.98				Non Asbestos
1A	G31	MD11			35	70	3.80	7.61				
		MD11			2	70	0.22	7.61				Non Asbestos
1A	G34	None Detected										
1A	C41	B			1.5	90	0.16	9.78				Non Asbestos
1A	C44	None Detected										
1A	E41	None Detected										
1A	E44	None Detected										
1A	F43	None Detected										
1A	F46	None Detected										
1A	G43	None Detected										
1A	C51	None Detected										
1A	C54	None Detected										
1A	E51	None Detected										
1A	E54	None Detected										
1B	C23	None Detected										
1B	E26	None Detected										
1B	C31	None Detected										
1B	C34	MD11	1		100	160	10.87	17.39				
		MF		1	1	70	0.11	7.61	CD	CHRYSOTILE		
1B	E31	None Detected										
1B	E34	None Detected										
1B	F31	None Detected										
1B	F34	None Detected										
1B	G33	None Detected										
1B	G36	None Detected										
1B	H33	None Detected										
1B	E41	None Detected										
1B	E46	None Detected										
1B	F43	None Detected										
1B	F46	None Detected										
1B	E51	None Detected										
1B	E54	None Detected										
1B	F51	None Detected										
1B	F54	None Detected										
1C	C31	MD11	2		80	170	8.70	18.48				
		MF		2	1	170	0.11	18.48	CD	CHRYSOTILE		
1C	C34	None Detected										
1C	E31	None Detected										

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	
Sample number:	

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number				Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total			Width	Length				
1C	F33	None Detected										
1C	F34	None Detected										
1C	H36	None Detected										
1C	C41	None Detected										
1C	C44	None Detected										
1C	E41	None Detected										
1C	E44	None Detected										
1C	F43	None Detected										
1C	F46	None Detected										
1C	H43	None Detected										
1C	H46	None Detected										
1C	E51	None Detected										
1C	E54	None Detected										
1C	F51	None Detected										
1C	F54	None Detected										
1C	E61	None Detected										
1D	E23	None Detected										
1D	E26	None Detected										
1D	F23	None Detected										
1D	F26	F	3	3	0.2	80	0.02	8.70	CD	CHRYSOTILE		
1D	C31	None Detected										
1D	C34	F	4	4	0.5	122	0.05	13.26	CD	CHRYSOTILE		
1D		MD11	5		30	140	3.26	15.22				
1D		MF		5	1	80	0.11	8.70	CD	CHRYSOTILE		
1D	E13	None Detected										
1D	E34	None Detected										
1D	F31	None Detected										
1D	F34	None Detected										
1D	G31	F	6	6	0.5	58	0.05	6.30	CD	CHRYSOTILE		
1D	G34	None Detected										
1D	C41	None Detected										
1D	E43	None Detected										
1D	E46	None Detected										
1D	C51	None Detected										
1D	C56	None Detected										
1D	E53	None Detected										
1E	C23	None Detected										
1E	C26	None Detected										
1E	E23	None Detected										
1E	C31	None Detected										
1E	F31	None Detected										
1E	F34	None Detected										
1E	G31	None Detected										
1E	G34	None Detected										
1E	H33	None Detected										
1E	H36	None Detected										
1E	C41	None Detected										
1E	C44	F			1	70	0.11	7.61				Non Asbestos
1E	E41	None Detected										
1E	E44	None Detected										
1E	F43	None Detected										
1E	F46	F	7	7	1	115	0.11	12.50	CD	CHRYSOTILE		
1E	E51	None Detected										
1E	E54	None Detected										

Copy

Count (Page of) NIOSH 7402/ISO

Prep Time: 1200-230

Report number : 139934
Sample number: SSAPS-02-0.00 BPC
File name: Northgate
Sample Description: 170 : mg

Filter Type: PC 385 mm2
Date Sample was Run: 9/22/10

Magnification: 9,200 X

Preparation date: 9/22/10 By JAP
Analysis date: 9/23/10 By

Grid opening dimension: 0.0094 mm²
Level of Analysis: (C): CD, CDX

(A): ADX, ADQ

Grid loading Moderate to heavy Condition of Grid Good

Grid	Grid Opening	Number of structures Primary	Number of structures Total	Class	Type of Structure	Width mm	Length mm	Comments
1A	C2-6							
	E2-3							
	E2-6							
	E3-1							
	E3-4				F	9	55	Nanarb.
	G3-1				MDII	35	70	Nanarb
					MB	2	70	
	G3-4					5		
	C4-1				B	11	90	Nanarb.
	C4-4							
	E4-1							
	E4-4							
	F4-3							
	E4-6							
	G4-3							
	C5-1							
	C5-4							
	E5-1							
1B	E5-4							
	C3							
	E2-6							
	C5-1							
	C3-4	1			MDII	100	160	Chrysa.
					MF	1	70	
	E3-1							
	E3-4							
	F2-1							
	F3-4							
	G3-3							

EM-10A (2002)

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAPS-02-0.00 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
B	H3-6							
	H4-3							
	E4-1							
	E4-6							
	F4-3							
	F4-6							
	E5-1							
	E5-4							
	F5-1							
19	F5-4							
1C	C3-1	2			MDII	5x0	170	Chryso. EDS
					MI=	1	170	
	C3-4							
	E3-1							
	E3-3							
	E3-4							
	H3-6							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-3							
	F4-6							
	H4-3							
	H4-6							
	E5-1							
	E5-4							
	F5-1							
	F5-4							
1A	E1-1							
1D	E2-3							

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAPS-02-0.00 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1D	E2-6							
	F2-3							
	E2-6	3			F	0.2	80	Chryso.
	C3-1							
	C3-4	4			F	0.5	122	Chryso.
		5			MDII	30	140	Chryso.
					MF	1	60	
	F3-1							
	E3-4							
	F3-1							
	F3-4							
	G3-1	6			F	0.5	58	Chryso.
	G3-4							
	C4-1							
	E4-2							
	F4-6							
	C5-1							
	C5-6							
1E	E5-3							
1E	C2-3							
	C2-6							
	F2-3							
	C3-1							
	F3-1							
	F3-4							
	G3-1							
	G3-4							
	F3-3							
	F3-6							
	C4-1							
	C4-4				F	1	70	bonath.
	E4-1							
	E4-4							
	F4-3							

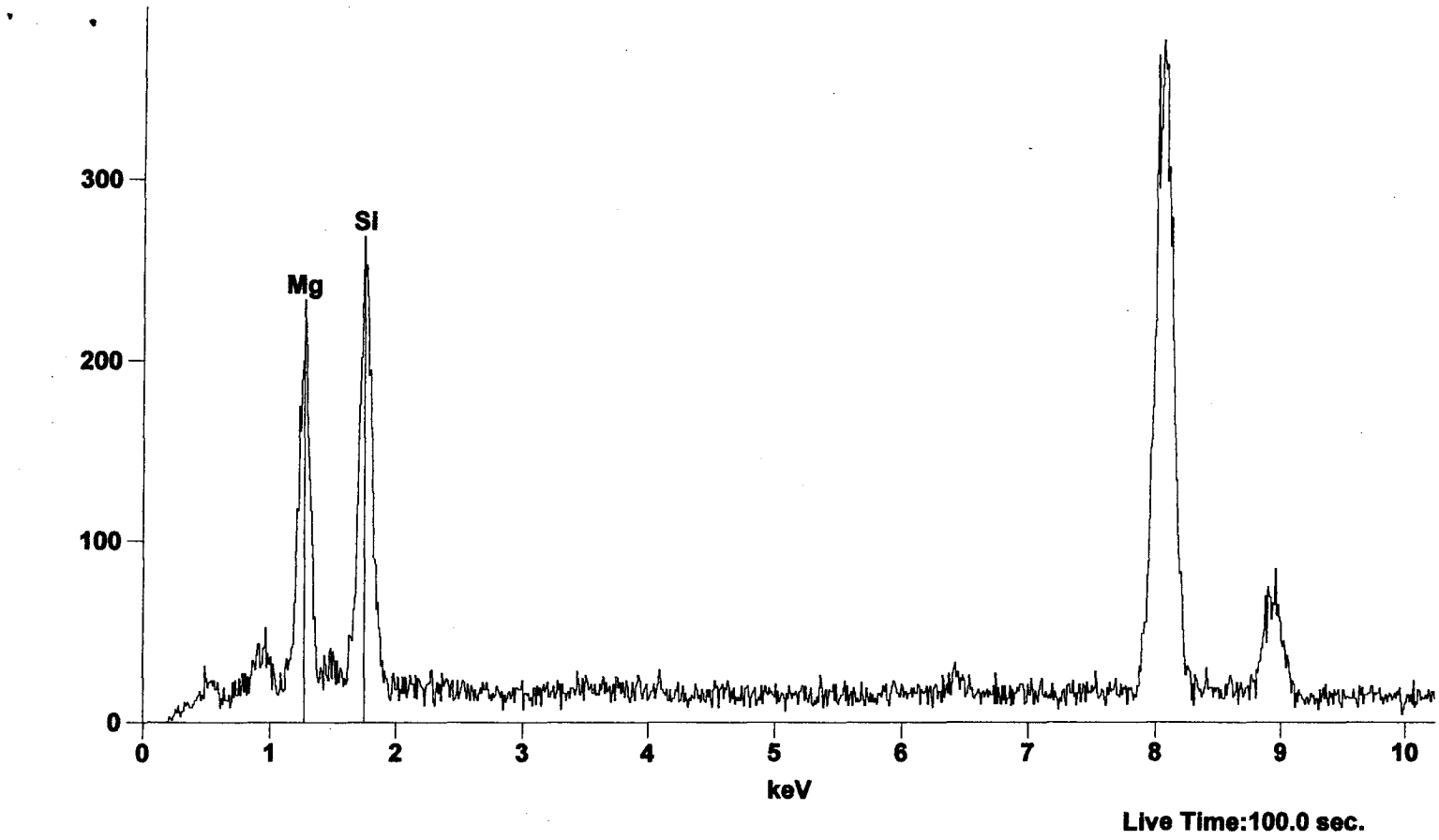
TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAPS-02-0.00 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
13	F4-6	7			F	1	11.5	Chrysot.
	ES-1							
17	ES-4							

Project: Regular Clients

Full scale counts: 378 **139934-SSAP5-02-00BPC-C3-1**



Quantitative Results 139934-SSAP5-02-00BPC-C3-1

Element Line	Net Counts	Weight %	Atom %	Formula	Compnd %
Mg K	2232	52.83	56.41	Mg	52.83
Si K	2813	47.17	43.59	Si	47.17
Total		100.00	100.00		100.00

9-2-10 Moisture content

# 139933	# SSAP7-03-0.00BPC	# 139933	# SSAPC-03-0.00BPC
dish wt.	19.24 init. wt		31.48
dish + S	120.82 (101.68 g)		131.62 (100.14 - initial wt)
7:30-8:30	119.44 (100.20)		129.67 (98.19)
9:40-10:40	119.20 (99.96)		129.63 (98.15)
11:45-12:45	119.18 (99.94)		

$100 \times \frac{101.68 - 99.94}{99.44} = 1.7\%$

$100 \times \frac{100.14 - 98.15}{98.15} = 2.03\%$

# 139934 - # SSAP6-02-0.00BPC		# 139934	# SSAP6-02-0.00BPC-F1
dish wt.	31.44		35.11
dish + S.	131.41 (99.97 - in. wt)		135.68 (100.57 g - in. wt)
7:30-8:30	128.99 (97.55)		133.80 (98.69)
9:40-10:40	128.96 (97.52)		133.64 (98.53)
		11:45-12:45	133.62 (98.51)

$100 \times \frac{99.97 - 97.52}{97.52} = 2.5\%$

$100 \times \frac{100.57 - 98.51}{98.51} = 2.09\%$

9-3-10

# 139934	# SSAP5-02-0.00BPC
dish wt.	31.46 initial wt
dish + S.	131.76 (100.30 g)
8:40-9:40	129.27 (97.81)
10:35-11:35	129.23 (97.77)

$100 \times \frac{100.3 - 97.77}{97.77} = 2.59\%$

Elutriator Data

Date: 9/22/10 Client: Northgate

Lab #: 139934

Sample ID: SSAPS-02-0.00BPC Sample weight (g): 77.5

Time air flow started: 830 * Tumbler rpm: 30/45

IST Flowmeter (mL/min): 100 ME Flowmeter (mL/min): 1370

Filter No.	Start Time	Tested flow rate (mL/min)	Final Filter Wt (mg)	Initial Filter Wt (mg)	Dust Weight (mg)	Time Value (min)	Avg. rate of deposition (ug/min)	Optimal time (min)	
1	830	185	0.03495	0.02519	9.76	30			OK
2	900		0.02854	0.02500	3.54	15			20% loss
3	915		0.02813	0.02501	3.12	15			25% loss
4	930		0.02942	0.02492	4.50	20			10% loss
5	950		0.03205	0.02494	7.11	35			~~35% loss~~ OK
6	1025		0.03071	0.02496	5.75	35			35% loss
7	1100		0.02918	0.02487	4.31	20			10% loss
8	1120		0.02799	0.02490	3.09	30			40% loss
			0.02992	0.02483	5.11	50			10% loss
Time	120						Dep. Rate	Estiimate	
1	935 947		4.710	4.634	0.076	12			
2	958 1022		4.720	4.607	0.113	24			
3	1035 1059		4.898	4.728	0.170	24			
4	1155 1219		4.823	4.744	0.079	24			
5									
6									
7									
8									

* Raise RPM to 45 @ 1030 AM

EMS Laboratories Inc.
117 West Bellevue Drive, Pasadena, CA 91105
Phone: 626-568-4065 Fax: 626-796-5282
Email: akolk@emslabs.com

Attn: Derrick Wills
Tronox-LLC-Henderson
PO Box 55
Henderson, NV 89009

Phone: (947) 375-7004

Project: Tronox LLX Henderson, 560 W. Lake Mead Dr., Henderson, NV/2027.001

Customer ID: TRNX26
Customer PO: 2027.001
Received: 8/27/2010 11:10AM
EMS LAB No: 139934
Date Prepared: 9/15/2010 12:30PM
Analysis Date: 9/17/2010 10AM

Report Date: August 20, 2010

Date Sampled: 8/24/2010 1:36PM

NIOSH 7402/ISO

DRAFT, MODIFIED ELUTRIATOR METHOD FOR THE DETERMINATION OF ASBESTOS IN SOILS AND BULK MATERIAL METHOD

EMS Laboratory Number:	139934		Mass of Respirable Dust on Filter:	158	µg
Customer Sample Number:	SSAP6-02-0.00BPC_FD		Area of collection filter:	385	mm^2
Minimum Level of Analysis (chrysotile):	CD		Grid openings area:	0.0094	mm^2
Minimum Level of Analysis (amphibole):	ADX		Grid Openings Analyzed:	101	
Magnification used for fiber counting:	9,200	x	Min. Str. Length/Max Str. Diameter:	>5/<0.4	microns
Aspect ratio for fiber definition:	3:1				
			Analyst(s):	Radha Singh	

Dust Generator - Total Dried Sample Weight-79.4g		Soil % Moisture	2.1	%
	Air Flow Rate Through ME Opening of Dust Generator:		1370	
Not Used	Air Flow Rate Through IST Opening of Dust Generator:		100	
Used in Tumbler	Estimate Total Air Flow Through Elutriator:		1470	

Analytical Sensitivity:	2.57E+06 Structure /g PM 10	Limit of Detection:	7.69E+06 Structure /g PM 10

Test For Uniformity (Chi-Square results)

Structure Class	Min ID Level Required	Counts: Primary Str.	Counts: Total Str.	Density St/mm^2	Poisson 95% Confidence Interval: Conc. Str/g PM10	Lower Limit Str/g PM10	Upper Limit Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	0	0	0	0	0	7.69E+06
Asbestos Structures>5um, ≤10um (Chrys)	CD	0	0	0	0	0	7.69E+06
Asbestos Structures>5um, ≤10um (Amph)	ADX	0	0	0	0	0	7.69E+06
Asbestos Structure >10um (Long)	ADX/CD	0	0	0	0	0	7.69E+06
Asbestos Structure >10um (Chrys)	CD	0	0	0	0	0	7.69E+06
Asbestos Structure >10um (Amph)	ADX	0	0	0	0	0	7.69E+06
Total Protocol Asbestos Structures	ADX/CD	0	0	0	0	0	7.69E+06
Protocol Asbestos Structures (Chrys)	CD	0	0	0	0	0	7.69E+06
Protocol Asbestos Structures (Amph)	ADX	0	0	0	0	0	7.69E+06
Total Protocol Non Asbestos Structures	NAM	0	0	0	0	0	7.69E+06

Approved by Technical Director

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm^2
Report number :	139934	**Magnification:**	9200
Sample number:	SSAP6-02-0.00BPC_FD	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 9/15/2010 by Joel Paruli
Preparation Date: 9/16/2010 by Joel Paruli
Analysis Date: 9/17/2010 by Radha Singh

Asbestos Structures>5um, ≤10um (Chrys)	0
Asbestos Structures>5um, ≤10um (Amph)	0
Asbestos Structure >10um (Chrys)	0
Asbestos Structure >10um (Amph)	0
Protocol Asbestos Structures (Chrys)	0
Protocol Asbestos Structures (Amph)	0

Grid Openings	**101**
Mass - ug	**158**
Anlytical sensitivity	[redacted]

Grid ID	Grid Opening	Structure Type	Structure Number		Dimensions - mm		Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total	Width	Length	Width	Length				
1A	C23	None Detected										
1A	C26	None Detected										
1A	E23	None Detected										
1A	E26	None Detected										
1A	C31	None Detected										
1A	C34	None Detected										
1A	E31	None Detected										
1A	E34	None Detected										
1A	F31	None Detected										
1A	G33	None Detected										
1A	G36	None Detected										
1A	H33	None Detected										
1A	H36	None Detected										
1A	E41	None Detected										
1A	E44	None Detected										
1A	F41	None Detected										
1A	F44	None Detected										
1A	E51	None Detected										
1A	E54	None Detected,										
1A	F53	None Detected										
1B	C31	None Detected										
1B	C34	None Detected										
1B	E31	None Detected										
1B	E34	None Detected										
1B	F31	None Detected										
1B	G33	None Detected										
1B	G36	None Detected										
1B	C41	None Detected										
1B	C44	None Detected										
1B	E41	None Detected										
1B	F44	None Detected										
1B	G43	None Detected										
1B	G46	None Detected										
1B	C51	None Detected										
1B	C54	None Detected										
1B	E51	None Detected										
1B	E54	None Detected										
1B	F53	None Detected										
1B	F56	None Detected,										
1B	G33	None Detected										

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	139934
Sample number:	SSAP6-02-0.00BPC-PD

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number Primary	Structure Number Total			Dimensions (µm) Width	Dimensions (µm) Length	Level of ID	Mineral Type	Image Number	Structure Comments
1C	C23	None Detected										
1C	C26	None Detected										
1C	E23	None Detected										
1C	E26	F			20	110	2.17	11.96				Non Asbestos
1C	C31	None Detected										
1C	C34	None Detected										
1C	E31	None Detected										
1C	E34	None Detected										
1C	F33	None Detected										
1C	F36	None Detected										
1C	G33	None Detected										
1C	G36	None Detected										
1C	F41	None Detected										
1C	F44	None Detected										
1C	G41	None Detected										
1C	C51	None Detected										
1C	C54	None Detected										
1C	E56	None Detected										
1C	F53	None Detected										
1C	F56	None Detected										
1D	C23	None Detected										
1D	C26	None Detected										
1D	E23	None Detected										
1D	E26	B			12	50	1.30	5.43				Non Asbestos
1D	C31	None Detected										
1D	C34	None Detected										
1D	E31	None Detected										
1D	E34	None Detected										
1D	F31	None Detected										
1D	F34	None Detected										
1D	G33	None Detected										
1D	G36	None Detected										
1D	H33	None Detected										
1D	F41	None Detected										
1D	F44	None Detected										
1D	C43	None Detected										
1D	C46	None Detected										
1D	C51	None Detected										
1D	C54	None Detected										
1D	E53	None Detected										
1E	C31	None Detected										
1E	C34	None Detected										
1E	E31	None Detected										
1E	E34	None Detected										
1E	F31	None Detected										
1E	F34	None Detected										
1E	C31	None Detected										
1E	C34	None Detected										
1E	C41	None Detected										
1E	C44	None Detected										
1E	E41	None Detected										
1E	E44	None Detected										
1E	F41	None Detected										
1E	F44	None Detected										
1E	C51	None Detected										
1E	C54	None Detected										
1E	C61	None Detected										

EMS Laboratories

NIOSH 7402/ISO

117 W. Bellevue Drive
Pasadena, CA 91105
626-568-4065

Report Number:	139934
Sample number:	SSAP6-02-000BPC-FD1

Analyzed by:	
Date of Analysis:	

Grid ID	Grid Opening	Structure Type	Structure Number				Dimensions (µm)		Level of ID	Mineral Type	Image Number	Structure Comments
			Primary	Total			Width	Length				
1E	C64	None Detected										
1E	E61	None Detected										
1E	E64	None Detected										
1E	F61	None Detected										

Copy

Count (Page of) NIOSH 7402/ISO

Prep Time: 7:00 9:30

Report number : 139934
Sample number: SSAP6-02-0.00 BPC-FD
File name: Northgate
Sample Description: 158 mg

Filter Type: PC 385 mm2
Date Sample was Run: 9/15/10

E.O. 101 ✓

Magnification: 9,200 X

Preparation date: 9/16/10 By JAP
Analysis date: 9/19/10 By RC
(A): ADX, ADQ

Grid opening dimension: 0.0094 mm²
Level of Analysis: (C): CD, CDX

Grid loading Moderate
Condition of Grid good

Grid	Grid Opening	Number of structures Primary	Number of structures Total	Class	Type of Structure	Width mm	Length mm	Comments
A	C2-3							
	C2-6							
	E2-3							
	E2-6							
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	E3-1							
	G3-3							
	G3-6							
	H3-3							
	H3-6							
	E4-1							
	E4-4							
	E4-1							
	E4-4							
	E5-1							
	E5-4							
	F5-3							
B	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	G3-3							
	G3-6							
	C4-1							
	C4-4							
	E4-1							

EM –10A (2002)

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAPC-02-0.00 BPC-FD X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
	F4-4							
	G4-3							
	G4-6							
	C5-1							
	C5-4							
	E5-1							
	E5-4							
	E5-3							
	E5-6							
2D	G5-3							
1C	C2-3							
	C2-6							
	E2-3							
	E2-6				1=	20	110	Non asb.
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	E3-3							
	E3-6							
	G3-3							
	G3-6							
	F4-1							
	F4-4							
	G4-4							
	C5-1							
	C5-4							
	E5-6							
	E5-3							
2	E5-6							
1D	G2-3							
	C2-6							

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAP6-02-0.00BPC-FD X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
D	E2-3							
	E2-6				B	12	50	Non asb.
	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	G3-3							
	G3-6							
	H3-3							
	F4-1							
	E4-4							
	C4-3							
	C4-6							
	C5-1							
	C5-4							
2	E5-3							
E	C3-1							
	C3-4							
	E3-1							
	E3-4							
	F3-1							
	F3-4							
	C3-1							
	C3-4							
	C4-1							
	C4-4							
	E4-1							
	E4-4							
	F4-1							
	F4-4							
	C5-1							
	C5-4							
	C6-1							

TEM Asbestos Structure Count (Page of)

Report number: 139934 SAMPLE NO: SSAP6-02-0.00BPC-FD X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
E	C6-4							
	E6-1							
	E6-4							
	F6-1							

9-2-10 Moisture content

#139933 #SSAP7-03-0.00BPC		#139933 #SSAPC-03-0.00BPC	
dish wt.	19.24 init. wt		31.48
dish + S	120.82 (101.68 g)		131.62 (100.14 - initial wt)
7:30-8:30	119.44 (100.20)		129.67 (98.19)
9:40-10:40	119.20 (99.96)		129.63 (98.15)
11:45-12:45	119.18 (99.94)		

$100 \times \frac{101.68 - 99.94}{99.44} = 1.7\%$

$100 \times \frac{100.14 - 98.15}{98.15} = 2.03\%$

#139934 - #SSAP6-02-0.00BPC		#139934 #SSAP6-02-0.00BPC-FN	
dish wt.	31.44		35.11
dish + S.	131.41 (99.91 - in. wt)		135.68 (100.57 g - in. wt)
7:30-8:30	128.99 (97.55)		133.80 (98.69)
9:40-10:40	128.96 (97.52)		133.64 (98.53)
		11:45-12:45	133.62 (98.51)

$100 \times \frac{99.91 - 97.52}{97.52} = 2.5\%$

$100 \times \frac{100.57 - 98.51}{98.51} = 2.09\%$

9-3-10

#139934 #SSAP5-02-0.00BPC	
dish wt.	31.46 initial wt
dish + S.	131.76 (100.30 g)
8:40-9:40	129.27 (97.81)
10:35-11:35	129.23 (97.77)

$\% \, 100 \times \frac{100.3 - 97.77}{97.77} = 2.59\%$

Elutriator Data

Date: 9/15/10 Client: Northgate

Lab #: 139934

Sample ID: SSAP6-02-0.00BPGFD Sample weight (g): 79.4

Time air flow started: 630 * Tumbler rpm: 30/45

IST Flowmeter (mL/min): 100 ME Flowmeter (mL/min): 1370

Filter No.	Start Time	Tested flow rate (mL/min)	Final Filter Wt (mg)	Initial Filter Wt (mg)	Dust Weight (mg)	Time Value (min)	Avg. rate of deposition (ug/min)	Optimal time (min)	
1	830	195	0.03333	0.02503	8.30	30			3% loss
2 R	900		0.02920	0.02529	3.91	15			2% loss
3	915		0.02793	0.02402	3.91	30			30% loss
4	945		0.02718	0.02414	3.04	45			0% loss
5	1030		0.02672	0.02401	2.71	20			5% loss
6	1050		0.02982	0.02508	4.74	35			loss 20%
7	1125		0.02922	0.02502	4.20	35			loss 30%
8	1200		0.02719	0.02441	2.78	35			loss 80%
S.Time	End time						Dep. Rate	Estiimate	
1 931	945		4.763	4.676	0.082	14			
2 959	1029		4.881	4.631	0.250	30			
3 1035	1050		4.657	4.591	0.066	15			
4 1100	1125		4.844	4.644	0.200	25			
5 1136	1158		4.775	4.617	0.158	22			
6 1205	1230		4.864	4.668	0.196	25			
7									
8									

* Raise RPM to 45 @ 1030

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page _____ of _____

RECEIVING

TYPE OF SAMPLE
Air ☐ Water ☐
Soil ☐ Bulk ☐
Other _____

METHOD OF ANALYSIS
EPA 600/4-83-043 ☒ ISO ☐

LEVEL OF ANALYSIS
Chrysotile CD – CDQ
Amphibole ADX ADX

ASPECT RATIO
3:1 ☐ 5:1 ☐

EPA/600/R-94/134 100.1 ☐ 100.2 ☐

LENGTHS
All Sizes (EPA) ☐
(μm) ≥0.5 ☐
≥1.0 ☐
≥5.0 ☐
≥10.0 ☐
PCM Range* ☐
*(≥0.25 μm width ≥5.0 μm length)

FILTER TYPE / AREA (mm±)
MCE ☐ 385 ☒
PC ☒ 314 ☐
MCN ☐ 1017 ☐
Other _____

PORE SIZE
0.45 μm ☐ 0.8 μm ☐
0.1 μm ☐ 0.22 μm ☒
Other _____

G.O. Area (mm²) 0.0 0.94
No. of G.O. to Analyze 200

PREP

DIRECT PREP ☐
INDIRECT PREP ☐

Volume 10 liters
Working Volume _____ ml
Weight _____ grams
Ashed Area _____ %

Prepared By JAP.
Date 8/26/10

ANALYSIS

MICROSCOPE copy
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☒
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 ☒ Quantum System

Grid Address: _____
Screen Magnification: 2100 X
Camera Constant: 21.52
Accelerating Voltage: 100KV
Beam Current: 10 μA
K-Factor: 1.4
Analyst Redh Date 8/26/10

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C23		NAM																							
C26		↓																							
E23																									
E26																									
F23																									
F26																									
H23																									
H26																									
G23																									
G26																									
I123																									
I126																									
C3-1																									
C3-4																									
E3-1																									
E3-4																									
F3-1		↓																							

TEM - 1A (1-06)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: A
Screen Magnification: 9/a X
Camera Constant: 28-2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radle Date 8/26

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☑
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☑

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E3-4		NF																							
G3-1																									
G3-4																									
B3-1																									
B3-4																									
F3-1																									
C3-3																									
C3-6																									
E3-3																									
E3-6																									
F3-3																									
B3-6																									
G3-3																									
G3-6																									
B3-3																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: N
Screen Magnification: 9,900 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Rodh Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
1B-6		W,SN																							
K3-3																									
Ca-1																									
Cy-4																									
1E4-1																									
1E4-4																									
F4-1																									
1F4-4																									
H4-1																									
2H4-4																									
1B-6																									
Cy-3																									
Cy-6																									
E4-3																									
1E4-6		↓																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 910 X
Camera Constant: 25.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radha Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C3		NAD																							
C3-4																									
E3-1																									
E3-4																									
F3-1																									
F3-4																									
G3-1																									
G3-4																									
I B-1																									
I B-4																									
C3																									
C3-6																									
E3-3																									
E3-6																									
F3-3																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 10V X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 70 µA
K-Factor: 1.4
Analyst Rath Date 8/20

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☑
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☑

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
F4-3		NAD																							
F4-6																									
G4-3																									
G4-6																									
H4-3																									
H4-6																									
E5-1																									
E5-4																									
F5-1																									
F5-4																									
G5-1																									
G5-4																									
H5-1																									
H5-4																									
I5-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 9100 X
Camera Constant: 25.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Rad Date 8/26/10

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☑
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 ☑ Quantum System

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C5-6		NAD																							
E5-3																									
E5-6																									
I5-3																									
I5-6																									
K3-3																									
K5-6																									
K5-3																									
C6-1																									
C6-4																									
E6-1																									
E6-4																									
I6-1																									
I6-4																									
K6-1			↓																						

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: C
Screen Magnification: 9,000 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.14
Analyst Radha Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
L2-3		NAD																							
C26																									
E23																									
E26																									
F23																									
F26																									
L2 3																									
L20																									
I-23																									
B3-4																									
C3-1																									
C3-4																									
E3-1																									
F3-4																									
I23-4																									
I23-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank EMS Lab No. _____
Sample No. 8/25/10 Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: C
Screen Magnification: 9100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.14
Analyst Radle Date 8/20/10

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
B3-6		NAM																							
C3-3																									
C3-6																									
E3-3																									
E3-6																									
F3-3																									
F3-6																									
G3-3																									
G3-6																									
I3-3																									
I3-6																									
C4-1																									
C4-4																									
E4-1																									
E4-4		↓																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8/25/10

EMS Lab No. _____
Page 3 of _____

RECEIVING

ANALYSIS

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Address: C
Screen Magnification: 9,10X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Nadle Date 8/26/10

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E4-4		NAD																							
G4-1																									
G4-4																									
H4-1																									
H4-4																									
C5-4																									
E5-1																									
E5-4																									
F5-1																									
F5-4																									
G5-1																									
G5-4																									
H5-1																									
H5-4																									
K5-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8-25-10

EMS Lab No. _____
Page 2 of _____

RECEIVING

ANALYSIS

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Address: D
Screen Magnification: 9,900 X
Camera Constant: 25.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Jade Date 8/26/10

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
F4Q		NAM																							
G4-1																									
G4-Q																									
H4-1																									
H4Q																									
C5-1																									
C5-Q																									
E5-1																									
E5-Q																									
F5-1																									
F5-Q																									
G5-1																									
G5-Q																									
H5-1																									
H5-Q																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank
Sample No. 8-25-10

EMS Lab No. _____
Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: D
Screen Magnification: 9,100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radha Date 8/26/10

MICROSCOPE

H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☐
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM

Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
B3-4		NAD																							
E3-1																									
E3-4																									
F3-1																									
F3-4																									
G3-1																									
G3-4																									
B-1																									
B-4																									
B4-4																									
C4-1																									
C4-4																									
E4-1																									
E4-4																									
I2-1		N																							

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank EMS Lab No. _____
Sample No. 8-25-10 Page 3 of _____

RECEIVING

ANALYSIS

Grid Address: D
Screen Magnification: 9,500X
Camera Constant: 2.52
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Jadle Date 8/26/10

MICROSCOPE
- H600A - Serial No. 542-36-01 ☐
- H600B - Serial No. 542-05-06 ☐
- H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
- Kevex - Model No. 3200-0106-0365 ☐
- Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C5-3		NAD																							
C5-6																									
E5-3																									
E5-6																									
F5-3																									
F5-6																									
G5-3																									
G5-6																									
H5-3																									
H5-6																									
C6-1																									
C6-4																									
E6-1																									
E6-4																									
F6-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand blank EMS Lab No. _____
Sample No. 8-25-10 Page 1 of _____

RECEIVING

ANALYSIS

Grid Address: E
Screen Magnification: 9,700 X
Camera Constant: 2k.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Radke. Date 8/26/10

MICROSCOPE
H600A - Serial No. 542-36-01 ☐
H600B - Serial No. 542-05-06 ☒
H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
Kevex - Model No. 3200-0106-0365 ☐
Kevex - Model No. 3600-0206-0146 Quantum System ☒

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
C2-3		NAD																							
C2-6																									
E23																									
E26																									
E23																									
E26																									
G23																									
G26																									
B4																									
C3-1																									
C3-4																									
E3-1																									
E3-4																									
G3-1																									
G3-4																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

TEM ASBESTOS ANALYSIS

Client Sand Bank EMS Lab No. _____
Sample No. 8-25-10 Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: E
Screen Magnification: 9,100 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 14
Analyst Renee Date 8/26/10

MICROSCOPE
- H600A - Serial No. 542-36-01 ☐
- H600B - Serial No. 542-05-06 ☐
- H600C - Serial No. 542-24-03 ☐

ENERGY DISPERSIVE X-RAY SYSTEM
- Kevex - Model No. 3200-0106-0365 ☐
- Kevex - Model No. 3600-0206-0146 Quantum System ☐

Grid Opening	Structure Number	Structure	Dimensions (mm) Width	Dimensions (mm) Length	Fiber Classification NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Analysis Na	Mg	Si	Ca	Fe	Comments
E4-4		NAD																							
E4-1																									
E5-1																									
E5-4																									
F6-1																									

TEM - 1B (1-08)

OBSERVATIONS:

Clean ☐
Debris: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Gypsum: ☐ Very Light ☐ Light ☐ Moderate ☐ Heavy ☐ Very Heavy ☐
Condition of the Grid: ☐ Good ☐ Scrappy ☐ Undissolved Filter ☐ Folded ☐

Spot Size Measurements

Scope: #60B

Date: May 2010

Name: RS

Conditions of Measurements

High Voltage: 100K

Beam Current: 10 μA

Magnification: 19,260

Condenser Aperture Size: #2

Measurements from a photo 8.5

Shortest diameter: 8.5 **mm**

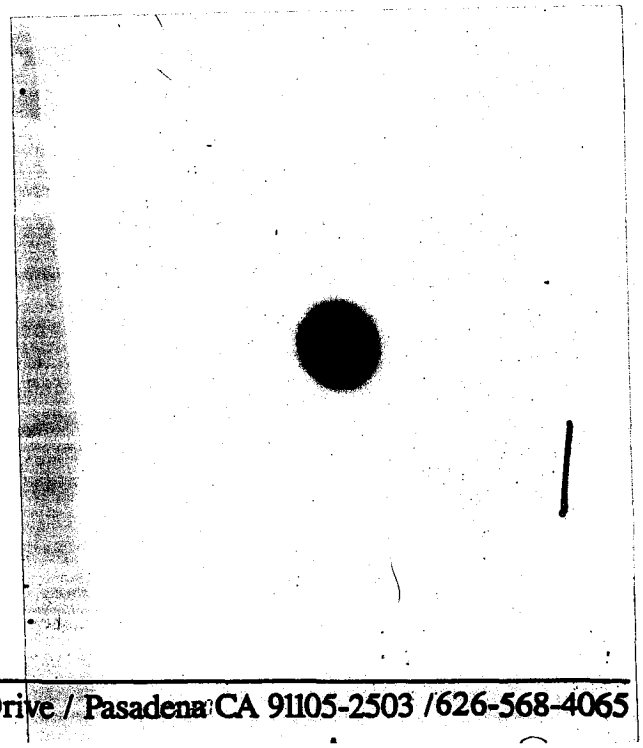
Longest diameter: 9 **mm**

Average: 8.75 **mm**

Spot Size Calculation

$$\text{Spot size in } \mu m = \frac{(\text{average spot size in mm}) \times 1000\ \mu m \times 0.4125}{\text{Magnification}}$$ 18 8

Note: 1.65/4 = 0.4125 (see the Hitachi Fax)



TEM CAMERA CONSTANT DETERMINATION

TEM H600B

Measured and Calculated by RJ Date May 2010

Camera Constant (mm A) = D (mm) X 1/2 X d (A)

where D (mm) is the diameter of a gold ring and

d (A) is the d-spacing in Angstroms for a particular reflection

CC (1*) = (24.1 mm) X 1/2 x 2.355 = 28.37

CC (2*) = (27.8 mm) X 1/2 x 2.039 = 28.34

CC (3*) = (39.3 mm) X 1/2 x 1.442 = 28.34

CC (4*) = (45.9 mm) X 1/2 x 1.230 = 28.23

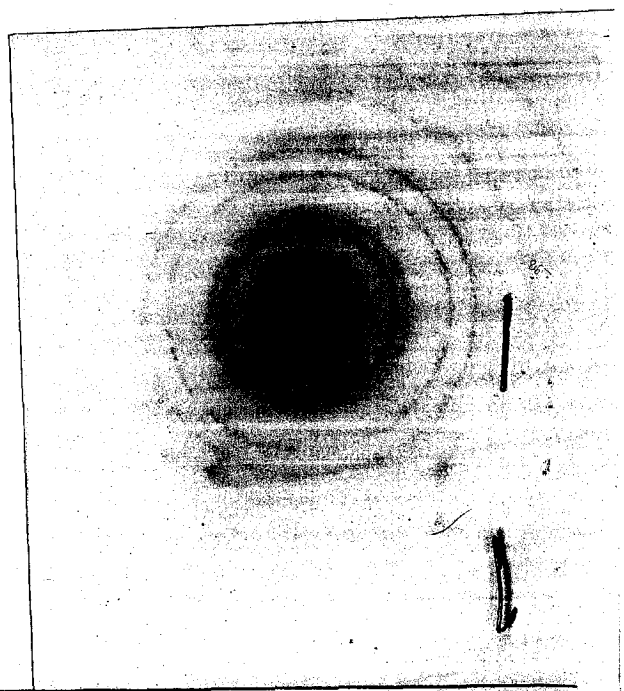
Average Camera Constant = 28.3

* 1 is the first largest diameter ring. 2 the second, etc.

Average Camera Constant = (CC<1> = ...= CC<n>) X 1/n

For gold:

d(A)	nk1
2.355	(111)
2.039	(200)
1.442	(220)
1.230	(311)
1.1774	(222)



08/07/01
csl

DATE: May 2010 A-600/B-600/C-600

WEEKLY CALIBRATION 3mo

MONTHLY CALIBRATION 3mth

AFTER SERVICE CALIBRATION___

BY: R

	Measurement	Number of Spacing Flourescent Screen Magnification	Distance (mm)	Number of Spacing Film Magnification
		25,000X	12,000X	
1	53 5/16	19,260	5 1/2	9,180
2	53 5/16	19,260	5 1/2	9,270
3	53 1/6	19,080	5 1/2	9,270
4	53 1/6	19,080	5 1/2	9,180
5	53 5/16	19,260	5 1/2	9,180
6			5 1/2	9,180
7	ave	19,200		
8			ave	9,200
9				
10				
	AVERAGE:			

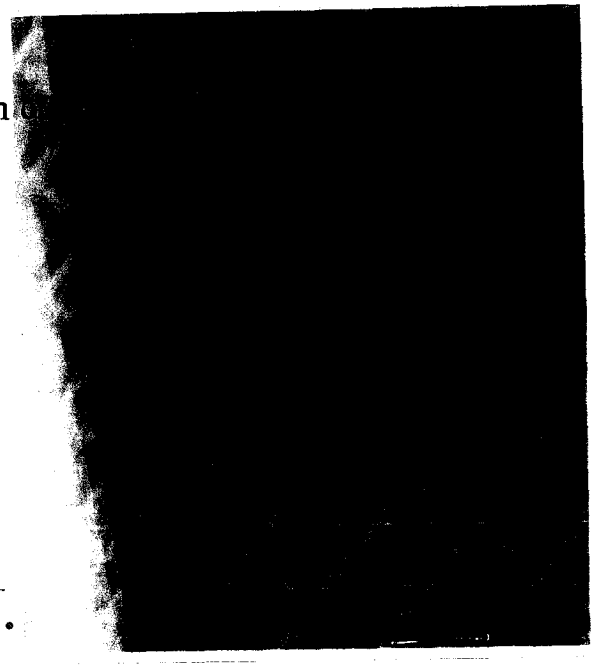
OPERATING VOLTAGE 100 KV

54, 864 lines/inch or 2,160 lines/mm or 0.463μm/line

28, 800 lines/inch or 1,134 lines/mm or 0.882μm/line

15, 240 lines/inch or 600 lines/mm or 1.67μm/line

16.94 μm for one bar and one opening for Ni screen on



EM CALIBRATION 2
992)

K= [Cn/C(Si)] / [In/I(Si)]
C(Si)= 18.74

n	Cn	RUN 1 I(Si)= 22860 In	Kn	RUN 2 I(Si)= 12101 In	Kn	RUN 3 I(Si)= 15953 In	Kn	RUN 4 I(Si)= 16554 In	Kn	RUN 5 I(Si)= 16203 In	Kn	RUN 6 I(Si)= 7464 In	Kn
Na	1.81	1694	1.3034	1095	1.0674	986	1.5627	1133	1.4112	1004	1.5587	395	1.8251
Mg	7.57	6992	1.3207	3738	1.3077	4447	1.4491	4902	1.3641	4714	1.3885	1983	1.5205
Al	6.54	7768	1.027	4152	1.0171	5455	1.0206	5761	1.0028	5708	0.9906	2576	1.0112
Si	18.74	22860	1	12101	1	15953	1	16554	1	16203	1	7464	1
K	0.97	1453	0.8144	827	0.7574	1311	0.6299	1333	0.6428	1195	0.7018	584	0.6615
Ca	8.26	6570	1.5336	3406	1.566	5845	1.203	5222	1.3973	4998	1.4289	2852	1.1535
Ti	3.02	2235	1.6483	1170	1.6668	1821	1.4118	1867	1.4289	1753	1.4895	928	1.2962
Mn	0.14	10	17.078	22	4.1092	12	9.9316	29	4.2645	2	60.523	22	2.5346
Fe	9.51	5898	1.9669	2935	2.0923	4934	1.6408	4856	1.73	4473	1.8383	2351	1.6111
O	43.83			7849	3.6059	7051	5.2917	10526	3.6783	9433	4.0174	3333	5.2377

** NVLAP REQUIREMENTS **
1.0 < K(Na) wrt Si < 4.0
1.0 < K(Mg) & K(Fe) wrt Si < 2.0
1.0 < K(Al) & K(Ca) wrt Si < 1.75

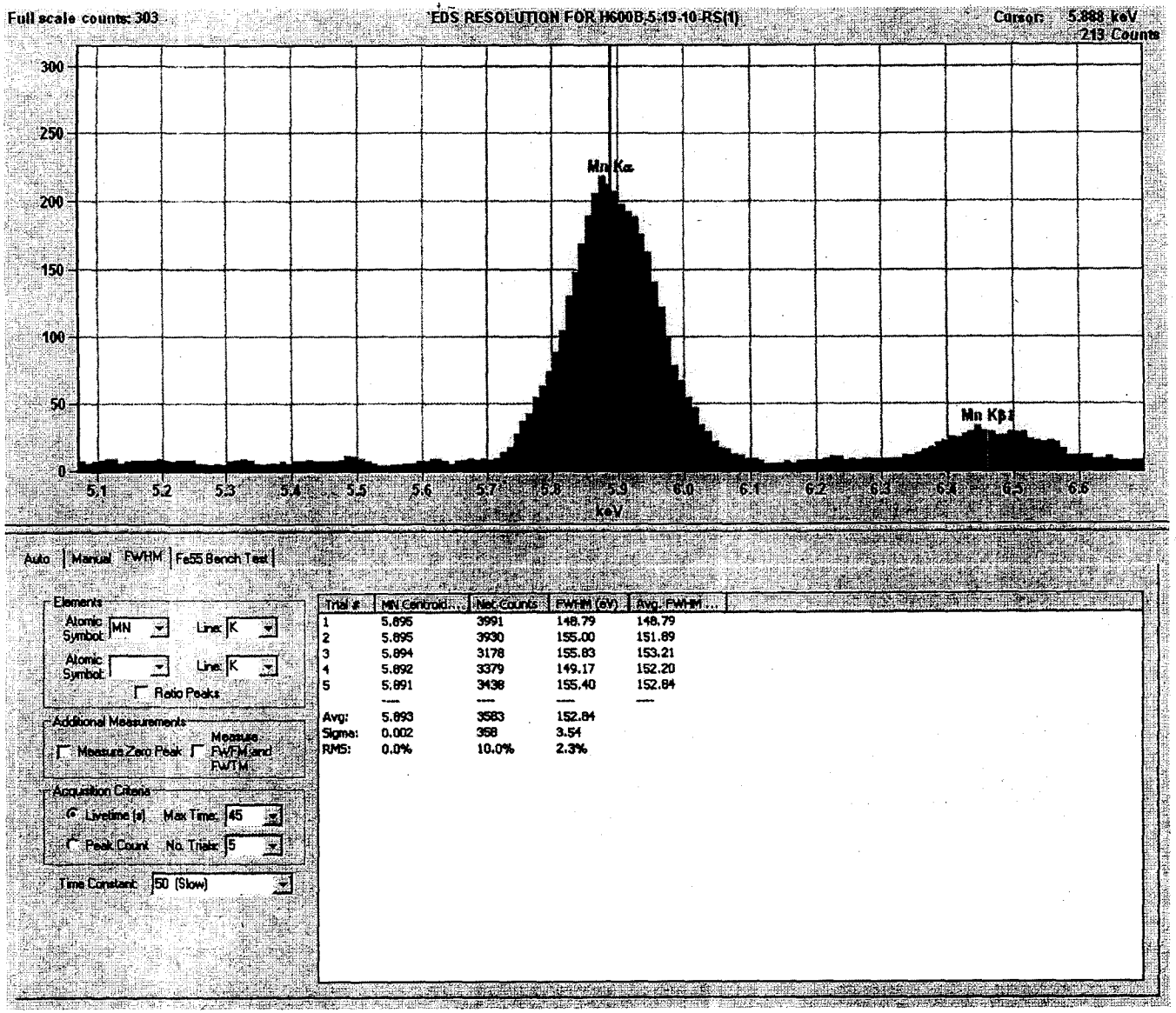
K(Mg)/K(Fe) < 1.5

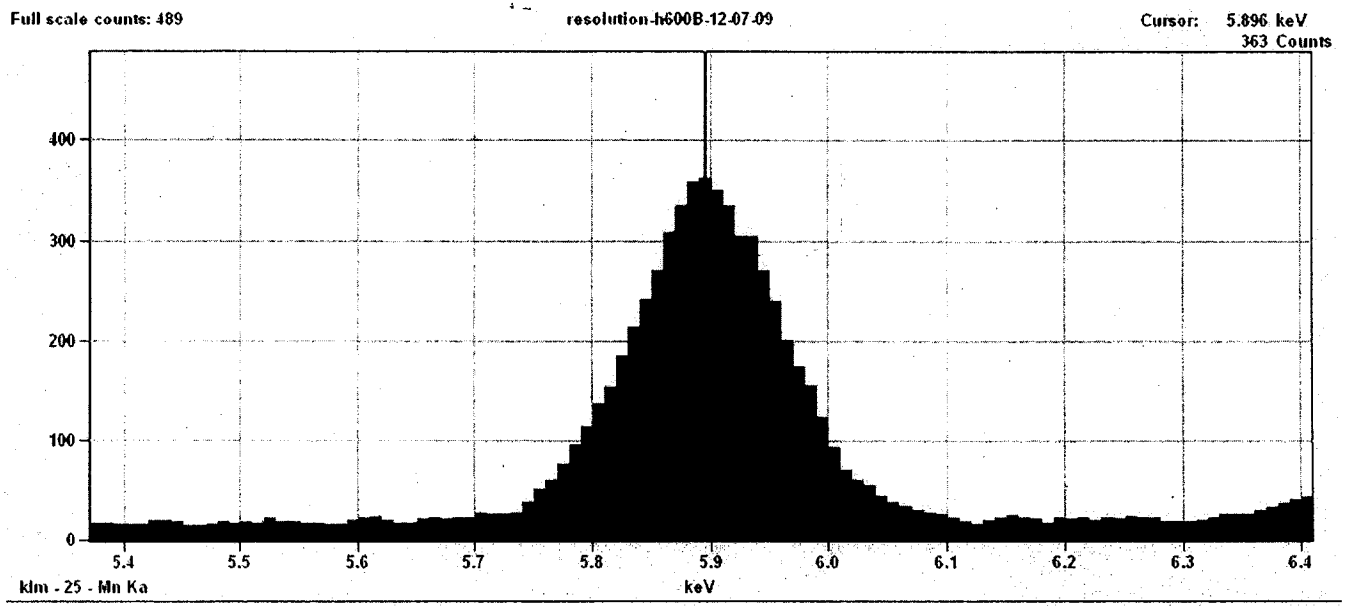
stdev <10% for Mg, Al, Si, Fe
stdev <20% for Na
wrt mean value of k-factor wrt Si

SCOPE B

RUN 7		RUN 8		RUN 9		RUN 10		RUN 11		RUN 12		RUN 13	
I(Si)=	12627	I(Si)=	4491	I(Si)=	15830	I(Si)=	14684	I(Si)=	25368	I(Si)=	25374	I(Si)=	4628
In	Kn	In	Kn	In	Kn	In	Kn	In	Kn	In	Kn	In	Kn
849	1.4365			950	1.6094	982	1.4442	1543	1.5879	1542	1.5893		
3523	1.4478	1332	1.362	4331	1.4765	4325	1.3715	7480	1.37	7479	1.3705	1213	1.5412
4458	0.9885	1569	0.9989	5717	0.9663	5043	1.0162	9260	0.9561	9260	0.9563	1556	1.038
12627	1	4491	1	15830	1	14684	1	25368	1	25374	1	4628	1
1099	0.5947	415	0.5601	1505	0.5444	1185	0.6414	2315	0.5672	2318	0.5666	363	0.6599
4553	1.2224	1818	1.0888	6257	1.1151	4602	1.4064	9813	1.1394	9832	1.1375	1754	1.163
1480	1.3749	563	1.2855	1994	1.2794	1703	1.3895	3188	1.2823	3196	1.2794	510	1.4624
4	23.583	13	2.5808	7	16.894			25	7.5806			6	5.7624
3889	1.6477	1422	1.6027	5899	1.3618	4371	1.7048	8840	1.4563	8884	1.4494	1497	1.5689
6102	4.8398	1894	5.5458	5950	6.2225	9471	3.6262	35609	1.6662	13315	4.4571	2045	5.293

SCOPE B


Full scale counts: 303
EDS RESOLUTION FOR H600B 5-19-10 RS(1)
Cursor: 5.888 keV
213 Counts
Mn Kα
Mn Kβ
keV
Auto
Manual
FWHM
Fe55 Bench Test
Elements
Atomic Symbol: MN
Line: K
Atomic Symbol:
Line: K
Ratio Peaks
Additional Measurements
Measure Zero Peak
Measure FWHM and FWTM
Acquisition Criteria
Livetime [s]
Max Time: 45
Peak Count
No. Trials: 5
Time Constant: 50 (Slow)
Trial #
MN Centroid...
Net Counts
FWHM (eV)
Avg. FWHM...
1 5.895 3991 148.79 148.79
2 5.895 3930 155.00 151.89
3 5.894 3178 155.83 153.21
4 5.892 3379 149.17 152.20
5 5.891 3438 155.40 152.84
Avg: 5.893 3583 152.84
Sigma: 0.002 358 3.54
RMS: 0.0% 10.0% 2.3%



Auto | Manual | FWHM | Fe55 Bench Test

Elements

Atomic Symbol: Mn Line: K

Atomic Symbol: Line: K

Ratio Peaks

Additional Measurements

Measure Zero Peak Measure FWFM and FWTM

Acquisition Criteria

Livetime (s) Max Time: 50

Peak Count No. Trials: 5

Time Constant: 50 (Slow)

Trial #	Mn Centroid ...	Net Counts	FWHM (eV)	Avg. FWHM ...
1	5.896	1277	126.16	126.16
2	5.900	5295	151.73	138.95
3	5.897	6460	146.02	141.30
4	5.898	5560	146.26	142.54
5	5.899	5291	133.62	140.76
	---	---	---	---
Avg:	5.898	4776	140.76	
Sigma:	0.001	2014	10.52	
RMS:	0.0%	42.2%	7.5%	

northgate
environmental management, inc.
24411 Ridge Route Drive, Suite 130
Laguna Hills, California 92653

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COPY

139933/31

Page: 1 of 1
Cooler # of

COC # 02027.01.2152
Total # of Samples: 9 Event Complete?

Regular | Rush | X | Mark One

Required Ship to Lab:
Lab Name: EMS Laboratories, Inc.
Address: 117 W Bellvue Dr
Pasadena, CA 91105
Lab PM: Tony Kolk
Phone/Fax: 626-568-4065
Lab PM email: akolk@emslabs.com
Applicable Lab Quote #:

Required Project Information:
Site ID #: TRONOX LLC. HENDERSON
Project #: 2027.01
Site Address: 560 W Lake Mead Pkwy
City: Henderson State, Zip: NV, 89015
Site PM Name: Derrick Willis
Phone/Fax: (949)375-7004
Site PM Email: derrick.willis@ngem.com

Required Invoice Information:
Send Invoice to:
Address: PO Box 55
City/State: Henderson, NV 89009 Phone #: (949) 260-9293
PO #
Send EDD to: Frank.Hagar@ngem.com
CC Hardcopy report to: PDF Electronic Version Only – FTP Upload
CC Hardcopy report to:

ITEM #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	MATRIX CODE	G=GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	Comments/Lab Sample I.D.	Analysis: Filter	Preservative: UNPRES	PhB-Asbestos
	SSAP7-03-0.00BPC	SSAP7-03	SO	C	N	08/24/2010	09:05	3				X
	SSAP7-03-0.33BPC	SSAP7-03	SO	C	N	08/24/2010	09:15	3				H
	SSAP6-03-0.00BPC	SSAP6-03	SO	C	N	08/24/2010	09:59	3				X
	SSAP6-03-0.33BPC	SSAP6-03	SO	C	N	08/24/2010	10:10	3				H
	SSAP6-02-0.00BPC	SSAP6-02	SO	C	N	08/24/2010	13:36	3				X
	SSAP6-02-0.33BPC	SSAP6-02	SO	C	N	08/24/2010	13:50	3				H
	SSAP6-02-0.00BPC_FD	SSAP6-02	SO	C	FD	08/24/2010	13:36	3				X
	SSAP5-02-0.00BPC	SSAP5-02	SO	C	N	08/24/2010	15:13	3				X
	SSAP5-02-0.33BPC	SSAP5-02	SO	C	N	08/24/2010	15:25	3				H

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Patrick Ferringer NGEM	8-25	1159	SSN NCIEMS	08/25/10	1159
SSN NCIEMS	8/25/10	1159			

Sample Receipt Conditions

	Temp in °C	Samples on Ice?	Sample intact?	Trip Blank?
	Y/N	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N	Y/N

SHIPPED VIA: SAMPLER NAME AND SIGNATURE

Company:
Tracking #:

PRINT Name of SAMPLER: Patrick Ferringer, NGEM
SIGNATURE of SAMPLER: Patrick Ferringer DATE Signed: 8-25-10 Time: 1159

139934

Laboratory Submittal Form

Date:	Time:	Relinquished by:	
Client:	Northgate Environmental Mgmt, Inc.	Date of Shipment:	
Address:	24411 Ridge Route Drive, Suite 130	Shipped from:	Carrier:
	Laguna Hills, CA 92653	Client P.O. No:	
Telephone:	949-375-7004	Client Project ID:	TRONOX LLC Henderson
Contact:	Cindy Arnold		02027.01.2152
Results via:	☐ Fax No:	☐ Email address:	☐ Verbal

(Complete written reports will follow all analyses, in addition to any prior verbal, fax, or email results)

Turnaround Time:	Other:	Sample Preservatives:	
Number of Samples:	5	Sampler's Name:	
Date & Time of Sample Collection:		Holding Times:	Signature:

Type: ☐ Water ☐ Waste Water ☐ Soil ☐ Filter ☐ Impinger ☐ Sorbent Tube ☐ Other

EMS Only	Client Sample No.	Description/Location	Analysis	Volume/ Weight
1	SSAP6-02-0.00BPC		TEM	
2	SSAP6-02.033BPC	SEE ATTACHMENT	HOLD	
3	SSAP6-02-0.00BPC_FD			
4	SSAP5-02-0.00BPC			
5	SSAP5-02-0.33BPC		HOLD	
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

139934

For EMS Only			
Laboratory Number:		Received by:	Time: 11:10
Date of Package Delivery:	8/27/2010	Shipping Bill Retained?	NONE
Condition of Package on Receipt:	OK	Condition of Custody Seal:	NONE
Number of Samples:	5	Chain of Custody Signature:	
Disposition of Samples:	EMS LABS	Misc. Info:	SF 7/06