EMS Laboratories Inc.
117 West Bellevue Drive, Pasadena, CA 91105
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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

Date Sampled: 9/14/2010 10:30AM

Customer ID: TRNX26
Customer PO: 2027.001
Received: 9/24/2010
EMS LAB No: 140411
Date Prepared: 10/21/2010 13:13
Analysis Date: 10/25/2010 10AM

Report Date: October 25, 2010

NIOSH 7402/ISO

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

EMS Laboratory Number:	140411		Mass of Respirable Dust on Filter:	176	µg
Customer Sample Number:	SSAN5-03-1.50BPC		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:	29	
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 -74.9g			Soil % Moisture	11.4	%
			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: 8.02E+06 Structure /g PM 10 Limit of Detection: 2.40E+07 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% Conf. Int. Conc. Str/g PM10	Poisson 95% Conf. Int. Lower Limit Str/g PM10	Poisson 95% Conf. Int. Upper Limit Str/g PM10
Asbestos Structures>5um, ≤10um	ADX/CD	60	61	224	4.89E+08	3.74E+08	6.28E+08
Asbestos Structures>5um, ≤10um (Chrys)	CD	57	58	213	4.65E+08	3.53E+08	4.65E+08
Asbestos Structures>5um, ≤10um (Amph)	ADX	3	3	11	2.41E+07	4.97E+06	7.04E+07
Asbestos Structure >10um (Long)	ADX/CD	39	40	147	3.21E+08	2.29E+08	4.38E+08
Asbestos Structure >10um (Chrys)	CD	35	36	132	2.89E+08	2.89E+08	4.00E+08
Asbestos Structure >10um (Amph)	ADX	4	4	14.7	3.21E+07	8.75E+06	8.22E+07
Total Protocol Asbestos Structures	ADX/CD	99	101	371	8.10E+08	8.10E+08	9.85E+08
Protocol Asbestos Structures (Chrys)	CD	92	94	345	7.54E+08	6.06E+08	9.23E+08
Protocol Asbestos Structures (Amph)	ADX	7	7	25.7	5.62E+07	2.26E+07	1.16E+08
Total Protocol Non Asbestos Structures	NAM	8	8	29.3	6.42E+07	2.77E+07	1.26E+08

Approved by Technical Director

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NIOSH 7402/ISO

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Client:	Derrick Willis, Tronox LLC-Henderson	**Filter Type:**	PC 385 mm²
Report number :	140411	**Magnification:**	9200
Sample number:	SSAN5-03-1.50BPC	**Grid Opening Dimension: mm^2**	0.0094
Project:	2027.001/Tronox LLC Henderson, 560 W. Lake Mead Dr.,	**Grid Loading:**	Moderate

Elutriation Date: 10/21/2010 by Joel Paruli
Preparation Date: 10/22/2010 by Joel Paruli
Analysis Date: 10/25/2010 by Radha Singh

Asbestos Structures>5um, ≤10um (Chrys)	58
Asbestos Structures>5um, ≤10um (Amph)	3
Asbestos Structure >10um (Chrys)	36
Asbestos Structure >10um (Amph)	4
Protocol Asbestos Structures (Chrys)	94
Protocol Asbestos Structures (Amph)	7

Grid Openings	29
Mass - ug	176
Anlytical sensitivity	[redacted]

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	E23	F	1	1	1	120	0.11	13.04	CD	Chrysotile		
1A	F26	MD11	2		50	100	5.43	10.87				
		MF		2	1	100	0.11	10.87	CD	Chrysotile		
		F	3	3	0.5	90	0.05	9.78	CD	Chrysotile		
1A	F31											
1A	F34	MD11	4		100	110	10.87	11.96				
		MF		4	0.5	110	0.05	11.96	CD	Chrysotile		
		F	5	5	1	98	0.11	10.65	CD	Chrysotile		
1A	G31	MD11	6		20	90	2.17	9.78				
		MF		6	0.2	58	0.02	6.30	CD	Chrysotile		
		MD11			165	350	17.93	38.04				
		MF			5	350	0.54	38.04		Amosite		
		MD11	7		25	80	2.72	8.70				
		MF		7	0.5	80	0.05	8.70	CD	Chrysotile		
		F	8	8	0.5	55	0.05	5.98	CD	Chrysotile		
1A	G34											
1A	C33											
1A	C36	MD11	9		30	95	3.26	10.33				
		MF		9	1	60	0.11	6.52	CD	Chrysotile		
1A	E33	F			5	89	0.54	9.67				Non Asbestos
		F	10	10	1	150	0.11	16.30	CD	Chrysotile		
		MD11			80	130	8.70	14.13				
		MF			5	130	0.54	14.13				Non Asbestos
		MD11	11		40	140	4.35	15.22				Double
		MF		11	1	140	0.11	15.22	CD	Chrysotile		Double
		MD22	12		75	600	8.15	65.22				Double
		MF		12	1	600	0.11	65.22	CD	Chrysotile		Double
		MF			5.5	380	0.60	41.30		Amosite		Double
1A	E36	MD11			80	90	8.70	9.78				
		MF			5	90	0.54	9.78	CD	Chrysotile		
		MD21	13		20	130	2.17	14.13				Double
		MF		13	0.2	130	0.02	14.13	CD	Chrysotile		
		MD11	14		70	130	7.61	14.13				
		MF		14	1	130	0.11	14.13	CD	Chrysotile		
		F	15	15	0.2	50	0.02	5.43	CD	Chrysotile		
1A	F41	MD11			40	100	4.35	10.87				
		MF			1	70	0.11	7.61				Non Asbestos
		F	16	16	0.5	68	0.05	7.39	CD	Chrysotile		
		F			5.5	210	0.60	22.83		Amosite		
1A	G41	F			8.5	580	0.92	63.04		Amosite		Double
		MD11	17		110	140	11.96	15.22				
		MF		17	1	130	0.11	14.13	CD	Chrysotile		
		MD11	18		90	130	9.78	14.13				
		MF		18	1	100	0.11	10.87	CD	Chrysotile		
1B	C26	F	19	19	0.2	55	0.02	5.98	CD	Chrysotile		
		MD21			130	230	14.13	25.00				
		MF			1	130	0.11	14.13				Non Asbestos
		MD11			55	140	5.98	15.22				
		MF			5	140	0.54	15.22		Amosite		
		MD11	20		170	220	18.48	23.91				
		MF		20	3.5	170	0.38	18.48	CD	Chrysotile		
		MD11	21		70	380	7.61	41.30				
		MB		21	2.5	380	0.27	41.30	CD	Chrysotile		

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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				
		MD11	22		60	200	6.52	21.74				Double
		MF		22	0.5	200	0.05	21.74	CD	Chrysotile		Double
1B	E31	MD42	23		70	380	7.61	41.30				
		MF		23	1	100	0.11	10.87	CD	Chrysotile		
		MB		24	2.5	290	0.27	31.52	CD	Chrysotile		
1B	E34	MD11	24		40	80	4.35	8.70				
		MF		25	0.5	75	0.05	8.15	CD	Chrysotile		
		MD11	25		40	120	4.35	13.04				
		MF		26	0.2	72	0.02	7.83	CD	Chrysotile		
		MD11	26		40	70	4.35	7.61				
		MF		27	0.5	60	0.05	6.52	CD	Chrysotile		
		F	27	28	0.5	49	0.05	5.33	CD	Chrysotile		
		MD11			140	230	15.22	25.00				
		MF			5.5	230	0.60	25.00		Amosite		
		F	28	29	0.5	48	0.05	5.22	CD	Chrysotile		
		MD11	29		55	110	5.98	11.96				
		MF		30	1.5	110	0.16	11.96	CD	Chrysotile		
		F	30	31	1	110	0.11	11.96	CD	Chrysotile		Double
1B	F33	F	31	32	1	52	0.11	5.65	CD	Chrysotile		
		F	32	33	0.5	50	0.05	5.43	CD	Chrysotile		
		MD11	33		10	55	1.09	5.98				
		MF		34	2.5	55	0.27	5.98	CD	Chrysotile		
1B	F44	MD11	34		30	60	3.26	6.52				
		MF		35	1.5	60	0.16	6.52		Amosite		
1B	G41	MD11	35		15	170	1.63	18.48				Double
		MF		36	0.5	170	0.05	18.48	CD	Chrysotile		
		F	36	37	1	85	0.11	9.24	CD	Chrysotile		
1B	H54	MD11			10	75	1.09	8.15				
		MF			1	75	0.11	8.15				Non Asbestos
1B	F56											
1B	C56	MD21	37		65	125	7.07	13.59				
		MF		38	1	125	0.11	13.59	CD	Chrysotile		
		F	38	39	0.5	50	0.05	5.43	CD	Chrysotile		
1C	C26	B			4.5	105	0.49	11.41	CD	Chrysotile		
1C	E23	F	39	40	0.5	62	0.05	6.74	CD	Chrysotile		
1C	E26	F	40	41	0.5	58	0.05	6.30	CD	Chrysotile		
		MD11	41		15	145	1.63	15.76				
		MF		42	0.5	145	0.05	15.76	CD	Chrysotile		
		F	42	43	0.5	68	0.05	7.39	CD	Chrysotile		
1C	E34	MD11			150	230	16.30	25.00				
		MF			6	230	0.65	25.00		Amosite		
1C	F31	MD11	43		15	72	1.63	7.83				
		MF		44	0.5	72	0.05	7.83	CD	Chrysotile		
1C	F34	MD21	44		30	82	3.26	8.91				
		MF		45	1	82	0.11	8.91	CD	Chrysotile		
		MD11			30	55	3.26	5.98				
		MF			8	55	0.87	5.98				Non Asbestos
1C	C33	MD11	45		88	185	9.57	20.11				
		MF		46	1	160	0.11	17.39	CD	Chrysotile		
		MD11	46		70	75	7.61	8.15				
		MF		47	0.5	70	0.05	7.61	CD	Chrysotile		
1C	C36	MD11			55	70	5.98	7.61				
		MF			5.5	70	0.60	7.61				Non Asbestos
		MD11	47		35	110	3.80	11.96				
		MF		48	0.5	60	0.05	6.52	CD	Chrysotile		
		MD21			115	200	12.50	21.74				
		MF			8	200	0.87	21.74		Amosite		
1C	E33	MD22	48		80	275	8.70	29.89				
		MF		49	1	275	0.11	29.89	CD	Chrysotile		
		MF		50	0.5	100	0.05	10.87	CD	Chrysotile		
1C	F33	MD11	49		25	58	2.72	6.30				
		MF		51	1	58	0.11	6.30	CD	Chrysotile		
1C	F36	MD21			115	200	12.50	21.74				
		MF			44	170	4.78	18.48				Non Asbestos

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Report Number:	
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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	C41	F	50	52	1	50	0.11	5.43	CD	Chrysotile		
		F	51	53	1	75	0.11	8.15	CD	Chrysotile		
1C	C44	MD11	52		12	70	1.30	7.61				
		MF		54	0.5	70	0.05	7.61	CD	Chrysotile		
		MD11			50	65	5.43	7.07				
		MF			12	65	1.30	7.07				Non Asbestos
1C	E41	F	53	55	0.5	58	0.05	6.30	CD	Chrysotile		
		F	54	56	0.5	49	0.05	5.33	CD	Chrysotile		
1C	F43											
1C	F46											
1C	C51	MD11			60	280	6.52	30.43				
		MF			6.5	280	0.71	30.43				Non Asbestos
		MD11			40	100	4.35	10.87				
1C	C54	MF			1.5	100	0.16	10.87				Non Asbestos
		MD11			60	115	6.52	12.50				
		MF			8	115	0.87	12.50				Non Asbestos
		MD21	55		80	130	8.70	14.13				
		MF		57	1	95	0.11	10.33	CD	Chrysotile		
		MD11	56		12	60	1.30	6.52				
		MF		58	0.5	50	0.05	5.43	CD	Chrysotile		
1C	E54	MD11	57		85	110	9.24	11.96				
		MF		59	1	60	0.11	6.52	CD	Chrysotile		
		MD11			35	80	3.80	8.70				
		MF			2	78	0.22	8.48				Non Asbestos
1D	F23	MD11			80	330	8.70	35.87				
		MF			5	110	0.54	11.96				Non Asbestos
1D	E26	F	58	60	0.5	50	0.05	5.43	CD	Chrysotile		
		MD11	59		60	110	6.52	11.96				
		MF		61	0.5	90	0.05	9.78	CD	Chrysotile		
		F	60	62	1	200	0.11	21.74	CD	Chrysotile		Double
1D	E31	MD11			40	170	4.35	18.48				
		MF			3.5	92	0.38	10.00		Amosite		
		MD11			70	140	7.61	15.22				
		MB			8.5	140	0.92	15.22	CD	Chrysotile		
		F	61	63	3.5	92	0.38	10.00		Amosite		
1D	E34	F	62	64	0.5	52	0.05	5.65	CD	Chrysotile		
1D	F33	MD11			70	390	7.61	42.39				
		MB			6.5	390	0.71	42.39	CD	Chrysotile		
		MD11	63		15	145	1.63	15.76				
		MF		65	1	145	0.11	15.76	CD	Chrysotile		
		F	64	66	0.5	52	0.05	5.65	CD	Chrysotile		
		MD11			110	260	11.96	28.26				
		MF			4	100	0.43	10.87				Non Asbestos
		F	65	67	0.5	55	0.05	5.98	CD	Chrysotile		
1D	C41	MD11	66		70	110	7.61	11.96				
		MF		68	0.5	70	0.05	7.61	CD	Chrysotile		
1D	C44	F	67	69	0.5	92	0.05	10.00	CD	Chrysotile		
		F	68	70	1	50	0.11	5.43	CD	Chrysotile		
1D	E41	F	69	71	1	56	0.11	6.09	CD	Chrysotile		
		MD11	70		75	112	8.15	12.17				
		MF		72	2.5	112	0.27	12.17		Amosite		
		MD11			150	200	16.30	21.74				
		MF			25	140	2.72	15.22	CD	Chrysotile		
1D	F43	MD11	71		80	170	8.70	18.48				
		MF		73	2.5	170	0.27	18.48	CD	Chrysotile		
		F	72	74	2.5	120	0.27	13.04		Amosite		
		MD11	73		40	140	4.35	15.22				
		MF		75	2.5	140	0.27	15.22		Amosite		
		MD11	74		40	70	4.35	7.61				
		MF		76	0.5	70	0.05	7.61	CD	Chrysotile		
		MD11	75		40	115	4.35	12.50				
		MF		77	0.5	100	0.05	10.87	CD	Chrysotile		
1E	C23	F	76	78	0.5	58	0.05	6.30	CD	Chrysotile		
		MD11	78		45	100	4.89	10.87				
		MF		79	1.5	100	0.16	10.87	CD	Chrysotile		
		MD11	79		35	180	3.80	19.57				
		MB		80	2.5	125	0.27	13.59	CD	Chrysotile		Double

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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
1E	E23	MD11	80		180	250	19.57	27.17				
		MF		81	0.5	80	0.05	8.70	CD	Chrysotile		
1E	E26	MD11	81		40	95	4.35	10.33				
		MF		82	0.5	95	0.05	10.33	CD	Chrysotile		
1E	F31	MD11			120	150	13.04	16.30				
		MB			5.5	150	0.60	16.30		Amosite		
1E	F34	F	82	83	1	50	0.11	5.43	CD	Chrysotile		
1E	G31	MD11	83		110	135	11.96	14.67				
		MF		84	1	135	0.11	14.67	CD	Chrysotile		
1E	B44	F	84	85	0.5	50	0.05	5.43	CD	Chrysotile		
1E	C41	MD11	85		40	70	4.35	7.61				
		MF		86	0.5	70	0.05	7.61	CD	Chrysotile		
1E	C44											
1E	C53	MD11	86		55	125	5.98	13.59				
		MF		87	1	125	0.11	13.59	CD	Chrysotile		
		MD11	87		20	105	2.17	11.41				
		MF		88	1	105	0.11	11.41	CD	Chrysotile		
1E	C56	F	88	89	3	245	0.33	26.63		Amosite		
		F			8.5	170	0.92	18.48		Amosite		
1E	E53	F			2	102	0.22	11.09				Non Asbestos
1E	E56	F	89	90	0.5	60	0.05	6.52	CD	Chrysotile		
		MD11	90		15	85	1.63	9.24				
		MF		91	1	80	0.11	8.70	CD	Chrysotile		
		F	91	92	0.5	70	0.05	7.61	CD	Chrysotile		
1E	G56	F	92	93	1	90	0.11	9.78	CD	Chrysotile		
		MD11	93		30	92	3.26	10.00				
		MF		94	1	80	0.11	8.70	CD	Chrysotile		
1E	H33	MD22	94		200	260	21.74	28.26				Double
		MF		95	1.5	210	0.16	22.83	CD	Chrysotile		Double
		MF		96	1	55	0.11	5.98	CD	Chrysotile		
1E	H36	MD11	95		110	160	11.96	17.39				
		MF		97	0.5	80	0.05	8.70	CD	Chrysotile		
		MD11	96		40	55	4.35	5.98				
		MF		98	1.5	50	0.16	5.43	CD	Chrysotile		
		F			5	220	0.54	23.91		Amosite		Double
1E	C26	F			2	60	0.22	6.52				Non Asbestos
		MD11			110	150	11.96	16.30				
		MF			1	115	0.11	12.50				Non Asbestos
		MD11	97	99	70	110	7.61	11.96				
		MF			1	70	0.11	7.61	CD	Chrysotile		
1E	F23	MD11	98	100	12	58	1.30	6.30				
		MF			1	50	0.11	5.43	CD	Chrysotile		
1E	F26											
1E	G23	MD11	99	101	22	80	2.39	8.70				
		MF			0.5	70	0.05	7.61	CD	Chrysotile		

SDG	#Sys_Sample_Code	Sample_Ty	Sample_M	sample_da	sample_tin	Sys_Loc_C	Lab Name	Lab_Anl_Method_Narr	M analysis_d
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010
140411	SSAN5-03-1.50BPC	N	SO	9/14/2010	10:30AM	SSAN5-03	EMS	NIOSH 7402/ISO	10/25/2010

analysis_S	Test_Type	Test_Batch	Lab_Samp	Basis	Lab_Prep	prep_date	prep_time	Cas_Rn	Chemical	Total_str	Result_Val	Result_Uni
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	61	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	58	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	3	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	40	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	36	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	4	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	101	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	94	[redacted]	s/gPM10
10AM	Initial		140411-2	NA	Elutriator	10/21/2010	13:13	[redacted]	[redacted]	7	[redacted]	s/gPM10

Detect_Fla	Detection_	lab_qualifie	Comment	parent_san	fraction	Sample_sc	validator_n	validator_q	validation_	validation_	analytical_s
Y				N							
Y				N							
Y				N							
Y				N							
Y				N							
Y				N							
Y				N							
Y				N							
Y				N							

bestos_sensitivity_un	rcent_moist	analyst_nam	95_UCL
Structure/g PM10	11.4	R.Singh	6.28E+08
Structure/g PM10	11.4	R.Singh	4.65E+08
Structure/g PM10	11.4	R.Singh	7.04E+07
Structure/g PM10	11.4	R.Singh	4.38E+08
Structure/g PM10	11.4	R.Singh	4.00E+08
Structure/g PM10	11.4	R.Singh	8.22E+07
Structure/g PM10	11.4	R.Singh	9.85E+08
Structure/g PM10	11.4	R.Singh	9.23E+08
Structure/g PM10	11.4	R.Singh	1.16E+08

Elutriator Data Date: 10/21/10 Client: Northgate

Lab #: 14041

Sample ID: SSAN5-03-1,50 BPC Sample weight (g): 74.9

Time air flow started: 1000 Tumbler rpm: 30

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	1200	175	0.02825	0.02464	3.61	30			80% loss
2	1230		0.03755	0.02485	12.70	15			OK
3	1245		0.02915	0.02479	4.36	20			70% loss
4	1305		0.02833	0.02465	3.68	15			60% loss
5	1320		0.03037	0.02521	5.16	15			35% loss
6	1335			~~0.02494~~ JR					
7									
8									

	S.Time	End Time						Dep. Rate	Estiimate
1	1251	1254		4,782	4.651	0.131	3		
2	1259	1303.15		4,883	4.683	0.200	4.15		
3	1313	1317		4,926	4.750	0.176	4		
4	1327	1330.45		4.855	4.699	0,156	3.45		
5									
6									
7									
8									
9									
10									

* RAISE RPM TO _____ @ _____

140411 2 soils for moisture content

9-24-10

#140411	#SA113-0.0 BPC	#SSAN5-03-1.00 BPC
dish wt.	31.46 g	31.44
dish + s.	131.53 (init. wt. 100.07 g)	132.03 (100.59 g)
7:55 - 8:55	125.41 (93.95 g)	124.50 (93.06 g)
10:55 - 11:55	125.11 (93.65 g)	124.42 (92.98)
1 - 2:00	125.09 (93.63 final wt.)	124.40 (92.96)

% moist. $100 \times \frac{100.07 - 93.63}{93.63} = 6.8\%$

$100 \times \frac{100.59 - 92.96}{92.96} = 8.2\%$

BP

9-27-10

#140525	#SSAQ3-05-0.0001 BPC	#SSAQ3-04-0.0001 BPC
dish wt.	31.46	31.46
d+s	131.77 (initial wt. 100.31 g)	131.51 (100.05 g)
7:50 - 8:50	124.55 (93.09 g)	124.88 (93.42 g)
10:00 - 11:00	124.46 (93.00 g)	124.63 (93.17)
12:00 - 1:00	124.43 (92.97 g) final wt.	124.62 (93.16 final wt)

% moist. $100 \times \frac{100.31 - 92.97}{92.97} = 7.9\%$

$100 \times \frac{100.05 - 93.16}{93.16} = 7.4\%$

BP

10-21-10

#140411	# SSAN5-03-1.50 BPC
dish wt.	19.23 g
D+S	119.77 (100.54 g initial wt.)
7:30 - 8:30	109.91 (90.68)
9:45 - 10:45	109.46 (90.23)
11:20 - 12:20	109.46 (90.23 g final wt.)

% moist. $100 \times \frac{100.54 - 90.23}{90.23} = 11.43\%$

BP

Count (Page of) NIOSH 7402/ISO

Prep Time: 100 → 330

Report number: 140411
Sample number: SSANS-03-1.50 BPC
File name: Northgate
Sample Description: 174 : mg

Filter Type: PC 385 mm2
Date Sample was Run: 10/21/10

Magnification: 9,200 X

Preparation date: 10/22/10 By JAP
Analysis date: 10-21-10 By RS
(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	E2-1	1			E	1	120	Chryso
	E2-6	2			MD11	50	140	Chryso
					ME	1	140	"
		3			E	0.5-	90	"
	F3-1							
	F3-4	4			MD11	140	110	Chryso
					MF	0.5-	110	
		5			E	1	98	Chryso
	G3-1	6			MD11	20	90	Chryso
					MF	0.2	58	
		7			MD11	165	350	EDS amosh.
					ME	5	350	
		8			MD11	25-	80	Chryso.
					ME	0.1-	80	
		9			E	0.5-	55-	Chryso
	G3-4							
	C3-3							
	C3-6	10			MD11	30	95-	Chryso.
					ME	1	60	
	E3-3				E	5-	89	EDS Nanosh.
		11			E	1	150	Chryso.
					MD11	80	130	EDS Nanosh
					ME	5-	130	
		12			MD11	40	140X	ME 1-140X doubled Chryso.
		13			MD 22	75	600X	doubled chryso
					ME	1	600X	
					MF	5.5-	380X	EDS amosh
	E3-6				MD11	80	90	EDS Nanosh.
					ME	5-	90	
		14			MD11	20	130X	doubled Chryso.
					ME	0.2	130	
		15			MD11	70	130	Chryso.
					MF	1	130	

TEM Asbestos Structure Count (Page of)

Report number: 140411 SAMPLE NO: SSANS-03-1.50 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1A		16			E	0.2	50	chryso.
	F4-1				MD11	40	100	Nonasb.
					ME	1	70	
		17			E	0.5-	68	chryso.
		18			E	5.5	210	amosb.
	G4-1	19			E	8.5	580	amosb EDS dbl w/#35
		20			MD11	110	140	Chryso.
					ME	1	130	
		21			MD11	90	130	chryso.
					ME	1	100	
1B	C2-6	1			E	0.2	55-	chryso.
					MD21	130	230	Nonasb
					ME	1	130	
		2			MD11	5.5-	140	EDS amosb
					ME	5-	140	
		3			MD11	170	220	amosb
					ME	3.5-	170	
		4			MD11	70	380	Chryso
					MB	2.5-	380	
		5			MD11	60	2mm+	dbl chryso
					ME	0.1-	2mm+	
	E3-1	6			MD21	70	380	chryso
					ME	1	140	
					MB	2.5-	290	
	E3-4	7			MD11	40	80	chryso
					ME	0.5-	75-	
		8			MD11	40	120	chryso
					ME	0.2	72	
		9			MD11	40	70	chryso
					ME	0.5-	60	
		10			E	0.5-	49	chryso
		11			MD11	140	230	amosb
					ME	5.5-	230	

TEM Asbestos Structure Count (Page of)

Report number: 140411 SAMPLE NO: SSAN5-03-1.50 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		12			E	0.5	4	Chrys0
		13			MD11	5	110	Chrys0.
					ME	1	110	
		14			E	1	110	Chrys0 dubbed
	F3-3	15			E	1	52	Chrys0.
		16			E	0.5	50	"
		17			MD11	10	5	Chrys0
					ME	0.5	5	
	F4-4	18			MD11	30	60	amosh
					ME	1	60	
	G4-1	19			MD11	1	170	dubbed Chrys0
					ME	0.5	170	
		20			E	1	85	Chrys0
	H5-4				MD11	10	75	Namsh
					ME	1	71	
	F5-6	NSD						
	G5-6	21			MD21	6	125	Chrys0.
					ME	1	125	
		22			E	0.5	50	Chrys0
1C	C2-6							
	E23	1			B	4.5	10	Chrys0.
	E26	2			E	0.5	62	"
		3			E	0.5	58	"
		4			MD11	1	14	"
					ME	0.5	14	
		5			E	0.5	68	"
	E34	6			MD11	10	230	amosh
					ME	6	230	
	F3-1	7			MD11	1	72	Chrys0
					ME	0.5	72	
	F3-4	8			MD21	30	82	Chrys0
					ME	1	82	
					MD11	30	55	Namsh.
					ME	8	55	

TEM Asbestos Structure Count (Page of)

Report number: 140411 SAMPLE NO: SSAN5-03-1.50 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1C	C3-3	9			MD11	88	185	Chryso
					MF	1	160	
		10			MD11	70	75	Chryso.
					MF	0.5	70	
	C3-6				MD11	55	70	Non asb
					MF	5.5	70	
		11			MD11	55	110	Chryso
					MF	0.5	60	
		12			MD21	115	200	amosite EDS
					MF	8	200	
	E3-3	13			MD22	80	275	Chryso
					MF	1	275	
					MF	0.5	100	
	F3-3	14			MD11	25	51	Chryso
					MF	1	51	
	F3-6				MD21	115	200	Non asb
					MF	4.1	170	
	C4-1	15			F	1	50	Chryso.
		16			F	1	75	Chryso
	C4-4	17			MD11	12	70	
					MF	0.5	70	Chryso
					MD11	50	65	Non asb.
					MF	12	65	
	E4-1	18			F	0.5	58	Chryso.
					F	0.5	49	"
	F4-3							
	F4-6							
	C5-1				MD11	60	280	Non asb
					MF	6.5	280	
					MD11	40	100	Non asb
	C5-4				MF	1.5	100	
					MD11	60	115	Non asb.
					MF	8	115	
		19			MD21	80	130	Chryso
					MF	1	95	
		20			MD11	1.2	60	Chryso.
					MF	0.5	50	
	E3-4	14			MD11	85	110	Chryso
					MF	1	60	

TEM Asbestos Structure Count (Page of)

Report number: 140411 SAMPLE NO: SSAN5-03-1.50 BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1C					MDII	35	80	Non ash
					MI-	7	76	
1D	F2-3				MDII	80	330	non ash
					MI-	5	110	
	F26	1			C	0.5-	50	Chryso
		2			MDII	60	110	Chryso
					MI-	0.5-	90	
		3			IC	1	200+	tubular chryso
	E3-4	4			MDII	40	170	
					MI-	3.5-	92	amosite
		5			MDII	70	140	Chryso
					MB	8.5-	140	
		6			IC	3.5-	92	amosite
	E34	7			IC	0.5-	52	Chryso
	E3-3	8			MDII	70	390	Chryso
					MB	6.5-	391	
		9			MDII	15	141	Chryso
					MI-	1	145	
		10			IC	0.5-	52	chryso
					MDII	110	260	Non ash.
					MI-	4	140	
		11			IC	0.5-	55-	Chryso
	C4-1	12			MDII	70	110	Chryso
					MI-	0.5-	70	
	C4-4	13			C	0.5-	92	Chryso
		14			IC	1	50	"
	E4-1				IC	1	56	"
		15			MDII	75-	112	amosite
					MI-	2.5-	112	
		16			MDII	150	200	chryso Coated
					MI-	21-	140	
	F4-3	17			MDII	80	170	Chryso
					MF	2.5-	170	
		18			IC	2.5-	120	amosite

TEM Asbestos Structure Count (Page of)

Report number: 140411 SAMPLE NO: SSAN5-03-1.5D 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		19			MDII	40	140	amosh
					MF	2.5-	140	
		20			MDII	40	70	Chryso
					MF	0.5	70	
		21			MDII	40	11.5-	chryso
					MF	0.5	100	
1E	G-3	1			F	0.1-	58	chryso
		2			MDII	4.5-	140	chryso
					MF	1.1-	140	
		3			MDII	3.5-	140*	double Chryso
					MB	2.5	125*	
	E2-3	4			MDII	180	250	Chryso
					MF	0.5	80	
	E2-6	5			MDII	40	91-	chryso
					MF	0.5-	91-	
	F2-1	6			MDII	120	150	amosite
					MB	5.5-	150	
	F2-4	7			F	1	50	chryso
	G2-1	8			MDII	110	135	chryso
					MF	1	13.5-	
	B4-4	9			F	0.5-	50	chryso
	C4-1	10			MDII	40	70	chryso
					MF	0.5	70	
	C4-4							
	C5-3	11			MDII	5.5-	125-	chryso
					MF	1	125-	
		12			MDII	20	105-	chryso
					MF	1	105-	
	C5-6	13			F	3	24.5-	amosite
		14			F	8.1-	170	amosite
					F			
	E5-3				F	2	102	hornblende
	F5-6	15			F	0.5-	60	chryso

TEM Asbestos Structure Count (Page of)

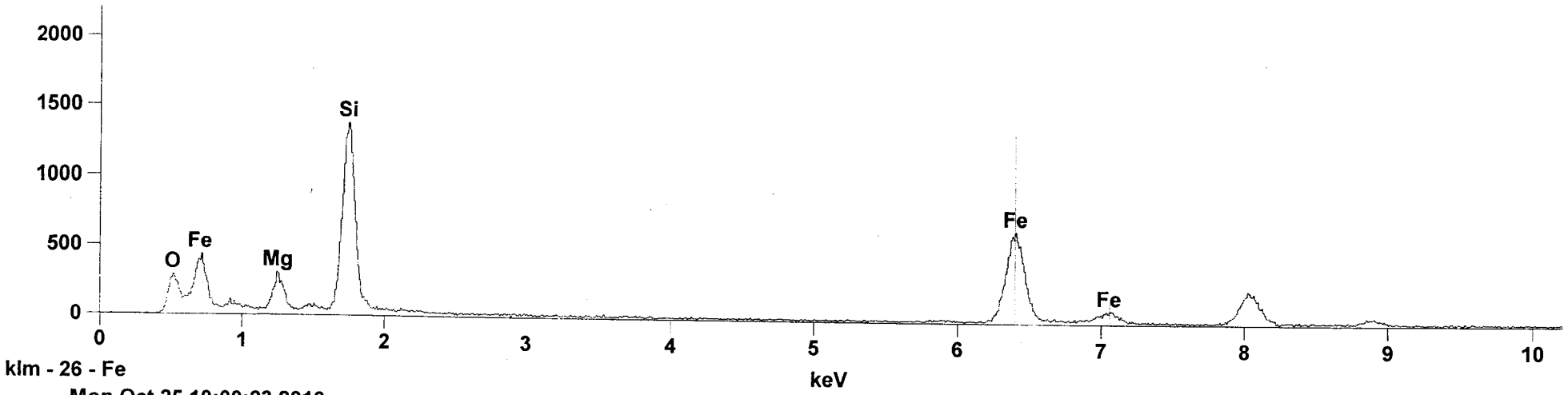
Report number: 140411 SAMPLE NO: SSAN5-03-1.5D BPC X 9,200

Grid	Grid Opening	Number of structures primary	Number of structures Total	Class	Type of Structure	Width Mm	Length Mm	Comments
1E		16			MDII	1.5-	85	chryso
					MF=	1	80	
		17			F	0.5-	70	chryso
	G5-6	18			F	1	90	chryso
		19			MDII	20	92	chryso
					MF=	1	80	
	H3-3	20			MDII	240	260X	Chryso dusted
					MF	1.5-	210X	
					MF=	1	52	
	B-6	21			MDII	110	160	chryso.
					MF	0.5-	80	
		22			MDII	40	55	chryso.
					MF	1.5-	50	
		23			F	5	220X	dusted amosh
	C2-6				F	2	60	Nonasb.
					MDII	110	150	Nonasb
					MF	1	40-	
		24			MDII	70	110	chryso.
	F2-3				MF	1	70	
		25			MDII	12	58	chryso.
					MF	1	50	
	F2-6							
	G2-3	26			MDII	22	50	chryso
					MF	0.5-	70	
		27			MDII	160	230	chryso.
					MF3	10	110	
		28			MDII	12	80	chryso
					MF	1	80	
		29			MDII	40	340X	dusted amosh
					MF	3.5-	340X	
	G-6	30			F	0.5-	55-	chryso.
		31			MDII	50	70	chryso
					MF	0.5	70	
		32			F	0.5	52	chryso
	B3-1							
	E4-3				MF	1.5-	55-	Nonasb
		33			F	3.5	220	amosite
	E6-1	34			F	1	140	chryso
		34-			F	1.5	52	chryso
		36			MDII	15	90	chryso
					MF	1	90	

Project: New Project

Full scale counts: 2034

140411SSAN5-03-150 BPC-A-G3-1(1)



klm - 26 - Fe

Mon Oct 25 10:00:23 2010
Gaussian Fit Chi Squared:9.256
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:32.0 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

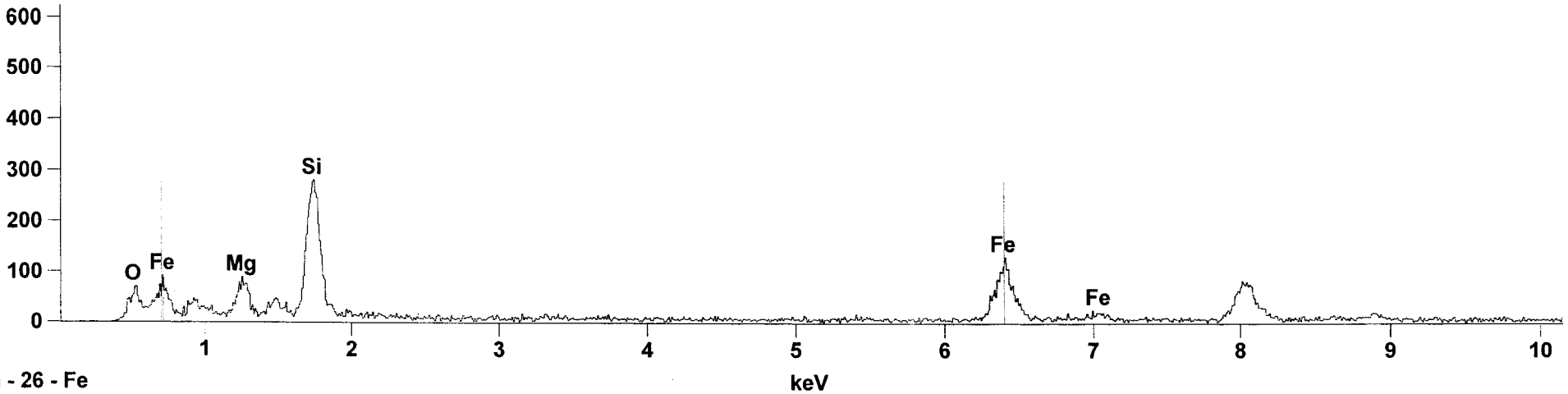
Quantitative Results 140411SSAN5-03-150 BPC-A-G3-1(1)

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	2794	27.41	+/- 0.54	34.16	+/- 0.67
Si K	14530	49.34	+/- 0.44	53.22	+/- 0.48
Fe K	10945	23.25	+/- 0.24	12.62	+/- 0.13
Total		100.00		100.00	

Project: New Project

Full scale counts: 573

140411SSAN5-03-150 BPC-A-E3-3(1)



klm - 26 - Fe

Mon Oct 25 10:12:46 2010
Gaussian Fit Chi Squared:3.456
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:14.8 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

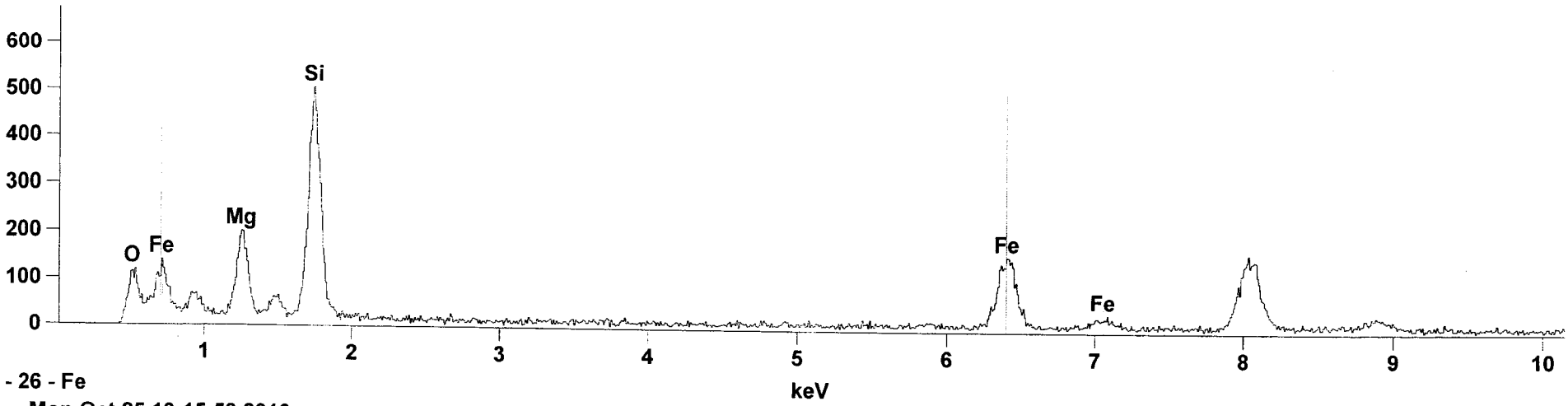
Quantitative Results 140411SSAN5-03-150 BPC-A-E3-3(1)

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	799	36.42	+/- 1.37	43.24	+/- 1.62
Si K	2966	46.81	+/- 0.90	48.09	+/- 0.92
Fe K	1698	16.77	+/- 0.44	8.66	+/- 0.23
Total		100.00		100.00	

Project: New Project

Full scale counts: 623

140411SSAN5-03-150 BPC-A-E3-3(2)



klm - 26 - Fe

Mon Oct 25 10:15:59 2010

Gaussian Fit Chi Squared:4.648

Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:41.5 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

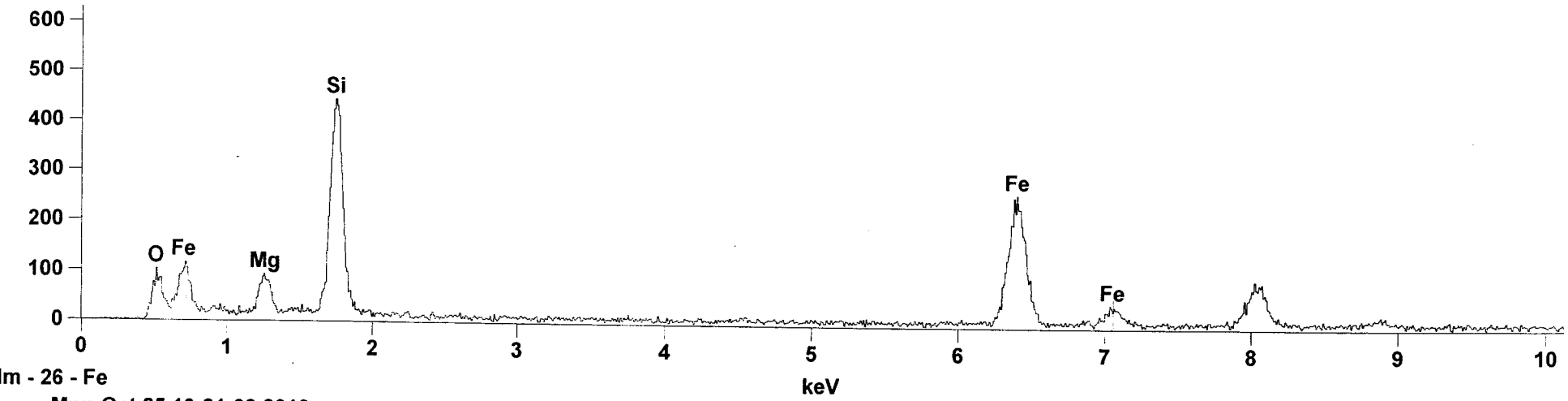
Quantitative Results 140411SSAN5-03-150 BPC-A-E3-3(2)

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1946	46.89	+/- 1.11	53.70	+/- 1.27
Si K	4822	40.22	+/- 0.61	39.87	+/- 0.60
Fe K	2471	12.90	+/- 0.29	6.43	+/- 0.14
Total		100.00		100.00	

Project: New Project

Full scale counts: 578

140411SSAN5-03-150 BPC-A-E3-3(3)



klm - 26 - Fe

Mon Oct 25 10:21:03 2010
Gaussian Fit Chi Squared:2.982
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:31.3 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

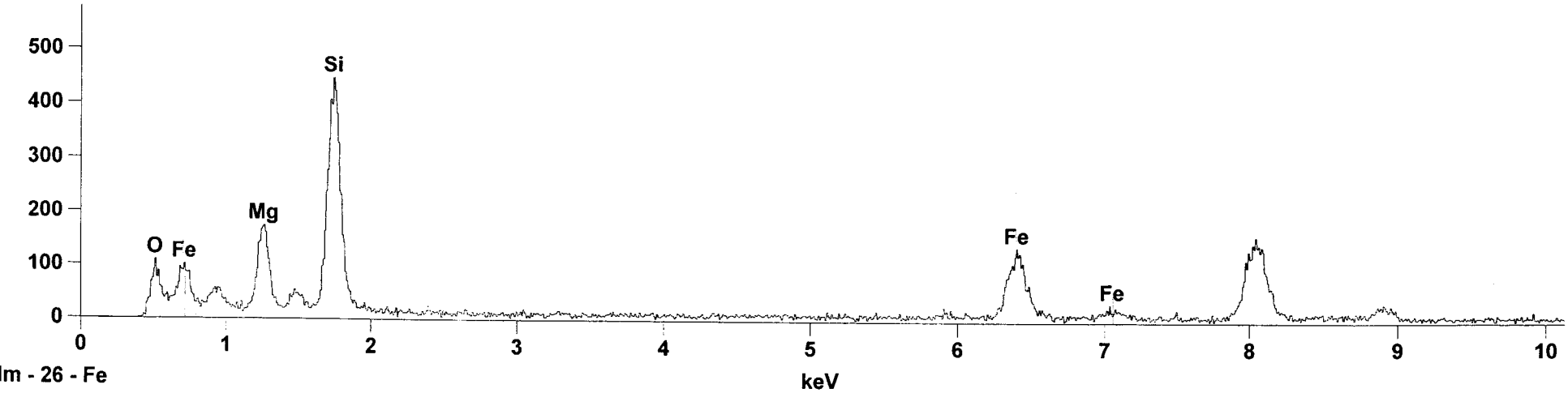
Quantitative Results 140411SSAN5-03-150 BPC-A-E3-3(3)

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	913	27.26	+/- 0.96	34.49	+/- 1.21
Si K	4524	46.76	+/- 0.72	51.20	+/- 0.79
Fe K	4018	25.98	+/- 0.43	14.31	+/- 0.24
Total		100.00		100.00	

Project: New Project

Full scale counts: 533

140411SSAN5-03-150 BPC-A-E3-6



klm - 26 - Fe

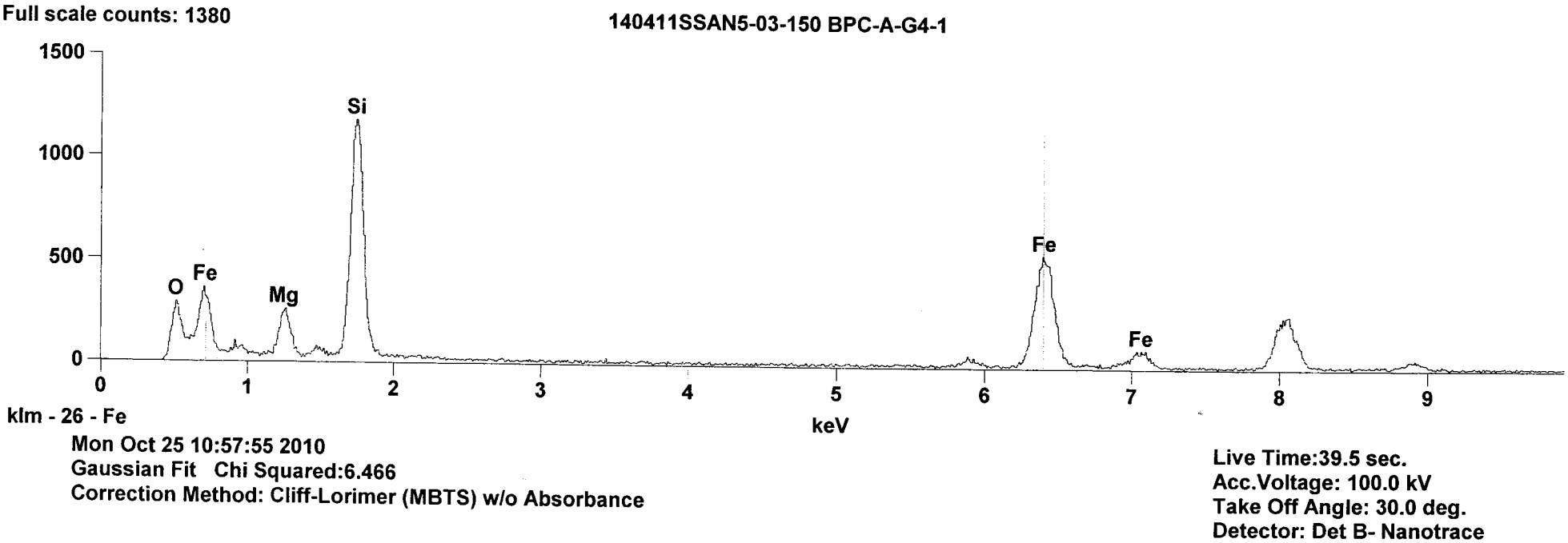
Mon Oct 25 10:24:26 2010
Gaussian Fit Chi Squared:3.948
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:31.2 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results 140411SSAN5-03-150 BPC-A-E3-6

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	1717	45.94	+/- 1.15	52.35	+/- 1.31
Si K	4591	42.53	+/- 0.66	41.93	+/- 0.65
Fe K	1990	11.53	+/- 0.28	5.72	+/- 0.14
Total		100.00		100.00	

Project: New Project



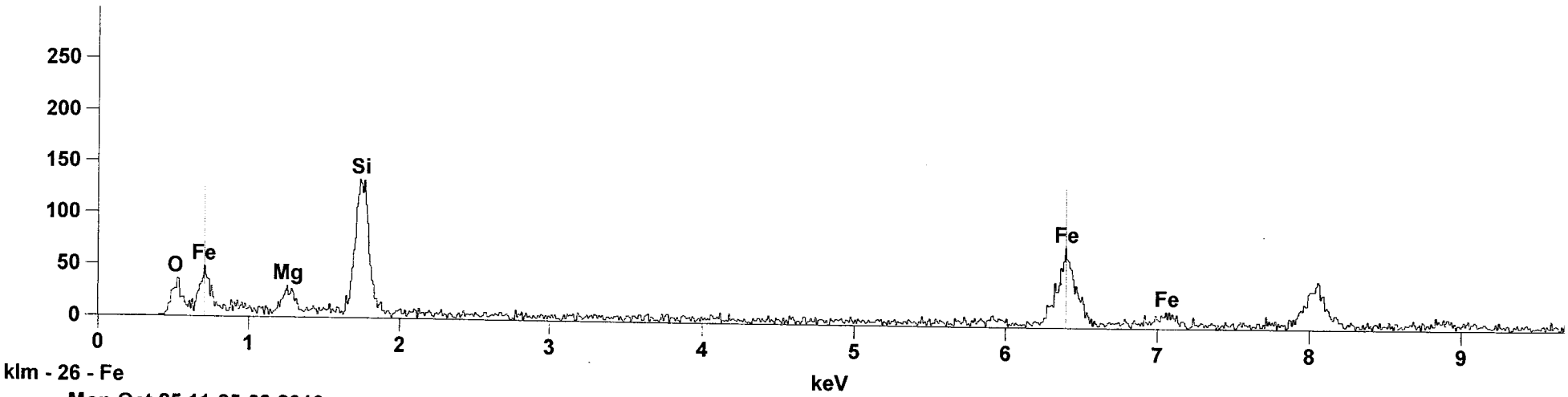
Quantitative Results 140411SSAN5-03-150 BPC-A-G4-1

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	2502	28.52	+/- 0.59	35.42	+/- 0.74
Si K	12307	48.56	+/- 0.47	52.19	+/- 0.50
Fe K	9285	22.92	+/- 0.25	12.39	+/- 0.14
Total		100.00		100.00	

Project: New Project

Full scale counts: 275

140411SSAN5-03-150 BPC-B-C2-6(1)



klm - 26 - Fe

Mon Oct 25 11:25:03 2010
Gaussian Fit Chi Squared:1.441
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:14.4 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

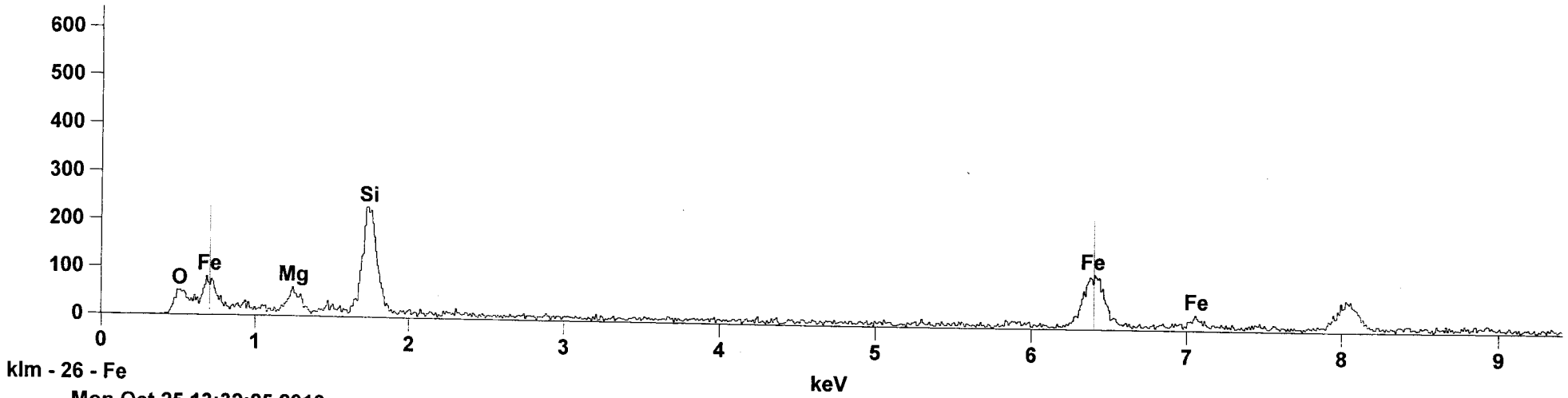
Quantitative Results 140411SSAN5-03-150 BPC-B-C2-6(1)

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	261	27.13	+/- 1.77	33.86	+/- 2.21
Si K	1374	49.44	+/- 1.40	53.41	+/- 1.52
Fe K	1041	23.44	+/- 0.79	12.73	+/- 0.43
Total		100.00		100.00	

Project: New Project

Full scale counts: 589

140411SSAN5-03-150 BPC-B-C3-6



klm - 26 - Fe

Mon Oct 25 13:32:25 2010
Gaussian Fit Chi Squared:2.764
Correction Method: Cliff-Lorimer (MBTS) w/o Absorbance

Live Time:10.4 sec.
Acc.Voltage: 100.0 kV
Take Off Angle: 30.0 deg.
Detector: Det B- Nanotrace

Quantitative Results 140411SSAN5-03-150 BPC-B-C3-6

Element Line	Net Counts	Weight %	Weight % Error	Atom %	Atom % Error
Mg K	526	30.05	+/- 1.37	37.01	+/- 1.69
Si K	2432	48.09	+/- 1.01	51.27	+/- 1.08
Fe K	1767	21.86	+/- 0.57	11.72	+/- 0.31
Total		100.00		100.00	

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 AD

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: 20,000 X
Camera Constant: 21.2
Accelerating Voltage: 100KV
Beam Current: 10 μA
K-Factor: 1.4
Analyst Reda Date 8/26/10

Grid Opening	Structure Number	Structure	Dimensions (min) Width	Dimensions (min) Length	NAM	TM	CM	CD	CQ	CMQ	CDQ	UF	AD	AX	ADX	AQ	ADQ	AZQ	AZZ	EDS Na	EDS Mg	EDS Si	EDS Ca	EDS Fe	Comments
C3		NAD																							
C26																									
E23																									
E26																									
F23																									
F26																									
H23																									
H26																									
C3-1																									
C3-4																									
E3-1																									
E3-4																									
F3-1																									

TEM - 1A (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: 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		NR																							
G3-1																									
G3-4																									
B3-1																									
B3-4																									
D3-1																									
C3-3																									
C3-6																									
E3-3																									
E3-6																									
F3-3																									
F3-6																									
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: 9,200 X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Rath 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
1B6		W>N																							
K3-3																									
Ca-1																									
C4-4																									
1E4-1																									
1E4-4																									
F4-1																									
1F4-4																									
H4-1																									
2H4-4																									
1J4-0																									
C4-3																									
C4-6																									
1E4-3																									
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: 2853
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
G3		NAD																							
G3-4																									
E3-1																									
E3-4																									
F3-1																									
F3-4																									
H3-1																									
H3-4																									
I3-1																									
I3-4																									
C3 3																									
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 EMS Lab No. _____
Sample No. 8/25/10 Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: B
Screen Magnification: 10V X
Camera Constant: 28.2
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.4
Analyst Mark 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	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
F4-3		NSD																							
F4-6																									
W-3																									
W-6																									
H43																									
H46																									
F-1																									
F5-4																									
F3-1																									
F3-4																									
W-1																									
W-4																									
H5-1																									
H5-4																									
W5-1																									

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 Radk 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																									
W3																									
W5-6																									
I-53																									
C6-1																									
C6-4																									
E6-1																									
E6-4																									
I6-1																									
I6-4																									
W6-1		↓																							

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: 9,800 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
C2-3		NAD																							
C26																									
E23																									
E26																									
F23																									
F26																									
G23																									
G26																									
H23																									
B34																									
C34																									
C34																									
E34																									
F34																									
G34																									
H34																									

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 Rader 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		NM																							
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 ☐

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

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																							
G4-1																									
G4-4																									
H4-1																									
H4-4																									
C5-4																									
E5-1																									
E5-4																									
F5-1																									
F5-4																									
W5-1																									
W5-4																									
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, EMS Lab No. _____
Sample No. 8-25-10 Page 2 of _____

RECEIVING

ANALYSIS

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

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
F4g		N/A																							
G4-1																									
G4-4																									
H4-1																									
H4-4																									
C5-1																									
C5-4																									
E5-1																									
E5-4																									
F5-1																									
F5-4																									
G5-1																									
G5-4																									
H5-1																									
H5-4																									

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 1 of _____

RECEIVING

ANALYSIS

Grid Address: D
Screen Magnification: 9,100X
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		NSD																							
E3-1																									
E3-4																									
F3-1																									
F3-4																									
G3-1																									
G3-4																									
IB-1																									
IB-4																									
B4-4																									
C4-1																									
C4-4																									
E4-1																									
E4-4																									
F4-1		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
Sample No.: 8-25-10
EMS Lab No.: _____
Page: 3 of _____

RECEIVING

ANALYSIS

Grid Address: D
Screen Magnification: 9,000X
Camera Constant: 2.52
Accelerating Voltage: 100KV
Beam Current: 10 µA
K-Factor: 1.9
Analyst: Zadle
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																									
I5-3																									
I5-6																									
G5-3																									
G5-6																									
H5-3																									
H5-6																									
C6-1																									
C6-4																									
E6-1																									
E6-4																									
I6-1																									

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: 9 100 X
Camera Constant: 2K2
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																									
E2-3																									
E2-6																									
E2-3																									
E2-6																									
G2-3																									
G2-6																									
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 blank EMS Lab No. _____
Sample No. 8-25-10 Page 2 of _____

RECEIVING

ANALYSIS

Grid Address: E
Screen Magnification: 9100 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																							
E4-4		↓																							
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: H-60B

Date: May 2010

Name: RS

Conditions of Measurements

High Voltage: 100K

Beam Current: 10 μA

Magnification: 19,200

Condenser Aperture Size: #2

Measurements from a photo 8.5

Shortest diameter: 8.5 mm

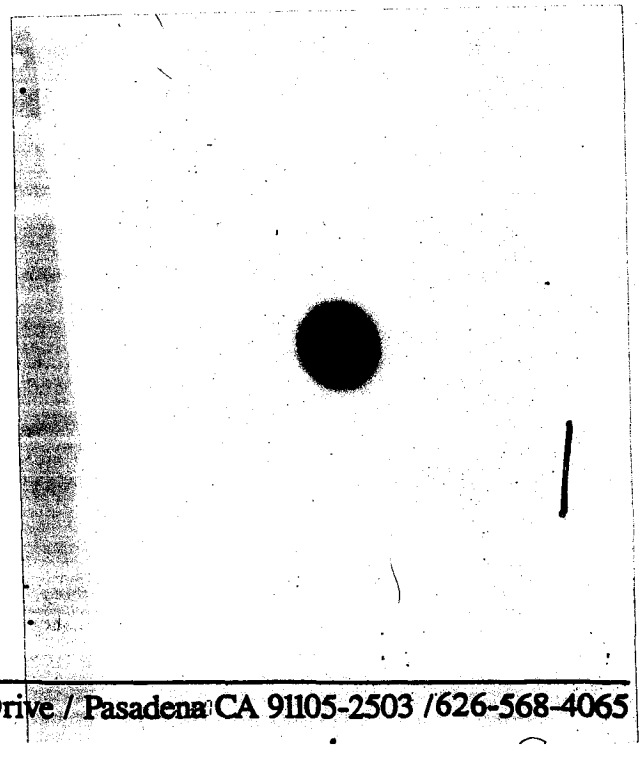
Longest diameter: 9 mm

Average: 8.75 mm

Spot Size Calculation

$$\text{Spot size in } \mu m = \frac{(\text{average spot size in mm}) \times 1000\ \mu m \times 0.4125}{\text{Magnification}}$$ 184

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



TEM CAMERA CONSTANT DETERMINATION

TEM H6aw B

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

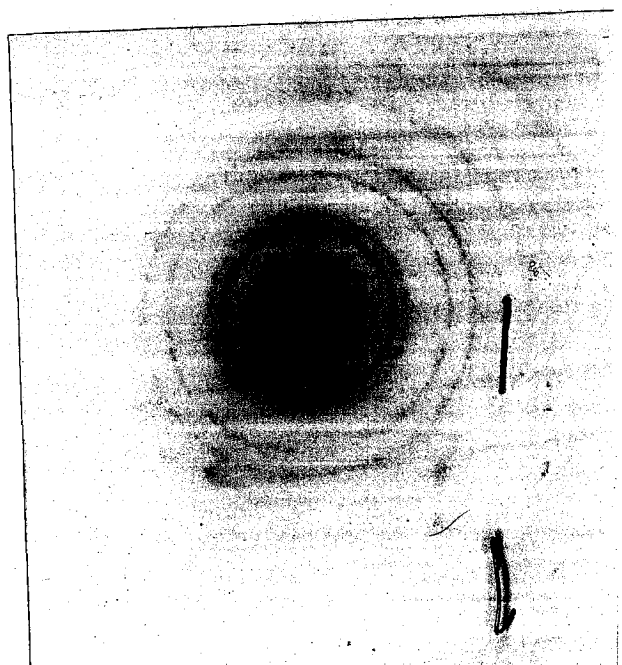
Average Camera Constant = 28.3

* 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 1/16 – 19,260	51/12 –	9180
2	53 5/16 – 19,260	51 5/12 –	9,270
3	53 1/16 – 19,080	51.5/12 –	9,270
4	53 1/16 – 19,080	51/12 –	9,180
5	53.5/16 – 19,260	51/12 –	9,180
6		51/12 –	9,180
7	ave 19,200		
8		ave	9,200
9			
10			
	AVERAGE:		

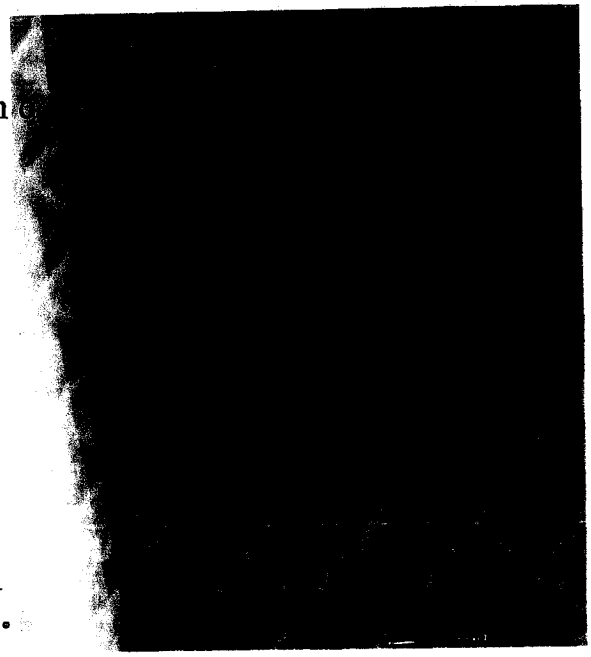
OPERATING VOLTAGE 100 KV

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

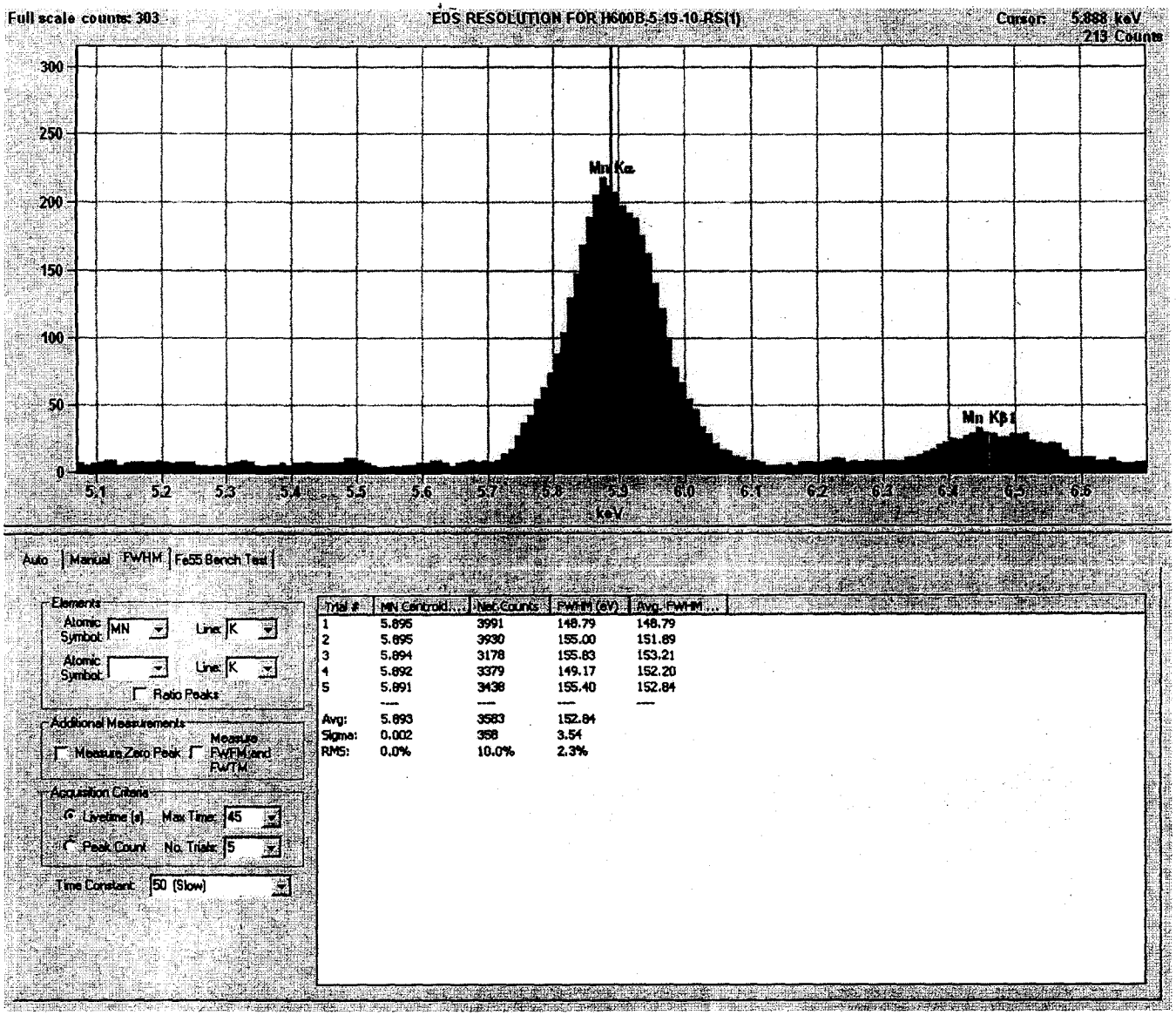
K(Mg)/K(Fe) < 1.5

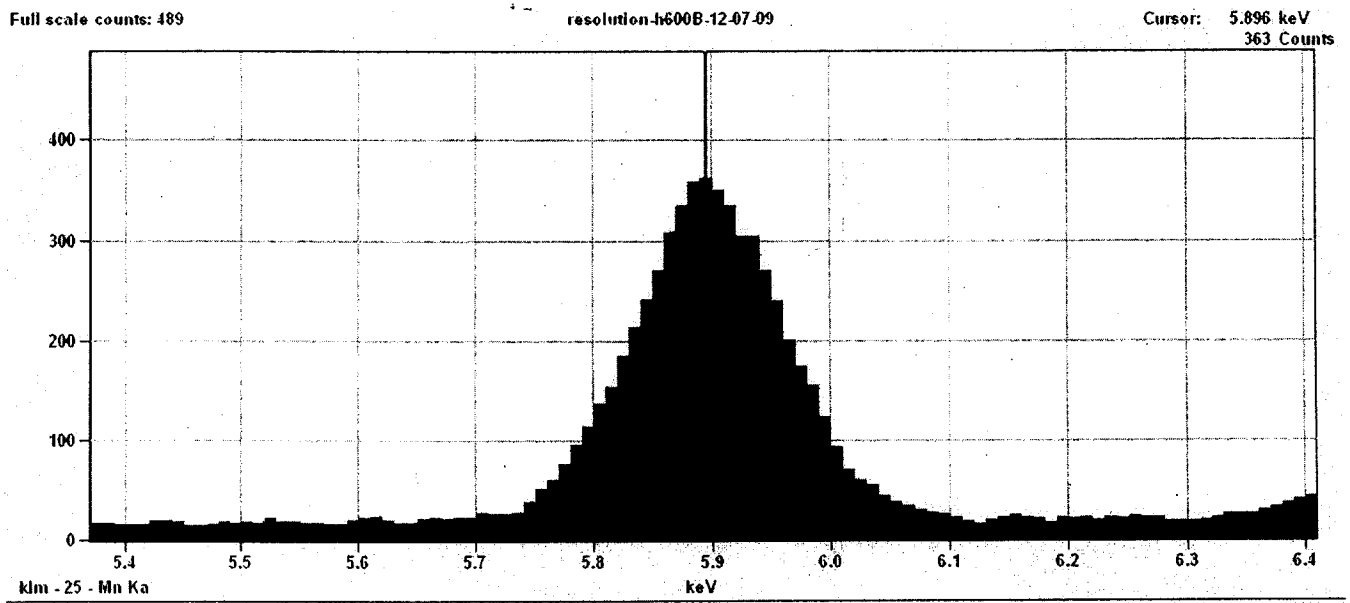
stdev <10% for Mg, Al, Si, Fe
stdev <20% for Na
wrt mean value of k-factor wrt Si

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
300
250
200
150
100
50
0
Mn Kα
Mn Kβ1
5.1
5.2
5.3
5.4
5.5
5.6
5.7
5.8
5.9
6.0
6.1
6.2
6.3
6.4
6.5
6.6
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 FWFM 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%	