



Battelle
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Report

SAMPLING AND ANALYSIS
TO DETERMINE SOURCE SIGNATURES
IN THE PHILADELPHIA AREA

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ABSTRACT

During July and August 1982, the U.S. Environmental Protection Agency conducted a major field study in the Philadelphia, PA area to gather field data to evaluate the predictive capabilities of receptor modeling. As part of this study, Battelle-Columbus Laboratories and NEA, Inc., conducted a program to obtain source emission or signature data for the receptor modeling effort. The program involved collection of particulate emission samples from major sources in the Philadelphia urban area and analysis of the samples for particle mass and chemical composition. Sampling was performed with a NEA-developed Dilution Source Sampling (DSS) system which provided for dilution of the source emissions with ambient air followed by collection of the particulate matter in $<2.5 \mu\text{m}$ and 2.5 to $10 \mu\text{m}$ size ranges with dichotomous samplers. During the period that source signature sampling was performed by NEA, EPA/RTP and other EPA contractor personnel collected ambient air and other source emission data required to assess the efficacy of receptor modeling.

Industrial processes that were sampled during the study included an antimony oxide roasting operation, a coal-fired power plant, two oil-fired power plants with different types of particulate emission controls, a petroleum catalytic cracking unit, a municipal refuse incinerator, and a secondary aluminum smelter. Source emission samples collected at each source were analyzed gravimetrically to determine particle mass and elemental composition of the particles collected on the filters was determined by energy dispersive X-ray fluorescence (XRF) analysis. The chemical composition data will form the basis for identifying elements unique to specific sources that can be used as tracers in the source apportionment work.

CONTENTS

Abstract.....	iii
Figures.....	v
Tables.....	v
1. Introduction.....	1
2. Conclusions.....	3
3. Recommendations.....	4
4. Experimental Procedures.....	5
General experimental approach.....	5
Sampling site descriptions.....	5
Source signature sampling.....	5
XRF analysis.....	9
Gravimetric analysis of DSS filters.....	25
5. Results and Discussion.....	26
6. Quality Assurance Summary.....	36
Deviations from quality assurance plan.....	36
Accuracy and precision of gravimetric analysis of filters.....	36
Accuracy and precision of X-ray fluorescence analysis.....	38
References.....	42
Appendices	
A. Southern Research report on evaluation of NEA dilution source sampler.....	43
B. Dilution source sampler (DSS) - Standard operating procedure.....	63
C. Energy Dispersive X-Ray fluorescence analysis of air filters - Standard operating procedure.....	71
D. Teflon filter handling and storage - Standard operating procedure.....	91
E. XRF analysis of source emission samples.....	110

FIGURES

<u>Number</u>		<u>Page</u>
1	Dilution source sampler (DSS).....	8

TABLES

1	Source Signature Sampling Protocol.....	6
2	Source Signature Sampling Sites.....	7
3	Source Signature Sampling Data.....	10
4	Source Sampling Data - Harshaw/Antimony Oxide Roasting Operation.....	12
5	Source Sampling Data - Eddystone/Coal-Fired Power Plant.....	14
6	Source Sampling Data - Schuylkill/Oil-Fired Power Plant.....	16
7	Source Sampling Data - Eddystone/Oil-Fired Power Plant.....	18
8	Source Sampling Data - British Petroleum/Catalytic Cracker.....	20
9	Source Sampling Data - Atlantic Metals Sec. Aluminum Smelter.....	22
10	Source Sampling Data - East Central Incinerator.....	23
11	Chemical Composition of Particulate Emissions Source - Harshaw/Antimony Oxide Roasting.....	27
12	Chemical Composition of Particulate Emissions Source - Eddystone/Coal-Fired Power Plant.....	28

TABLES (Continued)

<u>Number</u>		<u>Page</u>
13	Chemical Composition of Particulate Emissions Source - Schuylkill/Oil-Fired Power Plant.....	29
14	Chemical Composition of Particulate Emissions Source - Eddystone/Oil-Fired Power Plant.....	30
15	Chemical Composition of Particulate Emissions Source - British Petroleum/Catalytic Cracker.....	31
16	Chemical Composition of Particulate Emissions Source - Atlantic Metals/Secondary Aluminum Smelter.....	32
17	Chemical Composition of Particulate Emissions Source - East Central Incinerator.....	33
18	Accuracy and Precision of Gravimetric Analysis of Filters.....	37
19	Accuracy and Precision of XRF Analysis of QA Standard.....	38
20	Results of Analysis of QA Standard.....	39

SECTION 1

INTRODUCTION

Over the past several years, receptor modeling has evolved as a distinct discipline to apportion source contributions to ambient air particulates. The concept which has been discussed by Cooper⁽¹⁾ involves measurement of specific features of ambient particulates and use of these features to apportion the contribution to various sources which impact on a receptor site. Chemical and physical properties of the ambient particulate samples such as chemical composition, particle morphology, size distribution, etc., may be employed in receptor modeling. In order to employ receptor models, it is necessary to have information on specific characteristics of both ambient aerosols collected at receptor sites and particulate emissions from major sources which impact the receptor sites. Ideally, source emission samples should be acquired after mixing and cooling with ambient air so that they more closely approximate the size distribution and chemical composition of the particulate material after it has entered the ambient environment. Furthermore, it is highly desirable to collect both ambient and source aerosols using the same sampling technique so that size distribution and other characteristics will be similar for the two types of samples.

During July and August 1982, the U.S. Environmental Protection Agency conducted a major field study in the Philadelphia, PA area to gather field data to evaluate the predictive capabilities of receptor modeling. As part of this study, Battelle-Columbus Laboratories (BCL) and NEA, Inc., conducted a program to obtain source emission data for the receptor modeling effort. The program involved collection of particulate emission samples from major sources in the Philadelphia urban area and analysis of the samples for particle mass and chemical composition. Sampling was performed with a NEA-developed Dilution Source Sampling (DSS) system. This system provided for dilution of the source emissions with ambient air followed by collection of the particulate matter in $<2.5\text{ }\mu\text{m}$ and $2.5\text{ to }10\text{ }\mu\text{m}$ size ranges with dichotomous samplers. Thus, source emission samples and samples collected at ambient receptor sites during the study were obtained under similar conditions.

Source emission samples collected during the program were analyzed gravimetrically to determine particle mass and elemental composition of the particles collected on the filters was determined by energy dispersive X-ray fluorescence (XRF) analysis. After completion of the gravimetric and XRF analyses by NEA, the filter samples were submitted to Dr. T. G. Dzuby, EPA/RTP for additional physical and chemical analyses required to support the receptor modeling study.

During the period that source signature sampling was performed by NEA and BCL, EPA/RTP and other EPA contractor personnel collected ambient air and other source emission data required to assess the efficacy of receptor modeling.

SECTION 2

CONCLUSIONS

The study has provided source emission data to support EPA's receptor modeling/source apportionment work. Source signature data were obtained for an antimony oxide roasting operation, a coal-fired power plant, two oil-fired power plants with different types of particulate emission controls, a petroleum catalytic cracking unit, a municipal refuse incinerator, and a secondary aluminum smelter. Based on replicate measurements, it is concluded that the data for all sources except the secondary aluminum smelter are reliable and representative. The aluminum smelter data are too limited to judge the quality of the measurements made at this source. Measurements for a few specific elements in some of the source emissions may be subject to errors for various reasons. These cases are identified in the Recommendations Section and the text of the report.

SECTION 3

RECOMMENDATIONS

The elemental composition data obtained in this study are considered to be reliable and representative of the $<10\ \mu\text{m}$ particulate emissions from the respective sources. Therefore, the data with the following limitations are recommended as suitable for use in EPA's receptor modeling/source apportionment programs.

- 1) Antimony levels in the Eddystone coal-fired power plant are questionable. Residual contamination in the sampling system may have yielded erroneously high antimony values.
- 2) Copper values for the Schuylkill oil-fired power plant are questionable since it was necessary to use a copper inlet line on the sampling system because of the high stack gas temperature. A teflon inlet line was used for all the other sources.
- 3) The secondary aluminum smelter emission data are too limited to provide an adequate characterization of this source type. The extremely low stack particulate loading and, thus, the long sampling times required precluded adequate replication of the emission measurements at this source.
- 4) Significant compositional differences between the resuspended baghouse catch and the actual emission samples from the secondary aluminum smelter suggest that the former approach may not provide representative emission data. However, the data obtained in this study are limited and additional work would be necessary to resolve this issue.
- 5) The XRF method did not yield reliable measurements of barium in the coal-fired power plant emissions. In future studies, if barium is selected as a tracer for coal combustion sources, the XRF method should be improved, if possible, or an alternate analytical method should be employed for this element.

In general, the sampling and analytical methodology used in this study performed well and is recommended without any major changes or modifications for future source apportionment work. Future emission measurement studies should obtain additional data for sources that have not been well characterized, e.g., catalytic cracking units and for all sources over a sufficient time period to account for process variability.

SECTION 4

EXPERIMENTAL PROCEDURES

GENERAL EXPERIMENTAL APPROACH

Source signature sampling was performed at seven sites in the Philadelphia urban area over the period July 26 - August 18, 1982. Particulate emission sampling was performed at each site with the NEA Dilution Source Sampling (DSS) system according to the general protocol shown in Table 1. All sampling at each site was performed at a point downstream of particulate control devices. During the tests at each site, particulate emission samples were collected on Teflon, Nuclepore, or quartz fiber filter media to provide samples for the various analyses required for implementation and evaluation of the receptor model.

Following acquisition, the particle mass collected on each filter was determined gravimetrically and the elemental composition of the particulate catch on the Teflon and Nuclepore filters was determined by energy dispersive XRF. The samples were then sent to Dr. T. G. Dzuby, EPA/RTP for additional analyses (NAA, XRD, SEM, IC, etc.) required for the receptor modeling effort.

SAMPLING SITE DESCRIPTIONS

Source signature sampling was performed at the seven sites identified in Table 2. The sites were selected from a list of candidate sources developed by Engineering Sciences (ES) for the Philadelphia Modeling Study. Operators of at least 15 other sources on the ES list were contacted by BCL or ES; however either permission to sample at the site was denied, the plant was shut down, or the plant production was significantly curtailed during the study period.

SOURCE SIGNATURE SAMPLING

The dilution source sampling system shown in Figure 1 was used to collect particulate samples of the stack emissions for source signature characterization. Additional details of the system are reported by Houck, et al(2, 3). The system isokinetically extracts a source emission sample from a stack or duct and dilutes the sample with filtered ambient air. Two dichotomous samplers operated concurrently were used to acquire particulate samples from the diluted sample stream. The dichotomous samplers collect

TABLE 1. SOURCE SIGNATURE SAMPLING PROTOCOL

Sampling Period	Dichotomous Sampler	Filter Medium	
		Fine (<2.5 μm)	Coarse (2.5 - 10 μm)
1	A	Teflon	Teflon (oil-coated)
	B	Quartz	Quartz
2	A	Teflon	Teflon (oil-coated)
	B	Teflon	Nuclepore (oil-coated)
3	A	Teflon	Teflon (oil-coated)
	B	Quartz	Quartz
4	A	Teflon	Teflon (oil-coated)
	B	Teflon	Nuclepore (oil-coated)
5	A	Teflon	Teflon (oil-coated)
	B	Quartz	Quartz
6	A	Teflon	Teflon (oil-coated)
	B	Teflon	Nuclepore (oil-coated)

TABLE 2. SOURCE SIGNATURE SAMPLING SITES

Site/Address	Process Type	Emission Control	Period Sampled
Marshaw Chemical Co. Gloucester, NJ	Antimony Oxide Roasting	Baghouse/Wet Scrubber (wet scrubber not in operation during sampling)	July 26-28
Philadelphia Electric Co. Eddystone Station Philadelphia, PA	Coal-fired power plant	Electrostatic precipitator	July 29 - August 2
Philadelphia Electric Co. Schuylkill Station Christian St. Philadelphia, PA	Oil-fired power plant	Mechanical (cyclone) collector	August 2 - 6
Philadelphia Electric Co. Eddystone Station Eddystone, PA	Oil-fired power plant	Electrostatic precipitator	August 9 - 10
British Petroleum Co. Marcus Hook Refining Marcus Hook, PA	Catalytic Cracker	Electrostatic precipitator	August 11 - 13
Atlantic Metals Co. Orthodox & Delaware River Philadelphia, PA	Secondary Aluminum (Rotary Aluminum Dross Furnace)	Baghouse	August 16 - 17
City of Philadelphia East Central Incinerator Philadelphia, PA	Municipal Refuse Incineration	Electrostatic precipitator (not in operation during sampling)	August 17 - 18

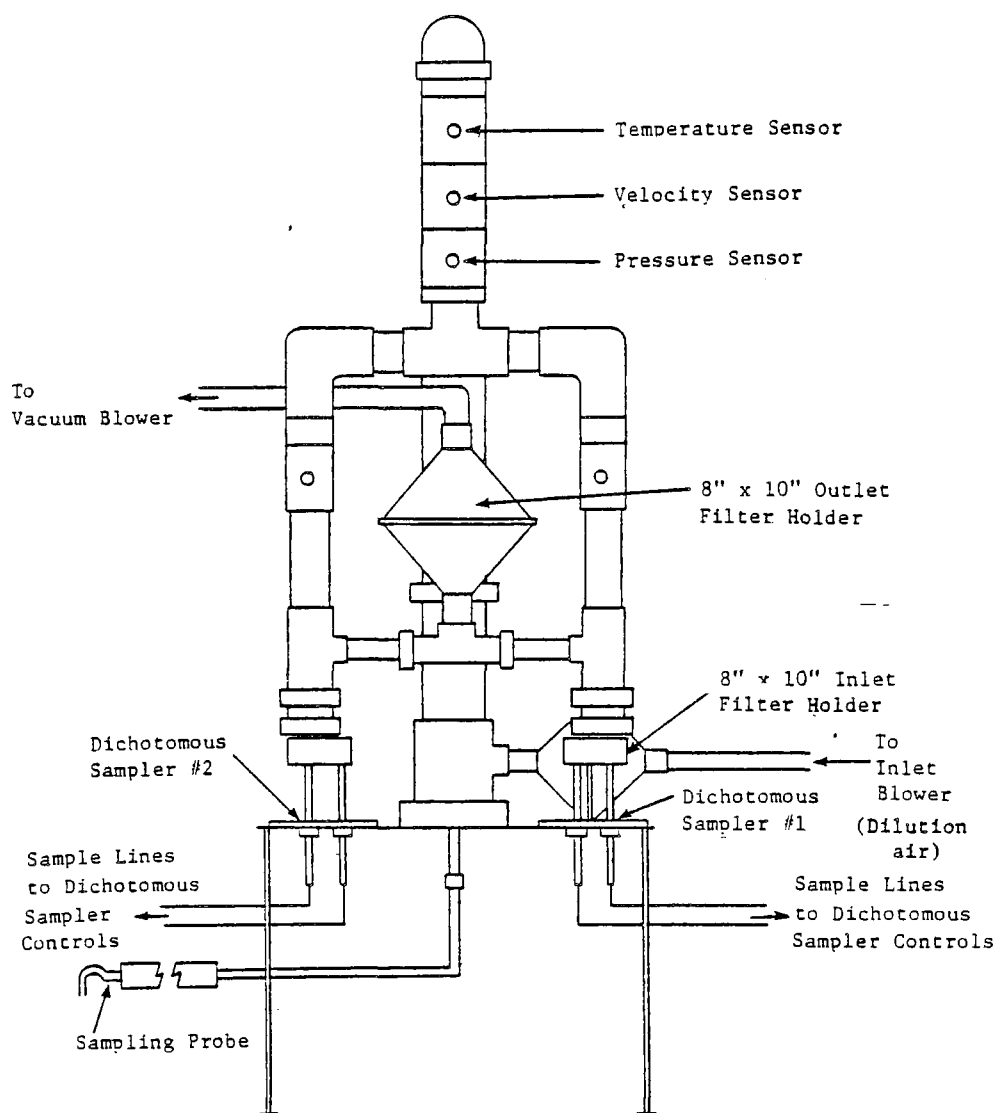


Figure 1. NEA dilution source sampler.

particulate material in the $<2.5 \mu\text{m}$ and $2.5\text{--}10 \mu\text{m}$ size ranges. The performance of the system has been characterized in laboratory studies conducted by Southern Research. The results of the Southern Research study are presented in Appendix A.

The operating procedures used to collect the source signature samples with the DSS are given in Appendix B. Table 3 provides data on the source and sampling system operation characteristics for each of the sites. Sampling data for the DSS filters collected at the various sites are given in Tables 4 through 10. The materials used for sample collection were: Membrana Teflon filters, 37 mm, $2 \mu\text{m}$ pore size, Nuclepore filters, 37 mm, $0.4 \mu\text{m}$ pore size, and Pallflex 2500 QAST quartz fiber filters, 37 mm. All Teflon and Nuclepore filters used for sampling the coarse particle fractions ($2.5\text{--}10 \mu\text{m}$) were oil-coated to prevent particle loss. The mass of particulate material collected on each filter is given in the last column of the tables.

XRF ANALYSIS

Elemental analysis of the DSS dichotomous sampler filters was performed by energy-dispersive X-ray fluorescence (EDXRF) with an EG&G Ortec TEFA III system. The procedures used to perform EDXRF analyses are given in Appendix C.

A block diagram showing the major components of the EDXRF system is shown below.

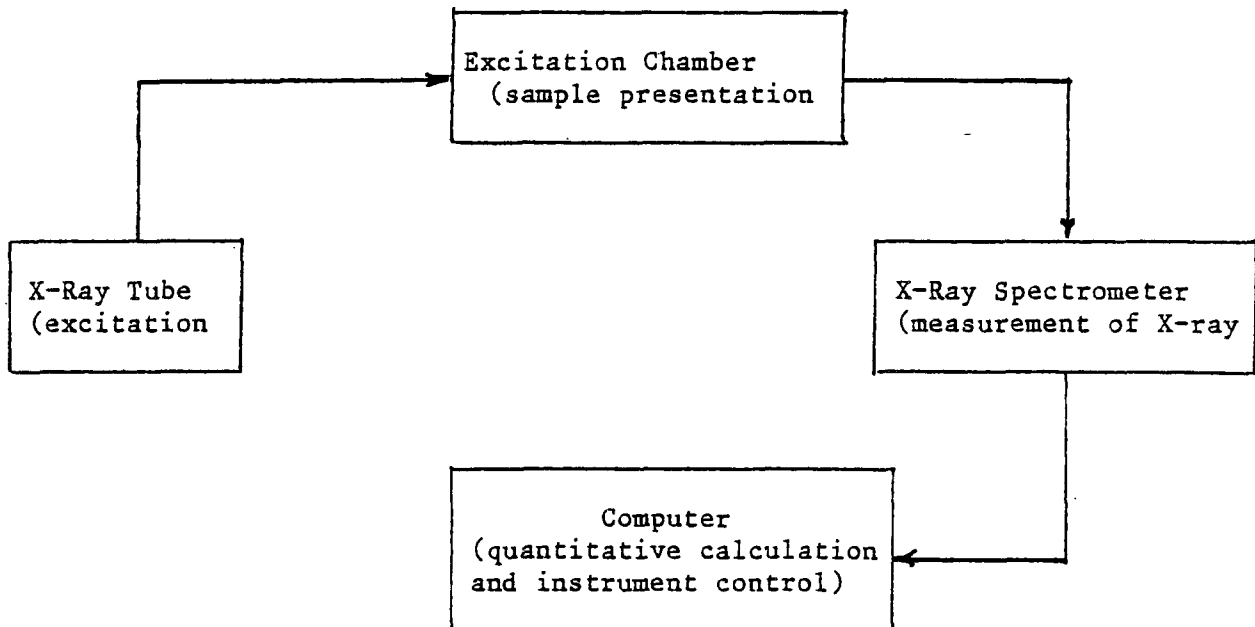


TABLE 3. SOURCE SIGNATURE SAMPLING DATA

Site (Process)	Stack Gas Velocity, m/s	Temperatures, °C			Sampling Location	Comments
		Stack	Dil. Chamber	Ambient		
Harsco Chem. Co. (Antimony Oxide Roasting)	6-8	25-29	23-38	22-38	Breach to stack, horizontal port, north side, inlet 81 cm from inside of breach wall.	Method 5, SO ₂ and NO _x measurements made concurrently by Engineering Science, oxide ores used during period of sample collection, weak SO ₂ odor detected at port openings, I.D. of ports were $\approx 2\text{-}3/4"$; hence 10 μ m preseparator could not be used and samples were collected isokinetically with a 1/2" I.D. button-hook nozzle, a 70:1 dilution ratio was used, stack gas was reported to be near saturation with water vapor, very high ambient humidity and rain.
Philadelphia Elec. Co. Eddystone Station (Coal-fired Power Plant)	14.1	136-137	34-35	28-30	Stack, south port, inlet 71 cm from inside of stack wall.	Plant operating at near full load (300 MW) during sample collection, strong SO ₂ odor from port openings, 10 μ m preseparator used. Method 5, SO ₂ , and NO _x measurements made by Engineering Sciences after source signature sampling period.
Philadelphia Elec. Co. Schuylkill Station (Oil-fired Power Plant)	14.6	338-349	24-33	22-30	Duct after mechanical collector prior to pre-heater, inlet 66 cm from inside of stack wall.	Method 5 and SO _x measurements made concurrently by Battelle Columbus, 660 MW plant operating at 460 MW during sample collection, oil fuel piped from ARCO refinery, used copper lined inlet hose rather than teflon lined hose due to high temperature of duct gas. 10 μ m preseparator could not be used due to small I.D. of inlet port, 1/4" button-hook nozzle, isokinetic sampling conditions and a 30:1 ratio were used.

TABLE 3. (Continued)

Site (Process)	Stack Gas Velocity, m/s	Temperatures, °C			Sampling Location	Comments
		Stack	Dil. Chamber	Ambient		
Philadelphia Elec. Co. Eddystone Station (Oil-fired Power Plant)	10.2	195-265	28-40	25-38	Breach to stack after induced draft fan, removed opacity meter to use its port, inlet 96 cm from inside of breach.	395 MW plant. Operating at 375 MW at time of sample collection started; load varied during sample collection, 10 µm preseparator used.
British Petroleum Co. (Catalytic Cracker)	10.2	245-250	26-41	22-35	North breach to stack, 2-1/4" port above opacity meter, inlet 117 cm from inside of breach.	Method 5, SO ₂ and NO _x measurements made concurrently by Engineering Science in stack, two identical breaches from ESP to stack, inadequate space to share sampling platform with Engineering Science; hence 4 inch ports could not be used, isokinetic sample collected from one breach with 1/4" button-hook nozzle without 10 µm preseparator, 20:1 dilution ratio, data supplied by BP personnel from previous Method 5 tests: 0.0102 grains/DSCF front half, 0.0814 grains/DSCF total.
Atlantic Metals Co. (Sec. Aluminum)	14.7	72-85	21-37	15-29	Breach to stack before induced draft fan after baghouse, inlet 102 cm from inside of breach.	Particulate grain loading very low at sampling point, two stacks were used, one stack by-passed the baghouse. On both sampling days heavy emissions were noted in the evenings from the by-pass stack, numerous leaks were also noted in ducting to stacks, a baghouse dust sample was collected from subsequent resuspension due to light loadings anticipated on filters. 10 µm preseparator used on probe inlet.
City of Philadelphia East Central Incinerator (Municipal refuse incineration)	12.9	92-107	27-32	18-22	North ports, second port from east, breach before induced draft fan, south stack, inlet 102 cm from inside of breach wall.	No power generation from system, volume reduction only, sampling platform ± 10 meters above ash/waste loading station, dilution air inlet filter would be good fugitive emission sample.

TABLE 4. SOURCE SAMPLING DATA - HARSHAW/ANTIMONY OXIDE ROASTING OPERATION

Test No.	Filter Type(a)	Filter No.	Size(b) Fraction	Sampling Date	Sampling Period, hr EDT(c)		Sampling Time, hrs(d)	Particle Mass Collected, µg
					Start	End		
1-A	Teflon (OC) Teflon	AC001	C	7/27/82	1052	1314	2.33	260
		AF126	F				2.33	1107
-B	Quartz Quartz	DC246	C	7/27/82	1052	1314	2.33	
		DF286	F				2.33	
2-A	Teflon (OC) Teflon	AC002	C	7/27/82	1342	1621	2.67	513
		AF127	F				2.67	1811
-B	Quartz Quartz	DC248	C	7/27/82	1342	1621	2.67	
		DF287	F				2.67	
3-A	Teflon (OC) Teflon	AC003	C	7/27/82	1640	1904	2.40	485
		AF128	F				2.40	1816
-B	Quartz Quartz	DC249	C	7/27/82	1640	1904	2.40	
		DF288	F				2.40	
4-A	Teflon (OC) Teflon	AC004	C	7/28/82	0831	1032	2.00	399
		AF130	F				2.00	2639
-B	Nuclepore Teflon	CC081	C	7/28/82	0831	1032	2.00	987
		AF129	F				2.00	2169
5-A	Teflon (OC) Teflon	AC005	C	7/28/82	1041	124	2.00	358
		AF132	F				2.00	1519
-B	Nuclepore Teflon	CC082	C	7/28/82	1041	124	2.00	726
		AF131	F				2.00	1159

TABLE 4. (Continued)

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, ^(d) hrs	Particle Mass Collected, μg
					Start	End		
6-A	Teflon (OC)	AC006	C	7/28/82	1303	1503	2.02	307
	Teflon	AF134	F				2.02	1356
-B	Nuclepore	CC083	C	7/28/82	1303	1503	2.02	709
	Teflon	AF133	F				2.02	1009
Field Blanks	Teflon	AF245						
	Teflon (OC)	AC080						
	Nuclepore	CC125						
	Quartz	DC285						
	Quartz	DF325						

^(a) OC indicates that filter was oil-coated to retain coarse particles.

^(b) F - Fraction $<2.5\mu\text{m}$; C - Fraction $2.5 - \sim 7\mu\text{m}$. Probe inlet preseparator was not used at this source because it would not fit through the sampling port. D_{50} for isokinetic sampling is $\sim 7\mu\text{m}$; see Appendix A.

^(c) Clock time

^(d) From dichotomous sampler timers

TABLE 5. SOURCE SAMPLING DATA - EDDYSTONE/COAL-FIRED POWER PLANT

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, ^(d) hrs	Particle Mass Collected, µg
					Start	End		
1-A	Teflon (OC)	AC007	C	8/2/82	0627	0647	0.35	4981
	Teflon	AF135	F				0.35	1580
-B	Quartz	DC250	C	8/2/82	0627	0647	0.35	
	Quartz	DF289	F				0.35	
2-A	Teflon (OC)	AC008	C	8/2/82	0658	0718	0.33	4074
	Teflon	AF136	F				0.33	1506
-B	Quartz	DC251	C	8/2/82	0658	0718	0.33	
	Quartz	DF290	F				0.33	
3-A	Teflon (OC)	AC009	C	8/2/82	0726	0746	0.33	3230
	Teflon	AF137	F				0.33	1114
-B	Quartz	DC252	C	8/2/82	0726	0746	0.33	
	Quartz	DF291	F				0.33	
4-A	Teflon (OC)	AC010	C	8/2/82	0759	0814	0.28	3381
	Teflon	AF138	F				0.28	989
-B	Nuclepore	CC084	C	8/2/82	0759	0814	0.28	3783
	Teflon	AF139	F				0.28	674
5-A	Teflon (OC)	AC011	C	8/2/82	0821	0831	0.16	1683
	Teflon	AF140	F				0.16	442
-B	Nuclepore	CC085	C	8/2/82	0821	0831	0.16	1995
	Teflon	AF141	F				0.16	306

TABLE 5. (Continued)

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, ^(d) hrs	Particle Mass Collected, µg
					Start	End		
6-A	Teflon (OC)	AC012	C	8/2/82	0839	0849	0.17	1773
	Teflon	AF142	F				0.17	491
-B	Nuclepore	CC086	C	8/2/82	0839	0849	0.17	2055
	Teflon	AF143	F				0.17	316
Field Blanks	Teflon (OC)	AC079						
	Teflon	AF244						
	Nuclepore	CC124						
	Quartz	DC284						
	Quartz	DF324						

(a)

OC indicates that filter was oil-coated to retain coarse particles.

(b)

F - Fraction <2.5µm; C - Fraction 2.5 - 10µm. Preseparator used on probe inlet.

(c)

Clock time

(d)

Based on dichotomous sampler timers

TABLE 6. SCHUYLKILL/OIL-FIRED POWER PLANT

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, hrs ^(d)	Particle Mass Collected, µg
					Start	End		
1-A	Teflon (OC) Teflon	AC013	C	8/4/82	1953	2123	1.52	49
		AF144	F				1.52	801
-B	Quartz Quartz	DC253	C	8/4/82	1953	2123	1.52	
		DF292	F				1.52	
2-A	Teflon (OC) Teflon	AC014	C	8/4/82	2133	2333	2.00	20
		AF145	F				2.00	656
-B	Quartz Quartz	DC254	C	8/4/82	2133	2333	2.00	
		DF293	F				2.00	
3-A	Teflon (OC) Teflon	AC015	C	8/4-5/82	2337	0137	2.00	5
		AF146	F				2.00	178
-B	Quartz Quartz	DC255	C	8/4-5/82	2337	0137	2.00	
		DF294	F				2.00	
4-A	Teflon (OC) Teflon	AC016	C	8/5/82	0153	0324	1.52	17
		AF147	F				1.52	539
-B	Nuclepore Teflon	CC087	C	8/5/82	0153	0324	1.52	33
		AF148	F				1.52	544
5-A	Teflon (OC) Teflon	AC017	C	8/5/82	0346	0646	3.01	22
		AF149	F				3.01	428
-B	Nuclepore Teflon	CC088	C	8/5/82	0346	0646	3.01	24
		AF150	F				3.01	417

TABLE 6. (Continued)

Test No.	(a)		Size (b) Fraction	Sampling Date	Sampling Period, hr EDT (c)		Sampling Time, hrs (d)	Particle Mass Collected, μg
	Filter Type	Filter No.			Start	End		
6-A	Teflon (OC)	AC018	C	8/5/82	1629	1950	3.35	90
	Teflon	AF151	F				3.35	1762
-B	Nuclepore	CC089	C	8/5/82	1629	1950	3.35	234
	Quartz	DF295	F				3.35	
7 A	Teflon (OC)	AC019	C	8/5-6/82	2041	0603 ^(e)	8.38	156
	Teflon	AF153	F				8.38	3911
-B	Nuclepore	CC090	C	8/5-6/82	2041	0203	5.37	102
	Teflon	AF132	F				5.37	3186
7B (Repeat)	Nuclepore	CC091	C	8/6/82	0302	0603	~ 3.03	3
	Teflon	AF154	F				3.03	517
Field Blanks	Teflon (OC)	AC078						
	Teflon	AF243						
	Nuclepore	CC123						
	Quartz	DC283						
	Quartz	DF323						

(a) OC indicates that filter was oil-coated to retain coarse particles.

(b) F - Fraction $<2.5 \mu\text{m}$; C - Fraction $2.5 - \sim 7 \mu\text{m}$. Preseparator on probe inlet was not used at this source because it would not fit through the sampling port. D_{50} for isokinetic sampling is $\sim 7 \mu\text{m}$; see Appendix A.

(c) Clock time

(d) Based on dichotomous sampler timers

(e) Sampler not operated from 0230 to 0300 hours

TABLE 7. SOURCE SAMPLING DATA - EDDYSTONE/OIL-FIRED POWER PLANT

Test No.	Filter Type	Filter No.	Size ^(a) Fraction	Sampling Date	Sampling Period, hr EDT		Sampling Time, hrs	Particle Mass Collected, µg
					Start	End		
1-A	Teflon (OC)	AC020	C	8/10/82	1447	1547	1.00	63
	Teflon	AF155	F				1.00	639
-B	Quartz	DC256	C	8/10/82	1447	1547	1.00	
	Quartz	DF296	F				1.00	
2-A	Teflon (OC)	AC021	C	8/10/82	1554	1654	1.00	48
	Teflon	AF156	F				1.00	546
-B	Quartz	DC257	C	8/10/82	1554	1654	1.00	
	Quartz	DF297	F				1.00	
3-A	Teflon (OC)	AC022	C	8/10/82	1703	1833	1.50	100
	Teflon	AF157	F				1.50	1079
-B	Quartz	DC258	C	8/10/82	1703	1833	1.50	
	Quartz	DF298	F				1.50	
4-A	Teflon (OC)	AC023	C	8/10/82	1845	1945	1.00	10
	Teflon	AF158	F				1.00	190
-B	Nuclepore	CC092	C	8/10/82	1845	1945	1.00	14
	Teflon	AF159	F				1.00	181
5-A	Teflon (OC)	AC024	C	8/10/82	2003	2133	1.50	92
	Teflon	AF160	F				1.50	1389
-B	Nuclepore	CC093	C	8/10/82	2003	2133	1.50	110
	Teflon	AF161	F				1.50	1473

TABLE 7. (Continued)

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, hrs ^(d)	Particle Mass Collected, μg
					Start	End		
6-A	Teflon (OC)	AC025	C	8/10/82	2140	2340	2.00	24
	Teflon	AF162	F				2.00	700
-B	Nuclepore	CC094	C	8/10/82	2140	2340	2.00	26
	Teflon	AF163	F				2.00	736
Field Blanks	Teflon (OC)	AC026						
	Teflon	AF164						
	Nuclepore	CC095						
	Quartz	DC259						
	Quartz	DF299						

(a) OC indicates that filter was oil-coated to retain coarse particles.

(b) F - Fraction $<2.5\mu\text{m}$; C - Fraction $2.5 - 10\mu\text{m}$. Preseparator used on probe inlet.

(c) Clock time.

(d) Based on dichotomous sampler timers.

TABLE 8. SOURCE SAMPLING DATA - BRITISH PETROLEUM/CATALYTIC CRACKER

Tst No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, hrs	Particle Mass Collected, µg
					Start	End		
1-A	Teflon (OC) Teflon	AC027	C	8/12/82	0927	1128	2.01	358
		AF165	F				2.01	6421
-B	Quartz Quartz	DC260	C	8/12/82	0927	1128	2.01	
		DF300	F				2.01	
2-A	Teflon (OC) Teflon	AC028	C	8/12/82	1135	1335	2.00	309
		AF166	F				2.00	6101
-B	Quartz Quartz	DC261	C	8/12/82	1135	1335	2.00	
		DF301	F				2.00	
3-A	Teflon (OC) Teflon	AC029	C	8/12/82	1343	1543	2.00	342
		AF167	F				2.00	7386
-B	Nuclepore Teflon	CC096	C	8/12/82	1343	1543	2.00	220 ^(e)
		AF168	F				2.00	7636
4-A	Teflon (OC) Teflon	AC031	C	8/12/82	1556	1756	2.00	319
		AF169	F				2.00	8221
-B	Nuclepore Teflon	CC097	C	8/12/82	1556	1756	2.00	260 ^(e)
		AF170	F				2.00	8127
5-A	Teflon (OC) Teflon	AC032	C	8/12/82	1802	2002	2.00	359
		AF171	F				2.00	7924
-B	Nuclepore Teflon	CC098	C	8/12/82	1802	2002	2.00	374 ^(e)
		AF172	F				2.00	7907

TABLE 8. (Continued)

Test No.	(a) Filter Type	Filter No.	(b) Size Fraction	Sampling Date	(c) Sampling Period, hr EDT		(d) Sampling Time, hrs	Particle Mass Collected, μg
					Start	End		
6-A	Teflon (OC)	AC033	C	8/12/82	2009	2323 ^(f)	3.09	612
	Teflon	AF173	F				3.09	10087
-B	Quartz	DC262	C	8/12/82	2009	2323 ^(f)	3.09	
	Quartz	DF302	F				3.09	
Field Blanks	Teflon (OC)	AC077						
	Teflon	AF242						
	Nuclepore	CC122						
	Quartz	DC282						
	Quartz	DF322						

(a) OC indicates that filter was oil-coated to retain coarse particles.

(b) F - Fraction $<2.5\mu\text{m}$ - $\sim 7\mu\text{m}$. Preseparator on probe inlet was not used at this source because it would not fit through the sampling port. D_{50} for isokinetic sampling is $\sim 7\mu\text{m}$; see Appendix A.

(c) Clock time.

(d) Based on dichotomous sampler timers.

(e) Particle mass incorrect due apparently to weighting error.

(f) Sampler off from 2239 to 2248 hours.

TABLE 9. SOURCE SAMPLING DATA - ATLANTIC METALS SEC. ALUMINUM SMELTER

Test No.	(a)		(b)		Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, hrs ^(d)	Particle Mass Collected, µg
	Filter Type	Filter No.	Size Fraction			Start	End		
1-A	Teflon (OC)	AC034	C	•	8/16/82	1430	1952 ^(e)	5.52	24
	Teflon	AF174	F					5.52	110
-B	Quartz	DC263	C		8/16/82	1430	1952 ^(e)	5.52	
	Quartz	DF303	F					5.52	
2-A	Teflon (OC)	AC035	C		8/17/82	1018	2004 ^(f)	9.61	153
	Teflon	AF175	F					9.61	604
-B	Nuclepore	CC100	C		8/17/82	1018	2004 ^(f)	9.61	
	Quartz	DF304	F					9.61	208
RS-1 ^(g)	Teflon (OC)	AC042	C						4939
	Teflon	AF183	F						624
RS-2 ^(g)	Nuclepore	CC111	C						2916
	Teflon	AF184	F						187
RS-3 ^(g)	Quartz	DC266	C						
	Quartz	DF306	F						
Field Blanks	Teflon	AF241							
	Teflon (OC)	AC076							
	Nuclepore	CC121							
	Quartz	DC281							
	Quartz	DF321							

(a) OC indicates that filter was oil-coated to retain coarse particles.

(b) F - Fraction <2.5µm; C - Fraction 2.5 - 10µm. Preseparator used on probe inlet.

(c) Clock time.

(d) Based on dichotomous sampler timers.

(e) Sampler off from 1937 to 1944 hours.

(f) Sampler off from 1228 to 1238 hours.

(g) Samples generated by resuspension and sampling of Atlantic Metals baghouse hopper dust.

TABLE 10. SOURCE SAMPLING DATA - EAST CENTRAL INCINERATOR

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, ^(d) hrs	Particle Mass Collected, µg
1-A	Teflon (OC)	AC036	C	8/18/82	1153	1253	2.00	131
	Teflon	AF176	F				2.00	1016
-B	Quartz	DC264	C	8/18/82	1153	1253	2.00	
	Quartz	DF305	F				2.00	
2-A	Teflon (OC)	AC037	C	8/18/82	1301	1401	1.00	220
	Teflon	AF177	F				1.00	1579
-B	Nuclepore	CC101	C	8/18/82	1301	1401	1.00	168
	Teflon	AF178	F				1.00	1672
3-A	Teflon (OC)	AC038	C	8/18/82	1407	1607	2.00	287
	Teflon	AF179	F				2.00	2783
-B	Quartz	DC265	C	8/18/82	1407	1607	2.00	
	Quartz	DF309	F				2.00	
4-A	Teflon (OC)	AC039	C	8/18/82	1617	1647	0.50	128
	Teflon	AF180	F				0.50	1028
-B	Nuclepore	CC102	C	8/18/82	1617	1647	0.50	105
	Teflon	AF181	F				0.50	1143
5-A	Teflon (OC)	AC046	C	8/18/82	1653	1823	1.50	313
	Teflon	AF182	F				1.50	2882
-B	Quartz	DC269	C	8/18/82	1653	1823	1.50	
	Quartz	DF310	F				1.50	

TABLE 10. (Continued)

Test No.	Filter Type ^(a)	Filter No.	Size ^(b) Fraction	Sampling Date	Sampling Period, hr EDT ^(c)		Sampling Time, ^(d) hrs	Particle Mass Collected, µg
					Start	End		
6-A	Teflon (OC)	AC047	C	8/18/82	1829	1914	0.75	313
	Teflon	AF192	F				0.75	944
-B	Nuclepore	CC103	C	8/18/82	1829	1914	0.75	101
	Teflon	AF193	F				0.75	937
7-A	Teflon (OC)	AC048	C	8/18/82	1918	2018	1.00	263
	Teflon	AF194	F				1.00	3321
-B	Quartz	DC270	C	8/18/82	1918	2018	1.00	
	Quartz	DF311	F				1.00	
Field Blanks	Teflon (OC)	AC075						
	Teflon	AF240						
	Nuclepore	CC120						
	Quartz	DC280						
	Quartz	DF320						

(a) OC indicates that filter was oil-coated to retain coarse particles.

(b) F - Fraction <2.5µm; C - Fraction 2.5-10µm. Preseparator used on probe inlet.

(c) Clock time.

(d) Based on dichotomous sampler times.

Atoms in the sample are excited from their ground state to higher energy levels by radiation from a X-ray tube. These excited atoms emit X-rays of discrete energies as they return to their normal ground state energy level. The energy of the X-rays is characteristic of the emitting element and is used to qualitatively identify the element while the number of observed X-rays, which is proportional to the number of atoms, is used to quantitatively determine a specific element's concentration through a direct comparison with standards.

There are a number of potential spectral interferences possible with EDXRF because of its low resolution relative to the number and spacing of possible X-ray lines. Correction factors are determined by analyzing single element standards and quantifying their interference with other elements. Samples exhibiting chemical composition uncharacteristic of normal samples may require additional corrections.

Most of the background counts in a region of interest are due to the scattering of primary radiation from the sample. A blank filter is run under each excitation condition and the background in each region of interest is linearly related to a high energy incoherent scatter peak due to the primary radiation. The same scatter peak is measured on all samples and the relationship is used to estimate the background in the analyte line region of interest.

GRAVIMETRIC ANALYSIS OF DSS FILTERS

The procedures used for handling the DSS dichotomous sampler filters and for gravimetric analysis of the filter samples are given in Appendix D.

SECTION 5

RESULTS AND DISCUSSION

The elemental compositions of the source signature samples determined by XRF analysis are presented in Appendix E. Data at the top of each page gives the sampling site and Test No., particle size fraction (C - 2.5 to 7 or 10 μm , F - <2.5 μm), the filter number and type, and the mass of particulate material collected on the filter (in μg). Elemental compositions are reported as concentration per unit filter area ($\mu\text{g}/\text{cm}^2$), total quantity of the element in the particulate material, and percentage by weight of the element in the particulate sample. Estimated uncertainties are reported for each measurement.

Summaries of the elemental composition of the particulate emissions from each of the sources are provided in Tables 11 through 17. These tables show the weighted average composition of the emissions calculated from all valid tests performed at a given site. The standard deviation (n-1) is also given to provide an indication of the variability in the measurements.

Following is a brief discussion of the results of the source signature measurements made at each site.

Harshaw Chemical (Antimony Roasting)--

The emissions from this source were composed primarily of Sb. The Sb concentration found in the samples was generally about 80 percent with a minimum of 67 percent and a maximum of 87 percent. The deposits ranged from a few hundred to a few thousand micrograms per filter. Only a few other elements (S, Cl, Fe, Ni, Cu, Zn and As) were observed, and these were typically at concentrations less than 1 percent. Field blanks were essentially at background levels.

Philadelphia Electric and Gas (Coal Fired Power Plant)--

The composition of the coal fired power plant emissions was similar to that previously reported for flyash. Elements such as P, S, Ge, As and Se were enriched in the fine particle fraction. The composition for most of the elements was reasonably constant for all samples.

The variability of the barium content in the samples is due mainly to difficulties in the XRF analysis. Background subtraction in the region of the barium X-ray is not very precise, particularly for samples with such unusual chemical composition. Barium concentrations must be twice

TABLE 11. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: Harshaw/Antimony Oxide Roasting

No. Tests 6

Element	Average Composition of Particulate Emission, % $\pm$ SD(a)	
	Fine Fraction, <2.5 μ m	Coarse Fraction, 2.5-7 μ m
Al	ND	0.33 $\pm$ 0.69
Si	ND	0.73 $\pm$ 1.59
P	ND	ND
S	1.28 $\pm$ 0.07	1.17 $\pm$ 0.28
Cl	0.74 $\pm$ 0.03	0.67 $\pm$ 0.15
K	ND	ND
Ca	ND	ND
Ti	ND	ND
V	ND	ND
Cr	<0.01	<0.01
Mn	<0.01	<0.01
Fe	0.10 $\pm$ 0.02	0.46 $\pm$ 0.67
Ni	0.01 $\pm$ 0.0008	0.01 $\pm$ 0.004
Cu	0.01 $\pm$ 0.0008	0.01 $\pm$ 0.004
Zn	0.01 $\pm$ 0.0005	0.01 $\pm$ 0.005
Ga	<0.01	<0.01
As	0.12 $\pm$ 0.05	0.11 $\pm$ 0.04
Se	<0.01	<0.01
Br	<0.01	0.01 $\pm$ 0.01
Rb	<0.01	<0.01
Sr	<0.01	0.01 $\pm$ 0.02
Y	<0.01	<0.01
Zr	<0.01	ND
Mo	0.07 $\pm$ 0.03	0.05 $\pm$ 0.02
Pd	<0.01	ND
Ag	<0.01	ND
Cd	0.01 $\pm$ 0.02	ND
In	0.02 $\pm$ 0.04	ND
Sn	0.04 $\pm$ 0.11	ND
Sb	78.94 $\pm$ 1.08	78.69 $\pm$ 6.10
Ba	0.02 $\pm$ 0.02	0.05 $\pm$ 0.07
La	0.01 $\pm$ 0.03	0.13 $\pm$ 0.18
Hg	<0.01	<0.01
Pb	0.20 $\pm$ 0.06	0.12 $\pm$ 0.01

a) ND - not detected.

TABLE 12. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: Eddystone/Coal-Fired Power Plant

No. Tests 6

Element	Average Composition of Particulate Emission, % $\pm$ SD(a)	
	Fine Fraction, <2.5 μ m	Coarse Fraction, 2.5-10 μ m
Al	14.46 $\pm$ 0.74	11.99 $\pm$ 1.73
Si	21.77 $\pm$ 1.23	19.08 $\pm$ 2.76
P	0.62 $\pm$ 0.06	0.22 $\pm$ 0.03
S	3.51 $\pm$ 0.51	0.55 $\pm$ 0.07
Cl	0.06 $\pm$ 0.02	0.10 $\pm$ 0.004
K	1.22 $\pm$ 0.04	1.34 $\pm$ 0.08
Ca	1.22 $\pm$ 0.03	1.46 $\pm$ 0.05
Ti	0.88 $\pm$ 0.05	0.96 $\pm$ 0.04
V	0.07 $\pm$ 0.02	0.06 $\pm$ 0.005
Cr	0.06 $\pm$ 0.01	0.05 $\pm$ 0.002
Mn	0.04 $\pm$ 0.002	0.04 $\pm$ 0.002
Fe	8.16 $\pm$ 0.30	9.15 $\pm$ 0.34
Ni	0.04 $\pm$ 0.005	0.03 $\pm$ 0.002
Cu	0.03 $\pm$ 0.001	0.02 $\pm$ 0.001
Zn	0.07 $\pm$ 0.007	0.04 $\pm$ 0.002
Ga	0.02 $\pm$ 0.001	0.02 $\pm$ 0.001
As	0.08 $\pm$ 0.004	0.04 $\pm$ 0.002
Se	0.04 $\pm$ 0.005	<0.01
Br	ND	<0.01
Rb	<0.01	0.01 $\pm$ 0.0008
Sr	0.13 $\pm$ 0.009	0.16 $\pm$ 0.003
Y	0.01 $\pm$ 0.002	0.02 $\pm$ 0.001
Zr	0.05 $\pm$ 0.02	0.03 $\pm$ 0.003
Mo	0.02 $\pm$ 0.008	0.02 $\pm$ 0.002
Pd	<0.01	<0.01
Ag	<0.01	<0.01
Cd	<0.01	<0.01
In	0.01 $\pm$ 0.003	<0.01
Sn	0.01 $\pm$ 0.02	<0.01
Sb	1.84 $\pm$ 1.04	0.06 $\pm$ 0.03
Ba	0.14 $\pm$ 0.12	0.11 $\pm$ 0.02
La	0.02 $\pm$ 0.03	<0.01
Hg	ND	ND
Pb	0.04 $\pm$ 0.002	0.03 $\pm$ 0.0008

a) ND - not detected.

TABLE 13. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: Schuylkill/Oil-Fired Power Plant

No. Tests 8

Element	Average Composition of Particulate Emission, % $\pm$ SD(a)	
	Fine Fraction, <2.5 μ m	Coarse Fraction, 2.5-7 μ m(b)
Al	1.75 $\pm$ 0.24	10.46 $\pm$ 2.71
Si	2.94 $\pm$ 0.46	21.72 $\pm$ 5.96
P	1.03 $\pm$ 0.14	1.40 $\pm$ 0.25
S	13.21 $\pm$ 0.51	9.06 $\pm$ 1.50
Cl	ND	<0.01
K	0.21 $\pm$ 0.03	0.32 $\pm$ 0.08
Ca	1.90 $\pm$ 0.53	8.37 $\pm$ 1.96
Ti	0.12 $\pm$ 0.03	1.02 $\pm$ 0.17
V	1.41 $\pm$ 0.24	1.61 $\pm$ 0.35
Cr	0.05 $\pm$ 0.009	0.17 $\pm$ 0.06
Mn	0.03 $\pm$ 0.006	0.07 $\pm$ 0.05
Fe	1.77 $\pm$ 0.36	3.69 $\pm$ 0.63
Ni	2.07 $\pm$ 0.38	1.76 $\pm$ 0.35
Cu	0.14 $\pm$ 0.10	2.36 $\pm$ 2.83
Zn	0.85 $\pm$ 0.21	0.91 $\pm$ 0.14
Ga	0.01 $\pm$ 0.004	0.03 $\pm$ 0.03
As	0.01 $\pm$ 0.007	0.09 $\pm$ 0.11
Se	<0.01	<0.01
Br	<0.01	<0.01
Rb	<0.01	<0.01
Sr	0.03 $\pm$ 0.007	0.13 $\pm$ 0.07
Y	<0.01	<0.01
Zr	0.02 $\pm$ 0.03	0.08 $\pm$ 0.08
Mo	0.14 $\pm$ 0.05	0.07 $\pm$ 0.06
Pd	<0.01	0.03 $\pm$ 0.04
Ag	<0.01	0.09 $\pm$ 0.14
Cd	<0.01	0.39 $\pm$ 0.41
In	<0.01	0.32 $\pm$ 0.21
Sn	0.02 $\pm$ 0.02	0.39 $\pm$ 0.39
Sb	0.12 $\pm$ 0.03	0.30 $\pm$ 0.23
Ba	0.19 $\pm$ 0.12	0.22 $\pm$ 0.36
La	0.23 $\pm$ 0.30	1.90 $\pm$ 2.18
Hg	<0.01	<0.01
Pb	1.11 $\pm$ 0.31	0.51 $\pm$ 0.27

a) ND - not detected. b) Does not include data from Tests 3A, 5B, 7B, or 7B (repeat).

TABLE 14. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: Eddystone/Oil-Fired Power Plant

No. Tests 6

Element	Average Composition of Particulate Emission, % $\pm$ SD(a)	
	Fine Fraction, <2.5 μ m	Coarse Fraction, 2.5-10 μ m
Al	1.24 $\pm$ 0.26	4.73 $\pm$ 1.27
Si	2.21 $\pm$ 0.49	9.37 $\pm$ 2.59
P	1.70 $\pm$ 0.35	2.34 $\pm$ 0.25
S	12.01 $\pm$ 1.67	9.13 $\pm$ 1.26
Cl	ND	0.01 $\pm$ 0.03
K	0.20 $\pm$ 0.05	0.34 $\pm$ 0.14
Ca	2.54 $\pm$ 0.59	10.63 $\pm$ 2.35
Ti	0.04 $\pm$ 0.04	0.83 $\pm$ 0.24
V	0.81 $\pm$ 0.18	1.80 $\pm$ 0.38
Cr	0.04 $\pm$ 0.01	0.11 $\pm$ 0.02
Mn	0.04 $\pm$ 0.01	0.08 $\pm$ 0.03
Fe	1.94 $\pm$ 0.42	3.56 $\pm$ 0.75
Ni	1.83 $\pm$ 0.47	2.28 $\pm$ 0.43
Cu	0.12 $\pm$ 0.03	0.15 $\pm$ 0.02
Zn	1.49 $\pm$ 0.37	1.84 $\pm$ 0.35
Ga	<0.01	0.03 $\pm$ 0.03
As	<0.01	0.03 $\pm$ 0.03
Se	<0.01	0.01 $\pm$ 0.02
Br	0.01 $\pm$ 0.006	0.01 $\pm$ 0.02
Rb	<0.01	0.05 $\pm$ 0.07
Sr	0.02 $\pm$ 0.004	0.15 $\pm$ 0.08
Y	<0.01	0.02 $\pm$ 0.02
Zr	0.03 $\pm$ 0.05	0.07 $\pm$ 0.11
Mo	0.10 $\pm$ 0.02	0.14 $\pm$ 0.08
Pd	0.01 $\pm$ 0.008	0.09 $\pm$ 0.07
Ag	<0.01	0.24 $\pm$ 0.33
Cd	0.01 $\pm$ 0.005	0.18 $\pm$ 0.29
In	<0.01	0.08 $\pm$ 0.12
Sn	0.05 $\pm$ 0.04	0.04 $\pm$ 0.07
Sb	0.19 $\pm$ 0.10	0.09 $\pm$ 0.21
Ba	0.40 $\pm$ 0.18	1.20 $\pm$ 1.18
La	0.27 $\pm$ 0.20	1.10 $\pm$ 1.49
Hg	<0.01	0.02 $\pm$ 0.04
Pb	2.29 $\pm$ 0.57	2.78 $\pm$ 0.50

a) ND - not detected.

TABLE 15. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: British Petroleum/Catalytic Cracker

No. Tests 6

Element	Average Composition of Particulate Emission, % $\pm$ SD(a)	
	Fine Fraction, <2.5 μ m	Coarse Fraction, 2.5-7 μ m(b)
Al	4.14 $\pm$ 0.73	24.19 $\pm$ 1.35
Si	10.41 $\pm$ 1.25	50.37 $\pm$ 3.78
P	0.01 $\pm$ 0.03	ND
S	4.20 $\pm$ 0.47	3.97 $\pm$ 1.61
Cl	ND	ND
K	0.03 $\pm$ 0.006	0.12 $\pm$ 0.02
Ca	0.03 $\pm$ 0.005	0.17 $\pm$ 0.04
Ti	0.11 $\pm$ 0.03	0.28 $\pm$ 0.04
V	ND	ND
Cr	ND	ND
Mn	ND	ND
Fe	0.22 $\pm$ 0.03	0.59 $\pm$ 0.03
Ni	0.02 $\pm$ 0.004	0.06 $\pm$ 0.01
Cu	<0.01	<0.01
Zn	<0.01	0.01 $\pm$ 0.003
Ga	<0.01	<0.01
As	ND	ND
Se	<0.01	<0.01
Br	<0.01	<0.01
Rb	<0.01	<0.01
Sr	<0.01	0.01 $\pm$ 0.003
Y	0.01 $\pm$ 0.001	0.03 $\pm$ 0.005
Zr	ND	0.01 $\pm$ 0.01
Mo	ND	<0.01
Pd	ND	<0.01
Ag	ND	0.02 $\pm$ 0.02
Cd	ND	0.01 $\pm$ 0.01
In	<0.01	<0.01
Sn	<0.01	ND
Sb	<0.01	0.01 $\pm$ 0.03
Ba	ND	0.10 $\pm$ 0.11
La	0.22 $\pm$ 0.04	0.65 $\pm$ 0.17
Hg	ND	ND
Pb	<0.01	0.03 $\pm$ 0.01

a) ND - not detected. b) Does not include data from Tests 3B, 4B, and 5B.

TABLE 16. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: Atlantic Metals/Secondary Aluminum Smelter

No. Tests 2

Element	Average Composition of Particulate Emissions, % $\pm$ SD(a)			
	Fine Fraction, $<2.5 \mu\text{m}$		Coarse Fraction, $2.5-10 \mu\text{m}$	
	Source	Baghouse RS	Source	Baghouse RS
Al	1.88 $\pm$ 0.62	ND	4.72 $\pm$ 0.17	ND
Si	4.40 $\pm$ 2.84	ND	7.32 $\pm$ 2.17	ND
P	0.65 $\pm$ 0.40	ND	0.33 $\pm$ 0.09	ND
S	22.00 $\pm$ 27.03	4.30 $\pm$ 0.008	1.27 $\pm$ 1.79	2.92 $\pm$ 0.19
Cl	13.44 $\pm$ 13.81	40.95 $\pm$ 1.51	23.41 $\pm$ 0.95	36.73 $\pm$ 1.52
K	11.14 $\pm$ 1.56	12.73 $\pm$ 1.95	7.39 $\pm$ 5.21	11.65 $\pm$ 0.84
Ca	0.15 $\pm$ 0.09	0.19 $\pm$ 0.03	0.95 $\pm$ 0.34	0.13 $\pm$ 0.007
Ti	0.02 $\pm$ 0.005	0.13 $\pm$ 0.0	0.16 $\pm$ 0.06	0.01 $\pm$ 0.001
V	0.01 $\pm$ 0.006	<0.01	0.01 $\pm$ 0.006	<0.01
Cr	0.01 $\pm$ 0.02	<0.01	0.11 $\pm$ 0.10	<0.01
Mn	0.01 $\pm$ 0.004	<0.01	0.01 $\pm$ 0.02	<0.01
Fe	0.19 $\pm$ 0.08	0.10 $\pm$ 0.01	1.64 $\pm$ 0.72	0.04 $\pm$ 0.004
Ni	0.02 $\pm$ 0.02	<0.01	0.10 $\pm$ 0.08	<0.01
Cu	0.07 $\pm$ 0.04	0.03 $\pm$ 0.0	0.14 $\pm$ 0.07	0.02 $\pm$ 0.001
Zn	0.16 $\pm$ 0.11	0.08 $\pm$ 0.006	0.25 $\pm$ 0.08	0.05 $\pm$ 0.001
Ga	<0.01	<0.01	<0.01	<0.01
As	0.02 $\pm$ 0.008	0.05 $\pm$ 0.01	<0.01	ND
Se	<0.01	<0.01	0.03 $\pm$ 0.007	<0.01
Br	0.06 $\pm$ 0.01	0.04 $\pm$ 0.004	0.05 $\pm$ 0.0	0.03 $\pm$ 0.001
Rb	<0.01	<0.01	<0.01	0.01 $\pm$ 0.0
Sr	<0.01	0.01 $\pm$ 0.008	<0.01	<0.01
Y	<0.01	0.01 $\pm$ 0.008	<0.01	<0.01
Zr	<0.01	0.05 $\pm$ 0.07	0.29 $\pm$ 0.37	ND
Mo	ND	0.04 $\pm$ 0.04	<0.01	0.02 $\pm$ 0.004
Pd	0.03 $\pm$ 0.04	<0.01	<0.01	<0.01
Ag	0.01 $\pm$ 0.01	<0.01	0.02 $\pm$ 0.02	<0.01
Cd	ND	0.07 $\pm$ 0.05	0.13 $\pm$ 0.13	<0.01
In	0.11 $\pm$ 0.14	0.09 $\pm$ 0.10	0.09 $\pm$ 0.06	<0.01
Sn	0.14 $\pm$ 0.13	0.02 $\pm$ 0.02	0.02 $\pm$ 0.02	<0.01
Sb	0.58 $\pm$ 0.03	0.07 $\pm$ 0.10	0.69 $\pm$ 0.28	0.03 $\pm$ 0.01
Ba	0.51 $\pm$ 0.67	0.23 $\pm$ 0.33	0.03 $\pm$ 0.05	<0.01
La	0.31 $\pm$ 0.44	0.18 $\pm$ 0.26	3.19 $\pm$ 4.51	0.01 $\pm$ 0.02
Hg	ND	<0.01	<0.01	<0.01
Pb	0.10 $\pm$ 0.03	2.23 $\pm$ 0.62	0.16 $\pm$ 0.08	0.74 $\pm$ 0.08

a) ND - not detected.

TABLE 17. CHEMICAL COMPOSITION OF PARTICULATE EMISSIONS

Source: East Central Incinerator

No. Tests 7

Element	Average Composition of Particulate Emission, % $\pm$ SD(a)	
	Fine Fraction, <2.5 μ m	Coarse Fraction, 2.5-10 μ m
Al	1.45 $\pm$ 0.61	6.04 $\pm$ 0.71
Si	1.79 $\pm$ 0.56	9.14 $\pm$ 1.69
P	0.65 $\pm$ 0.12	0.93 $\pm$ 0.13
S	2.94 $\pm$ 0.80	3.64 $\pm$ 0.37
Cl	25.31 $\pm$ 3.18	16.03 $\pm$ 3.28
K	8.46 $\pm$ 2.51	4.44 $\pm$ 0.81
Ca	0.28 $\pm$ 0.06	6.67 $\pm$ 0.69
Ti	0.04 $\pm$ 0.01	1.07 $\pm$ 0.14
V	<0.01	0.02 $\pm$ 0.01
Cr	0.02 $\pm$ 0.002	0.18 $\pm$ 0.07
Mn	0.02 $\pm$ 0.003	0.10 $\pm$ 0.02
Fe	0.33 $\pm$ 0.08	2.08 $\pm$ 0.31
Ni	0.03 $\pm$ 0.004	0.11 $\pm$ 0.05
Cu	0.15 $\pm$ 0.02	0.07 $\pm$ 0.03
Zn	10.97 $\pm$ 2.15	3.80 $\pm$ 2.07
Ga	0.02 $\pm$ 0.01	<0.01
As	<0.01	0.04 $\pm$ 0.03
Se	<0.01	<0.01
Br	0.30 $\pm$ 0.14	0.18 $\pm$ 0.10
Rb	0.02 $\pm$ 0.004	<0.01
Sr	<0.01	0.03 $\pm$ 0.008
Y	ND	<0.01
Zr	<0.01	0.03 $\pm$ 0.03
Mo	0.02 $\pm$ 0.01	<0.01
Pd	0.03 $\pm$ 0.01	0.01 $\pm$ 0.02
Ag	0.02 $\pm$ 0.009	0.01 $\pm$ 0.02
Cd	0.26 $\pm$ 0.05	0.07 $\pm$ 0.04
In	0.01 $\pm$ 0.01	0.02 $\pm$ 0.02
Sn	0.79 $\pm$ 0.18	0.08 $\pm$ 0.09
Sb	0.25 $\pm$ 0.11	0.11 $\pm$ 0.06
Ba	0.04 $\pm$ 0.04	0.28 $\pm$ 0.23
La	<0.01	0.33 $\pm$ 0.32
Hg	<0.01	0.03 $\pm$ 0.02
Pb	6.08 $\pm$ 1.39	1.73 $\pm$ 0.60

a) ND - not detected.

the standard deviations (see data in Appendix E) before the data is considered reliable.

Antimony was unusually high in the fine fraction, ranging from 0.98 percent to 3.8 percent. Although the entire sampler was thoroughly washed and scrubbed with brushes, soap, water and methanol between each source sampled, there is a remote possibility that metallic Sb condensed on the surface of the probe and was later volatilized during the coal fired power plant test. This hypothesis has been evaluated from several directions, but it has not been possible to definitively say that this was or was not a problem. Because of the unusual nature of the Sb results and the previously sampled source, it is recommended that Sb not be included in the receptor modeling data base or a footnote about the potential contamination be made.

Philadelphia Electric and Gas (Schuylkill Oil-Fired Power Plant)--

The deposits collected with these samples were, in general, less than those collected at the coal-fired boiler. Deposit loadings ranged from less than 10 μg /filter in the coarse fraction to almost 4,000 μg /filter even though sampling times were as long as 8 hours. Although some of the same elements such as V and Ni that have been previously reported were observed in the emissions from this boiler and the one at Eddystone, many other elements not previously reported such as Al, Si, P, S, Ca, Fe, Cu, Zn and Pb were found at concentrations greater than 1 percent. Also of interest was the presence of Mo at about one or two tenths of a percent. Mo may be useful as a tracer for oil combustion since it is relatively uncommon in most emissions and is typically at the nanogram level in urban aerosols. S is slightly enhanced in the fine fraction while most of the other elements are depleted in the fine fraction. The largest difference is in the Al, Si and Ca which are about 5 fold more abundant in the coarse fraction than in the fine fraction.

Substantial amounts of Sb were not observed, suggesting that the Sb observed in the coal-fired power plant emissions may have been real or that any Sb contamination had been removed from the sampling system.

Philadelphia Electric and Gas (Eddystone Oil-Fired Power Plant Station)--

These samples were also more lightly loaded than those collected at the coal-fired power plant. Even though sampling times between about 1 hour and 8 hours were used, deposit loadings ranged from 20 μg to about 1,500 μg /filter. The elements Ni and V usually associated with residual oil combustion were abundant in both the fine and coarse fractions. Other elements present at concentration greater than 1 percent included Al, Si, P, S, Ca, V, Fe, Ni, Zn and Pb. The concentration of Al, Si and Ca were several fold lower in the fine fraction than in the coarse fraction. Sulfur was the only element substantially enriched in the fine fraction while V, Fe, Ni, Zn and Pb were depleted in the fine fraction. Sb was not enriched in these emissions as was observed with the coal flyash. Mo was found in the fine and coarse fractions at concentrations similar to those observed in the Eddystone oil-fired power plant samples, i.e., ~0.1 percent. This observation provides additional support for the suggestion that Mo may be a suitable tracer element for oil combustion. (Also see comments on individual data sheets).

City of Philadelphia, East Central Incinerator (Municipal Refuse Incineration)--

The chemical composition of these incinerator samples was relatively constant during the sampling period. Most of the mass was in the fine fraction and the chemistry was similar in both fractions. Al, Si, Ca and Ti were generally more abundant in the coarse fraction while Cl, K, Zn, Cd, Sn, Sb and Pb were substantially enriched in the fine fraction. Cl was the most abundant element in both the fine and the coarse fraction.

British Petroleum (Catalytic Cracker)--

These results represent some of the first detailed elemental analysis of this type of emissions and, thus there is very little data for comparison. The high Al and Si, however, is in agreement with literature values. The Al and Si are about 4 fold greater in the coarse fraction than in the fine fraction. The only other element greater than 1 percent was S which was about 4 percent in the fine fraction and about 3 percent in the coarse fraction. The most notable feature about the chemistry of these emissions was the high abundance of La, Ce and Nd, all of which were about the same concentration, a few tenths of a percent. Since standards were not available Ce and Nd concentrations in the samples could not be quantified. Their spectral intensities, however, suggested concentrations similar to those of La.

The mass loadings on the three coarse samples collected on Nuclepore are incorrect as is obvious from the over 150 percent of the mass explained by the Al and Si. This is about a factor of 2 more than was observed for the other coarse samples collected from this source. Although a factor of two is suggestive of a weighing or calculational error, the source of the error could not be identified.

Atlantic Metals (Rotary Aluminum Dross Furnace)--

The most abundant elements present in these deposits are S, Cl and K. The next most abundant are Al and Si at a few percent. The concentration variability between samples, however, is much more substantial than had previously been observed with the other samples collected in Philadelphia. The S, for example, is 41 percent in the fine fraction filter AF 174, but only 2.8 percent on filter AF 175. This is a secondary Al smelter plant which processes metal in batches. It is possible that the 5 to 8 hour sampling periods integrated different stages of the batch operation. Unfortunately, a smaller number of replicates were obtained at this site due to the long sampling times required. Data are also presented for the composition of the baghouse collector dust which was resuspended and collected with dichotomous samplers. There are significant differences in the elemental composition of the resuspended samples and the actual source emission samples. For example, Al and Si present in percent levels in the emission samples were not detected in the resuspended baghouse dust samples and the concentrations of several other elements were considerably lower in the latter samples. The dissimilarity in the two types of samples suggests that the resuspended samples may not be representative of the source emissions. However, the data obtained in this study are too limited to substantiate this conclusion.

SECTION 6

QUALITY ASSURANCE SUMMARY

DEVIATIONS FROM QUALITY ASSURANCE PLAN

Gravimetric Analysis of Filters

The Standard Operating Procedure for weighing the fragile quartz fiber filters was modified when determining net weight because of material loss during handling and changes in humidity. The calculations of the net weight were made as follows to incorporate a correction due to handling and humidity effects.

Net weight = Gross weight - Tare weight - Correction value of material loss and humidity effects.

The correction value was determined by the mean weights of all of the field blanks and unused filters. The correction value was determined by the mean net weights of all of the field blanks and unused filters. The correction value for the fine quartz filters was - 42 μg . The correction value for the coarse filters was - 22 μg .

Filter Handling

Quartz fiber filters were not stored in metal dishes immediately after assigning ID numbers. They were stored in plastic petri dishes for about 1 week. (The metal cans did not arrive in time). It was decided that loading them into holders and wrapping with aluminum foil would cause more problems, since they would have to be unloaded for tare weighing, and the excess handling would result in loss of material from the filters. The effect of plastic petri dishes was thought to be insignificant, since the filters come wrapped in plastic, are held in plastic holders and were to be used for source sampling in which the organic deposits were expected to be high.

ACCURACY AND PRECISION OF GRAVIMETRIC ANALYSIS OF FILTERS

Precision of mass measurements, $\bar{W}_d$, is determined for each filter type by calculating the mean of the absolute value of the difference in replicate weighings, $W_{d,i}$, for n replicate weighings.

$$\bar{W}_d = \frac{1}{n} \sum_{i=1}^n |W_{d_i}|$$

Accuracy is assessed by determining the percent error, % E_i, for each weighing set i, where

$$\% E_i = 100 \times \frac{\text{measured tare weight} - \text{true tare weight}}{\text{true tare weight}}$$

The overall percent error, % $\bar{E}$, is the average percent error from each weighing set,

$$\% \bar{E} = \frac{1}{n} \sum_{i=1}^n | \% E_i |$$

These results are summarized in Table 18.

TABLE 18. ACCURACY AND PRECISION OF GRAVIMETRIC ANALYSIS OF FILTERS

Filter Type	Precision $\bar{W}_d$ in μg	Accuracy % $\bar{E}$	Completeness %
Oil Coated	3.4 (n = 13)	0.001	100
Nuclepore	3.4 (n = 8)	0.015	100
Teflon Membrane	3.2 (n = 18)	0.001	100
Quartz	56.1 (n = 13)	.001	100

ACCURACY AND PRECISION OF X-RAY FLUORESCENCE ANALYSIS

Precision for the XRF analysis was determined by calculating the mean and standard deviation of the QA standard in each analysis run. These results are summarized in Table 19. The QA data for each X-ray analysis run are listed in Table 20.

TABLE 19. ACCURACY AND PRECISION OF XRF
ANALYSIS OF QA STANDARD

Element	Mean Value $\mu\text{g}/\text{cm}^2$	Standard Deviation $\mu\text{g}/\text{cm}^2$	Relative Standard Deviation %	Accuracy Avg. % Error
Si	26.35	0.24	0.91	1.3
Ti	10.96	0.06	0.55	-0.3
Fe	30.55	0.19	0.62	0.5
Cd	32.78	0.11	0.34	0.9
Pb	25.71	0.13	0.50	0.8

Average Relative Standard Deviation, % = 0.58

TABLE 20. RESULTS OF ANALYSIS OF QA STANDARD

181/95-3					181/95-7				
QA STANDARD QS116					QA STANDARD QS116				
EL	CONCENTRATION		% ERROR		EL	CONCENTRATION		% ERROR	
	ACTUAL	MEASURED				ACTUAL	MEASURED		
SI	26.00	26.40+- 1.33	1.5		SI	26.00	25.92+- 1.31	- 0.3	
TI	11.00	10.98+- 0.55	- 0.2		TI	11.00	11.04+- 0.56	0.3	
FE	30.40	30.72+- 1.55	1.0		FE	30.40	30.55+- 1.54	0.5	
CD	32.50	32.76+- 1.66	0.8		CD	32.50	32.79+- 1.66	0.9	
PB	25.50	25.80+- 1.30	1.2		PB	25.50	25.71+- 1.29	0.8	

181/95-4					181/95-8				
QA STANDARD QS116					QA STANDARD QS116				
EL	CONCENTRATION		% ERROR		EL	CONCENTRATION		% ERROR	
	ACTUAL	MEASURED				ACTUAL	MEASURED		
SI	26.00	26.24+- 1.32	0.9		SI	26.00	26.33+- 1.33	1.3	
TI	11.00	10.91+- 0.55	- 0.8		TI	11.00	10.93+- 0.55	- 0.6	
FE	30.40	30.31+- 1.53	- 0.3		FE	30.40	30.55+- 1.54	0.5	
CD	32.50	32.71+- 1.66	0.6		CD	32.50	32.71+- 1.66	0.6	
PB	25.50	25.76+- 1.30	1.0		PB	25.50	25.64+- 1.29	0.6	

181/95-5					181/95-9				
QA STANDARD QS116					QA STANDARD QS116				
EL	CONCENTRATION		% ERROR		EL	CONCENTRATION		% ERROR	
	ACTUAL	MEASURED				ACTUAL	MEASURED		
SI	26.00	26.34+- 1.33	1.3		SI	26.00	26.19+- 1.32	0.7	
TI	11.00	10.92+- 0.55	- 0.8		TI	11.00	11.04+- 0.56	0.4	
FE	30.40	30.76+- 1.55	1.2		FE	30.40	30.58+- 1.55	0.6	
CD	32.50	32.63+- 1.66	0.4		CD	32.50	32.78+- 1.66	0.8	
PB	25.50	25.75+- 1.30	1.0		PB	25.50	25.76+- 1.30	1.0	

181/95-6					181/95-10				
QA STANDARD QS116					QA STANDARD QS116				
EL	CONCENTRATION		% ERROR		EL	CONCENTRATION		% ERROR	
	ACTUAL	MEASURED				ACTUAL	MEASURED		
SI	26.00	26.14+- 1.32	0.6		SI	26.00	26.01+- 1.31	0.0	
TI	11.00	11.00+- 0.55	- 0.0		TI	11.00	10.97+- 0.55	- 0.3	
FE	30.40	30.69+- 1.55	1.0		FE	30.40	30.39+- 1.54	- 0.0	
CD	32.50	32.93+- 1.67	1.3		CD	32.50	32.67+- 1.66	0.5	
PB	25.50	25.59+- 1.29	0.4		PB	25.50	25.57+- 1.29	0.3	

TABLE 20. (Continued)

181/95-11

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.18+- 1.32	0.7
TI	11.00	10.98+- 0.55	- 0.2
FE	30.40	30.22+- 1.53	- 0.6
CD	32.50	32.74+- 1.66	0.8
PB	25.50	25.52+- 1.29	0.1

181/95-15

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.37+- 1.33	1.4
TI	11.00	10.99+- 0.55	- 0.1
FE	30.40	30.34+- 1.53	- 0.2
CD	32.50	32.98+- 1.67	1.5
PB	25.50	25.89+- 1.30	1.5

181/95-12

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.52+- 1.34	2.0
TI	11.00	10.96+- 0.55	- 0.3
FE	30.40	30.54+- 1.54	0.4
CD	32.50	32.97+- 1.67	1.4
PB	25.50	25.69+- 1.29	0.7

181/95-16

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.36+- 1.33	1.4
TI	11.00	11.00+- 0.55	0.0
FE	30.40	30.78+- 1.56	1.3
CD	32.50	32.62+- 1.66	0.4
PB	25.50	25.77+- 1.30	1.1

181/95-13

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.23+- 1.32	0.9
TI	11.00	10.93+- 0.55	- 0.6
FE	30.40	30.66+- 1.55	0.9
CD	32.50	32.83+- 1.67	1.0
PB	25.50	25.83+- 1.30	1.3

181/95-17

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.76+- 1.35	2.9
TI	11.00	10.93+- 0.55	- 0.6
FE	30.40	30.61+- 1.55	0.7
CD	32.50	32.74+- 1.66	0.8
PB	25.50	25.67+- 1.29	0.7

181/95-14

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.44+- 1.33	1.7
TI	11.00	10.95+- 0.55	- 0.5
FE	30.40	30.74+- 1.55	1.1
CD	32.50	32.88+- 1.67	1.2
PB	25.50	25.91+- 1.30	1.6

181/95-18

QA STANDARD QS116

EL	CONCENTRATION		% ERROR
	ACTUAL	MEASURED	
SI	26.00	26.69+- 1.34	2.7
TI	11.00	11.04+- 0.56	0.4
FE	30.40	30.67+- 1.55	0.9
CD	32.50	32.87+- 1.67	1.1
PB	25.50	25.84+- 1.30	1.3

TABLE 20. (Continued)

181/95-20				
QA STANDARD QS116				
EL	CONCENTRATION		% ERROR	
	ACTUAL	MEASURED		
SI	26.00	26.75+- 1.35	2.9	
TI	11.00	10.81+- 0.55	- 1.7	
FE	30.40	30.17+- 1.52	- 0.8	
CD	32.50	32.70+- 1.66	0.6	
PB	25.50	25.42+- 1.28	- 0.3	

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3. Houck, J. E., Cooper, J. A., and Larson, E. R., "Dilution Sampling for Chemical Receptor Source Fingerprinting", Paper 82-61M.2 presented at the 75th Annual Meeting of the Air Pollution Control Association. New Orleans, LA. June 20-25, 1982.

APPENDIX A

SOUTHERN RESEARCH REPORT
ON EVALUATION OF NEA
DILUTION SOURCE SAMPLER

SORI-EAS-83-201

Contract Number 68-02-3118
Technical Directive 139

FINAL REPORT

DEVELOPMENT AND EVALUATION OF DILUTION PROBES USED FOR
SAMPLING TO DETERMINE SOURCE SIGNATURES

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INTRODUCTION

Source apportionment studies based on chemical element balance techniques require elemental composition signatures for the sources involved.^{1,2} Ideally, the same, or similar, sampling methodologies would be used in obtaining source samples as those used in obtaining samples from the ambient air. NEA, Inc., designed a sampler for this purpose which uses a slightly modified ambient air "dichotomous sampler" to provide source samples in two size fractions (0-2.5 μm and 2.5-10 μm) corresponding to those taken in the ambient.³ The samples are obtained on the same filter media used for ambient sampling. The NEA system is illustrated in Figure 1. In operation, a sample is withdrawn continuously from the stack (source) via the nozzle (1) and probe (2) and conveyed via the flexible hose (3) to a dilution device (4). In the dilution device the sample stream is diluted by mixing with a measured flow of filtered ambient air provided by the blower and filter (5). A portion of the diluted stream is withdrawn via the inlet tube (6) to the dichotomous sampler (7).

This system has two major advantages over conventional sampling methods for obtaining source signature analyses. First, the sample is obtained with the same size fractionation method as is used in many ambient air receptor studies; and second, the dilution process mimics to some extent the processes which actually take place as the flue gases are discharged to the atmosphere, including condensation of certain species which may be wholly or largely in the vapor phase at stack conditions. The time available for such condensation processes in the NEA system is, however, rather short (one to two seconds) and consequently the mixing occurs more rapidly than in the "real world". As a result of the short mixing time the final aerosol properties may not be quite those of the actual plume. Nonetheless, samples obtained with the dilution system are probably more similar with respect to condensible components to those downwind in the plume than samples taken at flue gas conditions.

The problem of most concern with regard to samples obtained with the NEA system is the possibility of size dependent particle losses in its various components. Losses could bias the size distribution of the samples obtained, and, if the elemental composition of the particles emitted by a source was strongly size dependent, the source signature derived from the sample might not be valid. Southern Research Institute was asked to: (1) evaluate the representativeness of samples taken using the system with regard to particle size bias and (2) if such biases were a problem, to rectify them insofar as possible, or (3) suggest alternative procedures for obtaining representative samples. Two laboratory calibration studies of the system were performed which revealed (1) substantial losses of large particles from inertial effects, and (2) other size-dependent losses which resulted from electrostatic charge effects. The following sections detail the experimental procedures used in carrying out the evaluation, the results of the tests, and our conclusions and recommendations with regard to the use of the system.

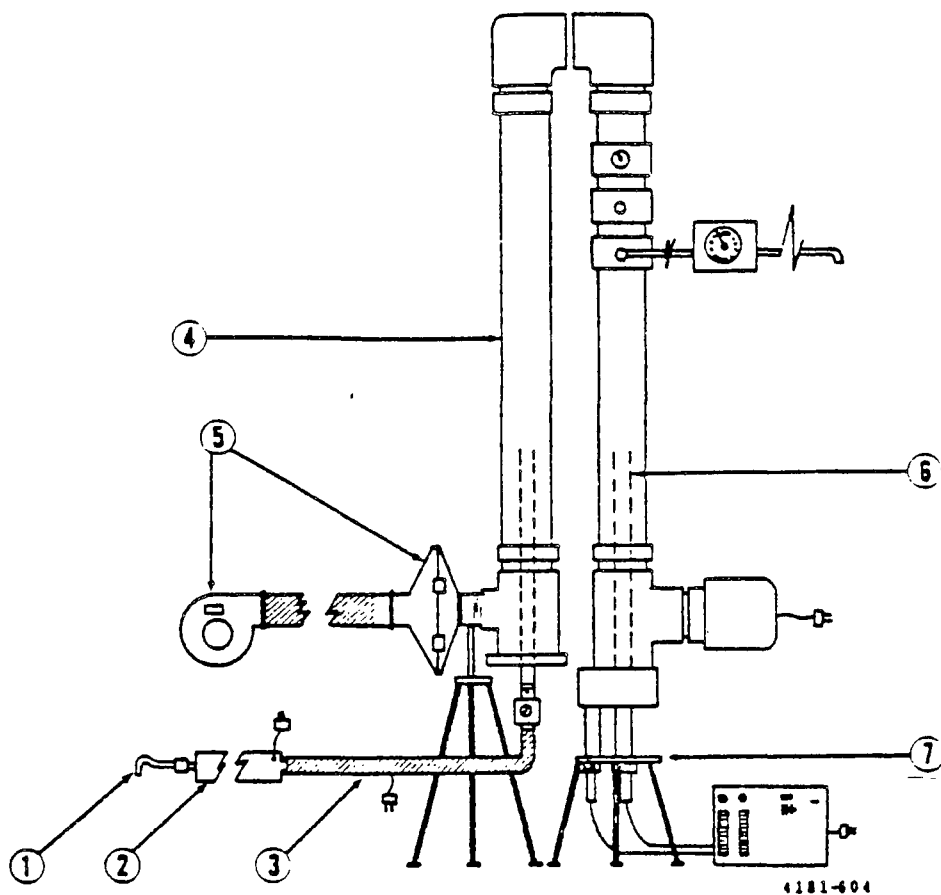
SYSTEM OPERATION

In field operations the system is set up at the sampling location and the velocity at the selected sampling point is measured. A nozzle and sampling rate are selected for isokinetic sampling and a total flow of sample plus dilution air is selected to obtain the desired dilution factor. The probe and hose are brought to operating temperatures by means of permanently wrapped heating tapes and the dichotomous sampler is loaded with a pair of filters. The probe is then inserted into the stack and sampling is begun. The sample flow is set and monitored by means of the pressure drop from the nozzle tip to the interior of the diluter--laboratory calibrations being used to establish the relationship between the pressure differential and the sampling flow rate. (The pressure differential used must include the velocity pressure of the gas stream at the sampling point.) The sampling rates and the total flow through the diluter are adjusted by varying the fan speeds of the dilution air inlet blower and the exhaust air blower. The total flow (sample plus dilution air) is measured by means of a thermal anemometer located in the second half of the main body of the diluter.

EXPERIMENTAL METHODOLOGY

System losses by particle size were examined over the range from 1.5 μm to 15 μm by challenging the system in a series of tests with monodisperse particles generated using a spinning disk aerosol generator. The particles were introduced to the system by sampling from a small (10 cm) diameter wind tunnel into which the probe end and sampling nozzle could be introduced. The gas velocities in the tunnel ranged from 5 to 20 m/s, spanning the range commonly encountered in actual field conditions. The test particles were made of ammonium fluorescein, which forms dry, relatively hard, non-hygroscopic particles. System losses were determined by breaking the system down into its component pieces and washing each internal surface with dilute ammonium hydroxide. The amounts of fluorescein in the washes were then measured by fluorimetry. In order to be able to account for all the aerosol sampled, a modified hi-volume filter assembly was used at the exhaust end of the system in addition to the blower as was shown in Figure 1. Washes of this filter together with those from the system itself made a complete mass balance possible.

Investigation of electrostatic effects in the sampling system was not planned as a part of the program, however, a charge neutralizer in the aerosol generator failed after much of the testing had been completed, resulting in dramatic increases in the losses (and much frustration in identifying the cause of the sudden increase in losses over those which had previously been measured). A total of 16 calibration runs were made with the complete system with neutral aerosols, 14 runs were made with the complete system with charged particles, and an additional 11 runs were made with the nozzle, probe and hose only to further characterize the electrostatic effects and look into the effectiveness of inlet charge neutralizers for alleviating the electrostatic losses.



Height approx	2 m
Diluter (pipe) diameter	10.2 cm
Dilution path approx	3 m
Dichotomous inlet (pipe) diameter	0.64 to 2.54 cm I.D.
Dilution ratio (typical)	20:1
Residence time	1-3 sec

Figure 1. NEA Dilution Sampling System. 1. Nozzle, 2. Probe, 3. Hose, 4. Diluter, 5. Blower and Filter, 6. Dichotomous Sampler Inlet, 7. Dichotomous Sampler.

RESULTS OF THE EXPERIMENTS

TESTS WITH NEUTRAL PARTICLES

The results of the first series of tests, those involving the full system and neutral particles, are summarized in Table 1 and Figures 2, 3 and 4. In this series of tests, particles ranging in size from 1.3 to 17 μm were used with sampling rates of 14 and 76 l/min and gas velocities from 8 to 17 m/s. A second, isokinetic sampler, consisting simply of a nozzle and filter assembly, was operated in parallel with the NEA system to provide reference values of the true concentrations of the test aerosols for comparisons with concentrations derived from the dichotomous sampler filters.

Very low losses were measured on surfaces within the diluter body proper during this series (e.g. 0.7% at 10 μm , with similar, negligible losses found for the body at the other sizes used). However, losses in the nozzle, probe and hose were unacceptably large when the system was operated under the initial protocol specified by NEA. The protocol called for very high sampling rates (approx. 75 l/min) and a three meter hose was used to permit as much flexibility as possible in setting the equipment up in the (usually cramped) sampling areas found at industrial sites. Under these conditions, losses in the hose alone ranged from 45% to 2 μm to 99% at 15 μm as shown in Figure 2. At the 75 l/min sample flow, the Reynolds number of the flow in the hose and probe was approximately 8000, indicating that the flow would be turbulent. Because particle losses are expected to be greater under conditions of turbulent flow than in laminar flow, the sample flow was reduced to 14 l/min. At this sampling rate the Reynolds number was reduced to about 1500.

One test was made at the reduced flow using 7 μm particles as the test aerosol. Some reduction in the losses was obtained compared to the 75 l/min. value as is also shown in Figure 2. However, the reduction was not great enough to make the system useful for particle sizes larger than about three to five micrometers while satisfactory operation up to 10-15 μm as was needed to support the "Inhalable Particulate" program. The nozzle losses remained about the same as on the previous 75 l/min runs, the probe losses increased somewhat (probably from increased settling at the lower flow), and the losses in the hose declined significantly. However, losses in the hose were still unacceptably large.

Although the flow rate had been reduced, losses in the nozzle were still high, and for gas streams having velocities in the range of 20 to 40 m/s, which are commonly encountered in industrial gas streams, even larger nozzle losses would be expected to occur.^{4,5} As an example, the D_{50} of a 4.75 mm gooseneck nozzle sampling at isokinetic rates from a 40 m/s gas stream is about 1.5 μm . A right angle precollector, developed at Southern Research⁶ to minimize nozzle losses in sampling with cascade impactors, produces a moderately sharp, predictable particle cutoff diameter in the range of 10 to 15 μm at a sampling rate of 14 l/min. Thus the use of the precollector would reduce particle losses at the entry to the probe to acceptable levels under almost any sampling circumstances envisioned for the use of this system. For the conditions at which the

Table 1. Summary of MEA Dilution Sampler Calibration Data

Time	Particle Diameter, μm	Concentration, Arbitrary Units				Dilution Velocity, fpm	Dilution Stage and Type ²	MEA Sample Flowrate, fpm	Concentration Ratios				Dilution Chamber Velocity, M/S			
		True	MEA Total	MEA BUF ¹	MEA Dichro. ¹				Theoretical, MEA/True	Measured, MEA/True	MEA BUF True	MEA Dichro. True				
5/17	1	10.5	-	100.8	4.6	6.1	11	1/2 1B	76	1.00	-	-	-	0.041	0.017	2.0
5/18	2	7.0	-	30.9	4.2	4.5	11	1/2 1B	76	1.00	-	-	-	0.156	0.27	2.1
5/18	3	7.0	78.4 - 91	86.1	11.6	11.0	11	1/2 1B	76	1.00	0.95-1.18	-0.14	0.15	0.131	0.15	2.0
5/18	4	16.3	(8.5)	9.5	0.050	-	11	1/2 1B	76	1.00	(2.75)	(0.014)	-	0.001	-	2.0
5/19	5	4.5	71.9	75.7	21.6	27.0	11	1/2 1B	76	1.00	1.05	0.11	0.10	0.31	0.37	2.0
5/19	6	2.5	10.9	11.6	5.4	9.0	11	1/2 1B	76	1.00	1.06	0.56	0.83	0.50	0.78	2.0
5/20	7	7.0	139.0	128.0	20.5	-	15	1/4 1B	14	1.00	0.92	0.70	-	0.72	-	1.8
5/20	8	7.0	174.0	197.0	95.9	103.0	15	1/4 SBRA	14	1.00	1.15	0.55	0.59	0.48	0.52	1.2
5/21	9	4.5	80.9	63.4	17.4	60.0	15	1/4 SBRA	14	1.00	0.81	0.59	0.74	0.72	0.93	1.2
5/21	10	7.0	638.0	617.0	293.0	350.0	15	1/4 SBRA	14	1.00	1.41	0.67	1.71	0.48	1.12	0.2
5/22	11	1.1	2.1	2.67	2.46	1.9 - 1.0	25	1/4 SBRA	14	1.00	1.07	0.99	0.76-1.2	0.91	0.71-1.12	1.2
6/2	12	2.5	46.8	44.2	11.6	10.8	25	1/4 SBRA	14	1.00	0.94	0.89	1.04	0.93	1.10	1.2
6/2	13	0.1	10.4	84.9	20.4	-	55	1/8 PSRA	14	1.01	1.35	1.46	-	0.43	-	1.2
6/6	14	0.4	53.3	138.0	77.6	93.4	55	1/8 PSRA	14	1.82	2.96	1.46	1.75	0.49	0.59	1.2
6/9	15	0.7	53.6	138.0	40.6	35.7	50	5/16 PSRA	14	2.70	2.57	0.58	0.66	0.22	0.26	1.2
6/11	16	0.7	67.0	136.0	64.7	57.4	50	5/16 PSRA	14	2.20	2.04	0.97	0.78	0.16	0.10	1.2

¹Total flow "No vol" filter at dilution system exhaust.

²Total concentration from dichotomous sampler.

³1B = Lawrence; SBRA = Southern Research prototype right angle precollector; PSRA = flow sensor (commercial) right angle precollector.

COMMENTS

10' hose } Reynolds No. ~800 in probe and hose.

5' hose } Reynolds No. ~1500 in probe and hose.

} Non-isokinetic to bend large particle concentrations into dichotomous sampler.

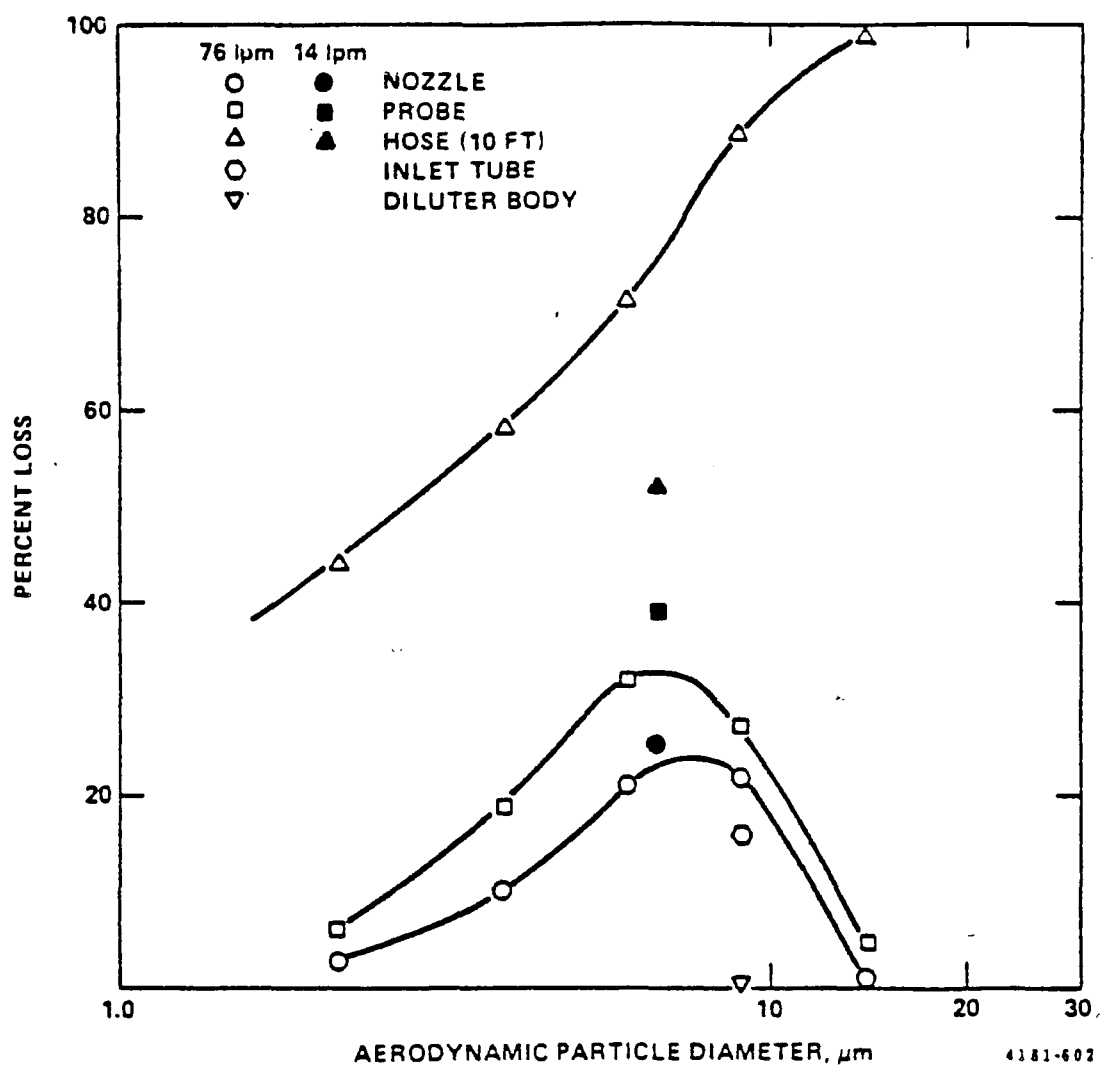


Figure 2. Percentage losses by particle size for systems components at sampling flow rates of 76 and 14 lpm using 10 foot hose.

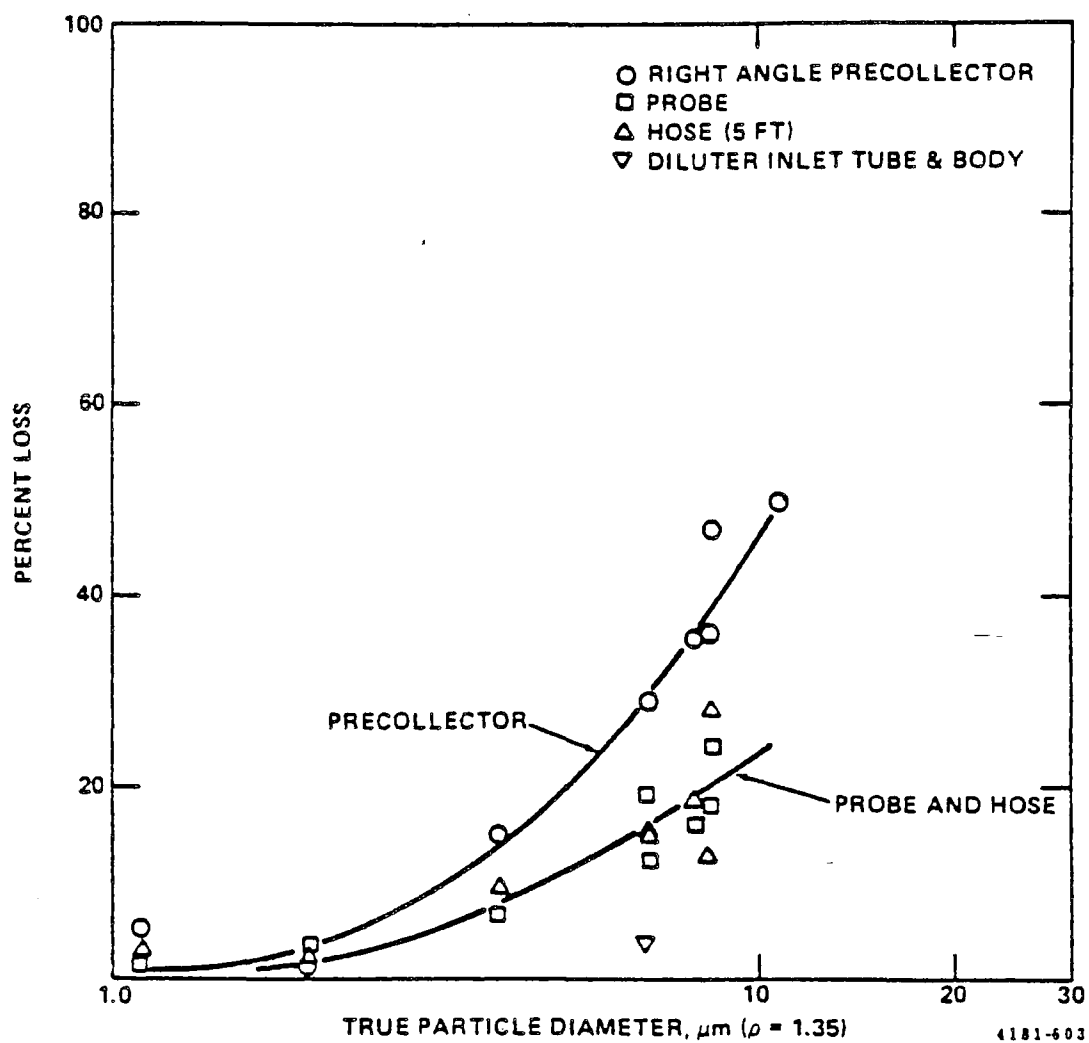


Figure 3. Percentage losses by particle size for system components at a flow rate of 14 lpm using 5 foot hose.

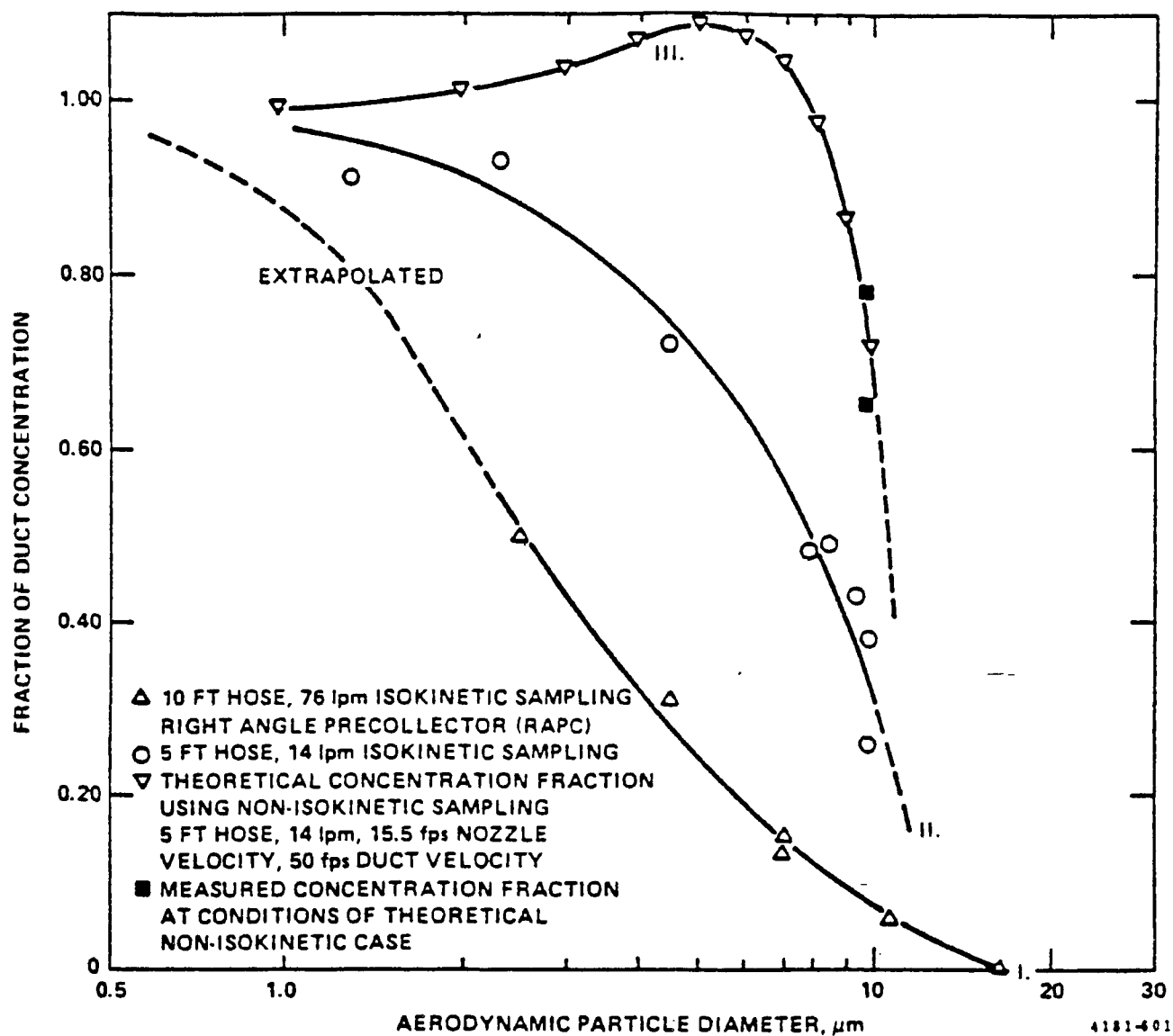


Figure 4. Fraction of duct concentration, corrected for dilution, at dichotomous sampler inlet by particle size. I. 10 foot hose, 76 lpm sampling rate isokinetic sampling. II. 5 foot hose; 14 lpm sampling rate, isokinetic sampling. III. 5 foot hose, 14 lpm sampling rate non-isokinetic sampling to compensate for losses. 5 foot probe used on all runs.

evaluation was done, the precollector D_{50} was estimated to be $12.5 \mu\text{m}$ on an aerodynamic basis. During the remainder of the evaluations the "gooseneck" nozzles were replaced with this precollector.

In order to further reduce the losses in the hose, a second hose with a slightly larger bore and a length of 1.5 m was substituted for the original (both were of the same nominal bore size and were made by the same manufacturer). Particle losses by diameter in the precollector, probe and hose when operated with the revised setup and flow rate are shown in Figure 3. By both reducing the sampling flow rate to 14 l/min., and reducing the length of the hose to 1.5 m, the losses approached acceptable levels, as illustrated in Figure 3. However, samples obtained in this fashion would have still been significantly depleted in the 5 to 10 μm interval.

The net penetration, by particle size, to the plane of the inlet of the dichotomous sampler is shown in Figure 4 for each of the test conditions and protocols previously described. By using the shorter hose, lower sampling rate, and the precollector, the overall system penetration was improved from the lower curve (I) shown in Figure 4 to the levels shown by the center curve (II). However, a large bias still existed for particles in the upper end of the size range to be covered, with losses approaching 70% at a diameter of 10 μm . At this point it appeared unlikely that any further significant reductions in the losses could be made by means of hardware modifications.

The possibility of compensating for the greater losses of larger particles by sampling at anisokinetic conditions was then investigated. If a nozzle larger than that required for isokinetic sampling at a given flow rate were used then the larger particles would be oversampled with respect to the smaller ones. Theoretical calculations of the effect of oversampling large particles through nonisokinetic sampling showed a potential for compensating for the system losses. The aspiration ratio, A , for nonisokinetic sampling as Belyaev and Levin¹ give

$$A = 1 + \left(\frac{W}{v} - 1 \right) \left(\frac{(2 + 0.62 v/W) St_w}{1 + (2 + 0.62 v/W) St_w} \right)^{-1}$$

where W = duct velocity,
 v = velocity in sampling nozzle,
 St_w = Stokes number of the nozzle, particle, duct velocity system,
 $= \frac{\rho d^2 w}{18 \eta D}$
 ρ = particle density (=1.0 for aerodynamic diameters),
 η = gas viscosity,
 d = particle diameter, and
 D = nozzle diameter.

Figure 4 also shows, as curve (III), the product of the measured penetration, curve (II), and the theoretical aspiration ratio (A) for $W = 15 \text{ m/s}$, $v = 4.65 \text{ m/s}$, and $D = .794 \text{ cm}$. The potential for loss compensation is clearly evident.

Two sample runs were made using 10 μm particles under the conditions for which curve III was calculated with results as shown in Figure 4 also. As shown

in Figure 4, the measured values fell within $\pm 10\%$ of the theoretical predictions at this particle size.

Further verification of a revised sampling protocol which incorporated the anisokinetic compensation scheme was desired; however, a requirement for immediate use of the system in a field program halted further testing for a period of several months.

RESULTS OF SAMPLING CHARGED PARTICLES

The NEA dilution sampler was returned to Southern Research for further evaluation following modifications to the system and a period of field use. Most of the modifications were related to splitting the diluted flow so that simultaneous operation of two dichotomous samplers would be possible. The primary purposes of this second round of calibrations were (1) to determine whether the introduction of additional bends and a reduction in the diameter of the diluter piping following the flow split would cause significant losses and (2) to demonstrate that the two dichotomous samplers received similar samples. A secondary goal was to evaluate the effectiveness of the anisokinetic sampling scheme suggested as a method for compensating for particle losses in the system upstream of the dichotomous sampler.

Initial tests of the modified system revealed increased losses in virtually every part of the system compared to those of the earlier tests. Very high losses were now found in the flexible hose which connects the diluter to the probe. Examination of the hose revealed that it had been overheated during a field sampling run, resulting in partial closure of the tubing and the creation of multitudinous fingerlike projections into the gas stream. At this point work was suspended until a duplicate hose could be obtained from the manufacturer.

After replacing the hose, subsequent runs produced data that showed losses that were less than those found with the bad hose but still much higher than those measured in the original evaluation. Figure 5 illustrates the data taken with the modified system. Increased losses were found in the probe, hose and diluter, including the front end of the diluter and the first bend. Except for the replacement of the damaged hose, it was presumed that none of these components had been modified since the earlier laboratory testing. Electrostatic effects were suspected since the greatest increases in the losses occurred in the non-conducting PVC and teflon portions of the train and did not seem to be related to inertial deposition in bends.

The data from calibration trials at a number of particle sizes are summarized in Table 2. Particle deposition as a percentage of the material reaching the component is plotted for the probe and hose in Figure 5. Table 2 includes the amounts of material collected by the various surfaces, the percentages of the material arriving at each part of the train that was retained by it, the sampling efficiencies of the dichotomous samplers from the diluted streams, and comparisons of the measured and theoretical biases resulting from anisokinetic sampling. Larger anisokinetic biases were intended but were not obtained because the actual flows used were higher than intended as discussed below. The dichotomous samplers were found to obtain practically identical samples at near 100% sampling efficiency from the diluted stream.

Table 2. NEA Dilution System Performance With Charged Aerosol At A Sampling Rate of Approximately 31 fpm

Run	Part. Dia. Micron	Pre-Col Catch/ % Loss	Probe Catch/ % Loss	Hose Catch/ % Loss	Diluter Catch/ % Loss	Left Dichot Catch/ % Of Theo.	Right Dichot Catch/ % Of Theo.	Filter Catch/ % Pene.	Total Catch	Probe- Pilot Delta P In. WC.	Run Time Min.	Nominal Flow LPM	Probable Flow LPM	Conc., M/A / Ref.	Conc. Ratio, Meas. / Theo.
2NEA ^a	7	46000 2.38	440000 11.19	950000 27.19	1696954 66.71	5516 75.97	4065 55.16	817062 20.77	4029697	.2	33	14.00	(14.00)	(8772)	(2.09)
2REF									1750000			12.70		4176	
3NEA ^a	7	2767500 41.98	770000 20.13	1650000 54.02	406475 28.94	28545 127.65	9410 111.19	960000 14.56	6591410	.2	38	14.00	(14.00)	(12391)	(1.52)
3REF									1700000			12.70		3523	
4NEA ^a	7	3675000 47.71	1150000 28.56	810000 28.15	496950 24.04			1570125 20.39	7702075	.2	60	14.00	(14.00)	(9169)	(1.61)
4REF									4343750			12.70		5700	
5NEA ^a	7	3240500 49.78	864000 26.43	1912500 79.53	54917 11.16			437360 6.72	6509277	.23	45	16.10	(16.00)	(3041)	(2.42)
5REF									2137500			12.70		3740	
6NEA	7	5765000 53.93	1625000 12.99	1470000 44.54	483329 26.41	15950 40.70	25990 67.11	1304812 12.71	1.069E7	.13	60	9.10	26.61	6697	1.81
6REF									2811000			12.70		3692	1.69
7NEA	7	5195000 54.69	1086750 25.25	1300000 40.40	511575 26.68	30415 74.33	36700 91.67	1139025 14.10	9499465	.2	60	14.00	33.00	4798	0.95
7REF									1562500			11.80		5012	1.27
8NEA	7	7500000 54.80	2062500 33.34	1725000 41.83	916192 38.19	41410 95.96	11750 80.45	1407800 10.29	1.169E7	.2	60	14.00	33.00	6912	1.38
8REF									1550000			11.80		5014	1.27

^aBad hose.

^bBased on probable flow.

(1) - Best estimate of uncertain value.

(Cont'd.)

Table 2 (Cont'd.)

Run	Part. Dia. Micron	Pre-Col Catch/ % Loss	Probe Catch/ % Loss	Nose Catch/ % Loss	Diluter Catch/ % Loss	Left Dichot Catch/ % Of Theo.	Right Dichot Catch/ % Of Theo.	Filter Catch/ % Pene.	Total Catch	Probe- Pilot Delta P In. WC.	Run Time Min.	Nominal Flow LPM	Probable Flow LPM	Conc. NEA ^b / REF	Conc. Ratio: Meas./ Theo.
9NEA	5	1675000 38.81	4275000 16.19	530000 23.94	124660 7.40	18240 128.42	44450 100.44	1476360 34.21	4316210	.2	60	14.00	13.00	2180	1.05 1.17
9REF									1470000			11.80		2076	
10NEA	5	2206000 43.89	750000 26.60	560000 23.06	261123 13.30	30750 84.63	31400 94.25	1184400 23.53	5025673	.2	60	14.00	33.00	2538	1.29 1.17
10REF									1395000			11.80		1970	
11NEA	5	1373950 30.92	551000 17.95	780000 30.97	239591 13.78	17425 85.78	36937 86.83	1424925 37.07	4443028	.1	60	7.00	21.33	1174	1.46 1.65
11REF									1540000			11.80		2175	
12NEA	5	1570000 44.64	563550 28.95	560000 40.48	190180 23.10	20150 109.35	20254 113.53	592825 16.86	3516959	.4	60	28.00	46.67	1256	0.88 0.91
12REF									1007500			11.80		1423	
13NEA	3	140500 11.31	52500 4.77	292500 27.88	187237 24.75	15400 92.96	15750 97.71	538168 43.33	1242055	.2	68	14.00	33.00	554	1.14 1.08
13REF									990000			11.80		486	
14NEA	1.5	64278 17.11	7950 2.55	120833 39.81	62286 34.10	4553 129.98	3550 105.33	1122747 29.88	175724	.2	80	14.00	33.00	142	1.16 1.02
14REF									115900			11.80		123	
15NEA	1.5	33975 8.34	10450 2.80	125000 34.46	41934 17.64	4214 73.94	3884 69.65	187750 46.11	407207	.2	70	14.00	33.00	176	1.47 1.02
15REF									99175			11.80		120	

^b Based on probable flow.

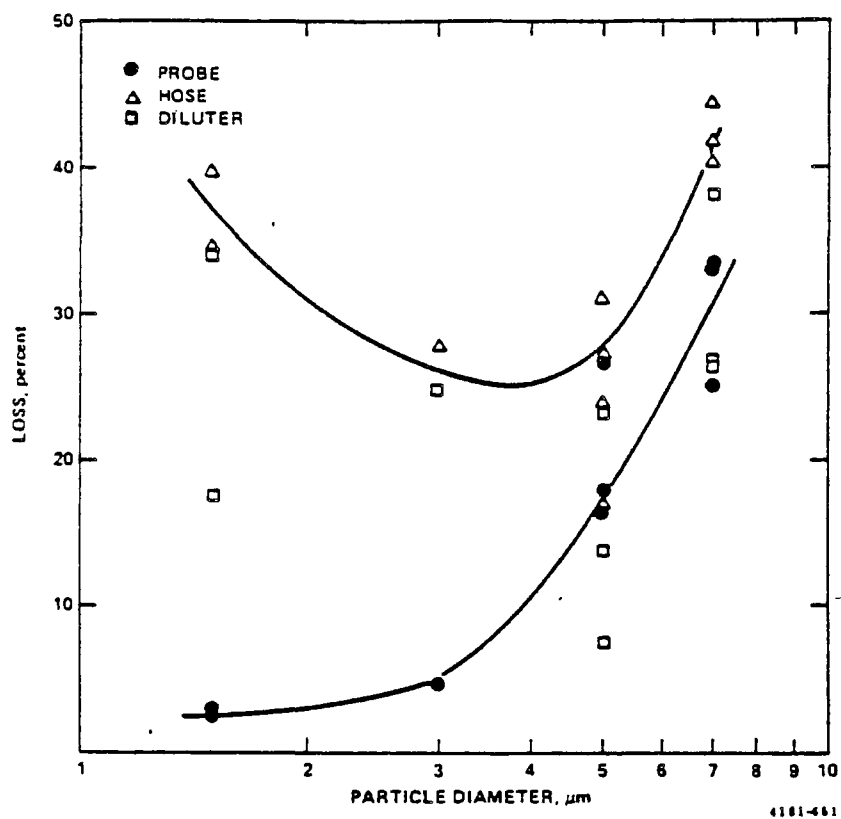


Figure 5. Probe, hose, and diluter losses by particle size for modified dilution system. Charged particles at ~33 lpm sampling rate.

At this point the diluter was returned to NEA because it was needed for a field program which they had scheduled. The replacement hose was retained and a substitute probe was fashioned from a length of stainless steel tubing of the same ID as that of the NEA probe. A series of experiments were then carried out to look into the possibility of electrostatic effects causing the increase in losses as compared to the first series of tests.

Measurements of the net charge/mass ratio showed that the particles carried a high unipolar charge at the inlet to the sampler while those which exited the hose carried no detectable net charge. A series of paired runs were then made in which tests were made with a Polonium 210 charge neutralizer mounted on the probe inlet nozzle alternating with duplicate tests without the neutralizer. The results of these tests are given in Table 3. Losses by particle size for the probe and hose, with and without charge neutralization, are shown in Figure 6. In comparing Figures 3 and 6 it is apparent that the differences in losses between the first evaluation and the second were indeed the result of electrostatic effects. The losses measured in the tests made with the charge neutralizer agree with the results from the tests of the original, unmodified diluter.

The severe charge effects in the second test series were found to have been caused by the failure of a Krypton 85 charge neutralizer which is an integral part of the aerosol generator. Evidently the tube containing the Krypton gas developed a leak in the time between the two tests, resulting in the production of a highly charged aerosol by the generator during the second test series. In addition, the original evaluation was carried out in June when the air in the laboratory was relatively moist while the second test series was done in November when the air was drier. The lower humidity may have also played a role in the charge effects.

FLOW MEASUREMENT

The tests conducted with the diluter in the second round of calibrations were all carried out with the same mechanical setup and under the same operating conditions as in the previous tests with the exception of the diluter modifications. The pitot-to-diluter pressure differential was set at the same value used in the previous tests in order to presumably reproduce the sampling flow rate that had been used in the earlier calibrations. The sampling nozzle was selected to produce an anisokinetic sampling condition which would theoretically result in over-sampling large particles by approximately the amounts required to make up for the anticipated losses in the precollector, probe and hose (approximately 2.5X at 10 μ m). A reference isokinetic sampler was run in parallel to provide data on the true particle concentrations. The results of the tests revealed that the theoretical and measured sampling biases did not agree well, contrary to previous experience. Further, too large a fraction of the particles entering the nozzle were retained by the precollector. The measured precollector efficiencies fell in line with what would have been expected for flow rates about twice those at which the system had been set up to run (approximately 33 l/min versus 14 l/min). If the higher flows indicated by the precollector performance were used in calculating concentrations, the discrepancies between the measured and predicted sampling biases largely vanished. Subsequent conversations with NEA personnel revealed that the fittings used

Table 3. Hose and Probe Losses At 14 lpm With Charged and Uncharged Particles

<u>Run.</u>	<u>Part. Dia. Micron</u>	<u>Charge Neut.</u>	<u>Pre-Col Catch/ % Loss</u>	<u>Probe Catch/ % Loss</u>	<u>Hose Catch/ % Loss</u>	<u>Filter Catch/ % Pene.</u>	<u>Total Catch</u>	<u>Run Time Min.</u>
16	5		139860 30.91	28600 9.15	117500 41.37	166500 36.80	452460	(20)
17	5		135000 19.14	54375 9.54	228384 44.27	287500 40.77	705259	38
18	5		161250 33.70	61000 19.23	93757 36.59	162500 33.96	478507	(30)
19	5		77500 19.95	38000 12.22	110383 40.45	162500 41.84	368383	30
20	5	X	177500 13.42	125000 10.91	130345 12.77	890000 67.28	1322845	50
21	5		55000 30.54	31500 25.19	31069 33.20	62500 34.71	180069	30
22	5	X	34000 8.13	37500 9.76	39238 11.32	307500 73.52	418238	30
23	5	X	105000 21.35	48000 12.41	43725 12.91	295000 59.99	491725	30
24	2	X	4160 4.69	4080 4.83	2388 2.97	73000 88.01	88628	40
25	2		15330 7.44	1820 0.95	56836 30.10	132000 64.08	205986	60
26	7	X	504000 34.40	162500 16.91	142280 17.82	656250 44.79	1465030	30
27	7		258000 36.66	51333 11.51	152525 38.66	242000 34.38	703858	(15)

() - Best estimate of uncertain value.

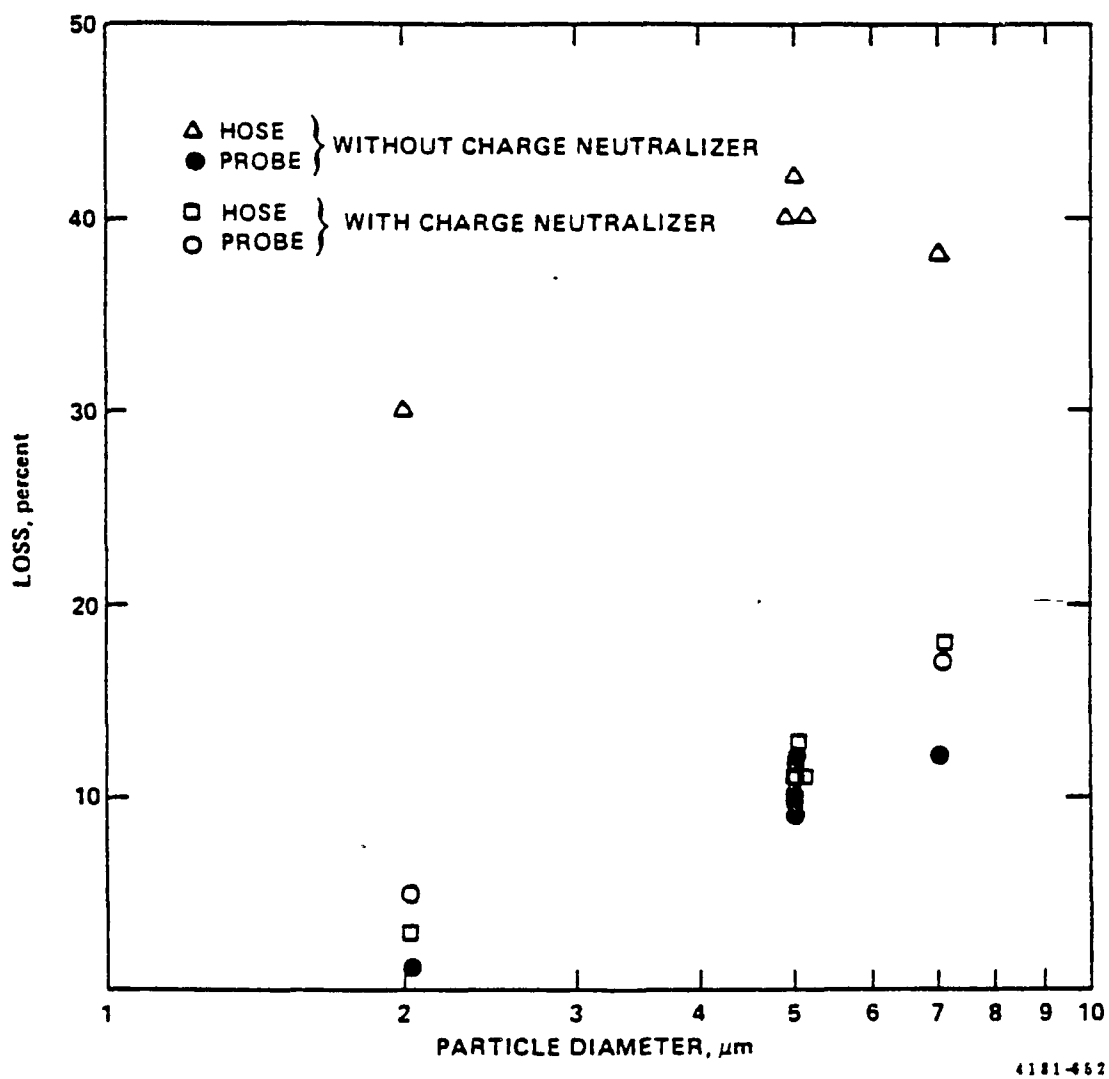


Figure 6. Probe and hose losses by particle size for charged and neutralized particles at a sampling rate of 14 lpm.

in attaching the hose to the probe and diluter had been changed in order to eliminate some minor flow restrictions. The elimination of the restrictions would have the effect of causing an increase in flow for any given probe/hose pressure drop. Attempts were made to measure the flow pressure drop characteristics of the system; however, perturbations introduced by the available calibration devices interfered too much to make the data meaningful. The operating pressure differential between the probe tip and the diluter is only about two to five mm of water. The previous flow calibrations were made using a venturi-based mass flow meter belonging to NEA which was assumed to produce no permanent pressure drop. Thus in the tests with neutral particles, the actual flows may have differed somewhat from the nominal values quoted as a result of similar, but probably smaller, errors in setting the sampling rates.

CONCLUSIONS AND RECOMMENDATIONS

The tests of the system in its original form revealed that serious biases would occur with respect to the size distribution of samples obtained with the system. Mechanical modifications were made which, together with a reduction in sample flow rate, reduced the losses substantially--but the reduction in losses was not sufficient for truly satisfactory field application. However, compensation for mechanical losses was found to be possible through oversampling of the larger particles at the probe inlet. This compensation can be achieved by sampling anisokinetically using an oversize inlet nozzle.

Reproducibility of the flow-pressure drop characteristics of the probe and hose have been found to be poor. The use of this pressure drop for setting the sample flow does not appear to be accurate or reproducible. This is particularly true in light of our experience with the damaged hose. Even in the absence of such permanent damage, minor distortions and "kinks" in the hose can result in significant flow errors. Therefore it is recommended that a venturi type flow meter be installed at the probe exit or diluter inlet so that a more reproducible and certain flow measurement can be made. Thermostatic control of the hose heater is also recommended so as to avoid the overheating problems to which the hose supplied by NEA had been subjected.

Although no solution can be suggested at present, the problem of electrostatic losses in the hose and diluter can be serious. One can certainly expect charged particles to be present when sampling the exhausts of electrostatic precipitators and it has also been noted that very high, unipolar, charge levels can be present on particles in the exhaust of a boiler, upstream of any control device.⁸ The possibility of strong, size dependent, biases in the samples obtained using the apparatus as a result of particle charge should always be considered. The data do suggest that the electrostatic deposition problems may largely be avoided if only conducting components are used throughout the system.

The diluter inlet pipe to which the hose is connected has no provision for heating. If condensibles are to be properly handled by the system, this pipe should be heated in order to avoid losses by condensation on the walls of the pipe.

The samples obtained by the two dichotomous samplers in the modified unit were found to be reasonably like one another and to fairly represent the concentrations of particles in the diluted stream. A few samples were taken of redispersed flyash in a simulated field environment using a larger wind tunnel than that used in performing the calibrations. In these runs it was noted that the particles in the larger (2-10 μm) size fraction did not adhere at all well to the membrane filter. Any slight jostling of the filters or breezes passing over them could cause much of the sample to be lost. Thus special provisions may be necessary for handling the coarse fraction filters when aerosols similar to this are sampled.

With the exceptions of the potential problems arising from electrostatic charge effects, and the possible problems related to retaining the retention of some types of particles by the filters, the system appears to provide a reasonable method for collecting samples for defining source signatures.

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APPENDIX B

DILUTION SOURCE SAMPLER (DSS)

Standard Operating Procedure

1. Measure stack gas velocity at point of sample collection with a pitot tube/manometer system.
2. Measure stack temperature at point of sample collection with a bi-metal thermometer or other temperature measuring device.
3. Estimate gas viscosity using the empirical equation:

$$\eta \approx \frac{T^{3/2}}{0.068T + 7.8},$$

where η is in micropoises.

4. Calculate the Stokes number for the available sampling nozzle diameters by the equation:

$$St_w = \frac{\rho d^2 w}{18 \eta D},$$

where St_w is the Stokes number,

ρ is the particle density ($\rho=1 \text{ g/cm}^3$ since aerodynamic diameters have been used in the calibration tests and calculations),

η is gas viscosity,

d is the particle diameter (10 μ for this calculation),

D is the nozzle diameter (1/8", 3/16", 1/4", 5/16", 3/8"),
and

w is the stack velocity.

5. Referring to Table A-1, obtain the sampling nozzle linear velocity corresponding to the volumetric velocity of 14 lpm for each sampling nozzle diameter. (Approximately 14 lpm is required to maintain the correct 10 μ cut-point in the preseparator.)

TABLE A-1. LINEAR VELOCITIES AND PRESSURE DIFFERENTIALS CORRESPONDING
TO VOLUMETRIC FLOWS AND NOZZLE DIAMETERS

Nozzle Diameter (inches)	12 lpm			14 lpm			16 lpm		
	MPS	FPM	$\Delta P(1n)$	MPS	FPM	$\Delta P(1n)$	MPS	FPM	$\Delta P(1n)$
1/8	25.1	4940	1.6	29.2	5746	1.95	33.6	6612	2.6
3/16	11.2	2204	0.80	13.1	2578	1.15	15.0	2952	1.35
1/4	6.33	1246	0.27	7.37	1450	0.40	8.44	1661	0.52
5/16	4.04	795	0.20	4.71	927	0.25	5.39	1061	0.30
3/8	2.81	553	0.15	3.27	643	0.17	3.75	738	0.22

6. Calculate the aspiration ratio for each nozzle using the following equation:

$$A = 1 + \left(\frac{w}{v} - 1 \right) \left(\frac{(2 + 0.62 v/w) St_w}{1 + (2 + 0.62 v/w) St_w} \right),$$

where A is the aspiration ratio. An aspiration ratio of 2.2 has been determined to provide the best non-isokinetic sampling velocity to oversample larger particles and compensate for their potential loss in the dilution sampling system,

w is the stack velocity,

v is the nozzle velocity, and

St_w is the Stokes number.

7. Select the nozzle diameter which best approximates an aspiration ratio of 2.2 at 14 lpm. A compromise between the preseparator cut-point and the aspiration ratio may be necessary. The linear velocity of the sampling nozzles at 12 and 16 lpm are given in Table A-1 should a minor adjustment in the experimental aspiration ratio be required.
8. Install correct sampling nozzle as determined from steps 1-7 and install a dichotomous inlet pipe to provide internal isokinetic conditions (17mm ID for 1.2 m/sec). Record nozzle and inlet pipe diameters chosen.
- 9.. Assemble pre-cleaned dilution sampling chamber.
10. Connect total stack pressure sensor to probe.
11. Insert probe and pressure sensor into stack a measured distance from the stack wall. Record distance and identify port (e.g., south port).
12. Plug in probe, connecting hose and inlet pipe heating tapes. Allow a minimum of 15 minutes warm-up time prior to sampling.
13. Install a clean glass fiber filter into the inlet 8" x 10" filter housing. Install a clean, preweighed numbered quartz filter into the outlet 8" x 10" filter housing. Record the quartz filter number.
14. Install 37 mm filters into dichotomous sampler units. Record filter numbers. Return numbered petri dish containers to filter field transport box.
15. Refer to Table A-1 to select correct pressure drop for the desired nozzle flow rate.

16. Simultaneously adjust the pressure drop between the dilution chamber and the stack and the total gas flow within the dilution chamber with variable transformers connected to an inlet blower and an outlet (vacuum) blower. The pressure drop is given by the equation:

$$\Delta P = P_{s,s} + \frac{1}{2} \rho_s V_s^2 - P_{d,s},$$

where, $P_{s,s}$ is the static pressure within the stack,
 ρ_s is the density of gas within the stack,
 V_s is the linear velocity of gas within the stack, and
 $P_{d,s}$ is the static pressure within the dilution chamber.

Adjust the linear velocity within the 4 inch (10.2 cm) dilution chamber to 1.2 m/sec which corresponds to a dilution ratio of approximately 42:1 with a stack sampling velocity of 14 lpm.

17. Turn-on dichotomous samplers. Adjust the total flow to 16.7 lpm and the coarse flow to 1.67 lpm using previously calibrated rotometers. Note start time on dichotomous sampler timers.
18. Readjust the pressure drop and dilution chamber gas flow described in step 16 after dichotomous samplers are running.
19. Disconnect thermal anemometer and install plug.
20. After 15 minutes of sampling time, measure the ambient temperature, dilution chamber temperature and re-measure stack temperature. Record temperature data. Re-install thermal anemometer and adjust the pressure drop and the dilution chamber flow if necessary. Disconnect thermal anemometer and install plug.
21. Estimate sampling duration from previous data on stack particulate loading, the experimental sampling dilution ratio and the mass of particles which is desired to be collected. The desired mass for Teflon and quartz filters is between 0.5 and 2 mg and for Nuclepore filters between 0.3 and 0.8 mg.
22. Visually inspect dichotomous filters intermittently to estimate the amount of mass collected and to estimate the length of time which sampling shall continue. Also readjust flow rates if necessary at these intermittent inspections.
23. When sufficient sample is collected, measure and record the pressure drop between the dilution chamber and stack, the velocity in the dilution chamber and the dichotomous sampler rotometer readings. Then turn off dichotomous samplers and immediately replace loaded filters into their original labeled petri dish containers. Record dichotomous sampler timer readings. Measure and record ambient, in-stack and dilution chamber temperatures. Record stop time.

24. Three replicate sample runs will be made of each filter loading configuration. Filter loading configuration A will have Teflon filters for collection of both fine and coarse particles in one dichotomous sampler and quartz filters for collection of both fine and coarse particles in the other. Filter loading configuration B will have Teflon filters for collection of both fine and coarse particles in one dichotomous sampler and a Teflon filter for collection of fine particles and a Nuclepore filter for collection of coarse particles on the other.
25. After all runs are completed at a given stack, the 8" x 10" quartz outlet filter will be removed, folded and placed into its glassine-lined, numbered envelope and the dilution chamber will be dismantled, returned to the staging area and thoroughly cleaned prior to subsequent use.

NEA, INC
DILUTION SAMPLING FIELD DATA SHEET

Start

Dichotomous Sampler (R) Serial # ΔP (dilution chamber--stack) _____
timer reading _____ Inner velocity dilution chamber _____

Dichotomous Sampler (L) Serial # Distance inlet from stack wall _____
timer reading _____ Sample port description _____

Start time _____

Stack temperature _____

Stack velocity _____ (calculations on reverse side)

Dichotomous Sampler (R) Rotometer Readings
total _____ coarse _____

Dichotomous Sampler (L) Rotometer Readings
total _____ coarse _____

Dichotomous Sampler (R) filter ID's, Filter type
fine _____ coarse _____ fine _____ coarse _____

Dichotomous Sampler (L) filter ID's, Filter type
fine _____ coarse _____ fine _____ coarse _____

Outlet Quartz 8" x 10" filter ID

Inlet nozzle diameter _____ Inlet nozzle linear velocity _____

Inlet nozzle volumetric velocity _____ Aspiration ratio _____

Dichotomous Sample inlet ID _____

Comments:

15 Minutes after Start-up and Intermittent Inspection

Time _____

Stack temperature _____

Ambient temperature _____

Dilution chamber temperature _____

Intermittent inspection--comments (include time)

Stop

Dichotomous Sample (R)
timer reading _____

ΔP (dilution chamber--stack) _____

Dichotomous Sample (L)
timer reading _____

Linear velocity dilution chamber _____

Ambient temperature _____

Stop time _____

Dilution chamber temperature _____

Stack temperature _____

Dichotomous Sample (R) Rotometer Readings
total _____ coarse _____

Dichotomous Sample (R) Rotameter Readings
total _____ coarse _____

Comments:

APPENDIX C

STANDARD OPERATING PROCEDURE ENERGY DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF AIR FILTERS

1. General Discussion

1. Analytical problem: Analysis of aerosols deposited on membrane type filters for the elements listed in Table A-2. Typical atmospheric concentrations and ranges are indicated in Figure A-4.
2. Principle: Atoms in the sample are excited from their ground state to higher energy levels by x-radiation from an X-ray tube. These excited atoms emit discrete energy X-rays as they return to their normal ground state energy level. The energy of these emitted X-rays is characteristic of the emitting element and is used to qualitatively identify the element while the number of observed X-rays, which is proportional to the number of atoms, is used to quantitatively determine a specific element's concentration through a direct comparison with standards.
3. Interferences: There are a number of potential spectral interferences possible with EDXRF because of its low resolution relative to the number and spacing of possible X-ray lines. The elements subject to potential spectral interferences in normal ambient aerosols, along with the corresponding interfering elements and correction factors are listed in Table A-3. Correction factors, F_{im} , are determined by analyzing single element standards of elements i and applying the formulas

$$F_{im} = \frac{N_m}{N_i}$$

where F_{im} = the fraction of counts due to element i that interfere with the counts for element m

N_m = background subtracted counts in region of interest m

N_i = background subtracted counts in region of interest i

(Rev. August, 1981)

TABLE A-2. X-RAY FLUORESCENCE
MINIMUM DETECTABLE CONCENTRATIONS*
(ng/cm²)
STANDARD ANALYSES†

Element	1	2	3	4	5**
Al	42	30	30	18	10
Si	35	24	18	12	8
P	45	30	23	15	10
S	140	90	70	47	30
Cl	90	60	45	32	20
K	30	20	15	11	6
Ca	30	20	15	11	6
Ti	10	6	5	3	2
V	6	4	3	2	1
Cr	6	4	3	2	1
Mn	9	6	5	3	1
Fe	12	8	6	4	2
Ni	10	6	5	3	1
Cu	10	6	5	3	1
Zn	10	6	5	3	1
Ga	8	6	4	3	1
As	8	6	4	3	1
Se	8	6	4	3	1
Br	12	8	6	4	2
Rb	20	14	10	7	4
Sr	20	14	10	8	4
Y	40	30	22	15	8
Zr	160	120	84	60	30
Pd	45	30	22	15	8
Ag	70	48	34	24	12
Cd	70	50	36	25	14
In	90	60	44	30	15
Sn	90	60	44	30	15
Sb	90	60	44	30	15
Ba	500	360	260	180	100
La	500	360	260	180	100
Hg	20	16	11	8	4
Pb	25	20	14	10	5

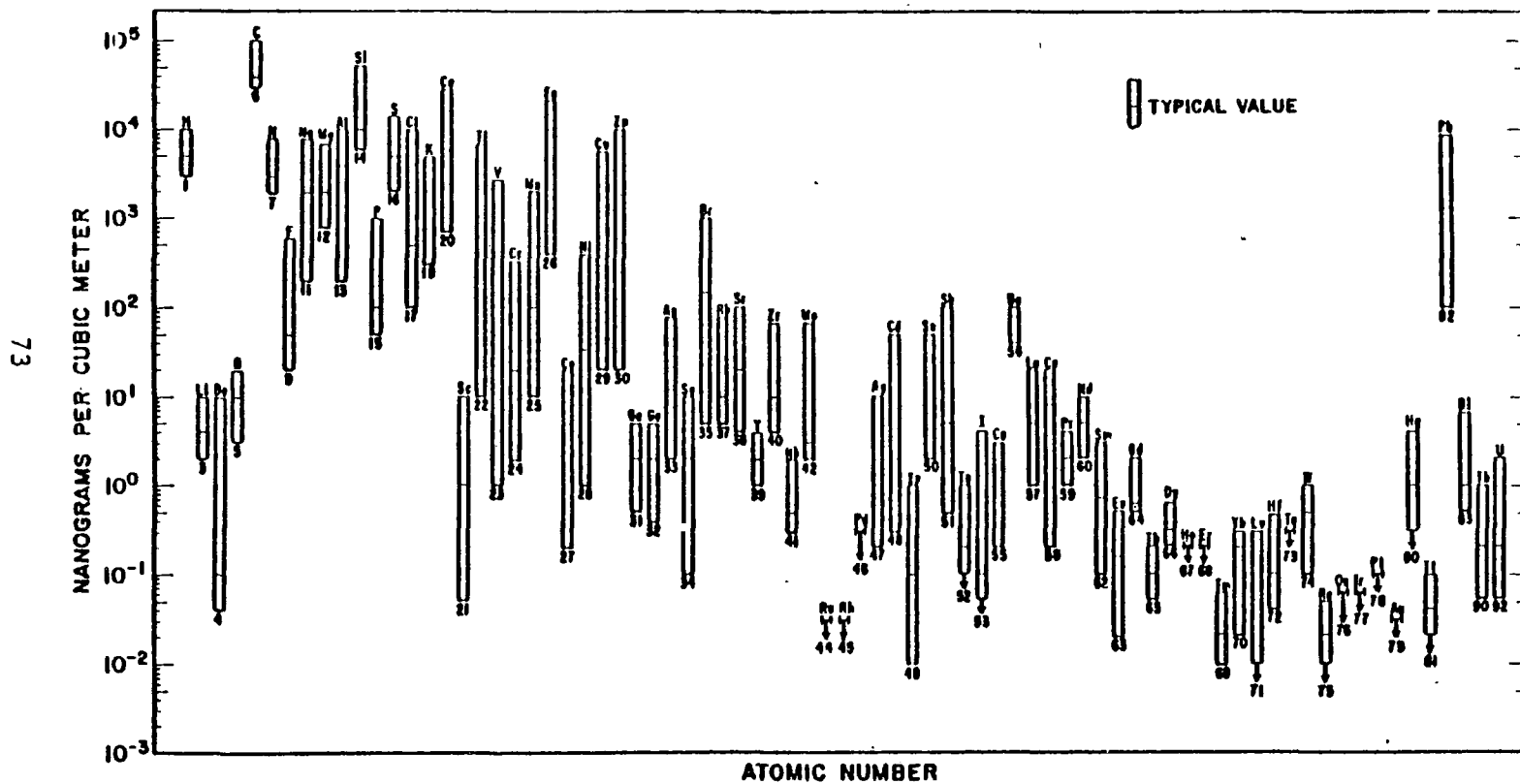
* Three sigma interference-free MDC for particulates deposited on filters with 1 mg/cm² densities such as Nuclepore and some cellulose and teflon filters MDC ~ (time)^{-1/2} (filter density)^{1/2}

** For stretched teflon filters

† Custom analysis for specific elements at special MDC's available upon request.

(Rev. August, 1981)

FIGURE A-4 URBAN AEROSOL TRACE ELEMENT RANGES AND TYPICAL VALUES



(Rev. August, 1961)

TABLE A-3. Potential Spectral Interferences

Element of Interest			Element of Interest			F_{im}
Element	Excitation Condition	Line	Element	Excitation Condition	Line	
Mg	2	K α	Br	1	L α	0.0098 $\pm$ 0.0003
Al	2	K α	Br	1	L α	0.176 $\pm$ 0.001
Al	2	K α	K	2	escape	0.0047 $\pm$ 0.0005
Si	2	K α	Br	1	L α	0.0028 $\pm$ 0.0003
Si	2	K α	Sr	1	L α	0.285 $\pm$ 0.002
P	2	K α	Ca	2	escape	0.0137 $\pm$ 0.0009
K	2	K α	Ca	2	K α	0.0121 $\pm$ 0.0008
K	2	K α	Cd	1	L β	1.116 $\pm$ 0.006
Ca	2	K α	K	2	K β	0.0309 $\pm$ 0.0008
S	3	K α	Pb	3	M	0.19 $\pm$ 0.02
Cl	3	K α	S	3	K α	0.026 $\pm$ 0.005
Cl	3	K α	Pb	3	M	0.073 $\pm$ 0.002
K	3	K α	Cd	1	L β	0.401 $\pm$ 0.003
Ca	3	K α	K	3	K β	0.070 $\pm$ 0.002
Ti	3	K α	Ba	1	L α	4.52 $\pm$ 0.04
V	3	K α	Ba	1	L β	2.38 $\pm$ 0.02
V	3	K α	Ti	3	K β	0.127 $\pm$ 0.002
Cr	3	K α	V	3	K β	0.132 $\pm$ 0.002
Mn	3	K α	Cr	3	K β	0.130 $\pm$ 0.001
Fe	3	K α	Mn	3	K β	0.116 $\pm$ 0.001
As	3	K α	Pb	3	L α	1.11 $\pm$ 0.01
Br	3	K α	Pb	3	L β	0.014 $\pm$ 0.001
Cu	1	K α	Ni	1	K β	0.065 $\pm$ 0.002
Zn	1	K α	Cu	1	K β	0.0376 $\pm$ 0.0006
Ga	1	K α	Zn	1	K β	0.0149 $\pm$ 0.0004
Ga	1	K α	Pb	1	L α	0.060 $\pm$ 0.001
Hg	1	L α	Pb	1	L α	0.0033 $\pm$ 0.0002
Hg	1	L α	Br	1	K α	0.00063 $\pm$ 0.00006
As	1	K α	Pb	1	L α	1.196 $\pm$ 0.005
Se	1	K α	Pb	1	L α	0.0076 $\pm$ 0.0004
Br	1	K α	Pb	1	L β	0.0140 $\pm$ 0.0005
Se	1	K α	Br	1	K α	0.0012 $\pm$ 0.0001
Rb	1	K α	Br	1	K β	0.156 $\pm$ 0.001
Rb	1	K α	Pb	1	L β	0.0107 $\pm$ 0.0004
Sr	1	K α	Pb	1	L γ	0.0073 $\pm$ 0.0007
Sr	1	K α	Br	1	K β	0.0008 $\pm$ 0.0002
Y	1	K α	Rb	1	K β	0.170 $\pm$ 0.001
Y	1	K α	Pb	1	L γ	0.121 $\pm$ 0.002
Y	1	K α	Br	1	K β	0.0008 $\pm$ 0.0002
Y	1	K α	Sr	1	K β	0.0025 $\pm$ 0.0003
Zr	1	K α	Sr	1	K β	0.166 $\pm$ 0.001
Zr	1	K α	Pb	1	L γ	0.0088 $\pm$ 0.0009
Zr	1	K α	Br	1	K β	0.0009 $\pm$ 0.0003
Sb	1	K α	Cd	1	K β	0.0245 $\pm$ 0.0008

(Rev. August, 1981)

and

$$\sigma F_{im} = \left[\left(\frac{\sigma N_m}{N_m} \right)^2 + \left(\frac{\sigma N_i}{N_i} \right)^2 \right]^{1/2}$$

where σF_{im} = uncertainty in F_{im}

σN_m = uncertainty in N_m

σN_i = uncertainty in N_i

Samples exhibiting chemical composition uncharacteristic of normal ambient aerosols may require additional corrections.

4. Minimum Detectable Concentrations (MDC) on filters are determined by the formula

$$MDC_i = 3 \sqrt{B_i \frac{M_i}{N_i}}$$

where

MDC_i = the minimum detectable concentration of element-i

M_i = known concentration of element i

N_i = Net number of counts measured when element i is analyzed under standard conditions

B_i = Number of background counts subtracted from total counts in region of interest i to obtain N_i .

Table A-2 lists MDC's for 5 standard analysis conditions.

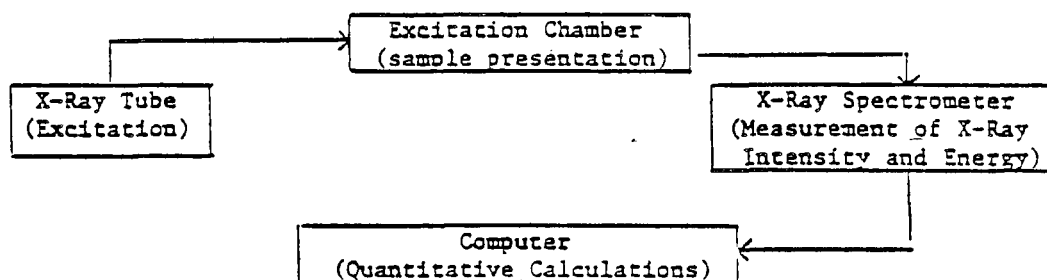
5. Background Subtraction: Most of the background counts in a region of interest are due to the scattering of primary radiation from the sample. The amount of this scattering depends upon the mass of the sample presented to the primary excitation beam. A blank filter is run under each excitation condition and the background in each region of interest is linearly related to a high energy incoherent scatter peak due to the primary radiation. The same scatter peak is monitored on all loaded samples and the linear relationship is used to estimate the background in the analyte line region of interest.

(Rev. August, 1981)

6. Precision and Accuracy: Count variations of less than 1% are typical over 24 hour periods. Figure A-5 shows the variability of the QC filter for the analysis of 630 filters over a period of 2 months ($< \pm 1.5\%$). All results are reproducible to within 1% when counting statistics are not the primary source of uncertainty. The accuracy in terms of the deposit on the filter is primarily limited by the uncertainties in the standard values which are typically 5%. Errors in the absorption corrections for the low atomic number elements ($Z < 20$) may approach the same order of magnitude as sampling errors.

2. Apparatus

The x-ray fluorescence analyzer used for the analysis is an Ortec TEFA III system. A block diagram of its major components is shown below:

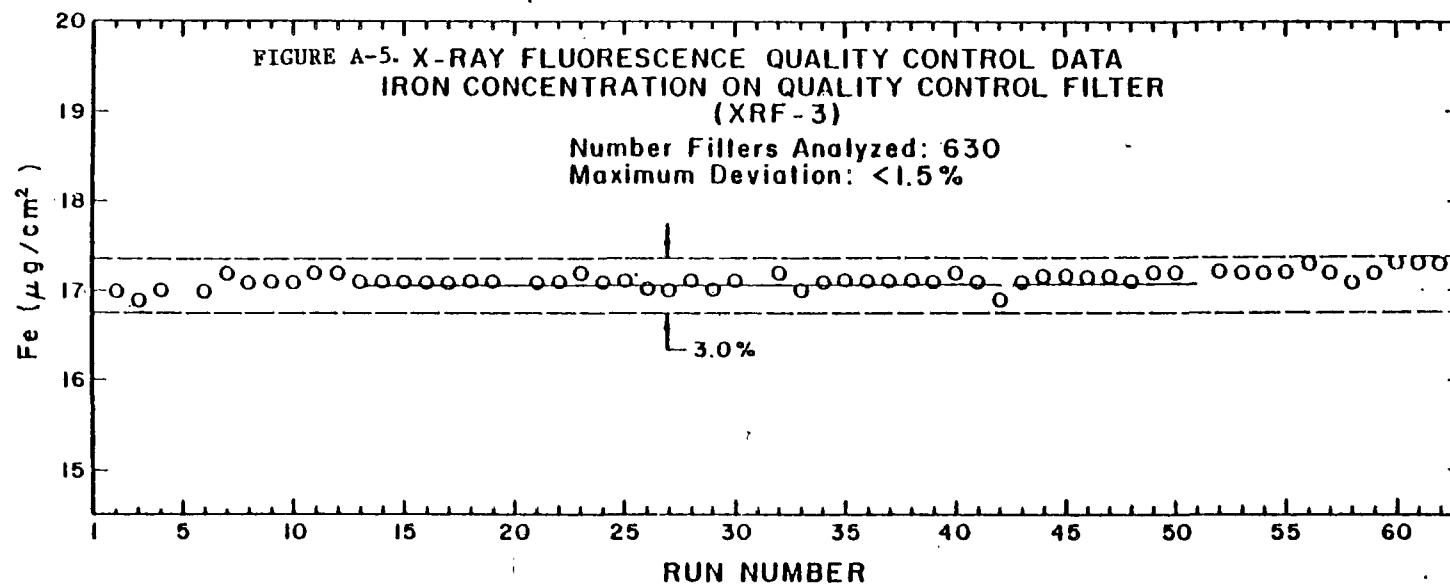


The primary function of the excitation system is to generate inner shell electron vacancies which result in the emission of x-rays characteristic of the sample elements. The TEFA system has a dual anode Mo/W x-ray tube. Mo and Cu primary x-ray filters can be used to obtain monochromatic excitation.

Air filters are presented to the excitation radiation and spectrometer in an evacuated excitation chamber.

The x-ray spectrometer consists of a Si(Li) x-ray detector amplifier and pulse height analyzer which measures the energy and intensity of the characteristic x-rays generated in the above excitation procedure.

(Rev. August, 1981)



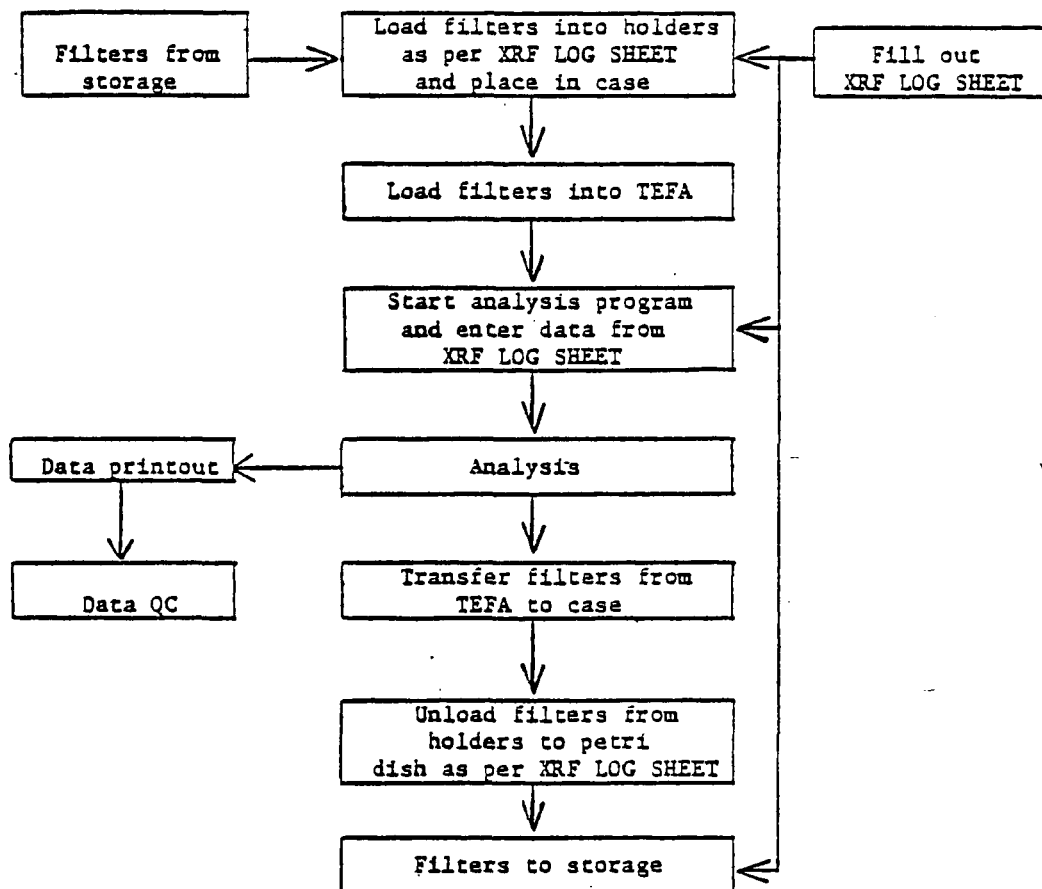
3. Calibration

The instrument is calibrated with single element thin film vapor deposited standards obtained from Micromatter Co., Eastsound, WA., and with multielement solution deposited standards obtained from Columbia Scientific Industries, Austin, TX. Particle standards obtained from Columbia Scientific Industries are used for Al and Si calibration. Plots of instrument response versus atomic number should yield smooth curves, and are used to validate standard concentrations. The surface concentration relevant to a specific excitation condition for each standard element is listed in the Standards Notebook. The standards are kept permanently mounted in clean, closed containers and are labelled with an ID number.

Standard concentration values are entered into the computer and stored on floppy disk by the ORACL program MAKSTD. The instrument is then calibrated by proceeding with a normal run, and using an "S" prefix for each of the standard ID numbers. Details of software usage are in the TEFA Software Notebook. Calibration should be performed only by supervisory personnel.

(Rev. August, 1981)

4. Flowchart Summary



(Rev. August, 1981)

5. Operating Procedure

The TEFA operating manual should be reviewed before operating the instrument. One should be familiar with the hazards of incorrect operation and the safety systems of the TEFA. Only designated personnel should operate the instrument and no procedures other than the ones described here should be performed unless instructed otherwise by the laboratory supervisor.

5.1 TEFA Start-up

1. Obtain TEFA key from the standards cabinet and switch CONTROL POWER to ON.
2. Press the SYSTEM POWER ON button.
3. Obtain the XR program disk from storage and insert in drive 0 (left hand drive).
4. Press the PWR button on the EEDS II control panel.
5. Adjust the MARKER joystick so that elapsed time is displayed on the CRT.
6. Turn on the printer, set to ON LINE, and switch to 8 LPI. Advance paper to top of page using the FORM ALIGN controls.
7. Press HV1 on the EEDS II control panel.
8. Press the DATA ENTRY X-RAYS button. A data parameter is selected by first pressing the RETURN key until the cursor is opposite the desired parameter, then pressing the space bar. Valid entries are displayed on the CRT. Set TUBE VOLTAGE to 5.0 Kv and TRAY SIZE to 12.
9. Press the SYSTEM CONTROL STANDBY button. Make sure the excitation chamber cover is closed.
10. After waiting 3 minutes, press the SYSTEM CONTROL ON button. This turns on the x-rays. The 3 red X-RAYS ON lights in the RADIATION section will come on, the green X-RAYS OFF light will go out, X-RAYS ON will flash on the CRT and the red X-RAYS ON light in the SYSTEM CONTROL section will flash. The excitation chamber cover must remain closed whenever the x-rays are being produced.
11. The TEFA should be allowed to warm up for 30 minutes before beginning analysis.

5.2 Filter Loading

1. Fill out an XRF LOG (Figure A-6) with PROJECT NAME, INITIAL, ID numbers and particle size codes (S). If there are also customer ID numbers, record them in the comments column. ID numbers and particle size codes are obtained from the sample LOG Book. Record the date in the XRF column in the Sample Log Book for all samples loaded. All 12 positions need not be filled. Position 1 must be a blank of the same type and preferably the same manufacturing lot as the filters to be analyzed. The blank ID must begin with "B". The last position must be a quality control standard. Obtain its ID number from the laboratory supervisor.

(Rev. August, 1981)

FIGURE A-6. XRF LOG

PROJECT NAME _____
 DATA DISK _____
 DATE _____
 TIME _____
 ANALYSIS SEQUENCE _____

INITIAL:

LOAD _____ ANALYZE _____ UNLOAD _____ QA _____

POSITION	ID					S	COMMENTS
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

2. Filter loading is done in the laminar flow hood. Turn the hood blower and lights on and clean the work surface with a Kaydry towel and methanol. Lay out a Kaydry towel in the hood. Clean a pair of forceps and the filter loading block with Kimwipes and methanol and place on the towel. Clean an XRF sample case inside and out and place in the hood. Obtain the filters to be analyzed from the sample storage cabinet. Place the filters to be loaded, a set of numbered filter holders, a box of Kimwipes, a methanol container, the XRF LOG and a pen in the hood. The filter containers should be labelled with their ID numbers.
3. Clean the filter holders with Kimwipes and methanol. Pay particular attention to surfaces which the filters will contact. Wear disposable gloves to avoid excess contact with methanol. When finished cleaning the filter holders, remove gloves and rinse hands if gloves are of the calced variety.
4. Select filter holder 1, place on the filter loading block, and remove the retaining ring. If the blank has already been loaded from a previous run, select filter holder 2 instead of 1.
5. Select the filter whose position number as indicated on the XRF LOG corresponds to the filter holder. Note the condition of the filter and record any comments on the XRF LOG that may apply to XRF analysis such as uneven deposit, wrinkled filter, water spot on filter, etc. Filters with loose deposits should not be analyzed.
6. Remove the filter from its container and place deposit side down in the filter holder. Use forceps and handle the filter only around its perimeter. If the deposit is touched by the forceps, clean them before proceeding.
7. Replace the retaining ring so that the filter is held in place -- without any wrinkles or other misalignment.
8. Place the numbered filter holder into the like numbered location in the sample case and the filter container in the proper numbered location in the filter container tray. The blank filter holder and container can both be placed in the large section of the filter container tray.
9. Repeat steps 4-8 for the remaining filters. The quality control standard is permanently loaded and is not put into the sample case.
10. Verify that the sample ID number to position number relationship is correct. Each filter holder number must match its position number in the sample case. The ID number on each filter container must correspond to its position in the filter container tray exactly as on the XRF LOG.
11. Place the filter container tray on top of the filter holders in the sample case, put the XRF LOG in the sample case, and transfer to the TEFA.
12. Clean up the laminar flow hood.

(Rev. August, 1981)

5.3 Analyzing Filters

1. Verify that TUBE VOLTAGE is 5.0 Kv and TUBE CURRENT is 1 μ amp. Press the SYSTEM CONTROL STANDBY button. Make certain the red X-RAYS ON lights are out and the green X-RAYS OFF light is on. Never open the excitation chamber cover unless this is the case.
2. Lift the excitation chamber cover to its open position.
3. Open the sample case and place the filter container tray in the lid.
4. Transfer each filter holder in sequence to the like numbered position in the TEFA sample tray. Make sure the seating is proper by rotating the filter holder and align the holder so that its indicating line points toward the center of the tray. Close the sample case. If the standard is not already in position, obtain it from the standard cabinet and place in position on the sample tray.
5. Verify that all samples are correctly loaded in their designated positions on the sample tray.
6. Make sure the excitation chamber gasket is properly seated and close the cover.
7. Push the X-RAY PATH PUMP button. The pump will quiet down after 10-20 seconds if the chamber is properly sealed.
8. Press the SYSTEM CONTROL ON button. The red X-RAYS ON lights will come on and the green X-RAYS OFF light will go out.
9. Select a formatted, zeroed disk and write the PROJECT NAME on the disk label. Use a felt tipped pen. Record the data disk number on the XRF LOG, as well as INITIAL, DATE, TIME, and ANALYSIS SEQUENCE. Obtain the analysis sequence number from the laboratory supervisor. Insert the data disk into drive 1 (right hand side).
10. Record the date, project, initial, and data disk number in the TEFA Log Book.
11. Press the DATA ENTRY X-RAYS button to return to spectrum mode, then press OPERATING MODE TERMINAL. Type "C" while holding down the CTRL key. Type R ORACL <RETURN>. Type RUN XR <RETURN>. Enter data as requested by the program and displayed on the CRT. If there are less than 12 samples, simply press return when asked for the next sample. Before verifying the particle size codes, check to see that the X-RAY PATH VACUUM READY light is on. Sample analysis begins when the particle size codes are verified and proceeds automatically from sample to sample for each excitation condition.
12. When analysis is complete, indicated by 5 beeps, press the DATA ENTRY X-RAYS button and verify that tube voltage is 5.0 Kv and tube current is 1 μ amp. Press the X-RAY PATH OFF and SYSTEM CONTROL STANDBY buttons. The green X-RAYS OFF light should come on and the red X-RAYS ON lights should go out.

(Rev. August, 1981)

13. Remove the data disk and place in storage. Advance the printout to top of the page and give printout to laboratory supervisor for review.
14. When excitation chamber has reached room pressure, check that red X-RAYS ON lights are out and green X-RAYS OFF light is on, and open chamber cover.
15. Transfer in sequence each filter holder from the TEFA sample tray to its like numbered position in the sample case. If the next run will use the same blank and/or quality control standard, they may be left in the sample tray. Otherwise return the blank to the sample case and the standard to its container in the standards cabinet.
16. Close the excitation chamber cover, place the XRF LOG in the sample case and transfer to the laminar flow hood for unloading.

5.4 Unloading Filters

1. Filter unloading is done in the laminar flow hood. Turn on the hood blower and lights and clean the work surface with a Kaydry towel and methanol. Lay out a Kaydry towel in the hood. Clean a pair of forceps and the filter loading block with Kimwipes and methanol and place on the towel. Place the sample case in the hood. Record your initial on the XRF LOG.
2. Select a filter holder and the corresponding filter container from the sample case. Check that the sample ID matches position number exactly as on the XRF LOG. Place the filter holder on the loading block and the filter container next to it.
3. Remove the retaining ring and transfer the filter to its container. Usually it is easiest to hold the filter holder over the open filter container and carefully invert the filter holder so that the filter drops deposit side up into its container. Sometimes use of the forceps is necessary. Replace the filter container lid and set aside. Set the filter holder aside.
4. Repeat steps 2 and 3 for the remaining filters.
5. Return the filters to the sample storage cabinet, the filter holders to the standards cabinet and the XRF LOG to the laboratory supervisor.
6. Clean up the laminar flow hood.

5.5 TEFA Shutdown

1. Verify that tube voltage is 5.0 Kv, and tube current is 1 uamp.
2. Press the SYSTEM CONTROL STANDBY and then SYSTEM CONTROL OFF buttons.
3. Press HV1 on the EEDS II control panel to turn off the high voltage.

(Rev. August, 1981)

4. Turn off the printer.
5. Press the PWR button on the EEDS II control panel to turn off power.
6. Press the SYSTEM POWER OFF button.
7. Switch CONTROL POWER to OFF and place key in the standards cabinet.
8. Return the XR program disk to storage, and close the disk drive doors.

6. Calculations

The count rate, I_i , of x-ray photon events from element i measured by the Si (Li) detector is proportional to the mass of element i , M_i , times an attenuation factor, A_i , which takes into consideration the absorption of the primary excitation and characteristic x-rays in the sample.

That is,

$$I_i = K_i M_i A_i \quad (1)$$

where K_i is a proportionality constant. An unknown mass, M_i , may be determined by comparing the count rate measured for the unknown with the count rate, I_i^s , measured with a known standard mass M_i^s .

$$M_i = \frac{I_i C_i}{A_i} \quad (2)$$

where C_i is a calibration factor,

$$C_i = \frac{A_i^s M_i^s}{I_i^s} \quad (3)$$

The uncertainties in M_i and C_i are given by

$$\sigma M_i = M_i \left[\left(\frac{\sigma C_i}{C_i} \right)^2 + \left(\frac{\sigma I_i}{I_i} \right)^2 \right]^{1/2} \quad (4)$$

and

$$\sigma C_i = C_i \left[\left(\frac{\sigma M_i^s}{M_i^s} \right)^2 + \left(\frac{\sigma I_i^s}{I_i^s} \right)^2 \right]^{1/2} \quad (5)$$

$$\frac{\sigma M_i^s}{M_i^s} = 0.05 \text{ per manufacturers specifications.}$$

(Rev. August, 1981)

Attenuation factors for elements of atomic number <15 can be substantial. A_i^s is corrected for by using particle size selected standards validated by neutron activation analysis. A_i is then determined empirically by intercomparison with neutron activation analysis for each particle size range. For $Z \geq 15$, $A_i = 1$ for thin aerosol deposits.

The sample count rate I_i is determined by measuring the total counts in region of interest i , subtracting the background, subtracting spectral interferences, and then dividing by the analysis live time. The channels and energies for each region of interest are shown in Table A-4. Background subtraction is accomplished by subtracting the product of total counts in region of interest i for a blank filter, and the ratio of the sample to blank Mo K α scatter peak counts, from the total counts in region of interest i . That is,

$$N_i = G_i - B_i \frac{S}{S^B} \quad (6)$$

where N_i is background subtracted counts, G_i is total counts, B_i is total counts from a blank filter in region of interest i , and S and S^B are counts in the Mo K α region for sample and blank, respectively. The uncertainty in background subtracted counts is given by

$$\sigma N_i = \left[G_i + B_i \frac{S}{S^B} \right]^{1/2} \quad (7)$$

After the background is subtracted, corrections are made for spectral interferences.

$$T_i = N_i - \sum_{m=1}^n F_{im} T_m, \quad (8)$$

where n = number of interfering elements, and T_i and T_m are both background and spectral interference subtracted counts. Spectral correction factors, F_{im} (section 1.3), are shown in Table A-3. The uncertainty in T_i is estimated by

$$\sigma T_i = \left[\sigma N_i^2 + \sum_{m=1}^n (T_m^2 \sigma F_{im}^2 + F_{im}^2 \sigma T_m^2) \right]^{1/2} \quad (9)$$

(Rev. August, 1981)

TABLE A-4.

EXCITATION CONDITION: 1
 ANODE: MO
 FILTER: MO
 VOLTAGE: 50
 CURRENT: 200
 ENERGY: 0- 40

SPECTRUM REGIONS OF INTEREST

REGION	CHANNEL	ENERGY		ELEMENT
1	156- 164	6.24-	6.56	FE
2	183- 191	7.32-	7.64	NI
3	197- 205	7.88-	8.20	CU
4	212- 220	8.48-	8.80	ZN
5	227- 235	9.08-	9.40	GA
6	247- 251	9.88-	10.04	HG
7	258- 269	10.32-	10.76	AS
8	276- 281	11.04-	11.24	SE
9	292- 302	11.68-	12.08	BR
10	310- 320	12.40-	12.80	PB
11	329- 339	13.16-	13.56	RB
12	348- 358	13.92-	14.32	SR
13	369- 379	14.76-	15.16	Y
14	389- 399	15.56-	15.96	ZR
15	412- 426	16.48-	17.04	MS*
16	521- 537	20.84-	21.48	PD
17	544- 560	21.76-	22.40	AG
18	568- 584	22.72-	23.36	CD
19	597- 613	23.88-	24.52	IN
20	623- 639	24.92-	25.56	SN
21	657- 664	26.28-	26.56	SB
22	790- 808	31.60-	32.32	BA
23	827- 845	33.08-	33.80	LA

* Mo K α scatter

EXCITATION CONDITION: 2
 ANODE: MO
 FILTER: --
 VOLTAGE: 15
 CURRENT: 200
 ENERGY: 0- 10

SPECTRUM REGIONS OF INTEREST

1	118- 132	1.18-	1.32	MO
2	141- 155	1.41-	1.55	AL
3	167- 181	1.67-	1.81	SI
4	193- 209	1.93-	2.09	P
5	324- 338	3.24-	3.38	K
6	365- 376	3.65-	3.76	CA
7	631- 649	6.31-	6.49	FE

EXCITATION CONDITION: 3
 ANODE: W
 FILTER: CU
 VOLTAGE: 35
 CURRENT: 200
 ENERGY: 0- 20

SPECTRUM REGIONS OF INTEREST

REGION	CHANNEL	ENERGY		ELEMENT
1	112- 120	2.24-	2.40	S
2	127- 135	2.54-	2.70	CL
3	162- 170	3.24-	3.40	K
4	180- 190	3.60-	3.80	CA
5	221- 231	4.42-	4.62	TI
6	243- 253	4.86-	5.06	V
7	266- 276	5.32-	5.52	CR
8	290- 300	5.80-	6.00	MN
9	313- 326	6.26-	6.52	FE
10	520- 534	10.40-	10.68	AS
11	585- 605	11.70-	12.10	BR
12	620- 640	12.40-	12.80	PB

Finally, the corrected counts are divided by analysis live time, L , to obtain the count rate,

$$I_1 = \frac{T_1}{L} \quad (10)$$

$$\text{and } \sigma I_1 = \frac{\sigma T_1}{L} \quad (11)$$

Calculations for instrument calibration are similar except that C_1 is solved for in eq. 3. Also, since single element and non-interfering multi-element standards are used for calibration, spectral corrections are not made and $T_1 = N_1$ and $\sigma T_1 = \sigma N_1$.

7. Quality Control

The filters are loaded and unloaded into specially machined acrylic holders. Filter loading is done in the laminar flow hood and the filters themselves are handled with forceps, out of the analysis and deposit area. The loaded filters are transported to and from the TEFA in covered sample cases, and the filter holders are cleaned between each use. These procedures prevent the possibility of sample contamination.

To prevent confusion in identification of the samples when they are out of their ID coded filter containers, a sample position number versus ID number relationship used. This relationship is established by the XRF LOG before the filters are removed from their containers and it is verified after each handling step in the procedure.

For each XRF analysis batch of 10 samples, one blank and a quality control standard is analyzed. Measured concentrations of the quality control standard, which contains several key elements, are compared with actual concentrations (Figure A-7). If the deviation is more than $\pm 2\%$, all samples of that run must be reanalyzed. The results of the quality control standard over a number of runs provides a measure of the XRF analysis precision. If the results show a trend in drift, recalibration is required.

Several elements, including K, Ca, Fe, As, Br and Pb are measured under more than one of the three excitation conditions normally used for each run. Results of these elements are compared for each of the excitation conditions under which they are measured. If agreement is for outside the calculated uncertainties, the sample must be reanalyzed.

(Rev. August, 1981)

```

PERT EAST 8
QA STANDARD Q3043
EL CONCENTRATION % ERROR
  ACTUAL MEASURED
TI 40.80 41.19+- 0.07 1.0
CR 44.30 44.79+- 0.25 1.1
FE 44.90 44.85+- 0.05 - 0.1
NI 47.30 47.05+- 0.26 - 0.5
ZN 44.80 44.89+- 0.25 0.2
CD 49.70 49.50+- 0.53 - 0.4

```

FIGURE A-7

```

PRT EAST 9
QA STANDARD Q3043
EL CONCENTRATION % ERROR
  ACTUAL MEASURED
TI 40.80 41.23+- 0.07 1.1
CR 44.30 44.92+- 0.25 1.4
FE 44.90 45.09+- 0.27 0.4
NI 47.30 46.94+- 0.36 - 0.3
ZN 44.80 44.80+- 0.05 0.0
CD 49.70 49.66+- 0.03 - 0.1

```

```

PRT EAST 10
QA STANDARD Q3043
EL CONCENTRATION % ERROR
  ACTUAL MEASURED
TI 40.80 40.99+- 0.06 0.5
CR 44.30 44.99+- 0.26 1.6
FE 44.90 45.39+- 0.39 1.1
NI 47.30 47.05+- 0.26 - 0.5
ZN 44.80 44.94+- 0.25 0.3
CD 49.70 49.42+- 0.62 - 0.6

```

```

PRT EAST 11
QA STANDARD Q3043
EL CONCENTRATION % ERROR
  ACTUAL MEASURED
TI 40.80 40.91+- 0.05 0.3
CR 44.30 44.57+- 0.23 0.6
FE 44.90 45.03+- 0.27 0.3
NI 47.30 47.07+- 0.26 - 0.5
ZN 44.80 44.76+- 0.25 - 0.1
CD 49.70 49.03+- 0.80 - 1.3

```

```

PRT EAST 12
QA STANDARD Q3043
EL CONCENTRATION % ERROR
  ACTUAL MEASURED
TI 40.80 40.82+- 0.05 0.1
CR 44.30 44.75+- 0.24 1.0
FE 44.90 44.63+- 0.24 - 0.6
NI 47.30 46.63+- 0.64 - 1.4
ZN 44.80 44.23+- 0.32 - 1.3
CD 49.70 49.33+- 0.52 - 0.7

```

```

PRT EAST 13
QA STANDARD Q3043
EL CONCENTRATION % ERROR
  ACTUAL MEASURED
TI 40.80 41.05+- 0.06 0.6
CR 44.30 44.80+- 0.25 1.1
FE 44.90 44.96+- 0.06 0.1
NI 47.30 46.97+- 0.36 - 0.7
ZN 44.80 44.76+- 0.25 - 0.1
CD 49.70 49.70+- 0.54 - 0.0

```

(Rev. August, 1981)

8. Quality Assurance

Calibration of the instrument is by thin film standards prepared by Micromatter, Inc., Eastsound, WA., and by solution deposited and particle standards made by Columbia Scientific Industries, Austin, TX. Plots of instrument response versus atomic number should yield smooth curves, and are used to validate standard concentrations.

Interlaboratory comparisons are used to check accuracy of the instrument calibration. Several techniques have been used in interlaboratory comparisons in addition to energy dispersive x-ray fluorescence, including neutron activation analysis, optical spectroscopy, wavelength dispersive x-ray fluorescence, and ion chromatography.

In house intermethod comparison with neutron activation analysis is done routinely. This independent method provides comparison with XRF on about 20 elements.

Results from each analysis run are reviewed by the laboratory supervisor. The inter-excitation and quality control standard results are checked as described in section 7. The laboratory supervisor must initial the XRF LOG before results of that run are considered valid. Periodic audits of the TEFA startup, filter loading and unloading, analysis, and TEFA shutdown procedures insure compliance with the Standard Operating Procedure.

(Rev. August, 1981).

APPENDIX D

TEFLON FILTER HANDLING AND STORAGE

Standard Operating Procedure

1. General Discussion

Teflon filters used for particulate collection consist of a polyolefin supporting ring bonded to the top (particle collection) surface of a Teflon membrane. Two sizes, 47 and 37 mm diameter, are used for TSP and dichotomous samples, respectively. Sample ID codes have a two-letter prefix followed by a three-digit number.

All filter handling procedures are to be done in the laminar flow hood. Clean the work area with a methanol dampened Kaydry towel, then lay out a clean Kaydry towel to use as a work surface before all handling procedures. The filters must be handled only by the supporting ring with clean forceps.

Filters are stored in individual PetriSlides, which in turn are placed in numerical order in plastic trays. Cardboard boxes each holding two PetriSlide trays are placed in the sample storage cabinet to insure secure storage.

2. Materials and Equipment

- Nulcepore aerosol filter holders with quick-disconnect fittings
- Sierra Model FH-240-P filter cassettes
- Millipore 49 x 9 mm plastic petri dishes
- Millipore 47 mm PetriSlides and trays
- Membrana Corp. Teflon filters, 47 and 37 mm diameter
- Sample transport boxes for both sample types
- forceps
- Kaydry towels
- methanol
- Baggies
- waterproof fine point markers
- 2-3/8" Caplugs
- adhesive labels
- Nuclepore 47 mm drain disks
- Ziploc bags

(Rev. July, 1982)

3. Filter Coding

1. Lay out a series of 5 - 10 PetriSlides on the work surface, label with the next sample ID numbers in sequence and remove their lids.
2. Select a new filter and inspect both sides for foreign particles, pin holes, discolorations, or other imperfections. Some particles may be carefully blown off with a photographic lens cleaning blower. Discard the filter if defective. Otherwise, place top side up in an open PetriSlide.
3. Repeat step 2 until all PetriSlides contain a filter.
4. Steady the filter in the PetriSlide by pressing down on the plastic ring of the filter with forceps. Write the ID number as recorded on the PetriSlide on the plastic ring of the filter using a fine point waterproof marker.
5. Repeat step 4 until all filters are coded with an ID number.
6. Check that the ID numbers on the filters correspond to those on the PetriSlides, wait a few seconds for the ink to dry, then replace the PetriSlide lids.
7. Return the coded filters and PetriSlides to the tray in numerical
8. Repeat steps 1 - 7 as necessary.
9. Record the ID numbers, lot number, and pore size of all filters coded in the Sample Log Book.
10. Place loaded trays in boxes and store in sample storage cabinet.

4. Loading - Dichotomous Samples

1. Obtain filters to be loaded from the sample storage cabinet.
2. Select a tared filter from the sample tray and place PetriSlide on work surface. Write the ID number on an adhesive label using a waterproof marking pen and stick to the lid of a clean 49 x 9 mm petri dish. Check that the ID number on the filter, the PetriSlide, and the petri dish match.

(Rev. July, 1982)

3. Place the bottom half (female part) of a clean Sierra filter cassette on the work surface and transfer the filter from its PetriSlide to the filter cassette. It should be placed top side up. Place the top half (male part) of a clean Sierra filter cassette in position over the bottom half and press down so that it snaps into proper alignment.
 4. Transfer the loaded filter cassette into the labeled petri dish top side up and set aside.
 5. Return the empty PetriSlide to its place in the tray.
 6. Repeat steps 2 - 5 as necessary.
 7. Return trays to boxes and sample storage cabinet.
 8. Continue with the Filter Shipping Standard Operating Procedure.
5. Loading - TSP Samples
1. Obtain filters to be loaded from the sample storage cabinet.
 2. Select a tared filter from the sample tray and place PetriSlide on work surface. Write the ID number on an adhesive label using a waterproof marking pen and stick on the base of a clean Nuclepore filter holder. Check that the ID number on the filter, the PetriSlide, and the filter holder base match.
 3. Using the forceps place a single drain disk on the filter holder base. Transfer the filter from its PetriSlide into position (top side up) on the drain disk. Place a clean locking ring into position, making sure proper alignment of filter holder base, drain disk, filter and locking ring is achieved. Screw the top tightly into position, being careful not to disturb alignment. Place a clean Baggie over the filter holder and a Caplug on top.
 4. Place the loaded filter into the sample transport box.
 5. Return the empty PetriSlide to its place in the tray.
 6. Repeat steps 2 - 5 as necessary.
 7. Return trays to boxes and sample storage cabinet.
 8. Continue with the Filter Shipping Standard Operating Procedure.

(Rev. July, 1982)

6. Unloading - Dichotomous Samples

1. Check that samples have been logged in according to the Filter Shipping Standard Operating Procedure. Obtain PetriSlide trays from sample storage cabinet.
2. Select a petri dish containing an exposed filter from the sample transport box and place on work surface. Obtain the PetriSlide with matching ID number from the tray and place on work surface.
3. Remove the petri dish lid and, being careful not to touch the filter, use a pair of forceps to remove the filter cassette assembly from the petri dish. Carefully separate the cassette assembly by sliding thumbnail between the top and bottom and prying apart. Then using a second pair of forceps, transfer the filter to its PetriSlide.
4. Make sure the ID number on the filter matches the others. Return the PetriSlide and filter to its place in the tray.
5. Record any unusual appearance or condition of the filter in the Sample Log Book.
6. Repeat steps 2 - 5 until filters are all unloaded.
7. Return trays to boxes and sample storage cabinet.

7. Unloading - TSP Samples

This Section is the same as Section 6, except for steps 2 and 3:

2. Select a sample from the sample transport box and set upright on the work surface. Obtain the PetriSlide with matching ID number from the tray and place on work surface.
3. Remove Caplug. Remove Baggie and discard. Unscrew top and lift off locking ring, being careful not to touch the filter. Transfer the filter to its PetriSlide.

8. Equipment Cleaning

1. After sample unloading, clean the sample transport boxes using a methanol dampened Kaydry towel. Clean both inside and outside surfaces.

(Rev. July, 1982)

2. Remove drain disks and adhesive labels from filter holders and petri dishes. Clean all parts (filter holder base, locking ring, screw top, Capug, filter cassette and petri dish) with a methanol dampened Kaydry towel. Pay particular attention to surfaces that contact the filter, and do not touch those surfaces after cleaning.
3. Place cleaned filter holder bases, screw tops, and Caplugs in sample transport box.
4. Place cleaned locking rings, filter cassettes, and petri dishes in Ziploc Bags.

(Rev. July, 1982)

GLASS AND QUARTZ FIBER FILTER HANDLING AND STORAGE

Standard Operating Procedure

1. General Discussion

Glass and quartz fiber filters are used for particulate collection primarily when carbon analysis is required. Two sizes, 47 and 37 mm diameter, are used for TSP and dichotomous samples, respectively. Sample ID codes have a two-letter prefix followed by a three-digit number.

All filter handling procedures are to be done in the laminar flow hood. Clean the work area with a methanol dampened Kaydry towel, then lay out a clean Kaydry towel to use as a work surface before all handling procedures. The filters must be handled only by the edge with clean forceps. Use wide tipped, non-serrated forceps to avoid damaging the fragile filters.

Filters are stored in individual PetriSlides, which in turn are placed in numerical order in plastic trays. Cardboard boxes each holding two PetriSlide trays are placed in the sample storage cabinet to insure secure storage.

2. Materials and Equipment

- Nulcepore aerosol filter holders with quick-disconnect fittings
- Sierra Model FH-240-P filter cassettes
- Millipore 49 x 9 mm plastic petri dishes
- Millipore 47 mm PetriSlides and trays
- Membrana Corp. Teflo filters, 47 and 37 mm diameter
- Sample transport boxes for both sample types
- forceps
- Kaydry towels
- methanol
- Baggies
- waterproof fine point markers
- 2-3/8" Caplugs
- adhesive labels
- Nuclepore 47 mm drain disks
- Ziploc bags

(Rev. July, 1982)

3. Filter Coding

1. Lay out a series of 5 - 10 PetriSlides on the work surface, label with the next sample ID numbers in sequence and remove their lids.
2. Select a new filter and inspect both sides for foreign particles, pin holes, discolorations, or other imperfections. Some particles may be carefully blown off. Discard the filter if defective. Otherwise, place top side up in an open PetriSlide and replace the lid.
3. Repeat step 2 until all PetriSlides contain a filter.
4. Return the coded filters and PetriSlides to the tray in numerical order.
5. Repeat steps 1 - 4 as necessary.
6. Record the ID numbers and lot number of all filters coded in the Sample Log Book.
7. Place loaded trays in boxes and store in sample storage cabinet.

4. Loading - Dichotomous Samples

1. Obtain filters to be loaded from the sample storage cabinet. --
2. Select a tared filter from the sample tray and place PetriSlide on work surface. Write the ID number on an adhesive label using a waterproof marking pen and stick to the lid (the portion without the embossed marking) of a clean 49 x 9 mm petri dish. Check that the ID number on the filter, the PetriSlide, and the petri dish match.
3. Place the bottom half (female part) of a clean Sierra filter cassette on the work surface and transfer the filter from its PetriSlide to the filter cassette. It should be placed top side up. Place the top half (male part) of a clean Sierra filter cassette in position over the bottom half and press down so that it snaps into proper alignment.
4. Transfer the loaded filter cassette into the labeled petri dish top side up and set aside.
5. Return the empty PetriSlide to its place in the tray.
6. Repeat steps 2 - 5 as necessary.
7. Return trays to boxes and sample storage cabinet.
8. Continue with the Filter Shipping Standard Operating Procedure.

(Rev. July, 1982)

5. Loading - TSP Samples

1. Obtain filters to be loaded from the sample storage cabinet.
2. Select a tared filter from the sample tray and place a PetriSlide on work surface. Write the ID number on an adhesive label using a waterproof marking pen and stick on the base of a clean Nuclepore filter holder. Check that the ID number on the PetriSlide and the filter holder base match.
3. Using the forceps place a single drain disk on the filter holder base. Transfer the filter from its PetriSlide into position (top side up) on the drain disk. Place a clean locking ring into position, making sure proper alignment of filter holder base, drain disk, filter and locking ring is achieved. Screw the top tightly into position, being careful not to disturb alignment. Place a clean Baggie over the filter holder and a Caplug on top.
4. Place the loaded filter into the sample transport box.
5. Return the empty PetriSlide to its place in the tray.
6. Repeat steps 2 - 5 as necessary.
7. Return trays to boxes and sample storage cabinet.
8. Continue with the Filter Shipping Standard Operating Procedure.

6. Unloading - Dichotomous Samples

1. Check that samples have been logged in according to the Filter Shipping Standard Operating Procedure. Obtain PetriSlide trays from sample storage cabinet.
2. Select a petri dish containing an exposed filter from the sample transport box and place on work surface. Obtain the PetriSlide with matching ID number from the tray and place on work surface.
3. Remove the petri dish lid and, being careful not to touch the filter, use a pair of forceps to remove the filter cassette assembly by sliding thumbnail between the top and bottom and prying apart. Then using a second pair of forceps, transfer the filter to its PetriSlide.
4. Make sure the ID number on the PetriSlide matches the others. Return the PetriSlide and filter to its place in the tray.

(Rev. July, 1982)

5. Record any unusual appearance or condition of the filter in the Sample Log Book.
6. Repeat steps 2 - 3 until filters are all unloaded.
7. Return trays to boxes and sample storage cabinet.

7. Unloading - TSP Samples

This Section is the same as Section 6, except for steps 2 and 3:

2. Select a sample from the sample transport box and set upright on the work surface. Obtain the PetriSlide with matching ID number from the tray and place on work surface.
3. Remove Caplug. Remove Baggie and discard. Unscrew top and lift off locking ring, being careful not to touch the filter. Transfer the filter to its PetriSlide.

8. Equipment Cleaning

1. After sample unloading, clean the sample transport boxes using a methanol dampened Kaydry towel. Clean both inside and outside surfaces.
2. Remove drain disks and adhesive labels from filter holders and petri dishes. Clean all parts (filter holder base, locking ring, screw top, Caplug, filter cassette and petri dish) with a methanol dampened Kaydry towel. Pay particular attention to surfaces that contact the filter, and do not touch those surfaces after cleaning.
3. Place cleaned filter holder bases, screw tops, and Caplugs in sample transport box.
4. Place cleaned locking rings, filter cassettes, and petri dishes in Ziploc bags.

(Rev. July, 1982)

FILTER SHIPPING

Standard Operating Procedure

1. General Discussion

Unexposed filters are shipped from NEA, Inc. to the field site for sample collection. After sampling, the exposed filters are return shipped to NEA for processing and analysis. This procedure describes the steps necessary to insure the integrity of the samples.

Sample logging procedures and forms filled out at both the shipping and receiving points provide chain of custody documentation. Filters are shipped in petri dishes or preloaded into holders that prevent chemical contamination or physical damage. The shipping container is designed to keep samples upright and cushioned from mechanical shock during shipment.

2. Equipment

1. Sample Transport Box to hold dichotomous and/or level TSP samples.
2. Nuclepore, Corp. Aerosol Holders, no. 430400.
3. Millipore plastic petri dishes, no. PD1004700.
4. Millipore PetriSlides, no. PD1504700.
5. Sierra Instruments Filter Holder, no. FH-240-P.
6. Plywood shipping container with flanged base.
7. Specification Packaging Corp. Tip (N) Tell indicator.

3. Shipping Filters to Sampling Site

1. Select samples to be shipped and record date in the "LOG OUT" column in the Sample Log Book.
2. Fill out a Chain of Custody form (Figure A-1). The person responsible for sample custody at the sampling site must be identified.
3. Load samples into a Sample Transport Box, or another container that will insure the samples are held securely and upright.
4. Pack the samples and Chain of Custody form in the shipping box and affix proper address label.
5. When samples are picked up by carrier, sign initials in Sample Log Book next to date recorded in step 1.

(Rev. July, 1982)

6. Notify the person to receive the samples of the date and carrier of the shipment.
7. When samples are received at the sampling site, the responsible person must complete the Chain of Custody form. If there are any discrepancies, notify the NEA Laboratory Supervisor.

4. Return Shipping of Exposed Samples

1. Select the samples to be shipped.
2. Fill out a Chain of Custody form (Figure A-1)
3. Load samples into the Sample Transport Box or other suitable container.
4. Pack the samples and Chain of Custody form in the shipping box. Include completed Chain of Custody forms as well, and address to NEA, Inc., 8310 S.W. Nimbus, Beaverton, OR 97005, attn: Laboratory Supervisor.
5. Attach a Tip N Tell indicator to the shipping box and remove wire. The Tip N Tell should be taped or stapled on, as the adhesive backing does not stick well to the varnished shipping box.
6. Notify the Laboratory Supervisor that a shipment has been made.
7. When shipment is received at NEA, fill in the Chain of Custody form and record date, initials, and condition of Tip N Tell in the Sample Log Book.
8. Proceed with the sample unloading procedure and give the Chain of Custody forms to the Laboratory Supervisor.

5. Optional Shipping Procedure

In some circumstances, such as when NEA personnel are travelling to or from the sampling site, it is desirable to hand carry the samples. In general, the procedures as in sections 3 and 4 should be followed except that the shipping box is not required.

(Rev. July, 1982)

FIGURE A-1. FILTER CUSTODY/SHIPPING FORM

Sample Shipping

Date _____

Carrier _____

Sample ID's _____

Shipped by _____

Sample Receiving

Date _____

Carrier _____

Sample ID's _____

Received by _____

Laboratory Supervisor _____

(Figure 1)

(Rev. July, 1982)

FILTER WEIGHING USING THE CAHN 27 ELECTROBALANCE

Standard Operating Procedure

General Discussion

1. Analytical Problem:

The mass of particles collected on filters must be determined. Two sizes of filters are commonly used, 37 and 47 mm diameter. A variety of filter media are used, such as teflon, Nuclepore, cellulose ester, glass fiber, and quartz. A deposit of at least 100 μg is required to achieve an accuracy of $\pm 10\%$, relative (400 μg for glass or quartz filters).

2. Interferences:

Electrostatic charge on the filter is one possible source of interference. This is eliminated by use of a beta source charge neutralizer. Humidity changes may affect the weight of deposit and filter weight for some types of filter media. Humidity changes are minimized by performing the weighing procedures in an air conditioned laboratory.

3. Minimum Detectable Quantity: 15 μg (three sigma), 50 μg for glass fiber and quartz filters.

4. Precision and Accuracy:

The balance is calibrated with class M weights. Uncertainty in net weight is $\pm 10 \mu\text{g}$ ($\pm 40 \mu\text{g}$ for glass or quartz filters).

5. The technician should read the Cahn 27 Instruction Manual entirely before using the balance, paying close attention to Section 3, Balance Operation. The balance is always left ON to provide maximum stability.

6. Keep the calibration weights clean and store in their proper container. Handle them only with the cleaned weight forceps (non-serrated stainless steel) and do not use the weight forceps for any other job.

(Rev. 6/28/82)

2. Equipment and Materials

- Cahn 27 Electrobalance with custom 60 mm open stirrups
- Po^{210} charge neutralizer
- Calibration weights, 10, 20, 50 and 100 mg Class M
- Tare weights, 20, 50 and 100 mg Class C
- weight forceps
- filter forceps
- Kaydry towels
- Kimwipes
- Methanol

3. Operating Procedure

3.1 Start Up:

1. Remove the stirrups from the weighing chamber as in Section 3.1.2 of the Cahn 27 Instruction Manual and set aside on a clean Kimwipe. Clean the weighing chamber with a methanol dampened Kimwipe. Replace the stirrups, one on the A side and one of the TARE side. Place the charge neutralizer in the center of the weighing chamber. Clean the area around the balance and lay out a clean Kaydry towel in front of the weighing chamber. Clean the weight forceps (non-serrated stainless steel) and filter forceps using a methanol dampened Kimwipe.
2. Obtain the calibration weights and the filters to be weighed from the sample storage cabinet.
3. Record technician, date and filter lot number on the data sheet.
4. Determine approximate weight of one of the filters by weighing on the A200 range. Select the 10, 20, 50 and 100 mg calibration weights in combination such that their combined weight equals within + 8 and - 12 mg of the filter weight. (When doing gross weights or reweights, use the same weights as for the tare weighing).
5. Set the balance controls to RANGE: A 20 and RESPONSE: 0. Make sure CALIBRATE, COARSE and FINE ZERO controls are locked. Press TARE twice to untare the balance.
6. Place the selected calibration weights on the A pan and balance with appropriate tare weights on the TARE pan so that the display reads 0 ± 20 mg.

(Rev. 6/28/82)

7. When the display stabilizes (after at least 30 seconds), press TARE to zero the balance.
8. Add the 20 mg calibration weight the the A pan (or remove it if already there). Display should read $+ 20.000 \pm 0.001$ (or $- 20.000 \pm 0.001$) when it stabilizes. If not, adjust CALIBRATE accordingly.
9. Remove (or replace) calibration weight and note than 0.000 ± 0.001 is displayed. If not, repeat steps 7 and 8. Record tare weight as the sum of the calibration weights $\pm$ display reading, and the calibration reading on the calibration log, as well as the other required information.
10. Remove calibration weights to their container.

3.2 Weighing Filters:

1. When weighing the filters, note any defects (torn, particles falling off, etc.) on the data sheet.
2. Place the first filter to be weighed on the charge neutralizer. After a few seconds, transfer the filter to the A platform and place the next filter to be weighed on the charge neutralizer.
3. When the display stabilizes (after at least 30 seconds), record the filter ID number and weight reading including $+$ or $-$ sign on the data sheet (Figure A-2)
4. Transfer the filter from the A platform to its container, transfer the filter on the charge neutralizer to the A platform, and place the next filter in sequence on the charge neutralizer.
5. Repeat steps 3 and 4 until all filters are weighed or until a total of 50 filters have been weighed.
6. Place the claibration weight(s) on the A pan. On the calibration logs record the tare weight as the sum of the calibration weights $\pm$ display reading. Press TARE if the reading is not 0.000.
7. Add the 20 mg calibration weight to the A pan (or remove it if already there). Record calibration reading (Figure A-3)
8. Place calibration and tare weights in their containers.

3.3 Replicates:

1. Replicate weighings should be performed on 10% of the filters (both tare and gross weighings), selected at random. They should be reweighed by a technician other than the one who did the original weighing.

(Rev. 6/28/82)

2. Weigh the filters using the procedures in sections 3.1 and 3.2. Indicate that the weighings are replicates on the data sheet.
3. Calculate the difference, W_d , between the original and replicate weighings, and record on the reweight data sheet.

3.4 Shutdown:

1. Replace the filters that were weighed in the sample storage cabinet.
2. Clean the balance as in 3.1.1.
3. Return the data sheets to the laboratory supervisor.

3.5 Calculations:

$$W_n = (W_g - W_c) \times 1000,$$

where, W_n = net deposit in μg

W_g = gross weight reading in mg

W_c = tare weight reading in mg

$$W_d = (W_g - W_r) \times 1000$$

or

$$W_d = (W_c - W_r) \times 1000,$$

where, W_d = difference between original and replicate weights in μg

W_r = replicate weight reading in mg.

3.6 Quality Control:

1. The tare and calibration weight checks at the end of a weighing set must be within ± 0.004 mg of their correct values or the entire set must be reweighed.
2. Replicate weighing differences, W_d , must be $\leq \pm 10 \mu\text{g}$ or $\leq 2\%$ of W_n or the entire set must be reweighed ($\leq \pm 40 \mu\text{g}$ for glass or quartz filters).

(Rev. 6/28/82)

3.7 Quality Assurance:

1. Class M weights are used for calibration. According to NBS circular 547, they are "...designed for use as reference standards, for work of the highest precision, and for investigations demanding a high degree of constancy over a period of time."
2. 10% replicate weighings by another technician ensures that weighing is without operator bias and precision is within limits.
3. Calibration and tare operations are performed before each set of ≤ 50 filters and are checked for accuracy after each set.
4. Results of replicate weighings and calibration and tare weight checks are reviewed by the laboratory supervisor. He must initial the calibration data sheet before the data is considered valid.

(Rev. 6/28/82)

Tech. _____

Date _____

Date _____

[illegible]

108

FIGURE A-3. CAIN 27 ELECTROBALANCE FILTER WEIGHING CALIBRATION

Date	Tech.	Filters Weighed	Tare, Gross or Reweights	Tare and Calibrate										QA		
				Initial					Final							
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			
				T			.			T			.			
				C			.			C			.			

APPENDIX E

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC001 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 260+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.088	0.000+-	0.568	0.000+-	0.218
SI	0.000+-	0.242	0.000+-	1.553	0.000+-	0.596
P	0.000+-	0.025	0.000+-	0.161	0.000+-	0.062
S	0.555+-	0.054	3.560+-	0.349	1.367+-	0.144
CL	0.315+-	0.032	2.021+-	0.207	0.776+-	0.085
K	0.000+-	0.375	0.000+-	2.405	0.000+-	0.924
CA	0.000+-	6.172	0.000+-	39.622	0.000+-	15.22
TI	0.000+-	0.303	0.000+-	1.947	0.000+-	0.748
V	0.000+-	0.003	0.000+-	0.019	0.000+-	0.007
CR	0.001+-	0.002	0.007+-	0.010	0.003+-	0.004
MN	0.000+-	0.002	0.003+-	0.010	0.001+-	0.004
FE	0.074+-	0.008	0.475+-	0.049	0.183+-	0.020
NI	0.008+-	0.002	0.048+-	0.013	0.019+-	0.005
CU	0.007+-	0.002	0.044+-	0.012	0.017+-	0.005
ZN	0.004+-	0.001	0.025+-	0.009	0.010+-	0.003
GA	0.002+-	0.001	0.011+-	0.009	0.004+-	0.003
AS	0.070+-	0.008	0.447+-	0.051	0.172+-	0.021
SE	0.006+-	0.002	0.037+-	0.010	0.014+-	0.004
BR	0.000+-	0.008	0.000+-	0.051	0.000+-	0.020
RB	0.002+-	0.002	0.015+-	0.015	0.006+-	0.006
SR	0.000+-	0.003	0.000+-	0.019	0.000+-	0.007
Y	0.000+-	0.003	0.000+-	0.021	0.000+-	0.008
ZR	0.000+-	0.014	0.000+-	0.088	0.000+-	0.034
MO	0.018+-	0.010	0.112+-	0.063	0.043+-	0.024
PD	0.000+-	0.009	0.000+-	0.060	0.000+-	0.023
AG	0.000+-	0.014	0.000+-	0.089	0.000+-	0.034
CD	0.000+-	0.018	0.000+-	0.117	0.000+-	0.045
IN	0.000+-	0.021	0.000+-	0.136	0.000+-	0.052
SN	0.000+-	0.140	0.000+-	0.900	0.000+-	0.346
SB	33.434+-	2.553	214.649+-	16.388	82.452+-	7.047
BA	0.000+-	0.099	0.000+-	0.637	0.000+-	0.245
LA	0.187+-	0.161	1.202+-	1.033	0.462+-	0.397
HG	0.000+-	0.003	0.000+-	0.020	0.000+-	0.008
PB	0.046+-	0.008	0.292+-	0.052	0.112+-	0.020

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF126 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1107+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.252	0.000+-	1.615	0.000+-	0.146
SI	0.000+-	0.272	0.000+-	1.744	0.000+-	0.158
P	0.000+-	0.066	0.000+-	0.426	0.000+-	0.038
S	2.208+-	0.115	14.178+-	0.740	1.281+-	0.068
CL	1.240+-	0.070	7.961+-	0.446	0.719+-	0.041
K	0.000+-	0.936	0.000+-	6.007	0.000+-	0.543
CA	0.000+-	16.400	0.000+-	105.29	0.000+-	9.514
TI	0.000+-	0.805	0.000+-	5.168	0.000+-	0.467
V	0.000+-	0.007	0.000+-	0.045	0.000+-	0.004
CR	0.009+-	0.002	0.057+-	0.015	0.005+-	0.001
MN	0.013+-	0.002	0.086+-	0.013	0.008+-	0.001
FE	0.114+-	0.009	0.733+-	0.055	0.066+-	0.005
NI	0.024+-	0.003	0.155+-	0.018	0.014+-	0.002
CU	0.015+-	0.002	0.095+-	0.014	0.009+-	0.001
ZN	0.016+-	0.002	0.102+-	0.013	0.009+-	0.001
GA	0.008+-	0.002	0.049+-	0.012	0.004+-	0.001
AS	0.340+-	0.018	2.183+-	0.114	0.197+-	0.010
SE	0.017+-	0.002	0.108+-	0.014	0.010+-	0.001
BR	0.000+-	0.002	0.000+-	0.015	0.000+-	0.001
RB	0.000+-	0.003	0.000+-	0.017	0.000+-	0.002
SR	0.000+-	0.004	0.000+-	0.024	0.000+-	0.002
Y	0.000+-	0.004	0.000+-	0.026	0.000+-	0.002
ZR	0.000+-	0.015	0.000+-	0.098	0.000+-	0.009
MO	0.000+-	0.012	0.000+-	0.078	0.000+-	0.007
PD	0.000+-	0.012	0.000+-	0.076	0.000+-	0.007
AG	0.000+-	0.016	0.000+-	0.102	0.000+-	0.009
CD	0.000+-	0.024	0.000+-	0.154	0.000+-	0.014
IN	0.000+-	0.029	0.000+-	0.185	0.000+-	0.017
SN	0.000+-	0.053	0.000+-	0.340	0.000+-	0.031
SB	137.382+-	6.430	881.992+-	41.278	79.698+-	3.799
BA	0.080+-	0.107	0.511+-	0.687	0.046+-	0.062
LA	0.000+-	0.165	0.000+-	1.059	0.000+-	0.096
HG	0.000+-	0.005	0.000+-	0.029	0.000+-	0.003
PB	0.277+-	0.016	1.779+-	0.101	0.161+-	0.009

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: AC002 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 513+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.214	0.000+- 1.377	0.000+- 0.268
SI	0.000+- 0.235	0.000+- 1.507	0.000+- 0.294
P	0.000+- 0.055	0.000+- 0.355	0.000+- 0.069
S	0.974+- 0.082	6.254+- 0.525	1.219+- 0.105
CL	0.565+- 0.051	3.628+- 0.324	0.707+- 0.065
K	0.000+- 0.652	0.000+- 4.184	0.000+- 0.816
CA	0.000+- 11.180	0.000+- 71.774	0.000+- 13.99
TI	0.000+- 0.566	0.000+- 3.632	0.000+- 0.708
V	0.000+- 0.005	0.000+- 0.031	0.000+- 0.006
CR	0.006+- 0.002	0.035+- 0.011	0.007+- 0.002
MN	0.005+- 0.001	0.033+- 0.009	0.007+- 0.002
FE	0.150+- 0.012	0.965+- 0.078	0.188+- 0.016
NI	0.008+- 0.002	0.051+- 0.013	0.010+- 0.002
CU	0.010+- 0.002	0.062+- 0.012	0.012+- 0.002
ZN	0.010+- 0.002	0.065+- 0.011	0.013+- 0.002
GA	0.004+- 0.002	0.025+- 0.010	0.005+- 0.002
AS	0.095+- 0.010	0.612+- 0.063	0.119+- 0.013
SE	0.008+- 0.002	0.051+- 0.010	0.010+- 0.002
BR	0.022+- 0.004	0.142+- 0.027	0.028+- 0.005
RB	0.009+- 0.002	0.060+- 0.013	0.012+- 0.002
SR	0.000+- 0.003	0.000+- 0.017	0.000+- 0.003
Y	0.000+- 0.003	0.000+- 0.018	0.000+- 0.004
ZR	0.000+- 0.012	0.000+- 0.074	0.000+- 0.014
MO	0.042+- 0.009	0.270+- 0.056	0.053+- 0.011
PD	0.000+- 0.010	0.000+- 0.064	0.000+- 0.013
AG	0.000+- 0.013	0.000+- 0.086	0.000+- 0.017
CD	0.000+- 0.018	0.000+- 0.115	0.000+- 0.022
IN	0.000+- 0.023	0.000+- 0.145	0.000+- 0.028
SN	0.000+- 0.270	0.000+- 1.734	0.000+- 0.338
SB	65.294+- 4.671	419.190+- 29.990	81.731+- 6.060
BA	0.000+- 0.079	0.000+- 0.506	0.000+- 0.099
LA	0.000+- 0.125	0.000+- 0.803	0.000+- 0.156
HG	0.000+- 0.003	0.000+- 0.020	0.000+- 0.004
PB	0.103+- 0.012	0.663+- 0.074	0.129+- 0.015

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF127 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1811+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.392	0.000+- 2.519	0.000+- 0.139
SI	0.000+- 0.423	0.000+- 2.713	0.000+- 0.150
P	0.000+- 0.106	0.000+- 0.679	0.000+- 0.037
S	3.373+- 0.170	21.653+- 1.093	1.196+- 0.061
CL	2.014+- 0.108	12.932+- 0.692	0.714+- 0.038
K	0.000+- 1.509	0.000+- 9.689	0.000+- 0.535
CA	0.000+- 26.160	0.000+- 167.95	0.000+- 9.273
TI	0.000+- 1.791	0.000+- 11.498	0.000+- 0.635
V	0.000+- 0.011	0.000+- 0.069	0.000+- 0.004
CR	0.018+- 0.003	0.114+- 0.020	0.006+- 0.001
MN	0.019+- 0.002	0.121+- 0.013	0.007+- 0.001
FE	0.312+- 0.017	2.006+- 0.110	0.111+- 0.006
NI	0.038+- 0.003	0.245+- 0.022	0.014+- 0.001
CU	0.025+- 0.003	0.161+- 0.016	0.009+- 0.001
ZN	0.026+- 0.002	0.169+- 0.016	0.009+- 0.001
GA	0.017+- 0.003	0.111+- 0.017	0.006+- 0.001
AS	0.432+- 0.023	2.771+- 0.145	0.153+- 0.008
SE	0.023+- 0.002	0.146+- 0.016	0.008+- 0.001
BR	0.000+- 0.033	0.000+- 0.213	0.000+- 0.012
RB	0.000+- 0.003	0.000+- 0.019	0.000+- 0.001
SR	0.000+- 0.004	0.000+- 0.026	0.000+- 0.001
Y	0.000+- 0.004	0.000+- 0.026	0.000+- 0.001
ZR	0.000+- 0.018	0.000+- 0.112	0.000+- 0.006
MO	0.238+- 0.015	1.527+- 0.097	0.084+- 0.005
PD	0.000+- 0.015	0.000+- 0.094	0.000+- 0.005
AG	0.000+- 0.020	0.000+- 0.128	0.000+- 0.007
CD	0.000+- 0.026	0.000+- 0.166	0.000+- 0.009
IN	0.000+- 0.037	0.000+- 0.237	0.000+- 0.013
SN	0.000+- 0.078	0.000+- 0.502	0.000+- 0.028
SB	222.020+- 10.377	1425.37+- 66.619	78.701+- 3.704
BA	0.000+- 0.095	0.000+- 0.608	0.000+- 0.034
LA	0.000+- 0.144	0.000+- 0.924	0.000+- 0.051
HG	0.000+- 0.005	0.000+- 0.035	0.000+- 0.002
PB	0.617+- 0.031	3.964+- 0.197	0.219+- 0.011

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 3A
 PARTICLE SIZE: C
 ANALYSIS ID: AC003 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 485+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.300+-	0.602	8.346+-	3.865	1.719+-	0.797
SI	3.000+-	1.501	19.260+-	9.635	3.967+-	1.986
P	0.000+-	0.045	0.000+-	0.292	0.000+-	0.060
S	0.901+-	0.080	5.787+-	0.512	1.192+-	0.108
CL	0.458+-	0.046	2.941+-	0.294	0.606+-	0.062
K	0.000+-	0.730	0.000+-	4.689	0.000+-	0.966
CA	0.000+-	9.548	0.000+-	61.295	0.000+-	12.63
TI	0.000+-	0.565	0.000+-	3.624	0.000+-	0.747
V	0.000+-	0.005	0.000+-	0.033	0.000+-	0.007
CR	0.010+-	0.002	0.066+-	0.013	0.014+-	0.003
MN	0.009+-	0.002	0.056+-	0.012	0.012+-	0.003
FE	1.375+-	0.073	8.825+-	0.471	1.818+-	0.104
NI	0.009+-	0.002	0.055+-	0.014	0.011+-	0.003
CU	0.010+-	0.002	0.067+-	0.014	0.014+-	0.003
ZN	0.017+-	0.002	0.106+-	0.014	0.022+-	0.003
GA	0.005+-	0.002	0.034+-	0.011	0.007+-	0.002
AS	0.097+-	0.010	0.623+-	0.064	0.128+-	0.013
SE	0.004+-	0.002	0.027+-	0.010	0.006+-	0.002
BR	0.000+-	0.011	0.000+-	0.067	0.000+-	0.014
RB	0.000+-	0.002	0.000+-	0.016	0.000+-	0.003
SR	0.043+-	0.004	0.275+-	0.025	0.057+-	0.005
Y	0.000+-	0.003	0.000+-	0.021	0.000+-	0.004
ZR	0.000+-	0.014	0.000+-	0.088	0.000+-	0.018
MO	0.039+-	0.010	0.249+-	0.067	0.051+-	0.014
PD	0.000+-	0.010	0.000+-	0.062	0.000+-	0.013
AG	0.000+-	0.014	0.000+-	0.090	0.000+-	0.019
CD	0.000+-	0.019	0.000+-	0.119	0.000+-	0.025
IN	0.000+-	0.024	0.000+-	0.155	0.000+-	0.032
SN	0.000+-	0.200	0.000+-	1.285	0.000+-	0.265
SB	50.342+-	3.901	323.196+-	25.046	66.577+-	5.339
BA	0.123+-	0.100	0.791+-	0.640	0.163+-	0.132
LA	0.157+-	0.156	1.005+-	1.003	0.207+-	0.207
HG	0.019+-	0.004	0.120+-	0.025	0.025+-	0.005
PB	0.087+-	0.013	0.559+-	0.083	0.115+-	0.017

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 3A
 PARTICLE SIZE: F
 ANALYSIS ID: AF128 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1816+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.443	0.000+- 2.842	0.000+- 0.157
SI	0.000+- 0.433	0.000+- 2.778	0.000+- 0.153
P	0.000+- 0.104	0.000+- 0.667	0.000+- 0.037
S	3.495+- 0.178	22.438+- 1.140	1.236+- 0.063
CL	2.045+- 0.110	13.131+- 0.705	0.723+- 0.039
K	0.000+- 1.549	0.000+- 9.948	0.000+- 0.548
CA	0.000+- 26.160	0.000+- 167.95	0.000+- 9.251
TI	0.000+- 1.761	0.000+- 11.304	0.000+- 0.623
V	0.000+- 0.010	0.000+- 0.067	0.000+- 0.004
CR	0.016+- 0.003	0.100+- 0.019	0.006+- 0.001
MN	0.022+- 0.002	0.143+- 0.014	0.008+- 0.001
FE	0.221+- 0.013	1.416+- 0.085	0.078+- 0.005
NI	0.042+- 0.004	0.270+- 0.023	0.015+- 0.001
CU	0.029+- 0.003	0.189+- 0.018	0.010+- 0.001
ZN	0.027+- 0.003	0.176+- 0.016	0.010+- 0.001
GA	0.009+- 0.003	0.058+- 0.017	0.003+- 0.001
AS	0.365+- 0.021	2.345+- 0.133	0.129+- 0.007
SE	0.027+- 0.003	0.174+- 0.019	0.010+- 0.001
BR	0.000+- 0.029	0.000+- 0.187	0.000+- 0.010
RB	0.000+- 0.003	0.000+- 0.021	0.000+- 0.001
SR	0.000+- 0.004	0.000+- 0.027	0.000+- 0.001
Y	0.000+- 0.005	0.000+- 0.030	0.000+- 0.002
ZR	0.000+- 0.018	0.000+- 0.118	0.000+- 0.006
MO	0.218+- 0.015	1.402+- 0.096	0.077+- 0.005
PD	0.000+- 0.014	0.000+- 0.093	0.000+- 0.005
AG	0.000+- 0.020	0.000+- 0.127	0.000+- 0.007
CD	0.000+- 0.030	0.000+- 0.195	0.000+- 0.011
IN	0.000+- 0.038	0.000+- 0.243	0.000+- 0.013
SN	0.000+- 0.078	0.000+- 0.503	0.000+- 0.028
SB	217.649+- 10.173	1397.31+- 65.310	76.963+- 3.622
BA	0.000+- 0.103	0.000+- 0.661	0.000+- 0.036
LA	0.000+- 0.159	0.000+- 1.022	0.000+- 0.056
HG	0.000+- 0.005	0.000+- 0.034	0.000+- 0.002
PB	0.868+- 0.042	5.575+- 0.270	0.307+- 0.015

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 4A
 PARTICLE SIZE: C
 ANALYSIS ID: AC004 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 399+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.250+-	0.136	1.605+-	0.874	0.402+-	0.219
SI	0.400+-	0.210	2.568+-	1.351	0.643+-	0.339
P	0.000+-	0.048	0.000+-	0.307	0.000+-	0.077
S	0.778+-	0.083	4.993+-	0.536	1.251+-	0.138
CL	0.483+-	0.053	3.101+-	0.341	0.777+-	0.088
K	0.000+-	0.673	0.000+-	4.323	0.000+-	1.083
CA	0.000+-	11.361	0.000+-	72.940	0.000+-	18.28
TI	0.000+-	0.572	0.000+-	3.673	0.000+-	0.920
V	0.000+-	0.005	0.000+-	0.033	0.000+-	0.008
CR	0.006+-	0.002	0.039+-	0.013	0.010+-	0.003
MN	0.003+-	0.002	0.022+-	0.012	0.006+-	0.003
FE	0.288+-	0.020	1.847+-	0.131	0.463+-	0.035
NI	0.009+-	0.002	0.061+-	0.015	0.015+-	0.004
CU	0.004+-	0.002	0.027+-	0.012	0.007+-	0.003
ZN	0.006+-	0.002	0.040+-	0.011	0.010+-	0.003
GA	0.003+-	0.002	0.019+-	0.011	0.005+-	0.003
AS	0.071+-	0.009	0.458+-	0.058	0.115+-	0.015
SE	0.007+-	0.002	0.043+-	0.011	0.011+-	0.003
BR	0.000+-	0.011	0.000+-	0.071	0.000+-	0.018
RB	0.000+-	0.003	0.000+-	0.016	0.000+-	0.004
SR	0.000+-	0.003	0.000+-	0.021	0.000+-	0.005
Y	0.000+-	0.004	0.000+-	0.023	0.000+-	0.006
ZR	0.000+-	0.014	0.000+-	0.091	0.000+-	0.023
MO	0.039+-	0.011	0.253+-	0.072	0.063+-	0.018
PD	0.000+-	0.011	0.000+-	0.069	0.000+-	0.017
AG	0.000+-	0.016	0.000+-	0.100	0.000+-	0.025
CD	0.000+-	0.020	0.000+-	0.128	0.000+-	0.032
IN	0.000+-	0.025	0.000+-	0.159	0.000+-	0.040
SN	0.000+-	0.200	0.000+-	1.286	0.000+-	0.322
SB	51.126+-	4.671	328.228+-	29.987	82.240+-	7.791
BA	0.111+-	0.104	0.715+-	0.671	0.179+-	0.168
LA	0.000+-	0.159	0.000+-	1.018	0.000+-	0.255
HG	0.000+-	0.004	0.000+-	0.026	0.000+-	0.007
PB	0.087+-	0.013	0.559+-	0.081	0.140+-	0.021

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 4A
 PARTICLE SIZE: F
 ANALYSIS ID: AF130 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 2639+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.584	0.000+- 3.747	0.000+- 0.142
SI	0.000+- 0.594	0.000+- 3.811	0.000+- 0.144
P	0.000+- 0.151	0.000+- 0.971	0.000+- 0.037
S	5.032+- 0.247	32.305+- 1.584	1.224+- 0.060
CL	3.038+- 0.159	19.505+- 1.018	0.739+- 0.039
K	0.000+- 2.153	0.000+- 13.823	0.000+- 0.524
CA	0.000+- 37.027	0.000+- 237.71	0.000+- 9.008
TI	0.000+- 1.710	0.000+- 10.981	0.000+- 0.416
V	0.000+- 0.017	0.000+- 0.112	0.000+- 0.004
CR	0.024+- 0.004	0.157+- 0.028	0.006+- 0.001
MN	0.031+- 0.003	0.200+- 0.016	0.008+- 0.001
FE	0.524+- 0.027	3.363+- 0.173	0.127+- 0.007
NI	0.058+- 0.004	0.372+- 0.028	0.014+- 0.001
CU	0.037+- 0.003	0.236+- 0.020	0.009+- 0.001
ZN	0.043+- 0.003	0.273+- 0.021	0.010+- 0.001
GA	0.018+- 0.003	0.116+- 0.018	0.004+- 0.001
AS	0.372+- 0.021	2.386+- 0.133	0.090+- 0.005
SE	0.032+- 0.003	0.208+- 0.019	0.008+- 0.001
BR	0.000+- 0.041	0.000+- 0.265	0.000+- 0.010
RB	0.000+- 0.004	0.000+- 0.023	0.000+- 0.001
SR	0.000+- 0.005	0.000+- 0.033	0.000+- 0.001
Y	0.000+- 0.005	0.000+- 0.035	0.000+- 0.001
ZR	0.000+- 0.021	0.000+- 0.132	0.000+- 0.005
MO	0.308+- 0.018	1.977+- 0.117	0.075+- 0.004
PD	0.000+- 0.019	0.000+- 0.122	0.000+- 0.005
AG	0.000+- 0.024	0.000+- 0.154	0.000+- 0.006
CD	0.000+- 0.032	0.000+- 0.205	0.000+- 0.008
IN	0.000+- 0.047	0.000+- 0.300	0.000+- 0.011
SN	0.000+- 0.106	0.000+- 0.683	0.000+- 0.026
SB	329.259+- 15.378	2113.85+- 98.727	80.104+- 3.754
BA	0.000+- 0.106	0.000+- 0.681	0.000+- 0.026
LA	0.000+- 0.164	0.000+- 1.050	0.000+- 0.040
HG	0.055+- 0.006	0.351+- 0.038	0.013+- 0.001
PB	0.800+- 0.039	5.133+- 0.250	0.195+- 0.009

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 4B
 PARTICLE SIZE: C
 ANALYSIS ID: CC081 - Nuclepore
 DARK PARTICLES ON BACK OF FILTER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 987+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.250+-	0.384	1.605+-	2.466	0.163+-	0.250
SI	0.350+-	0.473	2.247+-	3.038	0.228+-	0.308
P	0.000+-	0.058	0.000+-	0.374	0.000+-	0.038
S	0.000+-	0.131	0.000+-	0.840	0.000+-	0.085
CL	0.000+-	0.088	0.000+-	0.563	0.000+-	0.057
K	0.000+-	1.217	0.000+-	7.810	0.000+-	0.791
CA	0.000+-	19.314	0.000+-	123.99	0.000+-	12.56
TI	0.000+-	0.915	0.000+-	5.876	0.000+-	0.595
V	0.000+-	0.008	0.000+-	0.053	0.000+-	0.005
CR	0.006+-	0.003	0.039+-	0.018	0.004+-	0.002
MN	0.009+-	0.002	0.055+-	0.013	0.006+-	0.001
FE	0.382+-	0.025	2.455+-	0.158	0.249+-	0.016
NI	0.023+-	0.003	0.150+-	0.020	0.015+-	0.002
CU	0.009+-	0.002	0.055+-	0.015	0.006+-	0.002
ZN	0.015+-	0.002	0.098+-	0.014	0.010+-	0.001
GA	0.007+-	0.002	0.043+-	0.013	0.004+-	0.001
AS	0.144+-	0.012	0.928+-	0.079	0.094+-	0.008
SE	0.011+-	0.002	0.072+-	0.015	0.007+-	0.001
BR	0.000+-	0.018	0.000+-	0.116	0.000+-	0.012
RB	0.000+-	0.003	0.000+-	0.021	0.000+-	0.002
SR	0.034+-	0.004	0.221+-	0.027	0.022+-	0.003
Y	0.025+-	0.004	0.158+-	0.028	0.016+-	0.003
ZR	0.000+-	0.017	0.000+-	0.107	0.000+-	0.011
MO	0.119+-	0.015	0.765+-	0.094	0.077+-	0.010
PD	0.000+-	0.014	0.000+-	0.089	0.000+-	0.009
AG	0.000+-	0.019	0.000+-	0.125	0.000+-	0.013
CD	0.000+-	0.026	0.000+-	0.170	0.000+-	0.017
IN	0.000+-	0.034	0.000+-	0.220	0.000+-	0.022
SN	0.000+-	0.066	0.000+-	0.421	0.000+-	0.043
SB	122.631+-	7.828	787.289+-	50.256	79.757+-	5.155
BA	0.000+-	0.119	0.000+-	0.764	0.000+-	0.077
LA	0.029+-	0.186	0.186+-	1.191	0.019+-	0.121
HG	0.000+-	0.005	0.000+-	0.032	0.000+-	0.003
PB	0.209+-	0.018	1.343+-	0.117	0.136+-	0.012

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 4B
 PARTICLE SIZE: F
 ANALYSIS ID: AF129 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 2169+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.503	0.000+- 3.230	0.000+- 0.149
SI	0.000+- 0.503	0.000+- 3.230	0.000+- 0.149
P	0.000+- 0.126	0.000+- 0.807	0.000+- 0.037
S	4.247+- 0.211	27.264+- 1.354	1.257+- 0.063
CL	2.532+- 0.134	16.253+- 0.858	0.749+- 0.040
K	0.000+- 1.811	0.000+- 11.627	0.000+- 0.536
CA	0.000+- 31.392	0.000+- 201.54	0.000+- 9.292
TI	0.000+- 1.509	0.000+- 9.689	0.000+- 0.447
V	0.000+- 0.013	0.000+- 0.081	0.000+- 0.004
CR	0.018+- 0.004	0.114+- 0.023	0.005+- 0.001
MN	0.026+- 0.003	0.164+- 0.016	0.008+- 0.001
FE	0.428+- 0.023	2.749+- 0.146	0.127+- 0.007
NI	0.048+- 0.004	0.306+- 0.025	0.014+- 0.001
CU	0.036+- 0.003	0.230+- 0.021	0.011+- 0.001
ZN	0.033+- 0.003	0.213+- 0.018	0.010+- 0.001
GA	0.017+- 0.003	0.109+- 0.018	0.005+- 0.001
AS	0.283+- 0.017	1.817+- 0.111	0.084+- 0.005
SE	0.028+- 0.003	0.177+- 0.019	0.008+- 0.001
BR	0.074+- 0.005	0.476+- 0.030	0.022+- 0.001
RB	0.042+- 0.004	0.271+- 0.023	0.013+- 0.001
SR	0.067+- 0.005	0.432+- 0.031	0.020+- 0.001
Y	0.057+- 0.005	0.367+- 0.033	0.017+- 0.002
ZR	0.235+- 0.020	1.510+- 0.127	0.070+- 0.006
MO	0.277+- 0.018	1.777+- 0.115	0.082+- 0.005
PD	0.180+- 0.016	1.155+- 0.104	0.053+- 0.005
AG	0.222+- 0.021	1.422+- 0.138	0.066+- 0.006
CD	0.320+- 0.029	2.055+- 0.189	0.095+- 0.009
IN	0.652+- 0.043	4.189+- 0.278	0.193+- 0.013
SN	1.795+- 0.094	11.526+- 0.606	0.531+- 0.028
SB	265.790+- 12.418	1706.37+- 79.724	78.675+- 3.694
BA	0.188+- 0.118	1.206+- 0.758	0.056+- 0.035
LA	0.496+- 0.181	3.185+- 1.164	0.147+- 0.054
HG	0.064+- 0.007	0.414+- 0.043	0.019+- 0.002
PB	0.751+- 0.037	4.823+- 0.237	0.222+- 0.011

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 5A
 PARTICLE SIZE: C
 ANALYSIS ID: A0005 - Teflon
 LARGE BLACK PARTICLE NEAR EDGE OF FILTER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 358+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.146	0.000+-	0.935	0.000+-	0.261
SI	0.000+-	0.136	0.000+-	0.871	0.000+-	0.243
P	0.000+-	0.033	0.000+-	0.214	0.000+-	0.060
S	0.654+-	0.065	4.197+-	0.417	1.172+-	0.121
CL	0.344+-	0.038	2.206+-	0.244	0.616+-	0.070
K	0.000+-	0.474	0.000+-	3.042	0.000+-	0.849
CA	0.000+-	7.800	0.000+-	50.073	0.000+-	13.98
TI	0.000+-	0.400	0.000+-	2.568	0.000+-	0.717
V	0.000+-	0.004	0.000+-	0.023	0.000+-	0.006
CR	0.003+-	0.002	0.018+-	0.011	0.005+-	0.003
MN	0.001+-	0.002	0.003+-	0.011	0.001+-	0.003
FE	0.049+-	0.007	0.317+-	0.045	0.089+-	0.013
NI	0.006+-	0.002	0.038+-	0.013	0.011+-	0.004
CU	0.004+-	0.002	0.027+-	0.012	0.008+-	0.003
ZN	0.003+-	0.001	0.017+-	0.009	0.005+-	0.003
GA	0.002+-	0.001	0.015+-	0.009	0.004+-	0.003
AS	0.044+-	0.007	0.282+-	0.042	0.079+-	0.012
SE	0.003+-	0.002	0.020+-	0.010	0.006+-	0.003
BR	0.016+-	0.003	0.100+-	0.020	0.028+-	0.006
RB	0.004+-	0.002	0.029+-	0.016	0.008+-	0.004
SR	0.000+-	0.003	0.000+-	0.020	0.000+-	0.006
Y	0.000+-	0.004	0.000+-	0.023	0.000+-	0.006
ZR	0.000+-	0.014	0.000+-	0.092	0.000+-	0.026
MO	0.026+-	0.011	0.170+-	0.070	0.047+-	0.020
PD	0.000+-	0.011	0.000+-	0.069	0.000+-	0.019
AG	0.000+-	0.015	0.000+-	0.093	0.000+-	0.026
CD	0.000+-	0.020	0.000+-	0.126	0.000+-	0.035
IN	0.000+-	0.023	0.000+-	0.146	0.000+-	0.041
SN	0.000+-	0.170	0.000+-	1.092	0.000+-	0.305
SB	41.541+-	3.257	266.693+-	20.909	74.472+-	6.198
BA	0.000+-	0.107	0.000+-	0.686	0.000+-	0.192
LA	0.000+-	0.166	0.000+-	1.063	0.000+-	0.297
HG	0.000+-	0.004	0.000+-	0.025	0.000+-	0.007
PB	0.051+-	0.009	0.325+-	0.057	0.091+-	0.016

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 5A
 PARTICLE SIZE: F
 ANALYSIS ID: AF132 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1519+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.362	0.000+- 2.325	0.000+- 0.153
SI	0.000+- 0.352	0.000+- 2.261	0.000+- 0.149
P	0.000+- 0.087	0.000+- 0.561	0.000+- 0.037
S	3.069+- 0.155	19.702+- 0.992	1.297+- 0.066
CL	1.810+- 0.097	11.618+- 0.625	0.765+- 0.041
K	0.000+- 1.801	0.000+- 11.563	0.000+- 0.761
CA	0.000+- 22.317	0.000+- 143.27	0.000+- 9.433
TI	0.000+- 1.580	0.000+- 10.141	0.000+- 0.668
V	0.000+- 0.009	0.000+- 0.058	0.000+- 0.004
CR	0.013+- 0.003	0.086+- 0.017	0.006+- 0.001
MN	0.019+- 0.002	0.121+- 0.012	0.008+- 0.001
FE	0.200+- 0.012	1.281+- 0.077	0.084+- 0.005
NI	0.030+- 0.003	0.191+- 0.018	0.013+- 0.001
CU	0.020+- 0.002	0.130+- 0.014	0.009+- 0.001
ZN	0.021+- 0.002	0.134+- 0.013	0.009+- 0.001
GA	0.013+- 0.002	0.081+- 0.013	0.005+- 0.001
AS	0.181+- 0.012	1.159+- 0.074	0.076+- 0.005
SE	0.017+- 0.002	0.110+- 0.013	0.007+- 0.001
BR	0.000+- 0.018	0.000+- 0.116	0.000+- 0.008
RB	0.000+- 0.003	0.000+- 0.016	0.000+- 0.001
SR	0.000+- 0.003	0.000+- 0.022	0.000+- 0.001
Y	0.000+- 0.004	0.000+- 0.023	0.000+- 0.002
ZR	0.000+- 0.016	0.000+- 0.101	0.000+- 0.007
MO	0.178+- 0.012	1.146+- 0.078	0.075+- 0.005
PD	0.000+- 0.013	0.000+- 0.085	0.000+- 0.006
AG	0.000+- 0.017	0.000+- 0.107	0.000+- 0.007
CD	0.000+- 0.022	0.000+- 0.140	0.000+- 0.009
IN	0.000+- 0.032	0.000+- 0.203	0.000+- 0.013
SN	0.000+- 0.067	0.000+- 0.433	0.000+- 0.028
SB	184.827+- 8.642	1186.59+- 55.483	78.122+- 3.689
BA	0.000+- 0.083	0.000+- 0.534	0.000+- 0.035
LA	0.000+- 0.127	0.000+- 0.817	0.000+- 0.054
HG	0.000+- 0.005	0.000+- 0.030	0.000+- 0.002
PB	0.351+- 0.019	2.256+- 0.119	0.149+- 0.008

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 5B
 PARTICLE SIZE: C
 ANALYSIS ID: CC082 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 726+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.212	0.000+-	1.364	0.000+-	0.188
SI	0.000+-	0.193	0.000+-	1.236	0.000+-	0.170
P	0.000+-	0.043	0.000+-	0.277	0.000+-	0.038
S	1.439+-	0.101	9.236+-	0.652	1.272+-	0.091
CL	0.917+-	0.066	5.885+-	0.423	0.810+-	0.059
K	0.000+-	0.848	0.000+-	5.443	0.000+-	0.750
CA	0.000+-	14.137	0.000+-	90.763	0.000+-	12.50
TI	0.000+-	0.697	0.000+-	4.472	0.000+-	0.616
V	0.000+-	0.006	0.000+-	0.039	0.000+-	0.005
CR	0.003+-	0.002	0.019+-	0.015	0.003+-	0.002
MN	0.011+-	0.002	0.069+-	0.012	0.010+-	0.002
FE	0.106+-	0.010	0.681+-	0.062	0.094+-	0.009
NI	0.012+-	0.003	0.075+-	0.018	0.010+-	0.002
CU	0.010+-	0.002	0.065+-	0.013	0.009+-	0.002
ZN	0.003+-	0.002	0.053+-	0.011	0.007+-	0.002
GA	0.004+-	0.002	0.028+-	0.011	0.004+-	0.001
AS	0.085+-	0.009	0.546+-	0.056	0.075+-	0.008
SE	0.007+-	0.002	0.047+-	0.012	0.006+-	0.002
BR	0.023+-	0.003	0.150+-	0.022	0.021+-	0.003
RB	0.000+-	0.003	0.000+-	0.020	0.000+-	0.003
SR	0.000+-	0.004	0.000+-	0.025	0.000+-	0.003
Y	0.000+-	0.004	0.000+-	0.026	0.000+-	0.004
ZR	0.000+-	0.016	0.000+-	0.102	0.000+-	0.014
MO	0.000+-	0.013	0.000+-	0.084	0.000+-	0.012
PD	0.000+-	0.012	0.000+-	0.075	0.000+-	0.010
AG	0.000+-	0.016	0.000+-	0.105	0.000+-	0.014
CD	0.000+-	0.023	0.000+-	0.145	0.000+-	0.020
IN	0.000+-	0.029	0.000+-	0.188	0.000+-	0.026
SN	0.000+-	0.049	0.000+-	0.316	0.000+-	0.044
SB	93.239+-	5.637	598.597+-	36.191	82.439+-	5.112
BA	0.000+-	0.117	0.000+-	0.751	0.000+-	0.103
LA	0.000+-	0.183	0.000+-	1.176	0.000+-	0.162
HG	0.000+-	0.004	0.000+-	0.027	0.000+-	0.004
PB	0.151+-	0.013	0.971+-	0.083	0.134+-	0.012

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 5B
 PARTICLE SIZE: F
 ANALYSIS ID: AF131 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1159+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.292	0.000+- 1.873	0.000+- 0.162
SI	0.000+- 0.282	0.000+- 1.809	0.000+- 0.156
P	0.000+- 0.076	0.000+- 0.487	0.000+- 0.042
S	2.427+- 0.125	15.582+- 0.803	1.345+- 0.070
CL	1.456+- 0.080	9.346+- 0.511	0.806+- 0.045
K	0.000+- 1.036	0.000+- 6.653	0.000+- 0.574
CA	0.000+- 17.809	0.000+- 114.33	0.000+- 9.866
TI	0.000+- 0.865	0.000+- 5.555	0.000+- 0.479
V	0.000+- 0.007	0.000+- 0.047	0.000+- 0.004
CR	0.009+- 0.002	0.057+- 0.014	0.005+- 0.001
MN	0.011+- 0.002	0.071+- 0.011	0.006+- 0.001
FE	0.172+- 0.011	1.105+- 0.070	0.095+- 0.006
NI	0.023+- 0.003	0.146+- 0.016	0.013+- 0.001
CU	0.022+- 0.002	0.138+- 0.015	0.012+- 0.001
ZN	0.017+- 0.002	0.112+- 0.013	0.010+- 0.001
GA	0.006+- 0.002	0.038+- 0.011	0.003+- 0.001
AS	0.146+- 0.010	0.939+- 0.066	0.081+- 0.006
SE	0.013+- 0.002	0.081+- 0.012	0.007+- 0.001
BR	0.000+- 0.015	0.000+- 0.097	0.000+- 0.008
RB	0.000+- 0.003	0.000+- 0.016	0.000+- 0.001
SR	0.000+- 0.003	0.000+- 0.022	0.000+- 0.002
Y	0.000+- 0.004	0.000+- 0.023	0.000+- 0.002
ZR	0.000+- 0.014	0.000+- 0.093	0.000+- 0.008
MO	0.136+- 0.011	0.874+- 0.072	0.075+- 0.006
PD	0.000+- 0.012	0.000+- 0.074	0.000+- 0.006
AG	0.000+- 0.016	0.000+- 0.105	0.000+- 0.009
CD	0.000+- 0.021	0.000+- 0.136	0.000+- 0.012
IN	0.000+- 0.028	0.000+- 0.182	0.000+- 0.016
SN	0.000+- 0.056	0.000+- 0.357	0.000+- 0.031
SB	147.733+- 6.912	948.444+- 44.377	81.841+- 3.894
BA	0.070+- 0.089	0.449+- 0.569	0.039+- 0.049
LA	0.000+- 0.143	0.000+- 0.918	0.000+- 0.079
HG	0.000+- 0.004	0.000+- 0.028	0.000+- 0.002
PB	0.313+- 0.017	2.012+- 0.109	0.174+- 0.010

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 6A
 PARTICLE SIZE: C
 ANALYSIS ID: AC006 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 307+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT
AL	0.000+-	0.134	0.000+-	0.863	0.000+- 0.281
SI	0.000+-	0.134	0.000+-	0.863	0.000+- 0.281
P	0.000+-	0.032	0.000+-	0.204	0.000+- 0.066
S	0.715+-	0.066	4.589+-	0.423	1.493+- 0.146
CL	0.376+-	0.038	2.416+-	0.245	0.786+- 0.084
K	0.000+-	0.448	0.000+-	2.876	0.000+- 0.935
CA	0.000+-	7.704	0.000+-	49.463	0.000+- 16.09
TI	0.000+-	0.385	0.000+-	2.474	0.000+- 0.805
V	0.000+-	0.004	0.000+-	0.023	0.000+- 0.007
CR	0.004+-	0.002	0.024+-	0.011	0.008+- 0.004
MN	0.004+-	0.002	0.024+-	0.011	0.008+- 0.004
FE	0.060+-	0.008	0.385+-	0.049	0.125+- 0.016
NI	0.005+-	0.002	0.030+-	0.013	0.010+- 0.004
CU	0.002+-	0.002	0.015+-	0.011	0.005+- 0.004
ZN	0.006+-	0.001	0.036+-	0.010	0.012+- 0.003
GA	0.002+-	0.001	0.014+-	0.009	0.004+- 0.003
AS	0.043+-	0.006	0.276+-	0.040	0.090+- 0.013
SE	0.004+-	0.002	0.025+-	0.010	0.008+- 0.003
BR	0.000+-	0.008	0.000+-	0.053	0.000+- 0.017
RB	0.000+-	0.002	0.000+-	0.016	0.000+- 0.005
SR	0.000+-	0.003	0.000+-	0.020	0.000+- 0.007
Y	0.000+-	0.003	0.000+-	0.022	0.000+- 0.007
ZR	0.000+-	0.014	0.000+-	0.089	0.000+- 0.029
MO	0.031+-	0.011	0.196+-	0.068	0.064+- 0.022
PD	0.000+-	0.010	0.000+-	0.065	0.000+- 0.021
AG	0.000+-	0.014	0.000+-	0.091	0.000+- 0.029
CD	0.000+-	0.019	0.000+-	0.121	0.000+- 0.039
IN	0.000+-	0.023	0.000+-	0.149	0.000+- 0.049
SN	0.000+-	0.170	0.000+-	1.092	0.000+- 0.355
SB	42.011+-	3.133	269.709+-	20.115	87.726+- 7.138
BA	0.000+-	0.102	0.000+-	0.653	0.000+- 0.212
LA	0.068+-	0.163	0.439+-	1.048	0.143+- 0.341
HG	0.014+-	0.004	0.087+-	0.023	0.028+- 0.007
PB	0.050+-	0.008	0.318+-	0.053	0.103+- 0.018

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 6A
 PARTICLE SIZE: F
 ANALYSIS ID: AF134 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1356+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.312	0.000+-	2.002	0.000+-	0.148
SI	0.000+-	0.312	0.000+-	2.002	0.000+-	0.148
P	0.000+-	0.079	0.000+-	0.505	0.000+-	0.037
S	2.817+-	0.142	18.087+-	0.914	1.334+-	0.068
CL	1.592+-	0.087	10.219+-	0.558	0.754+-	0.042
K	0.000+-	1.137	0.000+-	7.299	0.000+-	0.538
CA	0.000+-	19.419	0.000+-	124.67	0.000+-	9.197
TI	0.000+-	0.976	0.000+-	6.266	0.000+-	0.462
V	0.000+-	0.008	0.000+-	0.053	0.000+-	0.004
CR	0.011+-	0.002	0.071+-	0.016	0.005+-	0.001
MN	0.012+-	0.002	0.078+-	0.010	0.006+-	0.001
FE	0.229+-	0.013	1.469+-	0.086	0.108+-	0.006
NI	0.031+-	0.003	0.201+-	0.019	0.015+-	0.001
CU	0.023+-	0.002	0.147+-	0.015	0.011+-	0.001
ZN	0.015+-	0.002	0.096+-	0.011	0.007+-	0.001
GA	0.010+-	0.002	0.067+-	0.012	0.005+-	0.001
AS	0.166+-	0.011	1.064+-	0.068	0.078+-	0.005
SE	0.017+-	0.002	0.112+-	0.013	0.008+-	0.001
BR	0.000+-	0.016	0.000+-	0.103	0.000+-	0.008
RB	0.000+-	0.003	0.000+-	0.016	0.000+-	0.001
SR	0.000+-	0.003	0.000+-	0.020	0.000+-	0.001
Y	0.000+-	0.004	0.000+-	0.023	0.000+-	0.002
ZR	0.000+-	0.014	0.000+-	0.093	0.000+-	0.007
MO	0.151+-	0.011	0.968+-	0.072	0.071+-	0.005
PD	0.000+-	0.012	0.000+-	0.075	0.000+-	0.006
AG	0.000+-	0.016	0.000+-	0.101	0.000+-	0.007
CD	0.000+-	0.023	0.000+-	0.146	0.000+-	0.011
IN	0.000+-	0.029	0.000+-	0.189	0.000+-	0.014
SN	0.000+-	0.057	0.000+-	0.363	0.000+-	0.027
SB	161.844+-	7.570	1039.04+-	48.602	76.651+-	3.630
BA	0.000+-	0.082	0.000+-	0.529	0.000+-	0.039
LA	0.000+-	0.130	0.000+-	0.835	0.000+-	0.062
HG	0.000+-	0.004	0.000+-	0.024	0.000+-	0.002
PB	0.269+-	0.015	1.729+-	0.096	0.128+-	0.007

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 6B
 PARTICLE SIZE: C
 ANALYSIS ID: CC083 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 709+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.182	0.000+- 1.169	0.000+- 0.165
SI	0.000+- 0.162	0.000+- 1.043	0.000+- 0.147
P	0.000+- 0.044	0.000+- 0.283	0.000+- 0.040
S	1.366+- 0.096	8.767+- 0.618	1.236+- 0.089
CL	0.901+- 0.064	5.782+- 0.409	0.815+- 0.059
K	0.000+- 0.767	0.000+- 4.922	0.000+- 0.694
CA	0.000+- 13.114	0.000+- 84.189	0.000+- 11.87
TI	0.000+- 0.656	0.000+- 4.209	0.000+- 0.594
V	0.000+- 0.006	0.000+- 0.036	0.000+- 0.005
CR	0.014+- 0.002	0.088+- 0.015	0.012+- 0.002
MN	0.010+- 0.002	0.062+- 0.012	0.009+- 0.002
FE	0.115+- 0.010	0.741+- 0.065	0.104+- 0.009
NI	0.008+- 0.003	0.054+- 0.017	0.008+- 0.002
CU	0.011+- 0.002	0.071+- 0.013	0.010+- 0.002
ZN	0.007+- 0.002	0.047+- 0.011	0.007+- 0.001
GA	0.005+- 0.002	0.031+- 0.011	0.004+- 0.002
AS	0.071+- 0.008	0.457+- 0.051	0.064+- 0.007
SE	0.012+- 0.002	0.076+- 0.013	0.011+- 0.002
BR	0.000+- 0.010	0.000+- 0.065	0.000+- 0.009
RB	0.013+- 0.003	0.086+- 0.018	0.012+- 0.003
SR	0.000+- 0.004	0.000+- 0.024	0.000+- 0.003
Y	0.000+- 0.004	0.000+- 0.025	0.000+- 0.004
ZR	0.000+- 0.016	0.000+- 0.101	0.000+- 0.014
MO	0.102+- 0.013	0.655+- 0.085	0.092+- 0.012
PD	0.000+- 0.012	0.000+- 0.075	0.000+- 0.011
AG	0.000+- 0.016	0.000+- 0.106	0.000+- 0.015
CD	0.000+- 0.022	0.000+- 0.143	0.000+- 0.020
IN	0.000+- 0.028	0.000+- 0.181	0.000+- 0.025
SN	0.000+- 0.049	0.000+- 0.318	0.000+- 0.045
SB	84.123+- 5.056	540.071+- 32.456	76.162+- 4.701
BA	0.071+- 0.118	0.457+- 0.760	0.064+- 0.107
LA	0.000+- 0.182	0.000+- 1.170	0.000+- 0.165
HG	0.000+- 0.004	0.000+- 0.026	0.000+- 0.004
PB	0.135+- 0.012	0.867+- 0.077	0.122+- 0.011

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - TEST NO. 6B
 PARTICLE SIZE: F
 ANALYSIS ID: AF133 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1009+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 0.252	0.000+- 1.615	0.000+- 0.160
SI	0.000+- 0.252	0.000+- 1.615	0.000+- 0.160
P	0.000+- 0.065	0.000+- 0.415	0.000+- 0.041
S	2.250+- 0.116	14.446+- 0.748	1.432+- 0.075
CL	1.272+- 0.071	8.163+- 0.455	0.809+- 0.046
K	0.000+- 0.916	0.000+- 5.878	0.000+- 0.583
CA	0.000+- 15.595	0.000+- 100.12	0.000+- 9.924
TI	0.000+- 0.775	0.000+- 4.974	0.000+- 0.493
V	0.000+- 0.007	0.000+- 0.043	0.000+- 0.004
CR	0.010+- 0.002	0.064+- 0.014	0.006+- 0.001
MN	0.011+- 0.002	0.071+- 0.010	0.007+- 0.001
FE	0.187+- 0.011	1.199+- 0.074	0.119+- 0.007
NI	0.022+- 0.002	0.142+- 0.016	0.014+- 0.002
CU	0.014+- 0.002	0.088+- 0.012	0.009+- 0.001
ZN	0.015+- 0.002	0.098+- 0.012	0.010+- 0.001
GA	0.007+- 0.002	0.047+- 0.011	0.005+- 0.001
AS	0.113+- 0.009	0.725+- 0.056	0.072+- 0.006
SE	0.011+- 0.002	0.074+- 0.011	0.007+- 0.001
BR	0.000+- 0.015	0.000+- 0.097	0.000+- 0.010
RB	0.000+- 0.002	0.000+- 0.015	0.000+- 0.001
SR	0.000+- 0.003	0.000+- 0.019	0.000+- 0.002
Y	0.000+- 0.003	0.000+- 0.022	0.000+- 0.002
ZR	0.000+- 0.014	0.000+- 0.090	0.000+- 0.009
MO	0.131+- 0.011	0.841+- 0.070	0.083+- 0.007
PD	0.000+- 0.010	0.000+- 0.067	0.000+- 0.007
AG	0.000+- 0.014	0.000+- 0.093	0.000+- 0.009
CD	0.000+- 0.020	0.000+- 0.127	0.000+- 0.013
IN	0.000+- 0.027	0.000+- 0.171	0.000+- 0.017
SN	0.000+- 0.048	0.000+- 0.311	0.000+- 0.031
SB	127.631+- 5.975	819.388+- 38.358	81.217+- 3.886
BA	0.000+- 0.088	0.000+- 0.565	0.000+- 0.056
LA	0.000+- 0.133	0.000+- 0.855	0.000+- 0.085
HG	0.000+- 0.004	0.000+- 0.026	0.000+- 0.003
PB	0.252+- 0.014	1.617+- 0.092	0.160+- 0.009

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF245 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.015+-	0.010	0.099+-	0.065
SI	0.008+-	0.007	0.052+-	0.043
P	0.002+-	0.003	0.011+-	0.022
S	0.000+-	0.019	0.000+-	0.120
CL	0.000+-	0.006	0.000+-	0.038
K	0.000+-	0.002	0.000+-	0.013
CA	0.000+-	0.002	0.000+-	0.011
TI	0.001+-	0.001	0.006+-	0.007
V	0.000+-	0.001	0.003+-	0.005
CR	0.000+-	0.001	0.000+-	0.006
MN	0.001+-	0.001	0.009+-	0.007
FE	0.005+-	0.003	0.033+-	0.019
NI	0.000+-	0.001	0.000+-	0.006
CU	0.001+-	0.001	0.008+-	0.008
ZN	0.000+-	0.001	0.000+-	0.005
GA	0.001+-	0.001	0.007+-	0.005
AS	0.000+-	0.003	0.000+-	0.016
SE	0.000+-	0.001	0.002+-	0.006
BR	0.001+-	0.001	0.007+-	0.008
RB	0.000+-	0.002	0.003+-	0.010
SR	0.001+-	0.002	0.005+-	0.012
Y	0.001+-	0.002	0.007+-	0.015
ZR	0.015+-	0.010	0.096+-	0.064
MO	0.000+-	0.007	0.000+-	0.044
PD	0.000+-	0.006	0.000+-	0.037
AG	0.002+-	0.008	0.015+-	0.054
CD	0.002+-	0.012	0.011+-	0.076
IN	0.018+-	0.014	0.115+-	0.087
SN	0.000+-	0.016	0.000+-	0.105
SB	0.051+-	0.031	0.325+-	0.200
BA	0.238+-	0.080	1.527+-	0.512
LA	0.140+-	0.120	0.897+-	0.772
HG	0.001+-	0.002	0.007+-	0.011
PB	0.001+-	0.004	0.004+-	0.027

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: AC080 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.013	0.000+-	0.084
SI	0.001+-	0.010	0.004+-	0.061
P	0.000+-	0.004	0.000+-	0.025
S	0.000+-	0.021	0.000+-	0.135
CL	0.011+-	0.007	0.072+-	0.046
K	0.000+-	0.003	0.000+-	0.018
CA	0.000+-	0.002	0.000+-	0.012
TI	0.000+-	0.001	0.000+-	0.008
V	0.000+-	0.001	0.003+-	0.006
CR	0.000+-	0.001	0.003+-	0.007
MN	0.000+-	0.001	0.000+-	0.008
FE	0.003+-	0.003	0.021+-	0.020
NI	0.000+-	0.001	0.000+-	0.007
CU	0.000+-	0.001	0.000+-	0.008
ZN	0.001+-	0.001	0.007+-	0.007
GA	0.002+-	0.001	0.010+-	0.006
AS	0.000+-	0.003	0.000+-	0.019
SE	0.000+-	0.001	0.000+-	0.007
BR	0.000+-	0.001	0.000+-	0.009
RB	0.000+-	0.002	0.003+-	0.012
SR	0.000+-	0.002	0.000+-	0.015
Y	0.000+-	0.003	0.000+-	0.017
ZR	0.000+-	0.011	0.000+-	0.072
MO	0.000+-	0.008	0.000+-	0.051
PD	0.000+-	0.006	0.000+-	0.042
AG	0.000+-	0.010	0.000+-	0.064
CD	0.017+-	0.013	0.107+-	0.086
IN	0.019+-	0.016	0.122+-	0.105
SN	0.000+-	0.019	0.000+-	0.122
SB	0.000+-	0.034	0.000+-	0.217
BA	0.112+-	0.089	0.719+-	0.571
LA	0.000+-	0.135	0.000+-	0.867
HG	0.000+-	0.002	0.000+-	0.015
PB	0.006+-	0.005	0.038+-	0.032

SAMPLE ID: HARSHAW/ANTIMONY OXIDE ROASTING - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC125 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2	UG/FILTER
AL	0.000+- 0.024	0.000+- 0.157
SI	0.006+- 0.019	0.037+- 0.122
P	0.000+- 0.010	0.000+- 0.062
S	0.000+- 0.022	0.000+- 0.140
CL	0.000+- 0.009	0.000+- 0.060
K	0.000+- 0.003	0.000+- 0.018
CA	0.000+- 0.002	0.000+- 0.014
TI	0.000+- 0.001	0.000+- 0.009
V	0.001+- 0.001	0.008+- 0.006
CR	0.000+- 0.002	0.000+- 0.011
MN	0.000+- 0.001	0.000+- 0.010
FE	0.001+- 0.004	0.010+- 0.024
NI	0.000+- 0.001	0.000+- 0.009
CU	0.000+- 0.002	0.000+- 0.010
ZN	0.000+- 0.001	0.000+- 0.006
GA	0.001+- 0.001	0.005+- 0.007
AS	0.010+- 0.004	0.062+- 0.025
SE	0.000+- 0.001	0.000+- 0.010
BR	0.001+- 0.002	0.004+- 0.014
RB	0.004+- 0.002	0.027+- 0.015
SR	0.001+- 0.003	0.008+- 0.019
Y	0.000+- 0.003	0.000+- 0.021
ZR	0.000+- 0.014	0.000+- 0.088
MO	0.000+- 0.010	0.000+- 0.066
PD	0.000+- 0.009	0.000+- 0.056
AG	0.017+- 0.012	0.108+- 0.076
CD	0.001+- 0.018	0.007+- 0.114
IN	0.000+- 0.020	0.000+- 0.126
SN	0.000+- 0.024	0.000+- 0.156
SB	0.000+- 0.043	0.000+- 0.277
BA	0.000+- 0.108	0.000+- 0.694
LA	0.000+- 0.170	0.000+- 1.089
HG	0.000+- 0.003	0.000+- 0.016
PB	0.000+- 0.006	0.000+- 0.040

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC007 - Teflon
 DEPOSIT BUILT UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 4981+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	73.859+- 3.890	474.175+- 24.974	9.520+- 0.502
SI	118.165+- 6.202	758.621+- 39.820	15.230+- 0.800
P	1.378+- 0.307	8.846+- 1.974	0.178+- 0.040
S	3.487+- 0.237	22.385+- 1.520	0.449+- 0.031
CL	0.706+- 0.073	4.536+- 0.467	0.091+- 0.009
K	9.327+- 0.489	59.882+- 3.137	1.202+- 0.063
CA	10.502+- 0.577	67.424+- 3.703	1.354+- 0.074
TI	6.954+- 0.364	44.646+- 2.338	0.896+- 0.047
V	0.421+- 0.040	2.704+- 0.259	0.054+- 0.005
CR	0.360+- 0.021	2.314+- 0.132	0.046+- 0.003
MN	0.316+- 0.017	2.027+- 0.112	0.041+- 0.002
FE	66.114+- 3.444	424.450+- 22.108	8.521+- 0.444
NI	0.230+- 0.014	1.474+- 0.090	0.030+- 0.002
CU	0.179+- 0.011	1.149+- 0.070	0.023+- 0.001
ZN	0.317+- 0.018	2.038+- 0.117	0.041+- 0.002
GA	0.128+- 0.008	0.823+- 0.052	0.017+- 0.001
AS	0.243+- 0.016	1.562+- 0.101	0.031+- 0.002
SE	0.033+- 0.003	0.210+- 0.022	0.004+- 0.000
BR	0.000+- 0.017	0.000+- 0.109	0.000+- 0.002
RB	0.092+- 0.006	0.590+- 0.039	0.012+- 0.001
SR	1.182+- 0.062	7.589+- 0.396	0.152+- 0.008
Y	0.110+- 0.007	0.708+- 0.048	0.014+- 0.001
ZR	0.219+- 0.036	1.409+- 0.234	0.028+- 0.005
MO	0.094+- 0.013	0.602+- 0.085	0.012+- 0.002
PD	0.000+- 0.010	0.000+- 0.066	0.000+- 0.001
AG	0.007+- 0.015	0.048+- 0.094	0.001+- 0.002
CD	0.000+- 0.021	0.000+- 0.133	0.000+- 0.003
IN	0.005+- 0.022	0.035+- 0.142	0.001+- 0.003
SN	0.038+- 0.028	0.243+- 0.177	0.005+- 0.004
SB	0.859+- 0.133	5.512+- 0.853	0.111+- 0.017
BA	0.852+- 0.139	5.470+- 0.895	0.110+- 0.018
LA	0.000+- 0.185	0.000+- 1.189	0.000+- 0.024
HG	0.000+- 0.100	0.000+- 0.642	0.000+- 0.013
PB	0.200+- 0.014	1.283+- 0.092	0.026+- 0.002

SAMPLE ID: EDDYSTONE/COAL FIRED POWER PLANT - TEST NO. 1A
 PARTICLE SIZE: F /
 ANALYSIS ID: AF135 - Teflon
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1580+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	34.585+-	1.578	222.038+-	10.131	14.053+-	0.647
SI	51.683+-	2.354	331.803+-	15.110	21.000+-	0.966
P	1.437+-	0.261	9.227+-	1.676	0.584+-	0.106
S	7.929+-	0.377	50.901+-	2.418	3.222+-	0.154
CL	0.215+-	0.094	1.381+-	0.602	0.087+-	0.038
K	3.056+-	0.150	19.617+-	0.962	1.242+-	0.061
CA	2.978+-	0.268	19.117+-	1.723	1.210+-	0.109
TI	2.178+-	0.111	13.981+-	0.710	0.885+-	0.045
V	0.179+-	0.018	1.148+-	0.116	0.073+-	0.007
CR	0.142+-	0.008	0.909+-	0.050	0.058+-	0.003
MN	0.115+-	0.006	0.741+-	0.040	0.047+-	0.003
FE	20.531+-	0.941	131.808+-	6.040	8.342+-	0.386
NI	0.088+-	0.006	0.566+-	0.037	0.036+-	0.002
CU	0.074+-	0.005	0.474+-	0.031	0.030+-	0.002
ZN	0.155+-	0.008	0.994+-	0.054	0.063+-	0.003
GA	0.055+-	0.004	0.353+-	0.024	0.022+-	0.002
AS	0.200+-	0.011	1.286+-	0.071	0.081+-	0.004
SE	0.080+-	0.005	0.512+-	0.030	0.032+-	0.002
BR	0.000+-	0.005	0.000+-	0.032	0.000+-	0.002
RB	0.026+-	0.003	0.167+-	0.016	0.011+-	0.001
SR	0.334+-	0.016	2.144+-	0.103	0.136+-	0.007
Y	0.035+-	0.003	0.222+-	0.021	0.014+-	0.001
ZR	0.111+-	0.015	0.711+-	0.099	0.045+-	0.006
MO	0.055+-	0.009	0.353+-	0.055	0.022+-	0.003
PD	0.000+-	0.007	0.000+-	0.045	0.000+-	0.003
AG	0.000+-	0.010	0.000+-	0.065	0.000+-	0.004
CD	0.000+-	0.014	0.000+-	0.087	0.000+-	0.006
IN	0.020+-	0.015	0.126+-	0.099	0.008+-	0.006
SN	0.000+-	0.021	0.000+-	0.134	0.000+-	0.009
SB	9.422+-	0.462	60.487+-	2.968	3.828+-	0.189
BA	0.595+-	0.097	3.820+-	0.621	0.242+-	0.039
LA	0.165+-	0.131	1.056+-	0.842	0.067+-	0.053
HG	0.000+-	0.010	0.000+-	0.064	0.000+-	0.004
PB	0.099+-	0.008	0.634+-	0.050	0.040+-	0.003

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO08 - Teflon
 DEPOSIT BUILT UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 4074+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	69.081+-	3.638	443.502+-	23.359	10.885+-	0.574
SI	109.938+-	5.772	705.801+-	37.059	17.323+-	0.911
P	1.327+-	0.294	8.519+-	1.886	0.209+-	0.046
S	3.295+-	0.219	21.153+-	1.405	0.519+-	0.035
CL	0.588+-	0.065	3.777+-	0.419	0.093+-	0.010
K	8.344+-	0.438	53.570+-	2.813	1.315+-	0.069
CA	9.357+-	0.500	60.070+-	3.208	1.474+-	0.079
TI	6.128+-	0.322	39.344+-	2.066	0.966+-	0.051
V	0.392+-	0.037	2.519+-	0.235	0.062+-	0.006
CR	0.315+-	0.018	2.020+-	0.117	0.050+-	0.003
MN	0.278+-	0.015	1.783+-	0.099	0.044+-	0.002
FE	58.443+-	3.050	375.205+-	19.584	9.209+-	0.481
NI	0.206+-	0.013	1.324+-	0.082	0.032+-	0.002
CU	0.156+-	0.010	1.003+-	0.063	0.025+-	0.002
ZN	0.292+-	0.017	1.877+-	0.108	0.046+-	0.003
GA	0.114+-	0.007	0.730+-	0.047	0.018+-	0.001
AS	0.220+-	0.014	1.413+-	0.092	0.035+-	0.002
SE	0.024+-	0.003	0.155+-	0.019	0.004+-	0.000
BR	0.000+-	0.017	0.000+-	0.109	0.000+-	0.003
RB	0.078+-	0.005	0.503+-	0.034	0.012+-	0.001
SR	1.017+-	0.053	6.528+-	0.343	0.160+-	0.008
Y	0.107+-	0.007	0.687+-	0.046	0.017+-	0.001
ZR	0.196+-	0.032	1.260+-	0.207	0.031+-	0.005
MO	0.084+-	0.012	0.542+-	0.078	0.013+-	0.002
PD	0.014+-	0.009	0.092+-	0.058	0.002+-	0.001
AG	0.033+-	0.014	0.211+-	0.092	0.005+-	0.002
CD	0.042+-	0.019	0.269+-	0.123	0.007+-	0.003
IN	0.008+-	0.020	0.050+-	0.131	0.001+-	0.003
SN	0.023+-	0.025	0.150+-	0.161	0.004+-	0.004
SB	0.333+-	0.065	2.141+-	0.420	0.053+-	0.010
BA	0.726+-	0.127	4.664+-	0.813	0.114+-	0.020
LA	0.164+-	0.176	1.051+-	1.131	0.026+-	0.028
HG	0.000+-	0.014	0.000+-	0.088	0.000+-	0.002
PB	0.165+-	0.013	1.057+-	0.080	0.026+-	0.002

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF136 - Teflon
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1506+- 10 MICROGRAMS

ELEMENT	UG/CM2 .	UG/FILTER	PERCENT
AL	32.266+- 1.473	207.148+- 9.455	13.759+- 0.635
SI	48.425+- 2.206	310.890+- 14.159	20.650+- 0.950
P	1.283+- 0.233	8.234+- 1.496	0.547+- 0.099
S	6.664+- 0.318	42.786+- 2.045	2.842+- 0.137
CL	0.153+- 0.079	0.979+- 0.508	0.065+- 0.034
K	2.867+- 0.136	18.404+- 0.872	1.222+- 0.058
CA	2.933+- 0.168	18.832+- 1.081	1.251+- 0.072
TI	2.033+- 0.101	13.054+- 0.648	0.867+- 0.043
V	0.172+- 0.014	1.106+- 0.088	0.073+- 0.006
CR	0.134+- 0.007	0.863+- 0.048	0.057+- 0.003
MN	0.104+- 0.006	0.667+- 0.037	0.044+- 0.002
FE	19.325+- 0.886	124.067+- 5.687	8.241+- 0.382
NI	0.079+- 0.005	0.504+- 0.034	0.033+- 0.002
CU	0.062+- 0.004	0.401+- 0.028	0.027+- 0.002
ZN	0.148+- 0.008	0.953+- 0.052	0.063+- 0.003
GA	0.052+- 0.004	0.334+- 0.023	0.022+- 0.002
AS	0.178+- 0.010	1.142+- 0.066	0.076+- 0.004
SE	0.087+- 0.005	0.560+- 0.033	0.037+- 0.002
BR	0.000+- 0.005	0.000+- 0.032	0.000+- 0.002
RB	0.025+- 0.003	0.160+- 0.017	0.011+- 0.001
SR	0.322+- 0.015	2.064+- 0.099	0.137+- 0.007
Y	0.029+- 0.003	0.189+- 0.022	0.013+- 0.001
ZR	0.072+- 0.016	0.461+- 0.101	0.031+- 0.007
MO	0.060+- 0.010	0.388+- 0.063	0.026+- 0.004
PD	0.008+- 0.007	0.050+- 0.045	0.003+- 0.003
AG	0.000+- 0.011	0.000+- 0.071	0.000+- 0.005
CD	0.000+- 0.015	0.000+- 0.098	0.000+- 0.006
IN	0.026+- 0.018	0.165+- 0.114	0.011+- 0.008
SN	0.000+- 0.020	0.000+- 0.131	0.000+- 0.009
SB	2.286+- 0.132	14.673+- 0.848	0.975+- 0.057
BA	0.421+- 0.104	2.704+- 0.668	0.180+- 0.044
LA	0.117+- 0.150	0.748+- 0.962	0.050+- 0.064
HG	0.000+- 0.010	0.000+- 0.063	0.000+- 0.004
PB	0.104+- 0.008	0.668+- 0.054	0.044+- 0.004

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 3A
 PARTICLE SIZE: C
 ANALYSIS ID: AC009 - Teflon
 DEPOSIT BUILT UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 3230+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	61.444+-	3.220	394.469+-	20.675	12.214+-	0.641
SI	97.674+-	5.101	627.065+-	32.746	19.416+-	1.016
P	1.148+-	0.253	7.373+-	1.624	0.228+-	0.050
S	2.838+-	0.188	18.220+-	1.209	0.564+-	0.037
CL	0.466+-	0.055	2.994+-	0.355	0.093+-	0.011
K	6.702+-	0.352	43.025+-	2.260	1.332+-	0.070
CA	7.351+-	0.391	47.194+-	2.509	1.461+-	0.078
TI	4.794+-	0.253	30.778+-	1.626	0.953+-	0.050
V	0.312+-	0.030	2.003+-	0.193	0.062+-	0.006
CR	0.258+-	0.015	1.656+-	0.097	0.051+-	0.003
MN	0.214+-	0.012	1.371+-	0.078	0.042+-	0.002
FE	47.410+-	2.471	304.373+-	15.861	9.425+-	0.492
NI	0.163+-	0.010	1.044+-	0.067	0.032+-	0.002
CU	0.118+-	0.008	0.758+-	0.050	0.023+-	0.002
ZN	0.225+-	0.013	1.443+-	0.086	0.045+-	0.003
GA	0.092+-	0.006	0.590+-	0.040	0.018+-	0.001
AS	0.177+-	0.012	1.136+-	0.077	0.035+-	0.002
SE	0.023+-	0.003	0.146+-	0.018	0.005+-	0.001
BR	0.000+-	0.015	0.000+-	0.096	0.000+-	0.003
RB	0.061+-	0.005	0.393+-	0.029	0.012+-	0.001
SR	0.792+-	0.042	5.083+-	0.267	0.157+-	0.008
Y	0.083+-	0.006	0.530+-	0.040	0.016+-	0.001
ZR	0.137+-	0.027	0.880+-	0.175	0.027+-	0.005
MO	0.075+-	0.012	0.480+-	0.079	0.015+-	0.002
PD	0.009+-	0.009	0.060+-	0.059	0.002+-	0.002
AG	0.000+-	0.014	0.000+-	0.087	0.000+-	0.003
CD	0.016+-	0.019	0.102+-	0.123	0.003+-	0.004
IN	0.030+-	0.022	0.191+-	0.140	0.006+-	0.004
SN	0.025+-	0.026	0.161+-	0.168	0.005+-	0.005
SB	0.198+-	0.059	1.274+-	0.381	0.039+-	0.012
BA	0.637+-	0.128	4.092+-	0.819	0.127+-	0.025
LA	0.000+-	0.180	0.000+-	1.155	0.000+-	0.036
HG	0.000+-	0.012	0.000+-	0.077	0.000+-	0.002
PB	0.124+-	0.011	0.793+-	0.069	0.025+-	0.002

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 3A
 PARTICLE SIZE: F
 ANALYSIS ID: AF137 - Teflon
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1114+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	25.501+- 1.165	163.715+- 7.482	14.690+- 0.684
SI	37.646+- 1.716	241.685+- 11.014	21.687+- 1.007
P	1.054+- 0.191	6.766+- 1.229	0.607+- 0.110
S	5.506+- 0.265	35.346+- 1.700	3.172+- 0.155
CL	0.089+- 0.065	0.569+- 0.418	0.051+- 0.038
K	2.189+- 0.105	14.053+- 0.672	1.261+- 0.061
CA	2.089+- 0.123	13.411+- 0.791	1.203+- 0.072
TI	1.633+- 0.077	10.486+- 0.496	0.941+- 0.045
V	0.141+- 0.010	0.904+- 0.067	0.081+- 0.006
CR	0.098+- 0.006	0.632+- 0.037	0.057+- 0.003
MN	0.082+- 0.005	0.526+- 0.030	0.047+- 0.003
FE	14.793+- 0.679	94.974+- 4.357	8.522+- 0.397
NI	0.070+- 0.005	0.451+- 0.031	0.040+- 0.003
CU	0.055+- 0.004	0.351+- 0.025	0.031+- 0.002
ZN	0.131+- 0.007	0.842+- 0.047	0.076+- 0.004
GA	0.042+- 0.003	0.273+- 0.020	0.024+- 0.002
AS	0.140+- 0.008	0.896+- 0.053	0.080+- 0.005
SE	0.063+- 0.004	0.402+- 0.025	0.036+- 0.002
BR	0.000+- 0.005	0.000+- 0.032	0.000+- 0.003
RB	0.019+- 0.002	0.122+- 0.014	0.011+- 0.001
SR	0.226+- 0.011	1.452+- 0.071	0.130+- 0.007
Y	0.029+- 0.003	0.188+- 0.019	0.017+- 0.001
ZR	0.080+- 0.013	0.512+- 0.081	0.046+- 0.008
MO	0.037+- 0.007	0.240+- 0.048	0.022+- 0.004
PD	0.007+- 0.006	0.046+- 0.036	0.004+- 0.003
AG	0.000+- 0.009	0.000+- 0.056	0.000+- 0.005
CD	0.000+- 0.012	0.000+- 0.077	0.000+- 0.006
IN	0.012+- 0.013	0.077+- 0.087	0.007+- 0.007
SN	0.000+- 0.017	0.000+- 0.109	0.000+- 0.008
SB	1.814+- 0.108	11.647+- 0.695	1.045+- 0.061
BA	0.000+- 0.078	0.000+- 0.504	0.000+- 0.041
LA	0.000+- 0.123	0.000+- 0.792	0.000+- 0.071
HG	0.000+- 0.008	0.000+- 0.050	0.000+- 0.005
FE	0.070+- 0.006	0.451+- 0.041	0.040+- 0.004

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 4A
 PARTICLE SIZE: C
 ANALYSIS ID: AC010 - Teflon
 DEPOSIT BUILT UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 3381+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	61.605+-	3.215	395.507+-	20.640	11.698+-	0.611
SI	97.932+-	5.098	628.724+-	32.727	18.595+-	0.970
P	1.154+-	0.252	7.409+-	1.617	0.219+-	0.048
S	2.917+-	0.190	18.727+-	1.222	0.554+-	0.036
CL	0.537+-	0.058	3.450+-	0.371	0.102+-	0.011
K	7.182+-	0.375	46.106+-	2.407	1.364+-	0.071
CA	7.826+-	0.418	50.240+-	2.686	1.486+-	0.080
TI	5.312+-	0.275	34.101+-	1.769	1.009+-	0.052
V	0.369+-	0.031	2.371+-	0.198	0.070+-	0.006
CR	0.269+-	0.016	1.725+-	0.100	0.051+-	0.003
MN	0.237+-	0.013	1.522+-	0.086	0.045+-	0.003
FE	49.502+-	2.567	317.802+-	16.482	9.399+-	0.488
NI	0.182+-	0.011	1.171+-	0.073	0.035+-	0.002
CU	0.125+-	0.008	0.800+-	0.052	0.024+-	0.002
ZN	0.240+-	0.014	1.544+-	0.090	0.046+-	0.003
GA	0.093+-	0.006	0.599+-	0.040	0.018+-	0.001
AS	0.195+-	0.013	1.250+-	0.083	0.037+-	0.002
SE	0.024+-	0.003	0.153+-	0.018	0.005+-	0.001
BR	0.000+-	0.014	0.000+-	0.090	0.000+-	0.003
RB	0.066+-	0.005	0.423+-	0.031	0.013+-	0.001
SR	0.841+-	0.044	5.400+-	0.282	0.160+-	0.008
Y	0.080+-	0.006	0.517+-	0.040	0.015+-	0.001
ZR	0.122+-	0.028	0.784+-	0.182	0.023+-	0.005
MO	0.075+-	0.013	0.479+-	0.082	0.014+-	0.002
PD	0.013+-	0.010	0.084+-	0.063	0.002+-	0.002
AG	0.000+-	0.015	0.000+-	0.094	0.000+-	0.003
CD	0.026+-	0.020	0.170+-	0.132	0.005+-	0.004
IN	0.000+-	0.022	0.000+-	0.141	0.000+-	0.004
SN	0.000+-	0.027	0.000+-	0.172	0.000+-	0.005
SB	0.366+-	0.073	2.347+-	0.468	0.069+-	0.014
BA	0.451+-	0.130	2.894+-	0.834	0.086+-	0.025
LA	0.000+-	0.189	0.000+-	1.211	0.000+-	0.036
HG	0.000+-	0.012	0.000+-	0.078	0.000+-	0.002
PB	0.138+-	0.012	0.883+-	0.074	0.026+-	0.002

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 4A
 PARTICLE SIZE: F
 ANALYSIS ID: AF138 - Teflon
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 989+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	22.900+-	1.047	147.016+-	6.724	14.867+-	0.696
SI	34.574+-	1.576	221.967+-	10.117	22.446+-	1.048
P	0.950+-	0.173	6.097+-	1.108	0.617+-	0.112
S	5.143+-	0.248	33.015+-	1.593	3.339+-	0.165
CL	0.075+-	0.061	0.479+-	0.390	0.048+-	0.039
K	1.944+-	0.094	12.483+-	0.606	1.262+-	0.063
CA	1.944+-	0.131	12.483+-	0.844	1.262+-	0.086
TI	1.322+-	0.068	8.489+-	0.433	0.858+-	0.045
V	0.120+-	0.012	0.770+-	0.075	0.078+-	0.008
CR	0.088+-	0.005	0.566+-	0.034	0.057+-	0.003
MN	0.073+-	0.004	0.469+-	0.027	0.047+-	0.003
FE	13.120+-	0.602	84.227+-	3.866	8.517+-	0.400
NI	0.058+-	0.004	0.375+-	0.028	0.038+-	0.003
CU	0.047+-	0.004	0.304+-	0.023	0.031+-	0.002
ZN	0.101+-	0.006	0.647+-	0.038	0.065+-	0.004
GA	0.038+-	0.003	0.245+-	0.019	0.025+-	0.002
AS	0.121+-	0.007	0.779+-	0.048	0.079+-	0.005
SE	0.060+-	0.004	0.383+-	0.024	0.039+-	0.002
BR	0.000+-	0.006	0.000+-	0.039	0.000+-	0.004
RB	0.015+-	0.002	0.096+-	0.012	0.010+-	0.001
SR	0.201+-	0.010	1.289+-	0.064	0.130+-	0.007
Y	0.022+-	0.003	0.144+-	0.017	0.015+-	0.002
ZR	0.084+-	0.012	0.537+-	0.077	0.054+-	0.008
MO	0.029+-	0.007	0.184+-	0.044	0.019+-	0.004
PD	0.003+-	0.005	0.020+-	0.033	0.002+-	0.003
AG	0.000+-	0.009	0.000+-	0.055	0.000+-	0.006
CD	0.000+-	0.011	0.000+-	0.072	0.000+-	0.007
IN	0.014+-	0.013	0.092+-	0.083	0.009+-	0.008
SN	0.000+-	0.017	0.000+-	0.112	0.000+-	0.011
SB	2.897+-	0.158	18.600+-	1.015	1.881+-	0.104
BA	0.372+-	0.079	2.389+-	0.508	0.242+-	0.051
LA	0.000+-	0.114	0.000+-	0.734	0.000+-	0.074
HG	0.000+-	0.007	0.000+-	0.047	0.000+-	0.005
PB	0.068+-	0.006	0.434+-	0.039	0.044+-	0.004

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 48
 PARTICLE SIZE: C
 ANALYSIS ID: CC084 - Nuclepore
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 3783+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	66.517+- 3.412	427.042+- 21.908	11.290+- 0.580
SI	104.976+- 5.378	673.943+- 34.525	17.817+- 0.914
P	1.048+- 0.225	6.725+- 1.444	0.178+- 0.038
S	3.122+- 0.197	20.042+- 1.268	0.530+- 0.034
CL	0.568+- 0.060	3.647+- 0.387	0.096+- 0.010
K	7.892+- 0.406	50.668+- 2.608	1.340+- 0.069
CA	8.368+- 0.440	53.721+- 2.825	1.420+- 0.075
TI	5.541+- 0.287	35.576+- 1.843	0.941+- 0.049
V	0.348+- 0.034	2.235+- 0.217	0.059+- 0.006
CR	0.293+- 0.017	1.878+- 0.107	0.050+- 0.003
MN	0.261+- 0.014	1.675+- 0.092	0.044+- 0.002
FE	53.556+- 2.741	343.831+- 17.599	9.090+- 0.466
NI	0.205+- 0.012	1.316+- 0.080	0.035+- 0.002
CU	0.135+- 0.009	0.870+- 0.055	0.023+- 0.001
ZN	0.276+- 0.016	1.773+- 0.100	0.047+- 0.003
GA	0.109+- 0.007	0.701+- 0.045	0.019+- 0.001
AS	0.228+- 0.015	1.462+- 0.093	0.039+- 0.002
SE	0.021+- 0.003	0.133+- 0.019	0.004+- 0.000
BR	0.046+- 0.014	0.297+- 0.090	0.008+- 0.002
RB	0.084+- 0.006	0.537+- 0.036	0.014+- 0.001
SR	0.888+- 0.046	5.701+- 0.295	0.151+- 0.008
Y	0.092+- 0.007	0.590+- 0.044	0.016+- 0.001
ZR	0.197+- 0.031	1.267+- 0.199	0.033+- 0.005
MO	0.116+- 0.015	0.745+- 0.096	0.020+- 0.003
PD	0.007+- 0.011	0.047+- 0.072	0.001+- 0.002
AG	0.000+- 0.016	0.000+- 0.102	0.000+- 0.003
CD	0.026+- 0.022	0.168+- 0.143	0.004+- 0.004
IN	0.000+- 0.025	0.000+- 0.161	0.000+- 0.004
SN	0.007+- 0.030	0.045+- 0.192	0.001+- 0.005
SB	0.373+- 0.072	2.392+- 0.464	0.063+- 0.012
BA	1.019+- 0.153	6.543+- 0.980	0.173+- 0.026
LA	0.069+- 0.210	0.441+- 1.351	0.012+- 0.036
HG	0.000+- 0.012	0.000+- 0.079	0.000+- 0.002
PB	0.161+- 0.013	1.032+- 0.083	0.027+- 0.002

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 4B
 PARTICLE SIZE: F
 ANALYSIS ID: AF139 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 674+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	13.416+- 0.617	86.132+- 3.959	12.771+- 0.617
SI	20.323+- 0.928	130.474+- 5.959	19.345+- 0.929
P	0.662+- 0.120	4.248+- 0.773	0.630+- 0.115
S	4.261+- 0.207	27.354+- 1.332	4.056+- 0.206
CL	0.030+- 0.050	0.195+- 0.324	0.029+- 0.048
K	1.101+- 0.054	7.071+- 0.346	1.048+- 0.054
CA	1.122+- 0.081	7.205+- 0.520	1.068+- 0.079
TI	0.847+- 0.042	5.436+- 0.267	0.806+- 0.041
V	0.081+- 0.006	0.520+- 0.041	0.077+- 0.006
CR	0.051+- 0.004	0.329+- 0.023	0.049+- 0.003
MN	0.040+- 0.003	0.259+- 0.018	0.038+- 0.003
FE	7.182+- 0.331	46.108+- 2.125	6.836+- 0.331
NI	0.034+- 0.003	0.220+- 0.020	0.033+- 0.003
CU	0.029+- 0.003	0.185+- 0.017	0.027+- 0.003
ZN	0.061+- 0.004	0.389+- 0.026	0.058+- 0.004
GA	0.027+- 0.002	0.172+- 0.015	0.026+- 0.002
AS	0.093+- 0.006	0.596+- 0.039	0.088+- 0.006
SE	0.051+- 0.003	0.328+- 0.022	0.049+- 0.003
BR	0.000+- 0.005	0.000+- 0.032	0.000+- 0.005
RB	0.005+- 0.002	0.035+- 0.010	0.005+- 0.002
SR	0.117+- 0.006	0.754+- 0.040	0.112+- 0.006
Y	0.014+- 0.002	0.090+- 0.015	0.013+- 0.002
ZR	0.062+- 0.011	0.400+- 0.069	0.059+- 0.010
MO	0.020+- 0.007	0.127+- 0.043	0.019+- 0.006
PD	0.009+- 0.005	0.060+- 0.035	0.009+- 0.005
AG	0.012+- 0.008	0.076+- 0.051	0.011+- 0.008
CD	0.000+- 0.011	0.000+- 0.072	0.000+- 0.011
IN	0.014+- 0.013	0.087+- 0.083	0.013+- 0.012
SN	0.000+- 0.016	0.000+- 0.101	0.000+- 0.015
SB	1.966+- 0.115	12.621+- 0.738	1.871+- 0.113
BA	0.000+- 0.076	0.000+- 0.490	0.000+- 0.073
LA	0.000+- 0.117	0.000+- 0.749	0.000+- 0.111
HG	0.000+- 0.006	0.000+- 0.036	0.000+- 0.005
PB	0.037+- 0.005	0.239+- 0.032	0.035+- 0.005

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 5A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO11 - Teflon
 DEPOSIT BUILT UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1683+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	35.661+-	1.854	228.946+-	11.904	13.605+-	0.712
SI	56.993+-	2.952	365.897+-	18.949	21.744+-	1.133
P	0.667+-	0.144	4.282+-	0.923	0.254+-	0.055
S	1.621+-	0.108	10.404+-	0.692	0.618+-	0.041
CL	0.269+-	0.033	1.725+-	0.211	0.102+-	0.013
K	3.553+-	0.187	22.813+-	1.201	1.356+-	0.072
CA	3.937+-	0.206	25.278+-	1.324	1.502+-	0.079
TI	2.567+-	0.134	16.477+-	0.859	0.979+-	0.051
V	0.182+-	0.016	1.171+-	0.102	0.070+-	0.006
CR	0.118+-	0.008	0.757+-	0.050	0.045+-	0.003
MN	0.117+-	0.007	0.751+-	0.045	0.045+-	0.003
FE	23.833+-	1.236	153.010+-	7.933	9.093+-	0.475
NI	0.084+-	0.006	0.542+-	0.041	0.032+-	0.002
CU	0.063+-	0.005	0.407+-	0.032	0.024+-	0.002
ZN	0.116+-	0.007	0.746+-	0.048	0.044+-	0.003
GA	0.050+-	0.004	0.320+-	0.025	0.019+-	0.001
AS	0.089+-	0.008	0.571+-	0.049	0.034+-	0.003
SE	0.011+-	0.002	0.073+-	0.012	0.004+-	0.001
BR	0.000+-	0.005	0.000+-	0.032	0.000+-	0.002
RB	0.034+-	0.003	0.221+-	0.021	0.013+-	0.001
SR	0.397+-	0.021	2.546+-	0.136	0.151+-	0.008
Y	0.039+-	0.004	0.253+-	0.029	0.015+-	0.002
ZR	0.058+-	0.019	0.372+-	0.123	0.022+-	0.007
MO	0.031+-	0.011	0.198+-	0.072	0.012+-	0.004
PD	0.012+-	0.009	0.074+-	0.056	0.004+-	0.003
AG	0.007+-	0.013	0.047+-	0.084	0.003+-	0.005
CD	0.000+-	0.018	0.000+-	0.113	0.000+-	0.007
IN	0.016+-	0.020	0.104+-	0.128	0.006+-	0.008
SN	0.019+-	0.024	0.121+-	0.156	0.007+-	0.009
SB	0.000+-	0.048	0.000+-	0.311	0.000+-	0.018
BA	0.030+-	0.120	0.190+-	0.769	0.011+-	0.046
LA	0.000+-	0.180	0.000+-	1.158	0.000+-	0.069
HG	0.000+-	0.007	0.000+-	0.043	0.000+-	0.003
PB	0.070+-	0.009	0.451+-	0.055	0.027+-	0.003

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 5A
 PARTICLE SIZE: F
 ANALYSIS ID: AF140 - Teflon
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 442+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	11.277+- 0.519	72.398+- 3.335	16.371+- 0.840
SI	16.848+- 0.770	108.163+- 4.945	24.459+- 1.248
P	0.458+- 0.084	2.943+- 0.537	0.666+- 0.122
S	2.360+- 0.120	15.149+- 0.769	3.426+- 0.190
CL	0.030+- 0.029	0.195+- 0.185	0.044+- 0.042
K	0.893+- 0.044	5.734+- 0.285	1.297+- 0.071
CA	0.884+- 0.054	5.678+- 0.348	1.284+- 0.084
TI	0.586+- 0.035	3.759+- 0.225	0.850+- 0.054
V	0.027+- 0.008	0.172+- 0.054	0.039+- 0.012
CR	0.059+- 0.004	0.382+- 0.025	0.086+- 0.006
MN	0.032+- 0.002	0.208+- 0.016	0.047+- 0.004
FE	5.947+- 0.275	38.179+- 1.763	8.633+- 0.444
NI	0.033+- 0.003	0.210+- 0.019	0.047+- 0.004
CU	0.019+- 0.002	0.119+- 0.013	0.027+- 0.003
ZN	0.047+- 0.003	0.304+- 0.022	0.069+- 0.005
GA	0.018+- 0.002	0.115+- 0.012	0.026+- 0.003
AS	0.051+- 0.004	0.325+- 0.027	0.074+- 0.006
SE	0.023+- 0.002	0.145+- 0.013	0.033+- 0.003
BR	0.000+- 0.001	0.000+- 0.009	0.000+- 0.002
RB	0.004+- 0.001	0.023+- 0.010	0.005+- 0.002
SR	0.091+- 0.005	0.584+- 0.033	0.132+- 0.008
Y	0.010+- 0.002	0.064+- 0.014	0.014+- 0.003
ZR	0.054+- 0.010	0.349+- 0.063	0.079+- 0.014
MO	0.011+- 0.006	0.072+- 0.040	0.016+- 0.009
PD	0.004+- 0.005	0.028+- 0.031	0.006+- 0.007
AG	0.003+- 0.007	0.021+- 0.046	0.005+- 0.010
CD	0.016+- 0.010	0.100+- 0.066	0.023+- 0.015
IN	0.000+- 0.012	0.000+- 0.075	0.000+- 0.017
SN	0.021+- 0.015	0.133+- 0.095	0.030+- 0.022
SB	0.814+- 0.061	5.224+- 0.393	1.181+- 0.093
BA	0.404+- 0.077	2.593+- 0.492	0.586+- 0.112
LA	0.000+- 0.109	0.000+- 0.702	0.000+- 0.159
HG	0.000+- 0.005	0.000+- 0.031	0.000+- 0.007
PB	0.029+- 0.005	0.186+- 0.029	0.042+- 0.007

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 5B
 PARTICLE SIZE: C
 ANALYSIS ID: CC085 - Nuclepore
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1995+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	43.314+- 2.217	278.076+- 14.232	13.936+- 0.717
SI	68.254+- 3.487	438.188+- 22.386	21.959+- 1.127
P	0.706+- 0.150	4.531+- 0.961	0.227+- 0.048
S	1.811+- 0.118	11.626+- 0.760	0.583+- 0.038
CL	0.306+- 0.036	1.965+- 0.233	0.098+- 0.012
K	4.297+- 0.223	27.584+- 1.430	1.382+- 0.072
CA	4.587+- 0.238	29.451+- 1.525	1.476+- 0.077
TI	2.948+- 0.156	18.927+- 0.999	0.949+- 0.050
V	0.177+- 0.021	1.137+- 0.135	0.057+- 0.007
CR	0.159+- 0.010	1.019+- 0.063	0.051+- 0.003
MN	0.135+- 0.008	0.865+- 0.051	0.043+- 0.003
FE	27.949+- 1.432	179.435+- 9.191	8.992+- 0.463
NI	0.103+- 0.007	0.664+- 0.046	0.033+- 0.002
CU	0.076+- 0.006	0.489+- 0.036	0.024+- 0.002
ZN	0.151+- 0.009	0.968+- 0.058	0.048+- 0.003
GA	0.056+- 0.004	0.358+- 0.027	0.018+- 0.001
AS	0.118+- 0.009	0.759+- 0.058	0.038+- 0.003
SE	0.010+- 0.002	0.061+- 0.014	0.003+- 0.001
BR	0.024+- 0.007	0.151+- 0.046	0.008+- 0.002
RB	0.040+- 0.004	0.257+- 0.024	0.013+- 0.001
SR	0.475+- 0.025	3.048+- 0.161	0.153+- 0.008
Y	0.050+- 0.005	0.320+- 0.032	0.016+- 0.002
ZR	0.071+- 0.021	0.457+- 0.136	0.023+- 0.007
MO	0.062+- 0.013	0.401+- 0.081	0.020+- 0.004
PD	0.000+- 0.010	0.000+- 0.064	0.000+- 0.003
AG	0.000+- 0.014	0.000+- 0.090	0.000+- 0.005
CD	0.000+- 0.019	0.000+- 0.125	0.000+- 0.006
IN	0.000+- 0.022	0.000+- 0.142	0.000+- 0.007
SN	0.000+- 0.027	0.000+- 0.175	0.000+- 0.009
SB	0.187+- 0.058	1.199+- 0.373	0.060+- 0.019
BA	0.638+- 0.133	4.096+- 0.856	0.205+- 0.043
LA	0.000+- 0.193	0.002+- 1.238	0.000+- 0.062
HG	0.000+- 0.008	0.000+- 0.050	0.000+- 0.002
PB	0.080+- 0.009	0.512+- 0.060	0.026+- 0.003

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 5B
 PARTICLE SIZE: F
 ANALYSIS ID: AF141 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 306+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	7.132+- 0.331	45.787+- 2.127	14.985+- 0.851
SI	11.048+- 0.507	70.929+- 3.253	23.213+- 1.308
P	0.354+- 0.065	2.275+- 0.416	0.745+- 0.138
S	2.163+- 0.111	13.885+- 0.710	4.544+- 0.276
CL	0.025+- 0.027	0.160+- 0.171	0.052+- 0.056
K	0.560+- 0.029	3.595+- 0.187	1.177+- 0.072
CA	0.579+- 0.043	3.716+- 0.276	1.216+- 0.099
TI	0.360+- 0.027	2.309+- 0.174	0.756+- 0.062
V	0.012+- 0.008	0.076+- 0.051	0.025+- 0.017
CR	0.033+- 0.003	0.210+- 0.017	0.069+- 0.006
MN	0.019+- 0.002	0.120+- 0.012	0.039+- 0.004
FE	3.685+- 0.171	23.656+- 1.099	7.742+- 0.440
NI	0.020+- 0.002	0.129+- 0.015	0.042+- 0.005
CU	0.015+- 0.002	0.096+- 0.012	0.032+- 0.004
ZN	0.028+- 0.002	0.181+- 0.016	0.059+- 0.005
GA	0.012+- 0.001	0.074+- 0.009	0.024+- 0.003
AS	0.041+- 0.004	0.266+- 0.025	0.087+- 0.009
SE	0.025+- 0.002	0.160+- 0.013	0.052+- 0.005
BR	0.000+- 0.005	0.000+- 0.032	0.000+- 0.011
RB	0.003+- 0.002	0.019+- 0.010	0.006+- 0.003
SR	0.063+- 0.004	0.405+- 0.025	0.132+- 0.009
Y	0.007+- 0.002	0.046+- 0.014	0.015+- 0.005
ZR	0.057+- 0.010	0.367+- 0.064	0.120+- 0.021
MO	0.005+- 0.006	0.035+- 0.040	0.011+- 0.013
PD	0.021+- 0.006	0.134+- 0.039	0.044+- 0.013
AG	0.015+- 0.008	0.097+- 0.051	0.032+- 0.017
CD	0.002+- 0.010	0.016+- 0.064	0.005+- 0.021
IN	0.013+- 0.013	0.081+- 0.081	0.027+- 0.026
SN	0.039+- 0.016	0.250+- 0.102	0.082+- 0.033
SB	1.029+- 0.071	6.608+- 0.459	2.163+- 0.166
BA	0.000+- 0.077	0.000+- 0.496	0.000+- 0.162
LA	0.000+- 0.115	0.000+- 0.736	0.000+- 0.241
HG	0.000+- 0.004	0.000+- 0.025	0.000+- 0.008
PB	0.022+- 0.004	0.142+- 0.028	0.046+- 0.009

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 6A
 PARTICLE SIZE: C
 ANALYSIS ID: AC012 - Teflon
 DEPOSIT BUILT UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1773+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	39.227+-	2.037	251.835+-	13.075	14.205+-	0.742
SI	63.162+-	3.268	405.503+-	20.982	22.872+-	1.191
P	0.769+-	0.165	4.938+-	1.056	0.279+-	0.060
S	1.812+-	0.118	11.630+-	0.759	0.656+-	0.043
CL	0.282+-	0.035	1.811+-	0.226	0.102+-	0.013
K	3.967+-	0.208	25.466+-	1.337	1.436+-	0.076
CA	4.181+-	0.219	26.845+-	1.406	1.514+-	0.080
TI	2.783+-	0.145	17.869+-	0.933	1.008+-	0.053
V	0.183+-	0.017	1.172+-	0.107	0.066+-	0.006
CR	0.141+-	0.009	0.906+-	0.056	0.051+-	0.003
MN	0.126+-	0.007	0.807+-	0.048	0.046+-	0.003
FE	26.299+-	1.363	168.842+-	8.750	9.524+-	0.496
NI	0.088+-	0.007	0.565+-	0.042	0.032+-	0.002
CU	0.073+-	0.005	0.471+-	0.034	0.027+-	0.002
ZN	0.123+-	0.008	0.792+-	0.050	0.045+-	0.003
GA	0.058+-	0.004	0.373+-	0.028	0.021+-	0.002
AS	0.101+-	0.008	0.647+-	0.050	0.036+-	0.003
SE	0.012+-	0.002	0.080+-	0.012	0.005+-	0.001
BR	0.000+-	0.005	0.000+-	0.032	0.000+-	0.002
RB	0.034+-	0.003	0.217+-	0.020	0.012+-	0.001
SR	0.440+-	0.023	2.822+-	0.150	0.159+-	0.009
Y	0.044+-	0.004	0.284+-	0.028	0.016+-	0.002
ZR	0.098+-	0.019	0.628+-	0.123	0.035+-	0.007
MO	0.027+-	0.010	0.170+-	0.063	0.010+-	0.004
PD	0.009+-	0.008	0.055+-	0.050	0.003+-	0.003
AG	0.005+-	0.012	0.033+-	0.075	0.002+-	0.004
CD	0.000+-	0.016	0.000+-	0.106	0.000+-	0.006
IN	0.022+-	0.018	0.141+-	0.115	0.008+-	0.006
SN	0.031+-	0.022	0.197+-	0.140	0.011+-	0.008
SB	0.099+-	0.047	0.633+-	0.303	0.036+-	0.017
BA	0.270+-	0.110	1.735+-	0.704	0.098+-	0.040
LA	0.073+-	0.161	0.469+-	1.031	0.026+-	0.058
HG	0.000+-	0.007	0.000+-	0.046	0.000+-	0.003
PB	0.068+-	0.008	0.434+-	0.051	0.025+-	0.003

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 6A
 PARTICLE SIZE: F
 ANALYSIS ID: AF142 - Teflon
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 491+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	11.994+-	0.552	77.001+-	3.544	15.679+-	0.789
SI	18.234+-	0.833	117.065+-	5.349	23.837+-	1.192
P	0.476+-	0.087	3.055+-	0.557	0.622+-	0.114
S	2.528+-	0.127	16.230+-	0.818	3.305+-	0.180
CL	0.072+-	0.031	0.459+-	0.201	0.094+-	0.041
K	0.998+-	0.049	6.406+-	0.315	1.304+-	0.069
CA	0.944+-	0.058	6.063+-	0.373	1.235+-	0.080
TI	0.740+-	0.035	4.750+-	0.227	0.967+-	0.050
V	0.061+-	0.005	0.390+-	0.035	0.079+-	0.007
CR	0.044+-	0.003	0.284+-	0.020	0.058+-	0.004
MN	0.033+-	0.002	0.209+-	0.016	0.043+-	0.003
FE	6.496+-	0.300	41.702+-	1.924	8.491+-	0.428
NI	0.037+-	0.003	0.240+-	0.021	0.049+-	0.004
CU	0.023+-	0.002	0.150+-	0.015	0.031+-	0.003
ZN	0.053+-	0.004	0.339+-	0.023	0.069+-	0.005
GA	0.021+-	0.002	0.132+-	0.013	0.027+-	0.003
AS	0.062+-	0.005	0.398+-	0.030	0.081+-	0.006
SE	0.028+-	0.002	0.177+-	0.014	0.036+-	0.003
BR	0.000+-	0.005	0.000+-	0.032	0.000+-	0.007
RB	0.007+-	0.002	0.043+-	0.010	0.009+-	0.002
SR	0.095+-	0.005	0.609+-	0.034	0.124+-	0.007
Y	0.011+-	0.002	0.069+-	0.014	0.014+-	0.003
ZR	0.058+-	0.010	0.372+-	0.065	0.076+-	0.013
MO	0.005+-	0.006	0.029+-	0.040	0.006+-	0.008
PD	0.007+-	0.005	0.048+-	0.033	0.010+-	0.007
AG	0.017+-	0.008	0.108+-	0.051	0.022+-	0.010
CD	0.009+-	0.010	0.058+-	0.066	0.012+-	0.013
IN	0.000+-	0.013	0.000+-	0.082	0.000+-	0.017
SN	0.000+-	0.015	0.000+-	0.098	0.000+-	0.020
SB	0.905+-	0.066	5.807+-	0.422	1.182+-	0.089
BA	0.000+-	0.075	0.000+-	0.480	0.000+-	0.098
LA	0.000+-	0.110	0.000+-	0.709	0.000+-	0.144
HG	0.000+-	0.004	0.000+-	0.028	0.000+-	0.006
PB	0.028+-	0.005	0.179+-	0.029	0.036+-	0.006

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 6B
 PARTICLE SIZE: C
 ANALYSIS ID: CC086 - Nuclepore
 BUILD UP AT EDGES
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 2055+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	44.409+-	2.270	285.103+-	14.574	13.871+-	0.712
SI	70.671+-	3.605	453.708+-	23.147	22.073+-	1.131
P	0.711+-	0.150	4.565+-	0.966	0.222+-	0.047
S	2.029+-	0.131	13.024+-	0.840	0.634+-	0.041
CL	0.312+-	0.039	2.001+-	0.250	0.097+-	0.012
K	4.630+-	0.239	29.728+-	1.537	1.446+-	0.075
CA	4.782+-	0.248	30.701+-	1.589	1.494+-	0.078
TI	3.241+-	0.167	20.810+-	1.072	1.012+-	0.052
V	0.235+-	0.020	1.511+-	0.126	0.074+-	0.006
CR	0.155+-	0.010	0.995+-	0.061	0.048+-	0.003
MN	0.147+-	0.008	0.943+-	0.055	0.046+-	0.003
FE	30.001+-	1.535	192.604+-	9.855	9.370+-	0.482
NI	0.114+-	0.008	0.729+-	0.049	0.035+-	0.002
CU	0.079+-	0.006	0.506+-	0.036	0.025+-	0.002
ZN	0.153+-	0.009	0.982+-	0.060	0.048+-	0.003
GA	0.065+-	0.005	0.414+-	0.030	0.020+-	0.001
AS	0.115+-	0.009	0.739+-	0.057	0.036+-	0.003
SE	0.009+-	0.002	0.058+-	0.014	0.003+-	0.001
BR	0.025+-	0.007	0.157+-	0.046	0.008+-	0.002
RB	0.045+-	0.004	0.290+-	0.025	0.014+-	0.001
SR	0.497+-	0.026	3.190+-	0.167	0.155+-	0.008
Y	0.052+-	0.005	0.333+-	0.033	0.016+-	0.002
ZR	0.093+-	0.022	0.600+-	0.139	0.029+-	0.007
MO	0.076+-	0.013	0.487+-	0.083	0.024+-	0.004
PD	0.007+-	0.010	0.044+-	0.066	0.002+-	0.003
AG	0.000+-	0.014	0.000+-	0.089	0.000+-	0.004
CD	0.013+-	0.020	0.082+-	0.130	0.004+-	0.006
IN	0.001+-	0.022	0.003+-	0.143	0.000+-	0.007
SN	0.000+-	0.027	0.000+-	0.174	0.000+-	0.008
SB	0.139+-	0.057	0.890+-	0.364	0.043+-	0.018
BA	0.434+-	0.129	2.785+-	0.827	0.135+-	0.040
LA	0.084+-	0.194	0.542+-	1.245	0.026+-	0.061
HG	0.000+-	0.009	0.000+-	0.058	0.000+-	0.003
PB	0.091+-	0.010	0.582+-	0.063	0.028+-	0.003

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - TEST NO. 6B
 PARTICLE SIZE: F
 ANALYSIS ID: AF143 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 316+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	6.822+- 0.317	43.797+- 2.036	13.879+- 0.781
SI	10.475+- 0.481	67.246+- 3.085	21.311+- 1.188
P	0.337+- 0.062	2.161+- 0.395	0.685+- 0.127
S	2.430+- 0.123	15.599+- 0.790	4.943+- 0.295
CL	0.001+- 0.029	0.008+- 0.189	0.002+- 0.060
K	0.561+- 0.029	3.601+- 0.187	1.141+- 0.070
CA	0.590+- 0.044	3.788+- 0.282	1.200+- 0.097
TI	0.444+- 0.022	2.850+- 0.140	0.903+- 0.053
V	0.042+- 0.004	0.271+- 0.026	0.086+- 0.009
CR	0.031+- 0.003	0.200+- 0.016	0.063+- 0.006
MN	0.019+- 0.002	0.122+- 0.012	0.039+- 0.004
FE	3.673+- 0.171	23.577+- 1.096	7.472+- 0.420
NI	0.018+- 0.002	0.113+- 0.014	0.036+- 0.005
CU	0.014+- 0.002	0.092+- 0.012	0.029+- 0.004
ZN	0.042+- 0.003	0.269+- 0.020	0.085+- 0.007
GA	0.011+- 0.002	0.074+- 0.010	0.023+- 0.003
AS	0.046+- 0.004	0.293+- 0.027	0.093+- 0.009
SE	0.027+- 0.002	0.175+- 0.014	0.055+- 0.005
BR	0.000+- 0.003	0.000+- 0.019	0.000+- 0.006
RB	0.002+- 0.002	0.014+- 0.011	0.004+- 0.003
SR	0.052+- 0.004	0.333+- 0.023	0.105+- 0.008
Y	0.004+- 0.002	0.025+- 0.015	0.008+- 0.005
ZR	0.000+- 0.010	0.000+- 0.067	0.000+- 0.021
MO	0.001+- 0.007	0.007+- 0.045	0.002+- 0.014
PD	0.010+- 0.006	0.062+- 0.038	0.020+- 0.012
AG	0.007+- 0.008	0.046+- 0.053	0.015+- 0.017
CD	0.021+- 0.012	0.133+- 0.076	0.042+- 0.024
IN	0.012+- 0.014	0.079+- 0.089	0.025+- 0.028
SN	0.011+- 0.017	0.070+- 0.107	0.022+- 0.034
SB	1.060+- 0.074	6.806+- 0.475	2.157+- 0.165
BA	0.000+- 0.082	0.000+- 0.529	0.000+- 0.168
LA	0.000+- 0.127	0.000+- 0.816	0.000+- 0.259
HG	0.000+- 0.004	0.000+- 0.025	0.000+- 0.008
PB	0.026+- 0.005	0.170+- 0.031	0.054+- 0.010

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: AC079 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.008+-	0.013	0.051+-	0.083
SI	0.001+-	0.009	0.008+-	0.058
P	0.000+-	0.004	0.000+-	0.024
S	0.000+-	0.020	0.000+-	0.126
CL	0.014+-	0.007	0.089+-	0.045
K	0.000+-	0.003	0.000+-	0.018
CA	0.000+-	0.002	0.000+-	0.012
TI	0.000+-	0.001	0.000+-	0.007
V	0.000+-	0.001	0.000+-	0.006
CR	0.001+-	0.001	0.009+-	0.007
MN	0.000+-	0.001	0.000+-	0.008
FE	0.006+-	0.003	0.035+-	0.020
NI	0.002+-	0.001	0.011+-	0.008
CU	0.001+-	0.001	0.006+-	0.009
ZN	0.000+-	0.001	0.000+-	0.006
GA	0.000+-	0.001	0.000+-	0.005
AS	0.000+-	0.003	0.000+-	0.018
SE	0.000+-	0.001	0.000+-	0.007
BR	0.000+-	0.001	0.000+-	0.009
RB	0.002+-	0.002	0.012+-	0.011
SR	0.000+-	0.002	0.000+-	0.014
Y	0.000+-	0.003	0.000+-	0.016
ZR	0.000+-	0.011	0.000+-	0.070
MO	0.000+-	0.008	0.000+-	0.048
PD	0.006+-	0.007	0.038+-	0.045
AG	0.000+-	0.010	0.000+-	0.064
CD	0.034+-	0.013	0.217+-	0.087
IN	0.000+-	0.015	0.000+-	0.094
SN	0.000+-	0.018	0.000+-	0.119
SB	0.000+-	0.033	0.000+-	0.210
BA	0.100+-	0.085	0.640+-	0.544
LA	0.125+-	0.132	0.805+-	0.847
HG	0.000+-	0.002	0.000+-	0.013
PB	0.005+-	0.005	0.035+-	0.030

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF244 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.011+-	0.010	0.069+-	0.067
SI	0.023+-	0.007	0.149+-	0.048
P	0.001+-	0.003	0.008+-	0.021
S	0.029+-	0.014	0.183+-	0.087
CL	0.000+-	0.006	0.000+-	0.039
K	0.000+-	0.003	0.002+-	0.017
CA	0.000+-	0.002	0.000+-	0.010
TI	0.000+-	0.001	0.000+-	0.007
V	0.001+-	0.001	0.008+-	0.006
CR	0.001+-	0.001	0.006+-	0.007
MN	0.000+-	0.001	0.000+-	0.008
FE	0.003+-	0.003	0.020+-	0.020
NI	0.003+-	0.001	0.016+-	0.008
CU	0.001+-	0.001	0.008+-	0.008
ZN	0.000+-	0.001	0.003+-	0.005
GA	0.001+-	0.001	0.009+-	0.005
AS	0.001+-	0.003	0.004+-	0.017
SE	0.001+-	0.001	0.010+-	0.006
BR	0.000+-	0.001	0.000+-	0.009
RB	0.000+-	0.002	0.000+-	0.011
SR	0.000+-	0.002	0.000+-	0.014
Y	0.000+-	0.002	0.001+-	0.015
ZR	0.000+-	0.010	0.000+-	0.066
MO	0.002+-	0.007	0.015+-	0.047
PD	0.004+-	0.006	0.027+-	0.037
AG	0.000+-	0.009	0.000+-	0.060
CD	0.013+-	0.012	0.082+-	0.078
IN	0.015+-	0.015	0.096+-	0.095
SN	0.007+-	0.017	0.048+-	0.112
SB	0.037+-	0.031	0.237+-	0.201
BA	0.088+-	0.082	0.565+-	0.528
LA	0.295+-	0.130	1.896+-	0.835
HG	0.000+-	0.002	0.001+-	0.015
PB	0.000+-	0.004	0.002+-	0.028

SAMPLE ID: EDDYSTONE/COAL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC124 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.002+-	0.025	0.016+-	0.161
SI	0.022+-	0.019	0.141+-	0.125
P	0.000+-	0.010	0.000+-	0.062
S	0.000+-	0.022	0.000+-	0.144
CL	0.000+-	0.009	0.000+-	0.059
K	0.001+-	0.003	0.007+-	0.020
CA	0.000+-	0.002	0.000+-	0.014
TI	0.000+-	0.001	0.000+-	0.009
V	0.001+-	0.001	0.005+-	0.006
CR	0.000+-	0.002	0.000+-	0.011
MN	0.000+-	0.001	0.000+-	0.010
FE	0.005+-	0.004	0.031+-	0.025
NI	0.001+-	0.001	0.004+-	0.009
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.001+-	0.001	0.005+-	0.007
GA	0.000+-	0.001	0.002+-	0.006
AS	0.006+-	0.004	0.038+-	0.025
SE	0.000+-	0.002	0.000+-	0.010
BR	0.005+-	0.002	0.031+-	0.015
RB	0.000+-	0.002	0.000+-	0.015
SR	0.000+-	0.003	0.000+-	0.019
Y	0.001+-	0.003	0.003+-	0.022
ZR	0.000+-	0.014	0.000+-	0.089
MO	0.000+-	0.011	0.000+-	0.068
PD	0.007+-	0.009	0.042+-	0.059
AG	0.016+-	0.012	0.105+-	0.076
CD	0.005+-	0.018	0.030+-	0.116
IN	0.000+-	0.020	0.000+-	0.126
SN	0.000+-	0.024	0.000+-	0.154
SB	0.036+-	0.045	0.229+-	0.291
BA	0.116+-	0.111	0.747+-	0.712
LA	0.070+-	0.174	0.450+-	1.117
HG	0.001+-	0.003	0.004+-	0.017
PB	0.000+-	0.006	0.000+-	0.041

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC013 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 49+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.705+-	0.059	4.528+-	0.377	9.262+-	2.045
SI	1.510+-	0.106	9.691+-	0.683	19.823+-	4.289
P	0.082+-	0.050	0.526+-	0.320	1.076+-	0.691
S	0.509+-	0.143	3.269+-	0.915	6.686+-	2.318
CL	0.000+-	0.034	0.000+-	0.220	0.000+-	0.450
K	0.025+-	0.006	0.162+-	0.041	0.332+-	0.108
CA	0.443+-	0.040	2.843+-	0.254	5.815+-	1.298
TI	0.063+-	0.006	0.405+-	0.036	0.829+-	0.185
V	0.082+-	0.019	0.528+-	0.122	1.081+-	0.333
CR	0.016+-	0.004	0.106+-	0.024	0.216+-	0.066
MN	0.006+-	0.002	0.038+-	0.011	0.077+-	0.027
FE	0.238+-	0.030	1.527+-	0.194	3.124+-	0.753
NI	0.141+-	0.029	0.904+-	0.184	1.849+-	0.533
CU	0.087+-	0.007	0.560+-	0.044	1.146+-	0.251
ZN	0.064+-	0.011	0.409+-	0.074	0.837+-	0.228
GA	0.000+-	0.001	0.000+-	0.009	0.000+-	0.019
AS	0.000+-	0.006	0.000+-	0.037	0.000+-	0.075
SE	0.000+-	0.001	0.000+-	0.006	0.000+-	0.013
BR	0.001+-	0.001	0.006+-	0.009	0.013+-	0.019
RE	0.000+-	0.002	0.000+-	0.010	0.000+-	0.021
SR	0.007+-	0.002	0.043+-	0.014	0.087+-	0.034
Y	0.000+-	0.002	0.000+-	0.015	0.000+-	0.031
ZR	0.000+-	0.010	0.000+-	0.065	0.000+-	0.134
MO	0.000+-	0.008	0.000+-	0.048	0.000+-	0.099
PD	0.006+-	0.006	0.038+-	0.038	0.078+-	0.079
AG	0.000+-	0.008	0.000+-	0.054	0.000+-	0.111
CD	0.024+-	0.012	0.156+-	0.078	0.319+-	0.172
IN	0.030+-	0.014	0.194+-	0.091	0.397+-	0.202
SN	0.023+-	0.017	0.151+-	0.107	0.308+-	0.228
SB	0.023+-	0.032	0.147+-	0.207	0.300+-	0.427
BA	0.035+-	0.080	0.226+-	0.514	0.463+-	1.056
LA	0.000+-	0.126	0.000+-	0.808	0.000+-	1.652
HG	0.000+-	0.002	0.000+-	0.015	0.000+-	0.031
PB	0.043+-	0.014	0.276+-	0.089	0.564+-	0.216

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF144 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 801+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.629+-	0.127	16.876+-	0.814	2.107+-	0.105
SI	4.532+-	0.211	29.097+-	1.353	3.632+-	0.175
P	1.285+-	0.233	8.247+-	1.498	1.029+-	0.187
S	15.610+-	0.733	100.214+-	4.705	12.509+-	0.608
CL	0.000+-	0.182	0.000+-	1.168	0.000+-	0.146
K	0.297+-	0.018	1.905+-	0.116	0.238+-	0.015
CA	2.493+-	0.119	16.007+-	0.762	1.998+-	0.098
TI	0.136+-	0.013	0.870+-	0.081	0.109+-	0.010
V	2.073+-	0.097	13.311+-	0.621	1.662+-	0.080
CR	0.073+-	0.013	0.471+-	0.087	0.059+-	0.011
MN	0.048+-	0.003	0.309+-	0.022	0.039+-	0.003
FE	2.488+-	0.117	15.974+-	0.748	1.994+-	0.097
NI	3.017+-	0.139	19.368+-	0.893	2.418+-	0.115
CU	0.118+-	0.010	0.760+-	0.065	0.095+-	0.008
ZN	1.080+-	0.051	6.936+-	0.324	0.866+-	0.042
GA	0.018+-	0.004	0.113+-	0.024	0.014+-	0.003
AS	0.024+-	0.014	0.152+-	0.089	0.019+-	0.011
SE	0.000+-	0.002	0.000+-	0.016	0.000+-	0.002
BR	0.008+-	0.002	0.050+-	0.015	0.006+-	0.002
RB	0.000+-	0.002	0.000+-	0.012	0.000+-	0.002
SR	0.035+-	0.003	0.226+-	0.020	0.028+-	0.003
Y	0.002+-	0.004	0.013+-	0.023	0.002+-	0.003
ZR	0.000+-	0.012	0.000+-	0.076	0.000+-	0.009
MO	0.254+-	0.015	1.629+-	0.099	0.203+-	0.013
PD	0.007+-	0.007	0.043+-	0.044	0.005+-	0.006
AG	0.013+-	0.010	0.081+-	0.067	0.010+-	0.008
CD	0.000+-	0.014	0.000+-	0.088	0.000+-	0.011
IN	0.015+-	0.016	0.096+-	0.100	0.012+-	0.012
SN	0.028+-	0.018	0.179+-	0.119	0.022+-	0.015
SB	0.188+-	0.040	1.207+-	0.258	0.151+-	0.032
BA	0.395+-	0.092	2.534+-	0.591	0.316+-	0.074
LA	0.260+-	0.131	1.672+-	0.843	0.209+-	0.105
HG	0.005+-	0.003	0.032+-	0.020	0.004+-	0.003
PB	1.377+-	0.065	8.839+-	0.417	1.103+-	0.054

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: AC014 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 20+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.447+-	0.041	2.871+-	0.264	14.041+-	6.988
SI	0.922+-	0.068	5.922+-	0.434	28.966+-	14.33
P	0.043+-	0.033	0.274+-	0.210	1.339+-	1.218
S	0.322+-	0.117	2.068+-	0.750	10.114+-	6.159
CL	0.000+-	0.028	0.000+-	0.180	0.000+-	0.881
K	0.008+-	0.005	0.050+-	0.030	0.246+-	0.191
CA	0.270+-	0.024	1.734+-	0.155	8.484+-	4.219
TI	0.037+-	0.004	0.239+-	0.027	1.171+-	0.588
V	0.053+-	0.012	0.341+-	0.075	1.668+-	0.895
CR	0.008+-	0.003	0.053+-	0.017	0.257+-	0.152
MN	0.001+-	0.001	0.006+-	0.010	0.031+-	0.049
FE	0.124+-	0.018	0.795+-	0.117	3.890+-	1.987
NI	0.072+-	0.017	0.464+-	0.111	2.270+-	1.236
CU	0.051+-	0.005	0.331+-	0.030	1.617+-	0.805
ZN	0.028+-	0.007	0.180+-	0.044	0.882+-	0.482
GA	0.003+-	0.001	0.017+-	0.009	0.083+-	0.061
AS	0.008+-	0.005	0.051+-	0.032	0.248+-	0.197
SE	0.000+-	0.001	0.003+-	0.007	0.015+-	0.035
BR	0.000+-	0.002	0.002+-	0.010	0.008+-	0.049
RB	0.000+-	0.002	0.000+-	0.012	0.000+-	0.057
SR	0.007+-	0.002	0.043+-	0.015	0.208+-	0.127
Y	0.000+-	0.003	0.000+-	0.017	0.000+-	0.085
ZR	0.005+-	0.011	0.029+-	0.072	0.143+-	0.358
MO	0.000+-	0.008	0.000+-	0.054	0.000+-	0.265
PD	0.002+-	0.006	0.015+-	0.042	0.074+-	0.206
AG	0.000+-	0.010	0.000+-	0.062	0.000+-	0.302
CD	0.028+-	0.014	0.180+-	0.088	0.880+-	0.610
IN	0.015+-	0.015	0.097+-	0.099	0.476+-	0.538
SN	0.033+-	0.019	0.210+-	0.123	1.027+-	0.784
SB	0.021+-	0.036	0.137+-	0.233	0.669+-	1.185
BA	0.000+-	0.089	0.000+-	0.574	0.000+-	2.808
LA	0.049+-	0.138	0.313+-	0.887	1.532+-	4.403
HG	0.000+-	0.002	0.000+-	0.014	0.000+-	0.066
PB	0.016+-	0.009	0.105+-	0.061	0.515+-	0.390

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF145 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 656+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.688+-	0.084	10.837+-	0.539	1.653+-	0.086
SI	2.891+-	0.136	18.558+-	0.874	2.831+-	0.140
P	0.901+-	0.164	5.782+-	1.051	0.882+-	0.161
S	13.095+-	0.616	84.068+-	3.953	12.824+-	0.634
CL	0.000+-	0.152	0.000+-	0.977	0.000+-	0.149
K	0.190+-	0.012	1.220+-	0.079	0.186+-	0.012
CA	1.389+-	0.068	8.917+-	0.436	1.360+-	0.070
TI	0.141+-	0.008	0.904+-	0.051	0.138+-	0.008
V	1.217+-	0.057	7.815+-	0.363	1.192+-	0.058
CR	0.034+-	0.008	0.220+-	0.053	0.034+-	0.008
MN	0.029+-	0.002	0.186+-	0.015	0.028+-	0.002
FE	1.467+-	0.070	9.421+-	0.449	1.437+-	0.072
NI	1.803+-	0.084	11.573+-	0.539	1.765+-	0.086
CU	0.085+-	0.007	0.547+-	0.046	0.083+-	0.007
ZN	0.644+-	0.031	4.136+-	0.197	0.631+-	0.032
GA	0.016+-	0.003	0.103+-	0.019	0.016+-	0.003
AS	0.017+-	0.010	0.110+-	0.067	0.017+-	0.010
SE	0.004+-	0.002	0.028+-	0.011	0.004+-	0.002
BR	0.004+-	0.002	0.029+-	0.011	0.004+-	0.002
RB	0.003+-	0.002	0.022+-	0.010	0.003+-	0.001
SR	0.018+-	0.002	0.117+-	0.015	0.018+-	0.002
Y	0.000+-	0.003	0.000+-	0.017	0.000+-	0.003
ZR	0.000+-	0.009	0.000+-	0.060	0.000+-	0.009
MO	0.144+-	0.010	0.923+-	0.067	0.141+-	0.010
PD	0.005+-	0.005	0.035+-	0.035	0.005+-	0.005
AG	0.002+-	0.008	0.010+-	0.050	0.002+-	0.008
CD	0.003+-	0.011	0.019+-	0.071	0.003+-	0.011
IN	0.026+-	0.014	0.169+-	0.087	0.026+-	0.013
SN	0.015+-	0.015	0.098+-	0.099	0.015+-	0.015
SB	0.140+-	0.033	0.901+-	0.212	0.137+-	0.032
BA	0.000+-	0.073	0.000+-	0.472	0.000+-	0.072
LA	0.000+-	0.113	0.000+-	0.727	0.000+-	0.111
HG	0.003+-	0.002	0.017+-	0.016	0.003+-	0.002
PB	0.815+-	0.039	5.231+-	0.253	0.798+-	0.040

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 3A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO15 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: - 5+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER			
AL	0.158+-	0.022	1.014+-	0.141	-21.231+-	44.53
SI	0.319+-	0.027	2.049+-	0.174	-42.893+-	89.85
P	0.021+-	0.012	0.137+-	0.078	- 2.863+-	6.212
S	0.188+-	0.047	1.210+-	0.304	-25.325+-	53.39
CL	0.000+-	0.012	0.000+-	0.076	0.000+-	1.581
K	0.009+-	0.004	0.059+-	0.025	- 1.232+-	2.630
CA	0.105+-	0.011	0.676+-	0.068	-14.155+-	29.66
TI	0.013+-	0.002	0.081+-	0.014	- 1.689+-	3.548
V	0.020+-	0.005	0.128+-	0.029	- 2.684+-	5.651
CR	0.003+-	0.002	0.016+-	0.012	- 0.341+-	0.753
MN	0.002+-	0.002	0.014+-	0.010	- 0.292+-	0.644
FE	0.055+-	0.009	0.354+-	0.056	- 7.403+-	15.55
NI	0.022+-	0.007	0.144+-	0.042	- 3.013+-	6.367
CU	0.016+-	0.003	0.105+-	0.017	- 2.194+-	4.604
ZN	0.005+-	0.003	0.030+-	0.018	- 0.628+-	1.369
GA	0.000+-	0.001	0.000+-	0.007	0.000+-	0.150
AS	0.000+-	0.004	0.000+-	0.026	0.000+-	0.546
SE	0.001+-	0.001	0.009+-	0.007	- 0.196+-	0.439
BR	0.000+-	0.002	0.000+-	0.011	0.000+-	0.223
RB	0.002+-	0.002	0.015+-	0.013	- 0.307+-	0.698
SR	0.006+-	0.003	0.041+-	0.016	- 0.854+-	1.821
Y	0.000+-	0.003	0.000+-	0.019	0.000+-	0.394
ZR	0.000+-	0.012	0.000+-	0.078	0.000+-	1.624
MO	0.000+-	0.009	0.000+-	0.057	0.000+-	1.192
PD	0.002+-	0.007	0.015+-	0.045	- 0.315+-	1.149
AG	0.003+-	0.011	0.019+-	0.069	- 0.406+-	1.684
CD	0.018+-	0.014	0.113+-	0.093	- 2.360+-	5.308
IN	0.005+-	0.016	0.035+-	0.105	- 0.724+-	2.670
SN	0.000+-	0.020	0.000+-	0.127	0.000+-	2.658
SB	0.028+-	0.039	0.182+-	0.252	- 3.810+-	9.558
BA	0.000+-	0.096	0.000+-	0.615	0.000+-	12.88
LA	0.084+-	0.151	0.537+-	0.972	-11.244+-	31.10
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.351
PB	0.019+-	0.007	0.125+-	0.045	- 2.616+-	5.553

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 3A
 PARTICLE SIZE: F
 ANALYSIS ID: AF146 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 178+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.563+-	0.034	3.616+-	0.216	2.034+-	0.167
SI	0.939+-	0.048	6.031+-	0.305	3.393+-	0.257
P	0.272+-	0.050	1.746+-	0.320	0.982+-	0.188
S	3.985+-	0.196	25.583+-	1.256	14.390+-	1.075
CL	0.000+-	0.047	0.000+-	0.302	0.000+-	0.170
K	0.055+-	0.006	0.355+-	0.037	0.200+-	0.024
CA	0.505+-	0.025	3.245+-	0.163	1.825+-	0.138
TI	0.039+-	0.003	0.249+-	0.022	0.140+-	0.014
V	0.382+-	0.019	2.453+-	0.119	1.380+-	0.103
CR	0.014+-	0.003	0.087+-	0.022	0.049+-	0.013
MN	0.008+-	0.002	0.049+-	0.011	0.027+-	0.006
FE	0.483+-	0.025	3.104+-	0.161	1.746+-	0.133
NI	0.558+-	0.027	3.582+-	0.175	2.015+-	0.150
CU	0.028+-	0.004	0.180+-	0.023	0.101+-	0.014
ZN	0.214+-	0.011	1.372+-	0.071	0.772+-	0.059
GA	0.005+-	0.002	0.031+-	0.011	0.017+-	0.006
AS	0.007+-	0.006	0.046+-	0.041	0.026+-	0.023
SE	0.001+-	0.001	0.006+-	0.008	0.003+-	0.005
BR	0.002+-	0.002	0.015+-	0.011	0.008+-	0.006
RE	0.000+-	0.002	0.000+-	0.012	0.000+-	0.007
SR	0.008+-	0.002	0.055+-	0.016	0.031+-	0.009
Y	0.000+-	0.003	0.000+-	0.018	0.000+-	0.010
ZR	0.018+-	0.011	0.116+-	0.074	0.065+-	0.042
MO	0.029+-	0.009	0.188+-	0.057	0.106+-	0.032
PD	0.001+-	0.007	0.005+-	0.043	0.003+-	0.024
AG	0.000+-	0.010	0.000+-	0.065	0.000+-	0.037
CD	0.012+-	0.015	0.074+-	0.095	0.042+-	0.054
IN	0.000+-	0.017	0.000+-	0.106	0.000+-	0.060
SN	0.000+-	0.019	0.000+-	0.125	0.000+-	0.070
SB	0.049+-	0.038	0.314+-	0.242	0.176+-	0.136
BA	0.024+-	0.091	0.157+-	0.582	0.088+-	0.327
LA	0.244+-	0.140	1.569+-	0.901	0.882+-	0.510
HG	0.004+-	0.003	0.027+-	0.018	0.015+-	0.010
PB	0.263+-	0.015	1.686+-	0.096	0.948+-	0.076

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 4A
 PARTICLE SIZE: C
 ANALYSIS ID: AC016 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 17+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.376+-	0.035	2.416+-	0.226	14.117+-	8.356
SI	0.889+-	0.062	5.705+-	0.398	33.341+-	19.62
P	0.055+-	0.030	0.351+-	0.193	2.050+-	1.647
S	0.486+-	0.109	3.119+-	0.701	18.226+-	11.41
CL	0.000+-	0.026	0.000+-	0.165	0.000+-	0.964
K	0.016+-	0.005	0.103+-	0.030	0.603+-	0.393
CA	0.296+-	0.025	1.899+-	0.159	11.097+-	6.551
TI	0.034+-	0.004	0.219+-	0.024	1.280+-	0.761
V	0.058+-	0.010	0.371+-	0.066	2.169+-	1.325
CR	0.004+-	0.002	0.025+-	0.015	0.147+-	0.122
MN	0.004+-	0.001	0.025+-	0.008	0.147+-	0.098
FE	0.151+-	0.018	0.972+-	0.113	5.680+-	3.385
NI	0.068+-	0.014	0.439+-	0.089	2.565+-	1.587
CU	0.072+-	0.006	0.465+-	0.036	2.718+-	1.603
ZN	0.041+-	0.007	0.261+-	0.043	1.526+-	0.927
GA	0.000+-	0.001	0.000+-	0.007	0.002+-	0.042
AS	0.003+-	0.004	0.021+-	0.027	0.121+-	0.172
SE	0.001+-	0.001	0.008+-	0.006	0.050+-	0.044
BR	0.000+-	0.001	0.003+-	0.008	0.016+-	0.045
RB	0.000+-	0.001	0.000+-	0.009	0.000+-	0.050
SR	0.004+-	0.002	0.023+-	0.011	0.134+-	0.103
Y	0.000+-	0.002	0.000+-	0.013	0.000+-	0.074
ZR	0.000+-	0.009	0.000+-	0.056	0.000+-	0.329
MO	0.000+-	0.006	0.000+-	0.040	0.000+-	0.232
PD	0.001+-	0.005	0.006+-	0.031	0.034+-	0.182
AG	0.006+-	0.008	0.040+-	0.050	0.232+-	0.321
CD	0.009+-	0.010	0.055+-	0.063	0.323+-	0.416
IN	0.017+-	0.012	0.111+-	0.076	0.651+-	0.584
SN	0.038+-	0.015	0.244+-	0.096	1.425+-	1.005
SB	0.000+-	0.029	0.000+-	0.186	0.000+-	1.090
BA	0.000+-	0.070	0.000+-	0.448	0.000+-	2.619
LA	0.221+-	0.108	1.418+-	0.695	8.287+-	6.321
HG	0.000+-	0.002	0.000+-	0.013	0.002+-	0.074
PE	0.011+-	0.008	0.069+-	0.052	0.403+-	0.384

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 4A
 PARTICLE SIZE: F
 ANALYSIS ID: AF147 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 539+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.436+-	0.073	9.221+-	0.467	1.711+-	0.092
SI	2.253+-	0.107	14.464+-	0.689	2.684+-	0.137
P	0.734+-	0.134	4.714+-	0.857	0.875+-	0.160
S	11.098+-	0.524	71.247+-	3.362	13.221+-	0.670
CL	0.000+-	0.129	0.000+-	0.828	0.000+-	0.154
K	0.152+-	0.011	0.979+-	0.068	0.182+-	0.013
CA	1.288+-	0.061	8.269+-	0.394	1.534+-	0.078
TI	0.111+-	0.007	0.711+-	0.043	0.132+-	0.008
V	0.975+-	0.046	6.261+-	0.292	1.162+-	0.058
CR	0.033+-	0.007	0.214+-	0.044	0.040+-	0.008
MN	0.022+-	0.002	0.140+-	0.014	0.026+-	0.003
FE	1.204+-	0.058	7.733+-	0.372	1.435+-	0.074
NI	1.332+-	0.063	8.549+-	0.401	1.586+-	0.080
CU	0.088+-	0.007	0.567+-	0.043	0.105+-	0.008
ZN	0.542+-	0.026	3.482+-	0.167	0.646+-	0.033
GA	0.010+-	0.003	0.065+-	0.017	0.012+-	0.003
AS	0.009+-	0.010	0.057+-	0.064	0.011+-	0.012
SE	0.002+-	0.002	0.014+-	0.010	0.003+-	0.002
BR	0.003+-	0.002	0.017+-	0.011	0.003+-	0.002
RB	0.002+-	0.002	0.010+-	0.011	0.002+-	0.002
SR	0.016+-	0.002	0.104+-	0.016	0.019+-	0.003
Y	0.000+-	0.003	0.000+-	0.018	0.000+-	0.003
ZR	0.000+-	0.011	0.000+-	0.069	0.000+-	0.013
MO	0.091+-	0.010	0.587+-	0.061	0.109+-	0.012
PD	0.005+-	0.006	0.032+-	0.040	0.006+-	0.007
AG	0.011+-	0.010	0.071+-	0.062	0.013+-	0.011
CD	0.000+-	0.013	0.000+-	0.083	0.000+-	0.015
IN	0.000+-	0.015	0.000+-	0.094	0.000+-	0.018
SN	0.010+-	0.018	0.064+-	0.115	0.012+-	0.021
SB	0.057+-	0.034	0.363+-	0.220	0.067+-	0.041
BA	0.152+-	0.083	0.974+-	0.536	0.181+-	0.100
LA	0.141+-	0.124	0.906+-	0.798	0.168+-	0.148
HG	0.001+-	0.003	0.009+-	0.017	0.002+-	0.003
PB	0.729+-	0.036	4.678+-	0.228	0.868+-	0.045

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 4B
 PARTICLE SIZE: C
 ANALYSIS ID: CC087 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 33+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.656+-	0.053	4.208+-	0.341	12.927+-	4.106
SI	1.259+-	0.081	8.082+-	0.522	24.826+-	7.792
P	0.041+-	0.030	0.266+-	0.194	0.818+-	0.647
S	0.181+-	0.102	1.162+-	0.656	3.570+-	2.293
CL	0.000+-	0.025	0.000+-	0.160	0.000+-	0.491
K	0.014+-	0.005	0.092+-	0.035	0.284+-	0.137
CA	0.485+-	0.033	3.114+-	0.213	9.546+-	3.011
TI	0.056+-	0.005	0.361+-	0.032	1.108+-	0.354
V	0.073+-	0.011	0.471+-	0.073	1.446+-	0.498
CR	0.006+-	0.003	0.039+-	0.019	0.120+-	0.068
MN	0.007+-	0.002	0.045+-	0.011	0.139+-	0.054
FE	0.199+-	0.020	1.281+-	0.130	3.934+-	1.273
NI	0.064+-	0.015	0.414+-	0.096	1.271+-	0.489
CU	0.093+-	0.007	0.599+-	0.043	1.839+-	0.580
ZN	0.025+-	0.006	0.161+-	0.042	0.493+-	0.198
GA	0.000+-	0.001	0.000+-	0.008	0.000+-	0.026
AS	0.000+-	0.005	0.000+-	0.034	0.000+-	0.103
SE	0.000+-	0.001	0.000+-	0.009	0.000+-	0.026
BR	0.000+-	0.002	0.000+-	0.014	0.000+-	0.044
RE	0.000+-	0.002	0.000+-	0.015	0.000+-	0.047
SR	0.010+-	0.003	0.064+-	0.019	0.198+-	0.085
Y	0.001+-	0.003	0.006+-	0.021	0.018+-	0.066
ZR	0.000+-	0.014	0.000+-	0.088	0.000+-	0.269
MO	0.009+-	0.011	0.061+-	0.068	0.186+-	0.217
PD	0.000+-	0.008	0.000+-	0.052	0.000+-	0.161
AG	0.000+-	0.012	0.000+-	0.078	0.000+-	0.240
CD	0.000+-	0.018	0.000+-	0.113	0.000+-	0.347
IN	0.017+-	0.019	0.106+-	0.121	0.326+-	0.386
SN	0.000+-	0.024	0.000+-	0.152	0.000+-	0.466
SB	0.000+-	0.046	0.000+-	0.298	0.000+-	0.915
BA	0.000+-	0.111	0.000+-	0.714	0.000+-	2.192
LA	0.000+-	0.173	0.000+-	1.109	0.000+-	3.407
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.054
PB	0.021+-	0.010	0.133+-	0.064	0.408+-	0.234

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 4B
 PARTICLE SIZE: F
 ANALYSIS ID: AF148 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 544+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.246+-	0.064	8.000+-	0.413	1.469+-	0.080
SI	1.890+-	0.091	12.136+-	0.585	2.229+-	0.115
P	0.768+-	0.140	4.934+-	0.897	0.906+-	0.166
S	11.584+-	0.546	74.371+-	3.507	13.660+-	0.691
CL	0.000+-	0.135	0.000+-	0.864	0.000+-	0.159
K	0.153+-	0.011	0.984+-	0.068	0.181+-	0.013
CA	1.148+-	0.056	7.369+-	0.362	1.353+-	0.071
TI	0.099+-	0.006	0.635+-	0.040	0.117+-	0.008
V	1.039+-	0.048	6.667+-	0.311	1.225+-	0.061
CR	0.027+-	0.007	0.175+-	0.046	0.032+-	0.008
MN	0.023+-	0.002	0.147+-	0.015	0.027+-	0.003
FE	1.208+-	0.058	7.756+-	0.373	1.425+-	0.073
NI	1.496+-	0.070	9.604+-	0.449	1.764+-	0.089
CU	0.079+-	0.007	0.510+-	0.043	0.094+-	0.008
ZN	0.602+-	0.029	3.864+-	0.185	0.710+-	0.036
GA	0.008+-	0.003	0.052+-	0.017	0.010+-	0.003
AS	0.004+-	0.010	0.023+-	0.067	0.004+-	0.012
SE	0.005+-	0.002	0.030+-	0.012	0.006+-	0.002
BR	0.003+-	0.002	0.016+-	0.012	0.003+-	0.002
RB	0.003+-	0.002	0.018+-	0.012	0.003+-	0.002
SR	0.019+-	0.003	0.121+-	0.018	0.022+-	0.003
Y	0.000+-	0.003	0.000+-	0.020	0.000+-	0.004
ZR	0.016+-	0.011	0.105+-	0.074	0.019+-	0.014
MO	0.092+-	0.010	0.589+-	0.065	0.108+-	0.012
PD	0.005+-	0.007	0.031+-	0.044	0.006+-	0.008
AG	0.009+-	0.010	0.061+-	0.067	0.011+-	0.012
CD	0.001+-	0.014	0.008+-	0.092	0.002+-	0.017
IN	0.000+-	0.016	0.000+-	0.103	0.000+-	0.019
SN	0.005+-	0.020	0.031+-	0.126	0.006+-	0.023
SB	0.112+-	0.039	0.721+-	0.252	0.132+-	0.046
BA	0.092+-	0.090	0.590+-	0.581	0.108+-	0.107
LA	0.045+-	0.135	0.286+-	0.866	0.053+-	0.159
HG	0.003+-	0.003	0.019+-	0.019	0.004+-	0.003
PB	0.785+-	0.038	5.040+-	0.245	0.926+-	0.048

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 5A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO17 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 22+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.279+- 0.030	1.789+- 0.190	8.049+- 3.721
SI	0.582+- 0.045	3.739+- 0.292	16.827+- 7.685
P	0.048+- 0.027	0.306+- 0.172	1.378+- 0.992
S	0.297+- 0.091	1.908+- 0.581	8.588+- 4.666
CL	0.000+- 0.021	0.000+- 0.137	0.000+- 0.618
K	0.009+- 0.004	0.057+- 0.026	0.255+- 0.164
CA	0.231+- 0.021	1.485+- 0.133	6.681+- 3.065
TI	0.032+- 0.003	0.204+- 0.022	0.917+- 0.425
V	0.045+- 0.009	0.267+- 0.055	1.293+- 0.632
CR	0.006+- 0.002	0.040+- 0.014	0.182+- 0.104
MN	0.000+- 0.001	0.003+- 0.008	0.011+- 0.036
FE	0.121+- 0.015	0.778+- 0.096	3.501+- 1.633
NI	0.056+- 0.012	0.361+- 0.077	1.623+- 0.808
CU	0.275+- 0.017	1.768+- 0.110	7.957+- 3.615
ZN	0.039+- 0.007	0.251+- 0.042	1.129+- 0.543
GA	0.002+- 0.001	0.012+- 0.008	0.053+- 0.042
AS	0.007+- 0.004	0.048+- 0.027	0.216+- 0.155
SE	0.000+- 0.001	0.000+- 0.006	0.000+- 0.025
BR	0.000+- 0.001	0.000+- 0.008	0.000+- 0.037
RE	0.000+- 0.002	0.003+- 0.010	0.013+- 0.045
SR	0.001+- 0.002	0.004+- 0.012	0.016+- 0.056
Y	0.000+- 0.002	0.000+- 0.014	0.000+- 0.065
ZR	0.001+- 0.009	0.007+- 0.060	0.033+- 0.271
MO	0.006+- 0.007	0.037+- 0.046	0.166+- 0.218
PD	0.000+- 0.005	0.000+- 0.034	0.000+- 0.154
AG	0.013+- 0.009	0.082+- 0.057	0.368+- 0.306
CD	0.032+- 0.012	0.205+- 0.078	0.921+- 0.543
IN	0.015+- 0.013	0.097+- 0.084	0.434+- 0.425
SN	0.006+- 0.016	0.041+- 0.101	0.183+- 0.460
SB	0.015+- 0.030	0.098+- 0.194	0.443+- 0.897
BA	0.000+- 0.076	0.000+- 0.491	0.000+- 2.210
LA	0.175+- 0.119	1.123+- 0.766	5.051+- 4.129
HG	0.001+- 0.002	0.007+- 0.015	0.029+- 0.068
PB	0.006+- 0.008	0.040+- 0.049	0.179+- 0.233

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 5A
 PARTICLE SIZE: F
 ANALYSIS ID: AF149 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 428+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	1.204+- 0.062	7.727+- 0.399	1.806+- 0.102
SI	1.978+- 0.095	12.702+- 0.609	2.969+- 0.158
P	0.656+- 0.119	4.211+- 0.766	0.984+- 0.181
S	9.590+- 0.454	61.570+- 2.916	14.393+- 0.760
CL	0.000+- 0.111	0.000+- 0.715	0.000+- 0.167
K	0.123+- 0.009	0.789+- 0.059	0.184+- 0.014
CA	1.152+- 0.055	7.397+- 0.354	1.729+- 0.092
TI	0.080+- 0.006	0.514+- 0.040	0.120+- 0.010
V	0.811+- 0.038	5.207+- 0.246	1.217+- 0.064
CR	0.031+- 0.006	0.198+- 0.039	0.046+- 0.009
MN	0.021+- 0.002	0.133+- 0.013	0.031+- 0.003
FE	0.989+- 0.048	6.349+- 0.309	1.484+- 0.080
NI	1.135+- 0.054	7.289+- 0.344	1.704+- 0.090
CU	0.330+- 0.017	2.116+- 0.108	0.495+- 0.028
ZN	0.511+- 0.025	3.281+- 0.158	0.767+- 0.041
GA	0.006+- 0.002	0.042+- 0.015	0.010+- 0.004
AS	0.010+- 0.009	0.063+- 0.060	0.015+- 0.014
SE	0.003+- 0.002	0.018+- 0.010	0.004+- 0.002
BR	0.003+- 0.002	0.021+- 0.011	0.005+- 0.003
RB	0.000+- 0.002	0.002+- 0.011	0.001+- 0.003
SR	0.016+- 0.002	0.103+- 0.016	0.024+- 0.004
Y	0.000+- 0.003	0.000+- 0.018	0.000+- 0.004
ZR	0.021+- 0.010	0.137+- 0.067	0.032+- 0.016
MO	0.063+- 0.009	0.404+- 0.056	0.094+- 0.013
PD	0.009+- 0.006	0.056+- 0.041	0.013+- 0.010
AG	0.001+- 0.009	0.006+- 0.059	0.001+- 0.014
CD	0.002+- 0.013	0.014+- 0.084	0.003+- 0.020
IN	0.000+- 0.015	0.000+- 0.096	0.000+- 0.022
SN	0.039+- 0.019	0.253+- 0.120	0.059+- 0.028
SB	0.041+- 0.034	0.265+- 0.216	0.062+- 0.051
BA	0.255+- 0.086	1.637+- 0.550	0.383+- 0.129
LA	0.000+- 0.127	0.000+- 0.816	0.000+- 0.191
HG	0.002+- 0.003	0.010+- 0.017	0.002+- 0.004
PB	0.636+- 0.031	4.085+- 0.202	0.955+- 0.052

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 5B
 PARTICLE SIZE: C
 ANALYSIS ID: CCO88 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: - 24+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER			
AL	0.568+-	0.048	3.645+-	0.311	-15.400+-	6.638
SI	1.159+-	0.075	7.444+-	0.479	-31.453+-	13.44
P	0.047+-	0.028	0.300+-	0.179	- 1.267+-	0.926
S	0.391+-	0.098	2.507+-	0.630	-10.594+-	5.209
CL	0.000+-	0.024	0.000+-	0.154	0.000+-	0.652
K	0.010+-	0.005	0.065+-	0.032	- 0.274+-	0.178
CA	0.430+-	0.029	2.761+-	0.187	-11.665+-	4.992
TI	0.050+-	0.005	0.324+-	0.029	- 1.369+-	0.592
V	0.088+-	0.010	0.565+-	0.066	- 2.388+-	1.047
CR	0.007+-	0.003	0.042+-	0.018	- 0.177+-	0.107
MN	0.008+-	0.002	0.051+-	0.011	- 0.215+-	0.102
FE	0.206+-	0.019	1.324+-	0.121	- 5.594+-	2.418
NI	0.091+-	0.014	0.585+-	0.087	- 2.470+-	1.106
CU	0.455+-	0.025	2.921+-	0.162	-12.344+-	5.260
ZN	0.061+-	0.008	0.392+-	0.049	- 1.656+-	0.729
GA	0.001+-	0.001	0.009+-	0.009	- 0.039+-	0.043
AS	0.000+-	0.005	0.000+-	0.033	0.000+-	0.141
SE	0.004+-	0.002	0.026+-	0.010	- 0.109+-	0.063
BR	0.002+-	0.002	0.012+-	0.015	- 0.050+-	0.066
RB	0.000+-	0.002	0.000+-	0.015	0.000+-	0.065
SR	0.016+-	0.003	0.100+-	0.020	- 0.422+-	0.197
Y	0.001+-	0.003	0.004+-	0.022	- 0.015+-	0.091
ZR	0.000+-	0.014	0.000+-	0.089	0.000+-	0.377
MO	0.006+-	0.011	0.039+-	0.068	- 0.163+-	0.297
PD	0.001+-	0.008	0.006+-	0.054	- 0.023+-	0.228
AG	0.000+-	0.012	0.000+-	0.078	0.000+-	0.331
CD	0.000+-	0.018	0.000+-	0.115	0.000+-	0.488
IN	0.028+-	0.019	0.182+-	0.125	- 0.767+-	0.619
SN	0.000+-	0.025	0.000+-	0.158	0.000+-	0.669
SB	0.000+-	0.045	0.000+-	0.291	0.000+-	1.231
BA	0.000+-	0.112	0.000+-	0.719	0.000+-	3.036
LA	0.000+-	0.174	0.000+-	1.116	0.000+-	4.715
HG	0.001+-	0.003	0.004+-	0.018	- 0.017+-	0.076
PB	0.033+-	0.010	0.214+-	0.062	- 0.903+-	0.464

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 5B
 PARTICLE SIZE: F
 ANALYSIS ID: AF150 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 417+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.054+-	0.056	6.768+-	0.357	1.624+-	0.094
SI	1.509+-	0.074	9.689+-	0.474	2.325+-	0.127
P	0.642+-	0.117	4.124+-	0.751	0.990+-	0.182
S	9.781+-	0.463	62.797+-	2.972	15.071+-	0.800
CL	0.000+-	0.114	0.000+-	0.730	0.000+-	0.175
K	0.122+-	0.009	0.785+-	0.058	0.188+-	0.015
CA	0.929+-	0.045	5.966+-	0.288	1.432+-	0.077
TI	0.081+-	0.005	0.520+-	0.034	0.125+-	0.009
V	0.769+-	0.036	4.935+-	0.232	1.184+-	0.063
CR	0.031+-	0.006	0.202+-	0.037	0.048+-	0.009
MN	0.015+-	0.002	0.097+-	0.012	0.023+-	0.003
FE	0.924+-	0.045	5.931+-	0.290	1.424+-	0.077
NI	1.122+-	0.053	7.202+-	0.340	1.729+-	0.092
CU	0.158+-	0.009	1.015+-	0.060	0.244+-	0.016
ZN	0.486+-	0.024	3.122+-	0.151	0.749+-	0.040
GA	0.006+-	0.002	0.038+-	0.015	0.009+-	0.004
AS	0.004+-	0.009	0.027+-	0.060	0.006+-	0.014
SE	0.002+-	0.002	0.015+-	0.010	0.004+-	0.002
BR	0.007+-	0.002	0.043+-	0.012	0.010+-	0.003
RB	0.005+-	0.002	0.030+-	0.012	0.007+-	0.003
SR	0.012+-	0.003	0.077+-	0.016	0.018+-	0.004
Y	0.000+-	0.003	0.000+-	0.019	0.000+-	0.005
ZR	0.010+-	0.011	0.063+-	0.071	0.015+-	0.017
MO	0.082+-	0.010	0.527+-	0.062	0.126+-	0.015
PD	0.006+-	0.007	0.037+-	0.043	0.009+-	0.010
AG	0.004+-	0.010	0.029+-	0.064	0.007+-	0.015
CD	0.006+-	0.014	0.040+-	0.091	0.009+-	0.022
IN	0.000+-	0.016	0.000+-	0.103	0.000+-	0.025
SN	0.032+-	0.020	0.204+-	0.127	0.049+-	0.030
SB	0.084+-	0.037	0.539+-	0.240	0.129+-	0.058
BA	0.087+-	0.088	0.558+-	0.566	0.134+-	0.136
LA	0.224+-	0.135	1.437+-	0.865	0.345+-	0.208
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.004
PB	0.639+-	0.032	4.105+-	0.203	0.985+-	0.054

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 6A
 PARTICLE SIZE: C
 ANALYSIS ID: AC018 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 90+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.316+-	0.101	8.452+-	0.649	9.414+-	1.274
SI	2.678+-	0.188	17.191+-	1.210	19.149+-	2.523
P	0.299+-	0.150	1.920+-	0.962	2.139+-	1.098
S	1.083+-	0.290	6.952+-	1.862	7.743+-	2.246
CL	0.000+-	0.071	0.000+-	0.457	0.000+-	0.510
K	0.038+-	0.010	0.247+-	0.066	0.275+-	0.079
CA	1.354+-	0.118	8.690+-	0.760	9.679+-	1.370
TI	0.157+-	0.012	1.007+-	0.075	1.121+-	0.150
V	0.274+-	0.047	1.761+-	0.299	1.962+-	0.398
CR	0.018+-	0.007	0.115+-	0.046	0.128+-	0.053
MN	0.012+-	0.002	0.075+-	0.015	0.083+-	0.019
FE	0.486+-	0.069	3.117+-	0.441	3.472+-	0.625
NI	0.221+-	0.054	1.417+-	0.348	1.578+-	0.426
CU	0.049+-	0.007	0.317+-	0.042	0.353+-	0.061
ZN	0.124+-	0.030	0.793+-	0.190	0.884+-	0.233
GA	0.000+-	0.002	0.000+-	0.015	0.000+-	0.017
AS	0.000+-	0.010	0.000+-	0.062	0.000+-	0.069
SE	0.001+-	0.002	0.009+-	0.010	0.010+-	0.011
BR	0.001+-	0.002	0.008+-	0.010	0.009+-	0.012
RB	0.000+-	0.002	0.000+-	0.010	0.000+-	0.011
SR	0.023+-	0.003	0.150+-	0.019	0.167+-	0.028
Y	0.002+-	0.003	0.014+-	0.017	0.015+-	0.019
ZR	0.034+-	0.010	0.217+-	0.063	0.242+-	0.075
MO	0.007+-	0.008	0.043+-	0.054	0.048+-	0.061
PD	0.003+-	0.005	0.021+-	0.034	0.024+-	0.038
AG	0.002+-	0.008	0.014+-	0.051	0.016+-	0.057
CD	0.013+-	0.011	0.084+-	0.069	0.093+-	0.077
IN	0.017+-	0.012	0.107+-	0.080	0.120+-	0.090
SN	0.037+-	0.016	0.237+-	0.103	0.264+-	0.118
SB	0.045+-	0.031	0.288+-	0.197	0.321+-	0.223
BA	0.223+-	0.079	1.430+-	0.508	1.593+-	0.593
LA	0.152+-	0.113	0.975+-	0.726	1.087+-	0.818
HG	0.000+-	0.002	0.000+-	0.015	0.000+-	0.017
PB	0.111+-	0.039	0.713+-	0.247	0.794+-	0.289

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 6A
 PARTICLE SIZE: F
 ANALYSIS ID: AF151 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1762+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	4.759+-	0.224	30.553+-	1.435	1.734+-	0.082
SI	8.680+-	0.399	55.726+-	2.564	3.162+-	0.147
P	3.564+-	0.646	22.881+-	4.150	1.298+-	0.236
S	32.841+-	1.534	210.837+-	9.848	11.964+-	0.563
CL	0.000+-	0.384	0.000+-	2.467	0.000+-	0.140
K	0.692+-	0.037	4.444+-	0.240	0.252+-	0.014
CA	7.958+-	0.371	51.089+-	2.382	2.899+-	0.136
TI	0.296+-	0.035	1.897+-	0.227	0.108+-	0.013
V	4.847+-	0.225	31.116+-	1.446	1.766+-	0.083
CR	0.161+-	0.030	1.034+-	0.192	0.059+-	0.011
MN	0.110+-	0.007	0.706+-	0.045	0.040+-	0.003
FE	6.507+-	0.300	41.772+-	1.927	2.370+-	0.110
NI	6.205+-	0.284	39.838+-	1.823	2.261+-	0.104
CU	0.298+-	0.020	1.911+-	0.131	0.108+-	0.007
ZN	3.323+-	0.152	21.335+-	0.979	1.211+-	0.056
GA	0.035+-	0.008	0.226+-	0.050	0.013+-	0.003
AS	0.050+-	0.028	0.321+-	0.180	0.018+-	0.010
SE	0.002+-	0.007	0.011+-	0.043	0.001+-	0.002
BR	0.011+-	0.005	0.074+-	0.034	0.004+-	0.002
RB	0.005+-	0.002	0.033+-	0.015	0.002+-	0.001
SR	0.102+-	0.006	0.657+-	0.039	0.037+-	0.002
Y	0.000+-	0.007	0.000+-	0.042	0.000+-	0.002
ZR	0.046+-	0.015	0.294+-	0.098	0.017+-	0.006
MO	0.531+-	0.028	3.412+-	0.177	0.194+-	0.010
PD	0.011+-	0.008	0.068+-	0.048	0.004+-	0.003
AG	0.022+-	0.012	0.144+-	0.075	0.008+-	0.004
CD	0.007+-	0.015	0.045+-	0.099	0.003+-	0.006
IN	0.018+-	0.018	0.119+-	0.116	0.007+-	0.007
SN	0.096+-	0.023	0.613+-	0.149	0.035+-	0.008
SB	0.243+-	0.046	1.558+-	0.293	0.038+-	0.017
BA	0.806+-	0.112	5.173+-	0.721	0.294+-	0.041
LA	0.470+-	0.152	3.018+-	0.975	0.171+-	0.055
HG	0.007+-	0.005	0.044+-	0.030	0.002+-	0.002
PB	4.549+-	0.209	29.204+-	1.344	1.657+-	0.077

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 6B
 PARTICLE SIZE: C
 ANALYSIS ID: CC089 - Nuclepore
 PAIRED W/ QUARTZ
 EXPOSED AREA: 6.42 SQUARE CM
 MASS OF DEPOSIT: 234+- 23 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	2.241+- 0.123	14.388+- 0.788	6.149+- 0.692
SI	4.155+- 0.215	26.672+- 1.379	11.399+- 1.266
P	0.505+- 0.102	3.240+- 0.655	1.385+- 0.311
S	3.269+- 0.181	20.987+- 1.159	8.969+- 1.011
CL	0.023+- 0.044	0.149+- 0.285	0.064+- 0.122
K	0.096+- 0.009	0.618+- 0.060	0.264+- 0.036
CA	2.358+- 0.122	15.136+- 0.780	6.468+- 0.718
TI	0.217+- 0.013	1.396+- 0.081	0.597+- 0.068
V	0.649+- 0.034	4.169+- 0.217	1.781+- 0.198
CR	0.036+- 0.006	0.232+- 0.038	0.099+- 0.019
MN	0.024+- 0.002	0.152+- 0.015	0.065+- 0.009
FE	1.014+- 0.054	6.511+- 0.347	2.782+- 0.311
NI	0.670+- 0.036	4.301+- 0.229	1.838+- 0.205
CU	0.068+- 0.006	0.436+- 0.035	0.186+- 0.024
ZN	0.346+- 0.019	2.221+- 0.121	0.949+- 0.107
GA	0.003+- 0.002	0.018+- 0.014	0.008+- 0.006
AS	0.000+- 0.008	0.000+- 0.054	0.000+- 0.023
SE	0.000+- 0.002	0.000+- 0.010	0.000+- 0.004
BR	0.001+- 0.002	0.005+- 0.015	0.002+- 0.007
RB	0.000+- 0.002	0.000+- 0.016	0.000+- 0.007
SR	0.040+- 0.004	0.254+- 0.025	0.108+- 0.015
Y	0.002+- 0.004	0.011+- 0.023	0.005+- 0.010
ZR	0.017+- 0.014	0.111+- 0.092	0.047+- 0.040
MO	0.058+- 0.012	0.375+- 0.074	0.160+- 0.035
PD	0.003+- 0.009	0.018+- 0.055	0.008+- 0.023
AG	0.015+- 0.013	0.097+- 0.084	0.041+- 0.036
CD	0.000+- 0.018	0.000+- 0.117	0.000+- 0.050
IN	0.027+- 0.020	0.175+- 0.126	0.075+- 0.054
SN	0.000+- 0.024	0.000+- 0.157	0.000+- 0.067
SB	0.000+- 0.047	0.000+- 0.300	0.000+- 0.128
BA	0.045+- 0.115	0.288+- 0.736	0.123+- 0.315
LA	0.114+- 0.179	0.734+- 1.152	0.313+- 0.493
HG	0.000+- 0.003	0.000+- 0.019	0.000+- 0.008
PB	0.425+- 0.024	2.730+- 0.156	1.167+- 0.133

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 7A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO19 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 156+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	2.459+- 0.182	15.785+- 1.169	10.126+- 0.992
SI	4.934+- 0.339	31.678+- 2.174	20.321+- 1.909
P	0.603+- 0.274	3.873+- 1.760	2.484+- 1.140
S	2.360+- 0.587	15.149+- 3.771	9.718+- 2.498
CL	0.000+- 0.146	0.000+- 0.937	0.000+- 0.601
K	0.094+- 0.018	0.601+- 0.112	0.386+- 0.076
CA	2.624+- 0.220	16.845+- 1.413	10.805+- 1.141
TI	0.272+- 0.020	1.749+- 0.130	1.122+- 0.110
V	0.472+- 0.085	3.030+- 0.544	1.944+- 0.370
CR	0.031+- 0.012	0.199+- 0.077	0.127+- 0.050
MN	0.017+- 0.003	0.107+- 0.022	0.069+- 0.015
FE	0.902+- 0.128	5.791+- 0.821	3.715+- 0.578
NI	0.293+- 0.101	1.883+- 0.646	1.208+- 0.422
CU	0.214+- 0.017	1.376+- 0.107	0.883+- 0.089
ZN	0.172+- 0.055	1.106+- 0.353	0.710+- 0.231
GA	0.007+- 0.004	0.047+- 0.023	0.030+- 0.015
AS	0.005+- 0.013	0.034+- 0.083	0.022+- 0.053
SE	0.000+- 0.002	0.000+- 0.015	0.000+- 0.010
BR	0.002+- 0.002	0.015+- 0.014	0.010+- 0.009
RB	0.000+- 0.002	0.000+- 0.011	0.000+- 0.007
SR	0.038+- 0.004	0.247+- 0.027	0.159+- 0.020
Y	0.001+- 0.003	0.004+- 0.021	0.002+- 0.014
ZR	0.040+- 0.011	0.259+- 0.072	0.166+- 0.047
MO	0.021+- 0.012	0.133+- 0.077	0.085+- 0.050
PD	0.000+- 0.006	0.000+- 0.040	0.000+- 0.026
AG	0.009+- 0.009	0.058+- 0.059	0.037+- 0.038
CD	0.000+- 0.012	0.000+- 0.078	0.000+- 0.050
IN	0.000+- 0.014	0.000+- 0.089	0.000+- 0.057
SN	0.000+- 0.017	0.000+- 0.110	0.000+- 0.070
SB	0.056+- 0.035	0.359+- 0.226	0.230+- 0.145
BA	0.000+- 0.087	0.000+- 0.559	0.000+- 0.358
LA	0.000+- 0.128	0.000+- 0.824	0.000+- 0.528
HG	0.000+- 0.003	0.000+- 0.018	0.000+- 0.012
PB	0.102+- 0.067	0.658+- 0.432	0.422+- 0.278

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 7A
 PARTICLE SIZE: F
 ANALYSIS ID: AF153 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 3911+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	8.942+-	0.414	57.410+-	2.655	1.468+-	0.068
SI	15.305+-	0.701	98.259+-	4.498	2.512+-	0.115
P	6.166+-	1.118	39.584+-	7.177	1.012+-	0.184
S	67.177+-	3.123	431.277+-	20.047	11.027+-	0.513
CL	0.000+-	0.784	0.000+-	5.034	0.000+-	0.129
K	1.321+-	0.067	8.482+-	0.430	0.217+-	0.011
CA	14.336+-	0.666	92.034+-	4.277	2.353+-	0.110
TI	0.787+-	0.053	5.050+-	0.342	0.129+-	0.009
V	9.164+-	0.418	58.834+-	2.687	1.504+-	0.069
CR	0.313+-	0.054	2.010+-	0.349	0.051+-	0.009
MN	0.238+-	0.013	1.530+-	0.083	0.039+-	0.002
FE	12.448+-	0.572	79.917+-	3.670	2.043+-	0.094
NI	12.404+-	0.566	79.637+-	3.631	2.036+-	0.093
CU	0.637+-	0.040	4.091+-	0.257	0.105+-	0.007
ZN	6.673+-	0.305	42.841+-	1.956	1.095+-	0.050
GA	0.061+-	0.013	0.394+-	0.082	0.010+-	0.002
AS	0.050+-	0.044	0.322+-	0.280	0.008+-	0.007
SE	0.018+-	0.013	0.117+-	0.081	0.003+-	0.002
BR	0.027+-	0.010	0.172+-	0.062	0.004+-	0.002
RB	0.018+-	0.004	0.113+-	0.023	0.003+-	0.001
SR	0.192+-	0.010	1.231+-	0.066	0.031+-	0.002
Y	0.000+-	0.011	0.000+-	0.072	0.000+-	0.002
ZR	0.020+-	0.023	0.126+-	0.145	0.003+-	0.004
MO	1.027+-	0.050	6.593+-	0.322	0.169+-	0.008
PD	0.019+-	0.010	0.125+-	0.064	0.003+-	0.002
AG	0.013+-	0.015	0.087+-	0.094	0.002+-	0.002
CD	0.010+-	0.020	0.063+-	0.130	0.002+-	0.003
IN	0.000+-	0.023	0.000+-	0.149	0.000+-	0.004
SN	0.116+-	0.030	0.742+-	0.191	0.019+-	0.005
SB	0.454+-	0.063	2.913+-	0.402	0.074+-	0.010
BA	1.332+-	0.152	8.553+-	0.977	0.219+-	0.025
LA	0.273+-	0.192	1.755+-	1.235	0.045+-	0.032
HG	0.000+-	0.007	0.000+-	0.045	0.000+-	0.001
PB	8.667+-	0.397	55.644+-	2.548	1.423+-	0.065

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 7B
 PARTICLE SIZE: C
 ANALYSIS ID: CC090 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: - 102+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER	
AL	1.239+-	0.116	7.957+-	0.748 - 7.835+- 1.066
SI	2.432+-	0.208	15.614+-	1.334 -15.374+- 2.004
P	0.000+-	0.155	0.000+-	0.998 0.000+- 0.982
S	0.000+-	0.346	0.000+-	2.219 0.000+- 2.185
CL	0.000+-	0.086	0.000+-	0.553 0.000+- 0.545
K	0.000+-	0.011	0.000+-	0.069 0.000+- 0.068
CA	1.004+-	0.131	6.444+-	0.841 - 6.345+- 1.037
TI	0.135+-	0.013	0.866+-	0.084 - 0.853+- 0.118
V	0.000+-	0.051	0.000+-	0.328 0.000+- 0.323
CR	0.004+-	0.008	0.024+-	0.049 - 0.024+- 0.048
MN	0.004+-	0.003	0.027+-	0.017 - 0.026+- 0.017
FE	0.000+-	0.074	0.000+-	0.475 0.000+- 0.468
NI	0.000+-	0.061	0.000+-	0.390 0.000+- 0.384
CU	0.038+-	0.007	0.243+-	0.046 - 0.239+- 0.051
ZN	0.000+-	0.033	0.000+-	0.214 0.000+- 0.211
GA	0.000+-	0.002	0.000+-	0.015 0.000+- 0.014
AS	0.000+-	0.009	0.000+-	0.057 0.000+- 0.057
SE	0.001+-	0.002	0.006+-	0.013 - 0.006+- 0.013
BR	0.004+-	0.003	0.024+-	0.017 - 0.024+- 0.017
RB	0.000+-	0.003	0.000+-	0.016 0.000+- 0.016
SR	0.019+-	0.004	0.121+-	0.025 - 0.119+- 0.027
Y	0.005+-	0.004	0.032+-	0.024 - 0.032+- 0.024
ZR	0.000+-	0.014	0.000+-	0.092 0.000+- 0.091
MO	0.000+-	0.013	0.000+-	0.081 0.000+- 0.079
PD	0.000+-	0.008	0.000+-	0.052 0.000+- 0.052
AG	0.008+-	0.013	0.049+-	0.083 - 0.048+- 0.082
CD	0.000+-	0.018	0.000+-	0.118 0.000+- 0.116
IN	0.001+-	0.019	0.005+-	0.123 - 0.005+- 0.121
SN	0.000+-	0.025	0.000+-	0.159 0.000+- 0.157
SB	0.000+-	0.047	0.000+-	0.303 0.000+- 0.298
BA	0.000+-	0.114	0.000+-	0.734 0.000+- 0.722
LA	0.000+-	0.179	0.000+-	1.151 0.000+- 1.133
HG	0.000+-	0.003	0.000+-	0.017 0.000+- 0.017
PB	0.000+-	0.042	0.000+-	0.269 0.000+- 0.265

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 7B
 PARTICLE SIZE: F
 ANALYSIS ID: AF152 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 3186+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	7.416+-	0.344	47.609+-	2.209	1.495+-	0.070
SI	13.514+-	0.619	86.763+-	3.975	2.724+-	0.125
P	5.667+-	1.028	36.385+-	6.597	1.142+-	0.207
S	58.769+-	2.732	377.296+-	17.540	11.844+-	0.552
CL	0.000+-	0.685	0.000+-	4.399	0.000+-	0.138
K	1.163+-	0.059	7.469+-	0.380	0.234+-	0.012
CA	12.223+-	0.569	78.474+-	3.653	2.463+-	0.115
TI	0.710+-	0.045	4.558+-	0.289	0.143+-	0.009
V	7.766+-	0.355	49.856+-	2.278	1.565+-	0.072
CR	0.265+-	0.046	1.703+-	0.297	0.053+-	0.009
MN	0.196+-	0.011	1.257+-	0.069	0.039+-	0.002
FE	10.327+-	0.475	66.300+-	3.047	2.081+-	0.096
NI	10.208+-	0.466	65.535+-	2.991	2.057+-	0.094
CU	0.482+-	0.032	3.097+-	0.205	0.097+-	0.006
ZN	5.521+-	0.252	35.448+-	1.620	1.113+-	0.051
GA	0.055+-	0.011	0.356+-	0.071	0.011+-	0.002
AS	0.094+-	0.038	0.603+-	0.245	0.019+-	0.008
SE	0.008+-	0.010	0.054+-	0.067	0.002+-	0.002
BR	0.015+-	0.008	0.095+-	0.051	0.003+-	0.002
RB	0.004+-	0.003	0.023+-	0.017	0.001+-	0.001
SR	0.166+-	0.009	1.064+-	0.057	0.033+-	0.002
Y	0.000+-	0.009	0.000+-	0.059	0.000+-	0.002
ZR	0.055+-	0.018	0.352+-	0.117	0.011+-	0.004
MO	0.843+-	0.041	5.414+-	0.265	0.170+-	0.008
PD	0.017+-	0.008	0.110+-	0.049	0.003+-	0.002
AG	0.000+-	0.010	0.000+-	0.067	0.000+-	0.002
CD	0.023+-	0.015	0.145+-	0.099	0.005+-	0.003
IN	0.023+-	0.018	0.145+-	0.113	0.005+-	0.004
SN	0.086+-	0.022	0.553+-	0.143	0.017+-	0.004
SB	0.452+-	0.052	2.904+-	0.336	0.091+-	0.011
BA	1.126+-	0.119	7.229+-	0.765	0.227+-	0.024
LA	0.224+-	0.142	1.439+-	0.912	0.045+-	0.029
HG	0.005+-	0.006	0.034+-	0.036	0.001+-	0.001
PB	7.147+-	0.328	45.884+-	2.103	1.440+-	0.066

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 7B REPEAT
 PARTICLE SIZE: C
 ANALYSIS ID: CC091 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: - 3+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER			
AL	0.570+-	0.049	3.662+-	0.314	-137.34+-	515.2
SI	1.236+-	0.080	7.933+-	0.513	-297.50+-	1116
P	0.084+-	0.043	0.542+-	0.274	-20.333+-	76.94
S	0.286+-	0.109	1.834+-	0.702	-68.781+-	259.3
CL	0.000+-	0.027	0.000+-	0.171	0.000+-	6.413
K	0.018+-	0.006	0.114+-	0.037	- 4.264+-	16.05
CA	0.642+-	0.043	4.119+-	0.276	-154.46+-	579.3
TI	0.078+-	0.006	0.502+-	0.038	-18.839+-	70.66
V	0.114+-	0.014	0.733+-	0.087	-27.505+-	103.2
CR	0.008+-	0.003	0.054+-	0.021	- 2.013+-	7.590
MN	0.007+-	0.002	0.047+-	0.011	- 1.760+-	6.613
FE	0.219+-	0.022	1.403+-	0.144	-52.624+-	197.4
NI	0.079+-	0.015	0.509+-	0.098	-19.092+-	71.69
CU	0.112+-	0.008	0.720+-	0.049	-26.997+-	101.3
ZN	0.035+-	0.008	0.224+-	0.052	- 8.409+-	31.59
GA	0.000+-	0.001	0.003+-	0.010	- 0.119+-	0.572
AS	0.001+-	0.006	0.007+-	0.036	- 0.260+-	1.679
SE	0.002+-	0.002	0.015+-	0.010	- 0.566+-	2.155
BR	0.000+-	0.002	0.000+-	0.014	0.000+-	0.543
RB	0.000+-	0.002	0.000+-	0.016	0.000+-	0.590
SR	0.019+-	0.003	0.123+-	0.021	- 4.600+-	17.27
Y	0.003+-	0.003	0.017+-	0.022	- 0.626+-	2.488
ZR	0.000+-	0.014	0.000+-	0.089	0.000+-	3.353
MO	0.007+-	0.011	0.047+-	0.069	- 1.748+-	7.050
PD	0.001+-	0.008	0.008+-	0.054	- 0.284+-	2.290
AG	0.007+-	0.013	0.046+-	0.082	- 1.740+-	7.217
CD	0.000+-	0.017	0.000+-	0.111	0.000+-	4.163
IN	0.017+-	0.019	0.112+-	0.123	- 4.196+-	16.40
SN	0.000+-	0.024	0.000+-	0.157	0.000+-	5.894
SB	0.000+-	0.046	0.000+-	0.293	0.000+-	11.00
BA	0.035+-	0.114	0.228+-	0.733	- 8.544+-	42.20
LA	0.000+-	0.173	0.000+-	1.114	0.000+-	41.76
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.635
PB	0.022+-	0.012	0.144+-	0.075	- 5.381+-	20.37

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - TEST NO. 7B REPEAT
 PARTICLE SIZE: F
 ANALYSIS ID: AF154 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 517+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	1.108+- 0.058	7.114+- 0.370	1.377+- 0.076
SI	1.800+- 0.087	11.556+- 0.556	2.237+- 0.116
P	0.968+- 0.176	6.215+- 1.129	1.203+- 0.220
S	12.001+- 0.566	77.047+- 3.634	14.912+- 0.760
CL	0.000+- 0.140	0.000+- 0.896	0.000+- 0.174
K	0.167+- 0.011	1.070+- 0.072	0.207+- 0.015
CA	1.474+- 0.071	9.466+- 0.459	1.832+- 0.096
TI	0.047+- 0.007	0.300+- 0.043	0.058+- 0.008
V	1.072+- 0.051	6.884+- 0.326	1.332+- 0.068
CR	0.043+- 0.008	0.278+- 0.049	0.054+- 0.010
MN	0.026+- 0.002	0.165+- 0.014	0.032+- 0.003
FE	1.395+- 0.067	8.957+- 0.428	1.734+- 0.089
NI	1.456+- 0.068	9.348+- 0.438	1.869+- 0.092
CU	0.080+- 0.007	0.514+- 0.042	0.099+- 0.008
ZN	0.773+- 0.037	4.962+- 0.235	0.960+- 0.049
GA	0.011+- 0.003	0.071+- 0.019	0.014+- 0.004
AS	0.002+- 0.012	0.015+- 0.075	0.003+- 0.015
SE	0.007+- 0.002	0.042+- 0.013	0.008+- 0.003
BR	0.003+- 0.002	0.022+- 0.011	0.004+- 0.002
RB	0.002+- 0.001	0.014+- 0.010	0.003+- 0.002
SR	0.018+- 0.002	0.114+- 0.014	0.022+- 0.003
Y	0.000+- 0.003	0.000+- 0.018	0.000+- 0.003
ZR	0.046+- 0.009	0.296+- 0.060	0.057+- 0.012
MO	0.118+- 0.009	0.757+- 0.061	0.147+- 0.012
PD	0.005+- 0.005	0.031+- 0.034	0.006+- 0.007
AG	0.013+- 0.008	0.081+- 0.053	0.016+- 0.010
CD	0.000+- 0.011	0.000+- 0.068	0.000+- 0.013
IN	0.000+- 0.012	0.000+- 0.079	0.000+- 0.015
SN	0.017+- 0.015	0.107+- 0.097	0.021+- 0.019
SB	0.115+- 0.031	0.739+- 0.202	0.143+- 0.039
BA	0.244+- 0.072	1.565+- 0.465	0.303+- 0.090
LA	0.000+- 0.111	0.000+- 0.714	0.000+- 0.138
HG	0.000+- 0.002	0.000+- 0.014	0.000+- 0.003
PB	1.037+- 0.049	6.655+- 0.318	1.288+- 0.066

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: AC078 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.013	0.000+-	0.082
SI	0.000+-	0.009	0.000+-	0.059
P	0.000+-	0.004	0.000+-	0.024
S	0.000+-	0.020	0.000+-	0.130
CL	0.000+-	0.006	0.000+-	0.041
K	0.001+-	0.003	0.007+-	0.019
CA	0.000+-	0.002	0.000+-	0.012
TI	0.000+-	0.001	0.000+-	0.008
V	0.000+-	0.001	0.000+-	0.006
CR	0.000+-	0.001	0.000+-	0.007
MN	0.001+-	0.001	0.006+-	0.009
FE	0.003+-	0.003	0.021+-	0.020
NI	0.000+-	0.001	0.000+-	0.008
CU	0.001+-	0.001	0.003+-	0.009
ZN	0.000+-	0.001	0.000+-	0.006
GA	0.000+-	0.001	0.003+-	0.005
AS	0.000+-	0.003	0.000+-	0.019
SE	0.000+-	0.001	0.000+-	0.007
BR	0.000+-	0.001	0.000+-	0.009
RE	0.000+-	0.002	0.000+-	0.011
SR	0.000+-	0.002	0.000+-	0.014
Y	0.000+-	0.003	0.000+-	0.017
ZR	0.000+-	0.011	0.000+-	0.073
MO	0.000+-	0.008	0.000+-	0.051
PD	0.000+-	0.007	0.000+-	0.042
AG	0.000+-	0.010	0.000+-	0.063
CD	0.000+-	0.012	0.000+-	0.080
IN	0.000+-	0.015	0.000+-	0.097
SN	0.000+-	0.019	0.000+-	0.122
SB	0.009+-	0.036	0.060+-	0.231
BA	0.020+-	0.086	0.126+-	0.555
LA	0.099+-	0.136	0.637+-	0.875
HG	0.000+-	0.002	0.000+-	0.014
PB	0.005+-	0.005	0.032+-	0.031

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF243 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.001+-	0.010	0.007+-	0.065
SI	0.004+-	0.007	0.026+-	0.045
P	0.002+-	0.004	0.010+-	0.024
S	0.000+-	0.020	0.000+-	0.127
CL	0.000+-	0.007	0.002+-	0.044
K	0.000+-	0.002	0.000+-	0.014
CA	0.000+-	0.002	0.000+-	0.010
TI	0.000+-	0.001	0.003+-	0.007
V	0.000+-	0.001	0.002+-	0.005
CR	0.002+-	0.001	0.014+-	0.007
MN	0.000+-	0.001	0.003+-	0.003
FE	0.006+-	0.003	0.036+-	0.020
NI	0.002+-	0.001	0.012+-	0.003
CU	0.002+-	0.001	0.010+-	0.009
ZN	0.000+-	0.001	0.000+-	0.005
GA	0.002+-	0.001	0.016+-	0.006
AS	0.000+-	0.003	0.000+-	0.017
SE	0.001+-	0.001	0.008+-	0.007
BR	0.001+-	0.001	0.008+-	0.009
RB	0.000+-	0.002	0.000+-	0.011
SR	0.000+-	0.002	0.000+-	0.013
Y	0.000+-	0.002	0.000+-	0.016
ZR	0.009+-	0.011	0.060+-	0.068
MO	0.000+-	0.007	0.000+-	0.047
PD	0.002+-	0.007	0.012+-	0.043
AG	0.008+-	0.009	0.050+-	0.059
CD	0.000+-	0.012	0.000+-	0.079
IN	0.012+-	0.014	0.076+-	0.091
SN	0.018+-	0.017	0.116+-	0.107
SB	0.026+-	0.032	0.169+-	0.205
BA	0.030+-	0.080	0.191+-	0.511
LA	0.000+-	0.124	0.000+-	0.795
HG	0.001+-	0.002	0.005+-	0.011
PB	0.001+-	0.004	0.004+-	0.029

SAMPLE ID: SCHUYLKILL/OIL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC123 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.017+-	0.025	0.111+-	0.161
SI	0.023+-	0.019	0.146+-	0.124
P	0.000+-	0.010	0.000+-	0.062
S	0.000+-	0.022	0.000+-	0.143
CL	0.011+-	0.010	0.073+-	0.063
K	0.000+-	0.003	0.001+-	0.020
CA	0.001+-	0.002	0.005+-	0.015
TI	0.000+-	0.001	0.000+-	0.009
V	0.001+-	0.001	0.003+-	0.006
CR	0.000+-	0.002	0.000+-	0.011
MN	0.000+-	0.002	0.000+-	0.010
FE	0.002+-	0.004	0.013+-	0.024
NI	0.000+-	0.001	0.000+-	0.009
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.000+-	0.001	0.000+-	0.006
GA	0.001+-	0.001	0.003+-	0.006
AS	0.007+-	0.004	0.048+-	0.025
SE	0.000+-	0.001	0.000+-	0.009
BR	0.000+-	0.002	0.001+-	0.014
RB	0.002+-	0.002	0.010+-	0.015
SR	0.000+-	0.003	0.000+-	0.019
Y	0.001+-	0.003	0.006+-	0.022
ZR	0.000+-	0.014	0.000+-	0.088
MO	0.000+-	0.010	0.000+-	0.067
PD	0.000+-	0.009	0.000+-	0.056
AG	0.015+-	0.012	0.095+-	0.075
CD	0.000+-	0.018	0.000+-	0.113
IN	0.011+-	0.020	0.072+-	0.129
SN	0.000+-	0.024	0.000+-	0.152
SB	0.005+-	0.044	0.035+-	0.284
BA	0.056+-	0.109	0.358+-	0.701
LA	0.096+-	0.173	0.619+-	1.112
HG	0.000+-	0.003	0.000+-	0.016
PB	0.000+-	0.006	0.000+-	0.041

SAMPLE ID: EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC020 - Teflon
 FLAKE NEAR CENTER OF FILTER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 63+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.449+-	0.039	2.883+-	0.251	4.569+-	0.826
SI	0.806+-	0.059	5.177+-	0.380	8.203+-	1.433
P	0.230+-	0.087	1.476+-	0.561	2.339+-	0.963
S	0.886+-	0.138	5.688+-	0.887	9.012+-	2.003
CL	0.000+-	0.034	0.000+-	0.215	0.000+-	0.341
K	0.034+-	0.007	0.221+-	0.042	0.351+-	0.087
CA	0.925+-	0.066	5.940+-	0.421	9.412+-	1.634
TI	0.069+-	0.006	0.445+-	0.035	0.704+-	0.125
V	0.158+-	0.014	1.012+-	0.091	1.604+-	0.292
CR	0.011+-	0.003	0.070+-	0.019	0.111+-	0.035
MN	0.005+-	0.001	0.034+-	0.010	0.054+-	0.017
FE	0.315+-	0.031	2.019+-	0.199	3.200+-	0.597
NI	0.190+-	0.023	1.220+-	0.146	1.933+-	0.384
CU	0.016+-	0.003	0.100+-	0.022	0.158+-	0.043
ZN	0.170+-	0.019	1.093+-	0.121	1.731+-	0.335
GA	0.003+-	0.002	0.020+-	0.015	0.031+-	0.024
AS	0.005+-	0.010	0.034+-	0.062	0.054+-	0.098
SE	0.001+-	0.001	0.007+-	0.009	0.011+-	0.015
BR	0.001+-	0.002	0.005+-	0.010	0.008+-	0.016
RE	0.000+-	0.001	0.000+-	0.010	0.000+-	0.015
SR	0.010+-	0.002	0.062+-	0.013	0.098+-	0.026
Y	0.000+-	0.003	0.000+-	0.016	0.000+-	0.026
ZR	0.029+-	0.009	0.189+-	0.060	0.299+-	0.106
MO	0.000+-	0.007	0.000+-	0.042	0.000+-	0.067
PD	0.009+-	0.006	0.056+-	0.036	0.089+-	0.059
AG	0.002+-	0.008	0.014+-	0.050	0.022+-	0.080
CD	0.001+-	0.010	0.004+-	0.064	0.007+-	0.102
IN	0.000+-	0.012	0.000+-	0.080	0.000+-	0.126
SN	0.000+-	0.014	0.001+-	0.091	0.002+-	0.145
SB	0.051+-	0.030	0.324+-	0.196	0.514+-	0.321
BA	0.002+-	0.071	0.010+-	0.459	0.016+-	0.727
LA	0.000+-	0.117	0.000+-	0.748	0.000+-	1.185
HG	0.000+-	0.002	0.000+-	0.013	0.000+-	0.020
PB	0.310+-	0.036	1.991+-	0.229	3.154+-	0.617

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF155 - Teflon
 DEPOSIT SMEARED
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 639+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.467+-	0.074	9.419+-	0.476	1.474+-	0.078
SI	2.368+-	0.112	15.204+-	0.722	2.380+-	0.119
P	1.697+-	0.308	10.894+-	1.977	1.705+-	0.311
S	12.078+-	0.579	77.538+-	3.716	12.136+-	0.612
CL	0.000+-	0.144	0.000+-	0.927	0.000+-	0.145
K	0.231+-	0.015	1.484+-	0.095	0.232+-	0.015
CA	2.893+-	0.138	18.575+-	0.885	2.907+-	0.146
TI	0.000+-	0.021	0.000+-	0.138	0.000+-	0.022
V	0.844+-	0.043	5.421+-	0.273	0.849+-	0.045
CR	0.047+-	0.007	0.300+-	0.045	0.047+-	0.007
MN	0.038+-	0.003	0.243+-	0.019	0.038+-	0.003
FE	2.050+-	0.097	13.163+-	0.620	2.060+-	0.102
NI	1.840+-	0.086	11.812+-	0.550	1.849+-	0.091
CU	0.141+-	0.009	0.907+-	0.060	0.142+-	0.010
ZN	1.470+-	0.068	9.439+-	0.438	1.477+-	0.072
GA	0.008+-	0.005	0.049+-	0.033	0.008+-	0.005
AS	0.000+-	0.021	0.000+-	0.134	0.000+-	0.021
SE	0.001+-	0.004	0.009+-	0.028	0.001+-	0.004
BR	0.006+-	0.004	0.037+-	0.023	0.006+-	0.004
RB	0.000+-	0.002	0.000+-	0.011	0.000+-	0.002
SR	0.021+-	0.003	0.137+-	0.017	0.021+-	0.003
Y	0.000+-	0.005	0.000+-	0.029	0.000+-	0.005
ZR	0.000+-	0.011	0.000+-	0.071	0.000+-	0.011
MO	0.118+-	0.010	0.756+-	0.061	0.118+-	0.010
PD	0.014+-	0.006	0.088+-	0.038	0.014+-	0.006
AG	0.012+-	0.009	0.074+-	0.058	0.012+-	0.009
CD	0.014+-	0.012	0.092+-	0.076	0.014+-	0.012
IN	0.015+-	0.013	0.099+-	0.086	0.015+-	0.014
SN	0.000+-	0.017	0.000+-	0.106	0.000+-	0.017
SB	0.217+-	0.036	1.396+-	0.229	0.219+-	0.036
BA	0.418+-	0.081	2.687+-	0.521	0.421+-	0.082
LA	0.301+-	0.118	1.933+-	0.760	0.303+-	0.119
HG	0.002+-	0.003	0.010+-	0.022	0.002+-	0.003
PB	2.888+-	0.134	18.542+-	0.858	2.902+-	0.142

SAMPLE ID: EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: AC021 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 48+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.311+-	0.031	1.998+-	0.197	4.123+-	0.943
SI	0.606+-	0.047	3.890+-	0.304	8.030+-	1.773
P	0.171+-	0.072	1.097+-	0.462	2.265+-	1.063
S	0.671+-	0.120	4.308+-	0.770	8.893+-	2.429
CL	0.000+-	0.028	0.000+-	0.183	0.000+-	0.377
K	0.030+-	0.006	0.193+-	0.039	0.399+-	0.115
CA	0.712+-	0.052	4.573+-	0.335	9.440+-	2.068
TI	0.062+-	0.005	0.398+-	0.033	0.822+-	0.183
V	0.125+-	0.011	0.805+-	0.074	1.662+-	0.375
CR	0.007+-	0.003	0.043+-	0.016	0.089+-	0.039
MN	0.005+-	0.001	0.033+-	0.009	0.068+-	0.024
FE	0.218+-	0.024	1.402+-	0.157	2.894+-	0.680
NI	0.153+-	0.019	0.985+-	0.122	2.034+-	0.489
CU	0.013+-	0.003	0.083+-	0.020	0.171+-	0.055
ZN	0.121+-	0.015	0.774+-	0.095	1.597+-	0.384
GA	0.000+-	0.002	0.001+-	0.012	0.002+-	0.026
AS	0.000+-	0.008	0.000+-	0.054	0.000+-	0.112
SE	0.000+-	0.001	0.000+-	0.008	0.000+-	0.017
BR	0.000+-	0.001	0.000+-	0.009	0.000+-	0.019
RE	0.001+-	0.001	0.009+-	0.009	0.018+-	0.019
SR	0.006+-	0.002	0.037+-	0.013	0.076+-	0.031
Y	0.003+-	0.002	0.018+-	0.015	0.036+-	0.033
ZR	0.000+-	0.009	0.000+-	0.060	0.000+-	0.124
MO	0.007+-	0.006	0.047+-	0.041	0.097+-	0.087
PD	0.003+-	0.005	0.016+-	0.032	0.034+-	0.066
AG	0.015+-	0.008	0.099+-	0.051	0.205+-	0.113
CD	0.010+-	0.011	0.067+-	0.069	0.138+-	0.146
IN	0.000+-	0.012	0.000+-	0.075	0.000+-	0.154
SN	0.000+-	0.015	0.000+-	0.094	0.000+-	0.194
SB	0.000+-	0.029	0.000+-	0.183	0.000+-	0.379
BA	0.178+-	0.072	1.141+-	0.459	2.356+-	1.066
LA	0.274+-	0.115	1.757+-	0.738	3.627+-	1.698
HG	0.003+-	0.002	0.017+-	0.015	0.035+-	0.032
PB	0.249+-	0.027	1.598+-	0.183	3.299+-	0.779

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF156 - Teflon
 DEPOSIT SMEARED
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 546+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	1.137+- 0.059	7.299+- 0.380	1.338+- 0.074
SI	2.110+- 0.101	13.547+- 0.647	2.483+- 0.127
P	1.522+- 0.276	9.773+- 1.774	1.791+- 0.327
S	10.874+- 0.520	69.814+- 3.339	12.797+- 0.655
CL	0.000+- 0.129	0.000+- 0.828	0.000+- 0.152
K	0.194+- 0.013	1.248+- 0.085	0.229+- 0.016
CA	2.439+- 0.116	15.658+- 0.745	2.870+- 0.146
TI	0.000+- 0.021	0.000+- 0.136	0.000+- 0.025
V	0.671+- 0.035	4.309+- 0.224	0.790+- 0.044
CR	0.034+- 0.006	0.221+- 0.038	0.041+- 0.007
MN	0.032+- 0.003	0.207+- 0.017	0.038+- 0.003
FE	1.752+- 0.083	11.251+- 0.532	2.062+- 0.105
NI	1.522+- 0.071	9.771+- 0.457	1.791+- 0.090
CU	0.117+- 0.008	0.749+- 0.051	0.137+- 0.010
ZN	1.209+- 0.056	7.765+- 0.362	1.423+- 0.071
GA	0.008+- 0.004	0.050+- 0.028	0.009+- 0.005
AS	0.000+- 0.018	0.000+- 0.116	0.000+- 0.021
SE	0.000+- 0.003	0.002+- 0.022	0.000+- 0.004
BR	0.007+- 0.003	0.043+- 0.019	0.008+- 0.003
RB	0.001+- 0.002	0.004+- 0.011	0.001+- 0.002
SR	0.019+- 0.002	0.122+- 0.016	0.022+- 0.003
Y	0.000+- 0.004	0.000+- 0.025	0.000+- 0.005
ZR	0.000+- 0.010	0.000+- 0.067	0.000+- 0.012
MO	0.099+- 0.009	0.632+- 0.057	0.116+- 0.011
PD	0.004+- 0.005	0.029+- 0.034	0.005+- 0.006
AG	0.002+- 0.009	0.013+- 0.056	0.002+- 0.010
CD	0.012+- 0.012	0.076+- 0.075	0.014+- 0.014
IN	0.019+- 0.014	0.121+- 0.087	0.022+- 0.016
SN	0.039+- 0.016	0.251+- 0.103	0.046+- 0.019
SB	0.117+- 0.031	0.752+- 0.202	0.138+- 0.037
BA	0.364+- 0.080	2.337+- 0.513	0.428+- 0.094
LA	0.314+- 0.119	2.014+- 0.764	0.369+- 0.140
HG	0.000+- 0.003	0.000+- 0.018	0.000+- 0.003
PB	2.244+- 0.104	14.409+- 0.670	2.641+- 0.132

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 3A
 PARTICLE SIZE: C
 ANALYSIS ID: AC022 - Teflon
 BUILD UP OF DEPOSIT AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 100+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.573+-	0.049	3.682+-	0.317	3.678+-	0.485
SI	1.230+-	0.088	7.898+-	0.562	7.889+-	0.967
P	0.343+-	0.137	2.205+-	0.879	2.202+-	0.905
S	1.258+-	0.207	8.077+-	1.331	8.069+-	1.555
CL	0.000+-	0.051	0.000+-	0.325	0.000+-	0.325
K	0.052+-	0.009	0.332+-	0.056	0.332+-	0.065
CA	1.405+-	0.098	9.021+-	0.631	9.011+-	1.099
TI	0.098+-	0.008	0.631+-	0.049	0.630+-	0.079
V	0.236+-	0.021	1.512+-	0.136	1.510+-	0.203
CR	0.017+-	0.004	0.107+-	0.026	0.107+-	0.028
MN	0.009+-	0.002	0.058+-	0.013	0.058+-	0.014
FE	0.496+-	0.046	3.185+-	0.298	3.181+-	0.435
NI	0.323+-	0.035	2.072+-	0.224	2.070+-	0.305
CU	0.019+-	0.004	0.121+-	0.029	0.121+-	0.031
ZN	0.252+-	0.028	1.618+-	0.178	1.616+-	0.240
GA	0.004+-	0.003	0.025+-	0.018	0.025+-	0.019
AS	0.000+-	0.012	0.000+-	0.077	0.000+-	0.076
SE	0.001+-	0.002	0.007+-	0.013	0.007+-	0.013
BR	0.000+-	0.002	0.000+-	0.013	0.000+-	0.013
RB	0.002+-	0.002	0.015+-	0.012	0.015+-	0.012
SR	0.015+-	0.003	0.099+-	0.018	0.099+-	0.021
Y	0.001+-	0.003	0.005+-	0.021	0.005+-	0.021
ZR	0.009+-	0.012	0.059+-	0.074	0.059+-	0.075
MO	0.028+-	0.009	0.182+-	0.056	0.182+-	0.059
PD	0.000+-	0.006	0.000+-	0.039	0.000+-	0.039
AG	0.016+-	0.010	0.101+-	0.063	0.101+-	0.063
CD	0.019+-	0.014	0.120+-	0.090	0.120+-	0.090
IN	0.000+-	0.015	0.000+-	0.096	0.000+-	0.096
SN	0.006+-	0.019	0.037+-	0.123	0.037+-	0.123
SB	0.000+-	0.037	0.000+-	0.238	0.000+-	0.238
BA	0.206+-	0.091	1.324+-	0.582	1.323+-	0.596
LA	0.127+-	0.141	0.816+-	0.904	0.815+-	0.907
HG	0.000+-	0.003	0.000+-	0.018	0.000+-	0.018
PB	0.489+-	0.052	3.138+-	0.334	3.134+-	0.457

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 3A
 PARTICLE SIZE: F
 ANALYSIS ID: AF157 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1079+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	2.028+- 0.100	13.018+- 0.639	1.207+- 0.060
SI	3.571+- 0.167	22.929+- 1.073	2.125+- 0.101
P	2.784+- 0.505	17.875+- 3.242	1.657+- 0.301
S	19.379+- 0.918	124.414+- 5.895	11.532+- 0.557
CL	0.000+- 0.230	0.000+- 1.474	0.000+- 0.137
K	0.353+- 0.021	2.268+- 0.136	0.210+- 0.013
CA	4.392+- 0.206	28.198+- 1.324	2.614+- 0.125
TI	0.106+- 0.025	0.678+- 0.158	0.063+- 0.015
V	1.385+- 0.065	8.895+- 0.416	0.824+- 0.039
CR	0.069+- 0.010	0.444+- 0.063	0.041+- 0.006
MN	0.067+- 0.004	0.427+- 0.026	0.040+- 0.002
FE	3.098+- 0.144	19.889+- 0.927	1.843+- 0.088
NI	2.743+- 0.127	17.613+- 0.813	1.633+- 0.077
CU	0.204+- 0.013	1.313+- 0.082	0.122+- 0.008
ZN	2.240+- 0.103	14.380+- 0.663	1.333+- 0.063
GA	0.013+- 0.007	0.083+- 0.043	0.008+- 0.004
AS	0.002+- 0.026	0.016+- 0.167	0.001+- 0.016
SE	0.001+- 0.006	0.004+- 0.039	0.000+- 0.004
BR	0.016+- 0.005	0.100+- 0.031	0.009+- 0.003
RE	0.000+- 0.002	0.000+- 0.013	0.000+- 0.001
SR	0.040+- 0.003	0.259+- 0.022	0.024+- 0.002
Y	0.000+- 0.006	0.000+- 0.038	0.000+- 0.004
ZR	0.024+- 0.013	0.154+- 0.082	0.014+- 0.008
MO	0.184+- 0.012	1.180+- 0.080	0.109+- 0.007
PD	0.016+- 0.007	0.101+- 0.042	0.009+- 0.004
AG	0.000+- 0.009	0.000+- 0.060	0.000+- 0.006
CD	0.015+- 0.013	0.099+- 0.084	0.009+- 0.003
IN	0.003+- 0.014	0.016+- 0.093	0.002+- 0.009
SN	0.074+- 0.019	0.477+- 0.120	0.044+- 0.011
SB	0.137+- 0.035	0.879+- 0.223	0.081+- 0.021
BA	0.570+- 0.092	3.658+- 0.593	0.339+- 0.055
LA	0.117+- 0.126	0.751+- 0.811	0.070+- 0.075
HG	0.003+- 0.004	0.017+- 0.026	0.002+- 0.002
PB	4.107+- 0.189	26.370+- 1.215	2.444+- 0.115

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 4A
 PARTICLE SIZE: C
 ANALYSIS ID: AC023 - Teflon
 LARGE BLACK PARTICLE ON FILTER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 10+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.056+- 0.018	0.362+- 0.115	3.624+- 3.803
SI	0.192+- 0.021	1.235+- 0.134	12.346+- 12.42
P	0.038+- 0.025	0.246+- 0.159	2.465+- 2.934
S	0.115+- 0.050	0.741+- 0.320	7.407+- 8.071
CL	0.000+- 0.012	0.000+- 0.076	0.000+- 0.762
K	0.003+- 0.004	0.021+- 0.025	0.215+- 0.327
CA	0.199+- 0.018	1.275+- 0.115	12.754+- 12.81
TI	0.019+- 0.003	0.123+- 0.020	1.233+- 1.250
V	0.038+- 0.005	0.241+- 0.031	2.411+- 2.431
CR	0.003+- 0.002	0.016+- 0.012	0.162+- 0.200
MN	0.000+- 0.002	0.003+- 0.010	0.028+- 0.101
FE	0.079+- 0.011	0.504+- 0.072	5.041+- 5.092
NI	0.043+- 0.008	0.275+- 0.052	2.748+- 2.797
CU	0.000+- 0.002	0.002+- 0.013	0.022+- 0.135
ZN	0.037+- 0.006	0.235+- 0.041	2.354+- 2.389
GA	0.002+- 0.001	0.015+- 0.009	0.146+- 0.170
AS	0.002+- 0.005	0.013+- 0.034	0.127+- 0.367
SE	0.002+- 0.001	0.011+- 0.008	0.113+- 0.140
BR	0.001+- 0.002	0.003+- 0.011	0.035+- 0.116
RB	0.006+- 0.002	0.038+- 0.013	0.376+- 0.397
SR	0.004+- 0.003	0.024+- 0.016	0.242+- 0.292
Y	0.001+- 0.003	0.005+- 0.018	0.047+- 0.189
ZR	0.000+- 0.012	0.000+- 0.078	0.000+- 0.776
MO	0.002+- 0.008	0.015+- 0.054	0.146+- 0.564
PD	0.006+- 0.007	0.036+- 0.045	0.356+- 0.570
AG	0.023+- 0.011	0.149+- 0.069	1.487+- 1.641
CD	0.024+- 0.015	0.151+- 0.097	1.510+- 1.795
IN	0.000+- 0.016	0.000+- 0.103	0.000+- 1.031
SN	0.000+- 0.020	0.000+- 0.129	0.000+- 1.291
SB	0.000+- 0.040	0.000+- 0.259	0.000+- 2.592
BA	0.022+- 0.093	0.140+- 0.598	1.403+- 6.139
LA	0.000+- 0.147	0.000+- 0.942	0.000+- 9.415
HG	0.000+- 0.002	0.000+- 0.014	0.000+- 0.141
PB	0.061+- 0.011	0.391+- 0.069	3.908+- 3.969

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 4A
 PARTICLE SIZE: F
 ANALYSIS ID: AF158 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 190+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.452+-	0.028	2.901+-	0.180	1.527+-	0.124
SI	0.842+-	0.043	5.408+-	0.275	2.846+-	0.208
P	0.632+-	0.115	4.059+-	0.739	2.136+-	0.405
S	3.962+-	0.197	25.433+-	1.265	13.386+-	0.969
CL	0.000+-	0.047	0.000+-	0.305	0.000+-	0.160
K	0.062+-	0.006	0.399+-	0.041	0.210+-	0.024
CA	0.941+-	0.047	6.042+-	0.300	3.180+-	0.230
TI	0.000+-	0.019	0.000+-	0.123	0.000+-	0.065
V	0.297+-	0.016	1.905+-	0.105	1.002+-	0.077
CR	0.019+-	0.003	0.121+-	0.021	0.064+-	0.011
MN	0.014+-	0.002	0.093+-	0.010	0.049+-	0.006
FE	0.687+-	0.034	4.412+-	0.220	2.322+-	0.168
NI	0.652+-	0.032	4.185+-	0.203	2.203+-	0.158
CU	0.043+-	0.004	0.278+-	0.026	0.146+-	0.016
ZN	0.520+-	0.025	3.340+-	0.161	1.758+-	0.125
GA	0.002+-	0.002	0.014+-	0.015	0.007+-	0.008
AS	0.009+-	0.010	0.060+-	0.063	0.032+-	0.033
SE	0.001+-	0.001	0.003+-	0.009	0.002+-	0.005
BR	0.006+-	0.002	0.041+-	0.011	0.021+-	0.006
RB	0.000+-	0.001	0.000+-	0.009	0.000+-	0.005
SR	0.004+-	0.002	0.023+-	0.012	0.012+-	0.006
Y	0.002+-	0.002	0.014+-	0.016	0.007+-	0.008
ZR	0.031+-	0.009	0.200+-	0.056	0.105+-	0.030
MO	0.020+-	0.006	0.130+-	0.040	0.068+-	0.021
PD	0.004+-	0.005	0.024+-	0.031	0.012+-	0.016
AG	0.000+-	0.008	0.000+-	0.050	0.000+-	0.026
CD	0.007+-	0.010	0.046+-	0.067	0.024+-	0.035
IN	0.002+-	0.012	0.015+-	0.076	0.008+-	0.040
SN	0.023+-	0.014	0.148+-	0.091	0.078+-	0.048
SB	0.097+-	0.028	0.625+-	0.183	0.329+-	0.098
BA	0.356+-	0.074	2.284+-	0.473	1.202+-	0.257
LA	0.175+-	0.105	1.122+-	0.677	0.590+-	0.357
HG	0.002+-	0.002	0.013+-	0.014	0.007+-	0.007
PB	0.731+-	0.036	4.691+-	0.228	2.469+-	0.177

SAMPLE ID: OIL-EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 48
 PARTICLE SIZE: C
 ANALYSIS ID: CC092 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 14+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.124+-	0.029	0.798+-	0.186	5.744+-	4.348
SI	0.206+-	0.028	1.320+-	0.177	9.507+-	6.963
P	0.041+-	0.026	0.261+-	0.165	1.876+-	1.801
S	0.219+-	0.053	1.408+-	0.342	10.136+-	7.702
CL	0.000+-	0.014	0.000+-	0.089	0.000+-	0.640
K	0.000+-	0.004	0.000+-	0.026	0.000+-	0.187
CA	0.281+-	0.021	1.802+-	0.137	12.974+-	9.393
TI	0.014+-	0.003	0.090+-	0.016	0.649+-	0.482
V	0.044+-	0.005	0.284+-	0.033	2.045+-	1.491
CR	0.001+-	0.002	0.005+-	0.014	0.037+-	0.104
MN	0.004+-	0.002	0.026+-	0.010	0.185+-	0.151
FE	0.081+-	0.011	0.523+-	0.073	3.766+-	2.762
NI	0.054+-	0.009	0.344+-	0.055	2.474+-	1.825
CU	0.005+-	0.002	0.034+-	0.014	0.248+-	0.204
ZN	0.040+-	0.006	0.255+-	0.041	1.835+-	1.354
GA	0.000+-	0.001	0.000+-	0.009	0.000+-	0.067
AS	0.000+-	0.006	0.000+-	0.038	0.000+-	0.275
SE	0.000+-	0.001	0.000+-	0.009	0.000+-	0.064
BR	0.002+-	0.002	0.011+-	0.015	0.083+-	0.123
RB	0.000+-	0.002	0.000+-	0.016	0.000+-	0.114
SR	0.007+-	0.003	0.042+-	0.019	0.302+-	0.257
Y	0.000+-	0.003	0.000+-	0.022	0.000+-	0.157
ZR	0.000+-	0.014	0.000+-	0.089	0.000+-	0.643
MO	0.005+-	0.011	0.034+-	0.068	0.247+-	0.523
PD	0.000+-	0.008	0.000+-	0.052	0.000+-	0.376
AG	0.007+-	0.013	0.043+-	0.083	0.307+-	0.634
CD	0.000+-	0.018	0.000+-	0.115	0.000+-	0.828
IN	0.010+-	0.019	0.065+-	0.123	0.468+-	0.945
SN	0.000+-	0.025	0.000+-	0.158	0.000+-	1.138
SB	0.000+-	0.045	0.000+-	0.292	0.000+-	2.103
BA	0.000+-	0.112	0.000+-	0.719	0.000+-	5.178
LA	0.000+-	0.174	0.000+-	1.119	0.000+-	8.057
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.121
PB	0.087+-	0.012	0.557+-	0.079	4.011+-	2.943

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 48
 PARTICLE SIZE: F
 ANALYSIS ID: AF159 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 181+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.362+-	0.024	2.322+-	0.156	1.282+-	0.112
SI	0.781+-	0.040	5.013+-	0.257	2.768+-	0.209
P	0.599+-	0.109	3.844+-	0.700	2.123+-	0.404
S	3.892+-	0.194	24.986+-	1.245	13.796+-	1.026
CL	0.000+-	0.047	0.000+-	0.300	0.000+-	0.166
K	0.074+-	0.007	0.478+-	0.047	0.264+-	0.030
CA	0.838+-	0.043	5.379+-	0.273	2.970+-	0.223
TI	0.058+-	0.004	0.371+-	0.027	0.205+-	0.019
V	0.298+-	0.015	1.916+-	0.095	1.058+-	0.078
CR	0.009+-	0.003	0.056+-	0.018	0.031+-	0.010
MN	0.016+-	0.002	0.101+-	0.011	0.056+-	0.007
FE	0.676+-	0.034	4.340+-	0.217	2.396+-	0.178
NI	0.629+-	0.031	4.036+-	0.196	2.228+-	0.164
CU	0.045+-	0.004	0.287+-	0.026	0.158+-	0.017
ZN	0.491+-	0.024	3.155+-	0.152	1.742+-	0.128
GA	0.001+-	0.002	0.008+-	0.015	0.004+-	0.008
AS	0.000+-	0.010	0.000+-	0.063	0.000+-	0.035
SE	0.000+-	0.001	0.000+-	0.009	0.000+-	0.005
BR	0.004+-	0.002	0.029+-	0.011	0.016+-	0.006
RB	0.000+-	0.002	0.000+-	0.010	0.000+-	0.005
SR	0.007+-	0.002	0.044+-	0.013	0.025+-	0.007
Y	0.003+-	0.003	0.018+-	0.017	0.010+-	0.009
ZR	0.050+-	0.010	0.322+-	0.063	0.178+-	0.036
MO	0.018+-	0.007	0.118+-	0.043	0.065+-	0.024
PD	0.012+-	0.006	0.075+-	0.037	0.042+-	0.021
AG	0.009+-	0.009	0.061+-	0.057	0.034+-	0.032
CD	0.000+-	0.011	0.000+-	0.070	0.000+-	0.038
IN	0.000+-	0.013	0.000+-	0.081	0.000+-	0.045
SN	0.044+-	0.016	0.281+-	0.103	0.155+-	0.058
SB	0.101+-	0.031	0.650+-	0.196	0.359+-	0.110
BA	0.057+-	0.072	0.367+-	0.462	0.203+-	0.255
LA	0.172+-	0.115	1.106+-	0.736	0.610+-	0.408
HG	0.003+-	0.002	0.021+-	0.016	0.012+-	0.009
PB	0.719+-	0.035	4.618+-	0.225	2.550+-	0.188

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 5A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO24 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 92+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.564+- 0.047	3.621+- 0.300	3.931+- 0.537
SI	1.018+- 0.074	6.538+- 0.473	7.098+- 0.926
P	0.307+- 0.119	1.969+- 0.766	2.138+- 0.863
S	1.516+- 0.218	9.731+- 1.399	10.565+- 1.903
CL	0.000+- 0.053	0.000+- 0.340	0.000+- 0.369
K	0.045+- 0.008	0.286+- 0.048	0.311+- 0.062
CA	1.191+- 0.081	7.643+- 0.523	8.298+- 1.065
TI	0.087+- 0.006	0.559+- 0.041	0.607+- 0.080
V	0.205+- 0.018	1.319+- 0.114	1.432+- 0.199
CR	0.017+- 0.004	0.110+- 0.023	0.119+- 0.028
MN	0.008+- 0.002	0.054+- 0.012	0.059+- 0.014
FE	0.443+- 0.040	2.845+- 0.258	3.088+- 0.437
NI	0.296+- 0.031	1.900+- 0.199	2.063+- 0.311
CU	0.020+- 0.004	0.130+- 0.027	0.141+- 0.033
ZN	0.216+- 0.025	1.386+- 0.160	1.504+- 0.238
GA	0.000+- 0.002	0.002+- 0.015	0.003+- 0.017
AS	0.000+- 0.010	0.000+- 0.065	0.000+- 0.070
SE	0.000+- 0.002	0.000+- 0.010	0.000+- 0.011
BR	0.001+- 0.002	0.005+- 0.011	0.005+- 0.012
RB	0.002+- 0.002	0.011+- 0.011	0.011+- 0.012
SR	0.016+- 0.003	0.103+- 0.016	0.111+- 0.022
Y	0.000+- 0.003	0.000+- 0.018	0.000+- 0.019
ZR	0.020+- 0.011	0.126+- 0.068	0.137+- 0.075
MO	0.016+- 0.008	0.103+- 0.050	0.111+- 0.055
PD	0.014+- 0.006	0.091+- 0.041	0.098+- 0.046
AG	0.016+- 0.009	0.104+- 0.058	0.113+- 0.064
CD	0.025+- 0.013	0.158+- 0.083	0.171+- 0.092
IN	0.000+- 0.014	0.000+- 0.087	0.000+- 0.094
SN	0.011+- 0.017	0.073+- 0.112	0.079+- 0.122
SB	0.011+- 0.035	0.069+- 0.226	0.075+- 0.245
BA	0.000+- 0.081	0.000+- 0.522	0.000+- 0.566
LA	0.011+- 0.126	0.070+- 0.807	0.076+- 0.876
HG	0.000+- 0.002	0.002+- 0.016	0.002+- 0.017
PB	0.383+- 0.039	2.460+- 0.249	2.671+- 0.396

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 5A
 PARTICLE SIZE: F
 ANALYSIS ID: AF160 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1389+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT
AL	1.713+-	0.085	10.997+-	0.547	0.792+- 0.040
SI	3.000+-	0.141	19.259+-	0.906	1.387+- 0.066
P	2.371+-	0.430	15.221+-	2.761	1.096+- 0.199
S	19.672+-	0.924	126.297+-	5.935	9.093+- 0.432
CL	0.000+-	0.230	0.000+-	1.477	0.000+- 0.106
K	0.248+-	0.016	1.591+-	0.103	0.115+- 0.007
CA	3.351+-	0.160	21.514+-	1.028	1.549+- 0.075
TI	0.013+-	0.022	0.086+-	0.138	0.006+- 0.010
V	1.054+-	0.052	6.770+-	0.332	0.487+- 0.024
CR	0.047+-	0.008	0.300+-	0.052	0.022+- 0.004
MN	0.050+-	0.003	0.321+-	0.022	0.023+- 0.002
FE	2.530+-	0.118	16.242+-	0.760	1.169+- 0.055
NI	2.353+-	0.109	15.105+-	0.699	1.088+- 0.051
CU	0.169+-	0.011	1.086+-	0.070	0.078+- 0.005
ZN	2.063+-	0.095	13.248+-	0.611	0.954+- 0.045
GA	0.012+-	0.005	0.079+-	0.034	0.006+- 0.002
AS	0.014+-	0.021	0.090+-	0.133	0.006+- 0.010
SE	0.008+-	0.004	0.054+-	0.028	0.004+- 0.002
BR	0.012+-	0.004	0.076+-	0.023	0.005+- 0.002
RB	0.004+-	0.002	0.023+-	0.012	0.002+- 0.001
SR	0.025+-	0.003	0.161+-	0.017	0.012+- 0.001
Y	0.000+-	0.005	0.000+-	0.029	0.000+- 0.002
ZR	0.033+-	0.011	0.210+-	0.070	0.015+- 0.005
MO	0.164+-	0.011	1.051+-	0.072	0.076+- 0.005
PD	0.009+-	0.006	0.059+-	0.036	0.004+- 0.003
AG	0.009+-	0.009	0.058+-	0.058	0.004+- 0.004
CD	0.000+-	0.011	0.000+-	0.071	0.000+- 0.005
IN	0.017+-	0.013	0.108+-	0.087	0.008+- 0.006
SN	0.042+-	0.016	0.272+-	0.104	0.020+- 0.007
SB	0.286+-	0.039	1.834+-	0.247	0.132+- 0.018
BA	0.357+-	0.079	2.290+-	0.510	0.165+- 0.037
LA	0.281+-	0.118	1.806+-	0.756	0.130+- 0.054
HG	0.003+-	0.003	0.020+-	0.022	0.001+- 0.002
PE	2.847+-	0.132	18.279+-	0.846	1.316+- 0.062

SAMPLE ID: OIL-EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 5B
 PARTICLE SIZE: C
 ANALYSIS ID: CC093 - Nuclepore
 DARK PARTICLE NEAR CENTER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 110+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.738+-	0.059	4.736+-	0.380	4.318+-	0.525
SI	1.248+-	0.088	8.009+-	0.562	7.303+-	0.840
P	0.392+-	0.137	2.518+-	0.879	2.296+-	0.829
S	2.157+-	0.251	13.851+-	1.610	12.630+-	1.866
CL	0.000+-	0.062	0.000+-	0.395	0.000+-	0.360
K	0.044+-	0.008	0.284+-	0.052	0.259+-	0.053
CA	1.572+-	0.100	10.090+-	0.640	9.200+-	1.022
TI	0.103+-	0.007	0.664+-	0.047	0.605+-	0.070
V	0.252+-	0.020	1.620+-	0.131	1.477+-	0.180
CR	0.019+-	0.004	0.119+-	0.027	0.109+-	0.027
MN	0.015+-	0.002	0.096+-	0.014	0.087+-	0.015
FE	0.516+-	0.044	3.315+-	0.283	3.023+-	0.378
NI	0.351+-	0.034	2.251+-	0.221	2.053+-	0.275
CU	0.023+-	0.004	0.150+-	0.028	0.136+-	0.028
ZN	0.280+-	0.028	1.799+-	0.181	1.640+-	0.223
GA	0.000+-	0.003	0.003+-	0.017	0.002+-	0.016
AS	0.000+-	0.011	0.000+-	0.071	0.000+-	0.065
SE	0.000+-	0.002	0.001+-	0.013	0.001+-	0.012
BR	0.000+-	0.003	0.000+-	0.017	0.000+-	0.015
RE	0.000+-	0.003	0.000+-	0.016	0.000+-	0.015
SR	0.021+-	0.003	0.132+-	0.022	0.121+-	0.023
Y	0.000+-	0.004	0.000+-	0.024	0.000+-	0.022
ZR	0.000+-	0.014	0.000+-	0.092	0.000+-	0.084
MO	0.035+-	0.012	0.227+-	0.074	0.207+-	0.070
PD	0.000+-	0.008	0.000+-	0.053	0.000+-	0.048
AG	0.000+-	0.012	0.000+-	0.080	0.000+-	0.073
CD	0.000+-	0.018	0.000+-	0.113	0.000+-	0.103
IN	0.001+-	0.019	0.005+-	0.123	0.004+-	0.112
SN	0.000+-	0.025	0.000+-	0.159	0.000+-	0.145
SB	0.000+-	0.047	0.000+-	0.305	0.000+-	0.278
BA	0.000+-	0.116	0.000+-	0.744	0.000+-	0.678
LA	0.000+-	0.178	0.000+-	1.141	0.000+-	1.040
HG	0.000+-	0.003	0.000+-	0.020	0.000+-	0.018
PB	0.449+-	0.043	2.884+-	0.276	2.630+-	0.348

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 5B
 PARTICLE SIZE: F
 ANALYSIS ID: AF161 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1473+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.634+-	0.082	10.490+-	0.525	0.712+-	0.036
SI	3.049+-	0.143	19.576+-	0.921	1.329+-	0.063
P	2.431+-	0.441	15.606+-	2.831	1.059+-	0.192
S	20.143+-	0.946	129.318+-	6.075	8.777+-	0.417
CL	0.000+-	0.236	0.000+-	1.512	0.000+-	0.103
K	0.256+-	0.016	1.641+-	0.105	0.111+-	0.007
CA	3.237+-	0.154	20.779+-	0.986	1.410+-	0.068
TI	0.077+-	0.009	0.492+-	0.061	0.033+-	0.004
V	1.123+-	0.053	7.212+-	0.343	0.489+-	0.024
CR	0.068+-	0.008	0.435+-	0.054	0.030+-	0.004
MN	0.043+-	0.003	0.278+-	0.020	0.019+-	0.001
FE	2.578+-	0.121	16.551+-	0.775	1.123+-	0.053
NI	2.462+-	0.114	15.803+-	0.731	1.073+-	0.050
CU	0.153+-	0.010	0.982+-	0.067	0.067+-	0.005
ZN	2.114+-	0.098	13.573+-	0.626	0.921+-	0.043
GA	0.009+-	0.005	0.058+-	0.035	0.004+-	0.002
AS	0.000+-	0.021	0.000+-	0.137	0.000+-	0.009
SE	0.002+-	0.004	0.010+-	0.029	0.001+-	0.002
BR	0.013+-	0.004	0.083+-	0.024	0.006+-	0.002
RB	0.000+-	0.002	0.000+-	0.012	0.000+-	0.001
SR	0.027+-	0.003	0.175+-	0.018	0.012+-	0.001
Y	0.000+-	0.005	0.000+-	0.030	0.000+-	0.002
ZR	0.014+-	0.011	0.088+-	0.072	0.006+-	0.005
MO	0.163+-	0.011	1.047+-	0.073	0.071+-	0.005
PD	0.018+-	0.006	0.114+-	0.041	0.008+-	0.003
AG	0.000+-	0.009	0.000+-	0.057	0.000+-	0.004
CD	0.009+-	0.012	0.057+-	0.078	0.004+-	0.005
IN	0.000+-	0.014	0.000+-	0.087	0.000+-	0.006
SN	0.049+-	0.017	0.317+-	0.110	0.021+-	0.007
SB	0.190+-	0.036	1.219+-	0.228	0.083+-	0.015
BA	0.357+-	0.083	2.290+-	0.532	0.155+-	0.036
LA	0.215+-	0.122	1.381+-	0.782	0.094+-	0.053
HG	0.000+-	0.004	0.000+-	0.025	0.000+-	0.002
PB	2.984+-	0.138	19.158+-	0.887	1.300+-	0.061

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 6A
 PARTICLE SIZE: C
 ANALYSIS ID: AC025 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 24+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.239+-	0.030	1.532+-	0.191	6.385+-	2.777
SI	0.449+-	0.042	2.883+-	0.267	12.014+-	5.128
P	0.122+-	0.077	0.785+-	0.496	3.272+-	2.474
S	0.354+-	0.130	2.271+-	0.836	9.464+-	5.261
CL	0.000+-	0.031	0.000+-	0.200	0.000+-	0.832
K	0.026+-	0.006	0.167+-	0.039	0.697+-	0.332
CA	0.464+-	0.042	2.981+-	0.267	12.420+-	5.294
TI	0.039+-	0.004	0.249+-	0.028	1.038+-	0.448
V	0.077+-	0.011	0.492+-	0.071	2.048+-	0.903
CR	0.010+-	0.003	0.063+-	0.018	0.260+-	0.131
MN	0.002+-	0.002	0.016+-	0.010	0.067+-	0.052
FE	0.171+-	0.027	1.097+-	0.171	4.570+-	2.033
NI	0.114+-	0.025	0.735+-	0.162	3.061+-	1.442
CU	0.006+-	0.003	0.037+-	0.020	0.153+-	0.106
ZN	0.095+-	0.021	0.611+-	0.133	2.548+-	1.197
GA	0.003+-	0.002	0.021+-	0.012	0.086+-	0.063
AS	0.003+-	0.007	0.016+-	0.046	0.068+-	0.195
SE	0.001+-	0.001	0.004+-	0.008	0.015+-	0.035
BR	0.000+-	0.002	0.000+-	0.010	0.000+-	0.044
RE	0.002+-	0.002	0.013+-	0.011	0.053+-	0.051
SR	0.003+-	0.002	0.022+-	0.015	0.092+-	0.073
Y	0.004+-	0.003	0.025+-	0.017	0.103+-	0.084
ZR	0.001+-	0.011	0.007+-	0.069	0.027+-	0.289
MO	0.000+-	0.008	0.000+-	0.049	0.000+-	0.205
PD	0.013+-	0.007	0.082+-	0.043	0.342+-	0.229
AG	0.010+-	0.009	0.067+-	0.059	0.279+-	0.272
CD	0.000+-	0.013	0.000+-	0.082	0.000+-	0.340
IN	0.002+-	0.014	0.015+-	0.093	0.064+-	0.387
SN	0.013+-	0.019	0.085+-	0.119	0.353+-	0.519
SB	0.000+-	0.035	0.000+-	0.224	0.000+-	0.933
BA	0.208+-	0.087	1.335+-	0.557	5.563+-	3.279
LA	0.160+-	0.136	1.026+-	0.872	4.276+-	4.046
HG	0.004+-	0.003	0.027+-	0.017	0.112+-	0.086
PB	0.091+-	0.021	0.583+-	0.136	2.428+-	1.159

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 6A
 PARTICLE SIZE: F
 ANALYSIS ID: AF162 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 700+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.395+-	0.072	8.957+-	0.459	1.280+-	0.068
SI	2.344+-	0.111	15.050+-	0.715	2.150+-	0.107
P	2.027+-	0.368	13.016+-	2.361	1.859+-	0.338
S	14.408+-	0.681	92.501+-	4.371	13.214+-	0.652
CL	0.000+-	0.169	0.000+-	1.084	0.000+-	0.155
K	0.200+-	0.014	1.284+-	0.092	0.183+-	0.013
CA	2.636+-	0.128	16.920+-	0.825	2.417+-	0.123
TI	0.072+-	0.021	0.464+-	0.133	0.066+-	0.019
V	0.960+-	0.045	6.166+-	0.292	0.881+-	0.044
CR	0.055+-	0.007	0.354+-	0.047	0.051+-	0.007
MN	0.052+-	0.003	0.333+-	0.021	0.048+-	0.003
FE	2.387+-	0.112	15.322+-	0.718	2.189+-	0.107
NI	2.678+-	0.124	17.190+-	0.794	2.456+-	0.119
CU	0.125+-	0.010	0.802+-	0.063	0.115+-	0.009
ZN	2.217+-	0.102	14.232+-	0.656	2.033+-	0.098
GA	0.018+-	0.005	0.116+-	0.031	0.017+-	0.004
AS	0.008+-	0.018	0.049+-	0.113	0.007+-	0.016
SE	0.004+-	0.003	0.025+-	0.022	0.004+-	0.003
BR	0.020+-	0.003	0.126+-	0.020	0.018+-	0.003
RB	0.000+-	0.002	0.000+-	0.011	0.000+-	0.002
SR	0.026+-	0.003	0.164+-	0.017	0.023+-	0.002
Y	0.000+-	0.004	0.000+-	0.025	0.000+-	0.004
ZR	0.032+-	0.010	0.207+-	0.065	0.030+-	0.009
MG	0.109+-	0.009	0.703+-	0.058	0.100+-	0.008
PD	0.015+-	0.006	0.098+-	0.037	0.014+-	0.005
AG	0.009+-	0.009	0.055+-	0.056	0.008+-	0.008
CD	0.027+-	0.012	0.173+-	0.076	0.025+-	0.011
IN	0.004+-	0.013	0.023+-	0.081	0.003+-	0.012
SN	0.086+-	0.017	0.550+-	0.110	0.079+-	0.016
SB	0.329+-	0.040	2.109+-	0.256	0.301+-	0.037
BA	0.352+-	0.077	2.257+-	0.495	0.322+-	0.071
LA	0.138+-	0.111	0.887+-	0.710	0.127+-	0.102
HG	0.001+-	0.003	0.009+-	0.019	0.001+-	0.003
PB	2.149+-	0.100	13.799+-	0.643	1.971+-	0.096

SAMPLE ID: OIL-EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 6B
 PARTICLE SIZE: C
 ANALYSIS ID: CCO94 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 26+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.331+-	0.041	2.125+-	0.261	8.035+-	3.194
SI	0.654+-	0.056	4.199+-	0.361	15.879+-	6.158
P	0.099+-	0.074	0.636+-	0.476	2.406+-	2.016
S	0.305+-	0.131	1.960+-	0.841	7.413+-	4.240
CL	0.006+-	0.032	0.042+-	0.207	0.157+-	0.786
K	0.016+-	0.006	0.103+-	0.039	0.389+-	0.210
CA	0.667+-	0.051	4.283+-	0.325	16.198+-	6.247
TI	0.060+-	0.005	0.388+-	0.035	1.467+-	0.570
V	0.106+-	0.012	0.683+-	0.080	2.582+-	1.022
CR	0.002+-	0.003	0.015+-	0.019	0.058+-	0.076
MN	0.008+-	0.002	0.054+-	0.012	0.205+-	0.090
FE	0.192+-	0.028	1.234+-	0.181	4.666+-	1.892
NI	0.121+-	0.026	0.778+-	0.168	2.941+-	1.280
CU	0.008+-	0.003	0.050+-	0.021	0.190+-	0.108
ZN	0.096+-	0.021	0.618+-	0.138	2.336+-	1.026
GA	0.001+-	0.002	0.006+-	0.013	0.022+-	0.049
AS	0.000+-	0.008	0.000+-	0.050	0.000+-	0.188
SE	0.000+-	0.002	0.000+-	0.010	0.000+-	0.038
BR	0.000+-	0.002	0.000+-	0.015	0.000+-	0.057
RB	0.002+-	0.003	0.010+-	0.016	0.038+-	0.063
SR	0.016+-	0.003	0.102+-	0.020	0.386+-	0.165
Y	0.000+-	0.003	0.000+-	0.022	0.000+-	0.085
ZR	0.000+-	0.014	0.000+-	0.089	0.000+-	0.338
MO	0.017+-	0.011	0.111+-	0.070	0.419+-	0.309
PD	0.000+-	0.008	0.000+-	0.049	0.000+-	0.187
AG	0.000+-	0.012	0.000+-	0.080	0.000+-	0.302
CD	0.000+-	0.018	0.000+-	0.114	0.000+-	0.431
IN	0.015+-	0.019	0.097+-	0.123	0.367+-	0.486
SN	0.000+-	0.025	0.000+-	0.159	0.000+-	0.601
SB	0.000+-	0.045	0.000+-	0.292	0.000+-	1.104
BA	0.000+-	0.113	0.000+-	0.726	0.000+-	2.745
LA	0.000+-	0.175	0.000+-	1.121	0.000+-	4.241
HG	0.004+-	0.003	0.023+-	0.020	0.089+-	0.084
PB	0.101+-	0.022	0.651+-	0.144	2.464+-	1.079

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - TEST NO. 6B
 PARTICLE SIZE: F
 ANALYSIS ID: AF163 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 736+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.433+-	0.073	9.197+-	0.471	1.250+-	0.066
SI	2.415+-	0.115	15.501+-	0.735	2.107+-	0.104
P	2.037+-	0.370	13.078+-	2.373	1.778+-	0.323
S	14.784+-	0.698	94.915+-	4.482	12.904+-	0.634
CL	0.000+-	0.173	0.000+-	1.111	0.000+-	0.151
K	0.228+-	0.015	1.462+-	0.098	0.199+-	0.014
CA	2.523+-	0.123	16.200+-	0.787	2.202+-	0.111
TI	0.048+-	0.021	0.307+-	0.136	0.042+-	0.019
V	0.968+-	0.046	6.215+-	0.294	0.845+-	0.042
CR	0.051+-	0.007	0.328+-	0.047	0.045+-	0.006
MN	0.054+-	0.003	0.344+-	0.022	0.047+-	0.003
FE	2.458+-	0.115	15.781+-	0.739	2.145+-	0.105
NI	2.769+-	0.128	17.774+-	0.821	2.416+-	0.116
CU	0.132+-	0.010	0.847+-	0.065	0.115+-	0.009
ZN	2.331+-	0.107	14.962+-	0.689	2.034+-	0.098
GA	0.010+-	0.005	0.066+-	0.031	0.009+-	0.004
AS	0.019+-	0.018	0.119+-	0.115	0.016+-	0.016
SE	0.005+-	0.003	0.033+-	0.022	0.005+-	0.003
BR	0.021+-	0.003	0.135+-	0.021	0.018+-	0.003
RB	0.000+-	0.002	0.000+-	0.011	0.000+-	0.001
SR	0.020+-	0.002	0.126+-	0.016	0.017+-	0.002
Y	0.000+-	0.004	0.000+-	0.025	0.000+-	0.003
ZR	0.024+-	0.010	0.153+-	0.066	0.021+-	0.009
MO	0.111+-	0.009	0.712+-	0.060	0.097+-	0.008
PD	0.009+-	0.006	0.060+-	0.036	0.008+-	0.005
AG	0.013+-	0.009	0.083+-	0.059	0.011+-	0.008
CD	0.011+-	0.012	0.069+-	0.074	0.009+-	0.010
IN	0.000+-	0.013	0.000+-	0.082	0.000+-	0.011
SN	0.069+-	0.017	0.444+-	0.109	0.060+-	0.015
SB	0.286+-	0.038	1.834+-	0.247	0.249+-	0.034
BA	0.391+-	0.080	2.510+-	0.515	0.341+-	0.070
LA	0.180+-	0.115	1.156+-	0.739	0.157+-	0.100
HG	0.004+-	0.003	0.028+-	0.021	0.004+-	0.003
PB	2.224+-	0.103	14.279+-	0.664	1.941+-	0.094

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: AC026 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.011	0.000+-	0.073
SI	0.005+-	0.008	0.035+-	0.049
P	0.000+-	0.004	0.000+-	0.023
S	0.000+-	0.018	0.000+-	0.116
CL	0.000+-	0.006	0.000+-	0.038
K	0.000+-	0.002	0.000+-	0.015
CA	0.000+-	0.002	0.000+-	0.011
TI	0.002+-	0.001	0.011+-	0.007
V	0.001+-	0.001	0.007+-	0.005
CR	0.000+-	0.001	0.000+-	0.006
MN	0.000+-	0.001	0.000+-	0.007
FE	0.001+-	0.003	0.008+-	0.019
NI	0.001+-	0.001	0.005+-	0.007
CU	0.001+-	0.001	0.007+-	0.009
ZN	0.000+-	0.001	0.000+-	0.005
GA	0.001+-	0.001	0.004+-	0.004
AS	0.002+-	0.003	0.013+-	0.016
SE	0.000+-	0.001	0.000+-	0.006
BR	0.000+-	0.001	0.001+-	0.009
RE	0.000+-	0.001	0.000+-	0.009
SR	0.000+-	0.002	0.000+-	0.013
Y	0.004+-	0.002	0.028+-	0.015
ZR	0.031+-	0.010	0.197+-	0.065
MO	0.000+-	0.007	0.000+-	0.043
PD	0.002+-	0.005	0.013+-	0.035
AG	0.012+-	0.008	0.078+-	0.054
CD	0.002+-	0.012	0.011+-	0.074
IN	0.009+-	0.013	0.061+-	0.086
SN	0.000+-	0.016	0.000+-	0.103
SB	0.000+-	0.032	0.000+-	0.204
BA	0.093+-	0.076	0.595+-	0.486
LA	0.186+-	0.124	1.193+-	0.796
HG	0.002+-	0.002	0.011+-	0.013
PB	0.000+-	0.004	0.000+-	0.026

SAMPLE ID: OIL - EDDYSTONE/OIL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF164 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.007	0.000+-	0.047
SI	0.013+-	0.005	0.087+-	0.033
P	0.001+-	0.002	0.006+-	0.015
S	0.017+-	0.011	0.109+-	0.068
CL	0.001+-	0.004	0.005+-	0.028
K	0.000+-	0.002	0.000+-	0.011
CA	0.000+-	0.001	0.000+-	0.007
TI	0.000+-	0.001	0.000+-	0.005
V	0.000+-	0.001	0.000+-	0.004
CR	0.000+-	0.001	0.000+-	0.005
MN	0.000+-	0.001	0.000+-	0.006
FE	0.008+-	0.003	0.051+-	0.016
NI	0.000+-	0.001	0.001+-	0.005
CU	0.003+-	0.001	0.019+-	0.006
ZN	0.000+-	0.001	0.003+-	0.004
GA	0.002+-	0.001	0.011+-	0.005
AS	0.000+-	0.002	0.000+-	0.013
SE	0.001+-	0.001	0.006+-	0.004
BR	0.000+-	0.001	0.000+-	0.006
RB	0.000+-	0.001	0.000+-	0.008
SR	0.000+-	0.001	0.000+-	0.010
Y	0.000+-	0.002	0.000+-	0.011
ZR	0.000+-	0.008	0.000+-	0.053
MO	0.000+-	0.005	0.000+-	0.032
PD	0.011+-	0.005	0.070+-	0.032
AG	0.009+-	0.008	0.055+-	0.048
CD	0.006+-	0.010	0.042+-	0.061
IN	0.010+-	0.011	0.066+-	0.071
SN	0.020+-	0.013	0.129+-	0.083
SB	0.007+-	0.022	0.043+-	0.142
BA	0.126+-	0.062	0.806+-	0.396
LA	0.000+-	0.104	0.000+-	0.670
HG	0.003+-	0.002	0.022+-	0.012
PB	0.003+-	0.003	0.016+-	0.021

SAMPLE ID: OIL- EDDYSTONE/OIL-FIRED POWER PLANT - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC095 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.003+-	0.025	0.017+-	0.160
SI	0.018+-	0.019	0.118+-	0.122
P	0.000+-	0.010	0.000+-	0.061
S	0.027+-	0.022	0.177+-	0.143
CL	0.000+-	0.009	0.000+-	0.057
K	0.000+-	0.003	0.000+-	0.013
CA	0.000+-	0.002	0.000+-	0.013
TI	0.004+-	0.001	0.027+-	0.009
V	0.000+-	0.001	0.000+-	0.006
CR	0.000+-	0.002	0.000+-	0.011
MN	0.000+-	0.001	0.000+-	0.009
FE	0.002+-	0.004	0.016+-	0.023
NI	0.000+-	0.001	0.000+-	0.008
CU	0.000+-	0.002	0.000+-	0.011
ZN	0.000+-	0.001	0.000+-	0.006
GA	0.000+-	0.001	0.000+-	0.006
AS	0.000+-	0.004	0.000+-	0.024
SE	0.000+-	0.001	0.000+-	0.009
BR	0.000+-	0.002	0.000+-	0.014
RE	0.000+-	0.002	0.000+-	0.015
SR	0.001+-	0.003	0.005+-	0.019
Y	0.005+-	0.003	0.032+-	0.021
ZR	0.000+-	0.014	0.000+-	0.088
MO	0.003+-	0.010	0.021+-	0.066
PD	0.012+-	0.008	0.079+-	0.050
AG	0.000+-	0.013	0.000+-	0.082
CD	0.016+-	0.017	0.104+-	0.110
IN	0.009+-	0.020	0.055+-	0.127
SN	0.000+-	0.024	0.000+-	0.153
SB	0.017+-	0.043	0.107+-	0.279
BA	0.058+-	0.109	0.370+-	0.699
LA	0.114+-	0.171	0.730+-	1.100
HG	0.001+-	0.003	0.004+-	0.017
PB	0.011+-	0.006	0.070+-	0.040

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC027 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 358+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	13.339+-	0.965	85.638+-	6.194	23.929+-	1.855
SI	28.621+-	2.125	183.744+-	13.641	51.341+-	4.073
P	0.000+-	0.160	0.000+-	1.028	0.000+-	0.287
S	1.510+-	0.371	9.696+-	2.379	2.709+-	0.669
CL	0.000+-	0.091	0.000+-	0.582	0.000+-	0.163
K	0.057+-	0.009	0.365+-	0.058	0.102+-	0.016
CA	0.120+-	0.011	0.773+-	0.069	0.216+-	0.020
TI	0.157+-	0.164	1.006+-	1.054	0.281+-	0.295
V	0.000+-	0.066	0.000+-	0.422	0.000+-	0.118
CR	0.000+-	0.031	0.000+-	0.196	0.000+-	0.055
MN	0.000+-	0.011	0.000+-	0.070	0.000+-	0.020
FE	0.331+-	0.036	2.126+-	0.232	0.594+-	0.067
NI	0.029+-	0.005	0.187+-	0.032	0.052+-	0.009
CU	0.012+-	0.002	0.079+-	0.016	0.022+-	0.004
ZN	0.005+-	0.002	0.032+-	0.012	0.009+-	0.003
GA	0.003+-	0.001	0.021+-	0.008	0.006+-	0.002
AS	0.000+-	0.004	0.000+-	0.024	0.000+-	0.007
SE	0.000+-	0.001	0.002+-	0.008	0.001+-	0.002
BR	0.000+-	0.002	0.000+-	0.011	0.000+-	0.003
RB	0.006+-	0.002	0.039+-	0.013	0.011+-	0.004
SR	0.006+-	0.003	0.040+-	0.018	0.011+-	0.005
Y	0.016+-	0.003	0.101+-	0.022	0.028+-	0.006
ZR	0.014+-	0.013	0.089+-	0.081	0.025+-	0.023
MO	0.012+-	0.009	0.075+-	0.057	0.021+-	0.016
PD	0.010+-	0.007	0.064+-	0.047	0.018+-	0.013
AG	0.029+-	0.011	0.187+-	0.073	0.052+-	0.020
CD	0.000+-	0.015	0.000+-	0.095	0.000+-	0.027
IN	0.010+-	0.017	0.067+-	0.110	0.019+-	0.031
SN	0.002+-	0.021	0.014+-	0.135	0.004+-	0.038
SB	0.000+-	0.041	0.000+-	0.261	0.000+-	0.073
BA	0.031+-	0.096	0.197+-	0.614	0.055+-	0.172
LA	0.291+-	0.167	1.870+-	1.074	0.523+-	0.301
HG	0.001+-	0.003	0.009+-	0.017	0.003+-	0.005
PB	0.010+-	0.006	0.067+-	0.038	0.019+-	0.011

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF165 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 6421+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	50.549+- 2.303	324.522+- 14.786	5.054+- 0.230
SI	119.080+- 5.416	764.491+- 34.771	11.906+- 0.542
P	0.000+- 0.704	0.000+- 4.522	0.000+- 0.070
S	41.949+- 1.944	269.313+- 12.480	4.194+- 0.194
CL	0.000+- 0.483	0.000+- 3.101	0.000+- 0.048
K	0.443+- 0.024	2.846+- 0.153	0.044+- 0.002
CA	0.405+- 0.021	2.601+- 0.135	0.041+- 0.002
TI	1.333+- 0.604	8.560+- 3.876	0.133+- 0.060
V	0.000+- 0.241	0.000+- 1.550	0.000+- 0.024
CR	0.000+- 0.111	0.000+- 0.711	0.000+- 0.011
MN	0.000+- 0.040	0.000+- 0.258	0.000+- 0.004
FE	2.708+- 0.127	17.387+- 0.813	0.271+- 0.013
NI	0.298+- 0.015	1.910+- 0.099	0.030+- 0.002
CU	0.029+- 0.003	0.184+- 0.021	0.003+- 0.000
ZN	0.071+- 0.005	0.454+- 0.030	0.007+- 0.000
GA	0.020+- 0.002	0.130+- 0.015	0.002+- 0.000
AS	0.000+- 0.005	0.000+- 0.033	0.000+- 0.001
SE	0.021+- 0.002	0.132+- 0.014	0.002+- 0.000
BR	0.007+- 0.002	0.046+- 0.014	0.001+- 0.000
RB	0.008+- 0.002	0.052+- 0.016	0.001+- 0.000
SR	0.048+- 0.004	0.310+- 0.026	0.005+- 0.000
Y	0.109+- 0.007	0.698+- 0.042	0.011+- 0.001
ZR	0.000+- 0.015	0.000+- 0.095	0.000+- 0.001
MO	0.001+- 0.010	0.006+- 0.067	0.000+- 0.001
PD	0.003+- 0.009	0.020+- 0.058	0.000+- 0.001
AG	0.000+- 0.013	0.000+- 0.085	0.000+- 0.001
CD	0.000+- 0.018	0.000+- 0.115	0.000+- 0.002
IN	0.026+- 0.020	0.168+- 0.127	0.003+- 0.002
SN	0.000+- 0.023	0.002+- 0.147	0.000+- 0.002
SB	0.001+- 0.044	0.009+- 0.281	0.000+- 0.004
BA	0.000+- 0.110	0.000+- 0.706	0.000+- 0.011
LA	2.830+- 0.247	18.168+- 1.588	0.283+- 0.025
HB	0.007+- 0.004	0.043+- 0.024	0.001+- 0.000
PB	0.107+- 0.009	0.685+- 0.059	0.011+- 0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: AC028 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 309+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	11.292+-	0.845	72.493+-	5.427	23.469+-	1.914
SI	24.331+-	1.875	156.205+-	12.038	50.570+-	4.227
P	0.000+-	0.151	0.000+-	0.973	0.000+-	0.315
S	1.076+-	0.359	6.911+-	2.307	2.237+-	0.750
CL	0.000+-	0.088	0.000+-	0.564	0.000+-	0.183
K	0.056+-	0.008	0.361+-	0.054	0.117+-	0.018
CA	0.074+-	0.008	0.478+-	0.052	0.155+-	0.018
TI	0.139+-	0.132	0.892+-	0.849	0.289+-	0.275
V	0.000+-	0.058	0.000+-	0.375	0.000+-	0.121
CR	0.000+-	0.026	0.000+-	0.170	0.000+-	0.055
MN	0.000+-	0.009	0.000+-	0.056	0.000+-	0.018
FE	0.273+-	0.031	1.750+-	0.199	0.567+-	0.067
NI	0.028+-	0.005	0.182+-	0.030	0.059+-	0.010
CU	0.002+-	0.002	0.014+-	0.013	0.005+-	0.004
ZN	0.006+-	0.002	0.036+-	0.011	0.012+-	0.003
GA	0.003+-	0.001	0.016+-	0.007	0.005+-	0.002
AS	0.000+-	0.003	0.000+-	0.022	0.000+-	0.007
SE	0.003+-	0.001	0.021+-	0.009	0.007+-	0.003
BR	0.001+-	0.002	0.008+-	0.011	0.003+-	0.004
RB	0.001+-	0.002	0.008+-	0.012	0.003+-	0.004
SR	0.003+-	0.003	0.020+-	0.017	0.006+-	0.005
Y	0.017+-	0.003	0.108+-	0.021	0.035+-	0.007
ZR	0.012+-	0.012	0.079+-	0.078	0.026+-	0.025
MO	0.000+-	0.008	0.000+-	0.054	0.000+-	0.017
PD	0.001+-	0.007	0.004+-	0.043	0.001+-	0.014
AG	0.021+-	0.011	0.137+-	0.069	0.045+-	0.022
CD	0.009+-	0.015	0.059+-	0.093	0.019+-	0.030
IN	0.008+-	0.017	0.053+-	0.106	0.017+-	0.034
SN	0.000+-	0.020	0.000+-	0.129	0.000+-	0.042
SB	0.000+-	0.038	0.000+-	0.247	0.000+-	0.080
BA	0.148+-	0.094	0.951+-	0.604	0.308+-	0.196
LA	0.310+-	0.161	1.991+-	1.031	0.645+-	0.334
HG	0.003+-	0.003	0.019+-	0.017	0.006+-	0.006
PB	0.011+-	0.006	0.070+-	0.036	0.023+-	0.012

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF166 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 6101+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	47.214+-	2.152	303.112+-	13.814	4.968+-	0.227
SI	112.102+-	5.099	719.697+-	32.735	11.796+-	0.537
P	0.000+-	0.704	0.000+-	4.522	0.000+-	0.074
S	42.869+-	1.986	275.220+-	12.752	4.511+-	0.209
CL	0.000+-	0.493	0.000+-	3.168	0.000+-	0.052
K	0.360+-	0.020	2.308+-	0.129	0.038+-	0.002
CA	0.342+-	0.018	2.197+-	0.117	0.036+-	0.002
TI	1.111+-	0.503	7.133+-	3.230	0.117+-	0.053
V	0.000+-	0.221	0.000+-	1.421	0.000+-	0.023
CR	0.000+-	0.101	0.000+-	0.646	0.000+-	0.011
MN	0.000+-	0.030	0.000+-	0.194	0.000+-	0.003
FE	2.345+-	0.110	15.052+-	0.706	0.247+-	0.012
NI	0.254+-	0.014	1.631+-	0.087	0.027+-	0.001
CU	0.031+-	0.003	0.198+-	0.022	0.003+-	0.000
ZN	0.048+-	0.004	0.305+-	0.023	0.005+-	0.000
GA	0.018+-	0.002	0.116+-	0.014	0.002+-	0.000
AS	0.000+-	0.005	0.000+-	0.033	0.000+-	0.001
SE	0.019+-	0.002	0.119+-	0.014	0.002+-	0.000
BR	0.003+-	0.002	0.021+-	0.014	0.000+-	0.000
RB	0.009+-	0.003	0.058+-	0.017	0.001+-	0.000
SR	0.043+-	0.004	0.275+-	0.026	0.005+-	0.000
Y	0.091+-	0.006	0.587+-	0.039	0.010+-	0.001
ZR	0.000+-	0.016	0.000+-	0.100	0.000+-	0.002
MO	0.000+-	0.011	0.000+-	0.070	0.000+-	0.001
PD	0.000+-	0.009	0.000+-	0.059	0.000+-	0.001
AG	0.000+-	0.014	0.000+-	0.092	0.000+-	0.002
CD	0.000+-	0.019	0.000+-	0.123	0.000+-	0.002
IN	0.066+-	0.022	0.421+-	0.141	0.007+-	0.002
SN	0.009+-	0.025	0.056+-	0.157	0.001+-	0.003
SB	0.023+-	0.047	0.146+-	0.302	0.002+-	0.005
BA	0.000+-	0.116	0.000+-	0.744	0.000+-	0.012
LA	2.341+-	0.238	15.031+-	1.531	0.246+-	0.025
HG	0.002+-	0.004	0.010+-	0.024	0.000+-	0.000
PE	0.081+-	0.009	0.518+-	0.055	0.008+-	0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 3A
 PARTICLE SIZE: C
 ANALYSIS ID: ACO29 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 342+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	13.730+-	0.972	88.149+-	6.237	25.741+-	1.970
SI	28.570+-	2.128	183.417+-	13.663	53.561+-	4.286
P	0.000+-	0.174	0.000+-	1.119	0.000+-	0.327
S	1.825+-	0.450	11.718+-	2.887	3.422+-	0.849
CL	0.000+-	0.110	0.000+-	0.708	0.000+-	0.207
K	0.061+-	0.009	0.392+-	0.057	0.114+-	0.017
CA	0.082+-	0.009	0.526+-	0.055	0.154+-	0.017
TI	0.158+-	0.155	1.013+-	0.996	0.296+-	0.291
V	0.000+-	0.063	0.000+-	0.407	0.000+-	0.119
CR	0.000+-	0.029	0.000+-	0.187	0.000+-	0.055
MN	0.000+-	0.010	0.000+-	0.064	0.000+-	0.019
FE	0.321+-	0.034	2.063+-	0.220	0.602+-	0.067
NI	0.038+-	0.005	0.243+-	0.034	0.071+-	0.010
CU	0.000+-	0.002	0.000+-	0.012	0.000+-	0.004
ZN	0.009+-	0.002	0.056+-	0.012	0.016+-	0.003
GA	0.005+-	0.001	0.029+-	0.009	0.009+-	0.003
AS	0.000+-	0.004	0.000+-	0.024	0.000+-	0.007
SE	0.002+-	0.001	0.012+-	0.009	0.004+-	0.003
BR	0.000+-	0.002	0.000+-	0.012	0.000+-	0.003
RB	0.004+-	0.002	0.025+-	0.013	0.007+-	0.004
SR	0.003+-	0.003	0.020+-	0.018	0.006+-	0.005
Y	0.012+-	0.003	0.076+-	0.022	0.022+-	0.007
ZR	0.000+-	0.013	0.000+-	0.083	0.000+-	0.024
MO	0.002+-	0.009	0.012+-	0.058	0.003+-	0.017
PD	0.013+-	0.008	0.080+-	0.050	0.023+-	0.014
AG	0.009+-	0.011	0.061+-	0.070	0.018+-	0.020
CD	0.016+-	0.016	0.102+-	0.101	0.030+-	0.030
IN	0.000+-	0.017	0.000+-	0.111	0.000+-	0.033
SN	0.000+-	0.021	0.000+-	0.135	0.000+-	0.039
SB	0.000+-	0.041	0.000+-	0.261	0.000+-	0.076
BA	0.000+-	0.097	0.000+-	0.626	0.000+-	0.183
LA	0.244+-	0.171	1.569+-	1.098	0.458+-	0.321
HG	0.004+-	0.003	0.025+-	0.019	0.007+-	0.005
PB	0.009+-	0.006	0.059+-	0.040	0.017+-	0.012

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 3A
 PARTICLE SIZE: F
 ANALYSIS ID: AF167 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 7386+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	48.557+- 2.213	311.737+- 14.205	4.321+- 0.192
SI	120.034+- 5.459	770.619+- 35.049	10.434+- 0.475
P	0.000+- 0.805	0.000+- 5.168	0.000+- 0.070
S	51.271+- 2.373	329.163+- 15.238	4.457+- 0.206
CL	0.000+- 0.590	0.000+- 3.789	0.000+- 0.051
K	0.385+- 0.021	2.469+- 0.136	0.033+- 0.002
CA	0.361+- 0.019	2.319+- 0.122	0.031+- 0.002
TI	1.222+- 0.604	7.847+- 3.876	0.106+- 0.052
V	0.000+- 0.231	0.000+- 1.486	0.000+- 0.020
CR	0.000+- 0.101	0.000+- 0.646	0.000+- 0.009
MN	0.000+- 0.040	0.000+- 0.258	0.000+- 0.003
FE	2.501+- 0.117	16.055+- 0.752	0.217+- 0.010
NI	0.273+- 0.014	1.752+- 0.092	0.024+- 0.001
CU	0.017+- 0.003	0.108+- 0.018	0.001+- 0.000
ZN	0.041+- 0.003	0.262+- 0.021	0.004+- 0.000
GA	0.016+- 0.002	0.106+- 0.014	0.001+- 0.000
AS	0.000+- 0.006	0.000+- 0.037	0.000+- 0.001
SE	0.025+- 0.002	0.159+- 0.016	0.002+- 0.000
BR	0.008+- 0.002	0.050+- 0.015	0.001+- 0.000
RB	0.009+- 0.003	0.055+- 0.017	0.001+- 0.000
SR	0.044+- 0.004	0.283+- 0.026	0.004+- 0.000
Y	0.113+- 0.007	0.724+- 0.044	0.010+- 0.001
ZR	0.006+- 0.016	0.039+- 0.101	0.001+- 0.001
MO	0.000+- 0.011	0.000+- 0.070	0.000+- 0.001
PD	0.004+- 0.009	0.029+- 0.061	0.000+- 0.001
AG	0.000+- 0.015	0.000+- 0.093	0.000+- 0.001
CD	0.000+- 0.019	0.000+- 0.120	0.000+- 0.002
IN	0.033+- 0.021	0.214+- 0.135	0.003+- 0.002
SN	0.059+- 0.025	0.379+- 0.162	0.005+- 0.002
SB	0.041+- 0.047	0.261+- 0.302	0.004+- 0.004
BA	0.000+- 0.116	0.000+- 0.747	0.000+- 0.010
LA	2.959+- 0.259	18.999+- 1.660	0.257+- 0.022
HG	0.002+- 0.004	0.015+- 0.024	0.000+- 0.000
PR	0.159+- 0.011	1.021+- 0.073	0.014+- 0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 3B
 PARTICLE SIZE: C
 ANALYSIS ID: CC096 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 220+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	19.820+-	1.260	127.245+-	8.092	57.722+-	4.509
SI	44.519+-	2.865	285.811+-	18.391	129.65+-	10.21
P	0.000+-	0.156	0.000+-	1.003	0.000+-	0.455
S	3.509+-	0.557	22.526+-	3.573	10.219+-	1.686
CL	0.000+-	0.137	0.000+-	0.881	0.000+-	0.400
K	0.112+-	0.011	0.718+-	0.071	0.326+-	0.036
CA	0.095+-	0.009	0.607+-	0.059	0.276+-	0.029
TI	0.289+-	0.208	1.855+-	1.333	0.841+-	0.606
V	0.000+-	0.084	0.000+-	0.537	0.000+-	0.244
CR	0.000+-	0.041	0.000+-	0.265	0.000+-	0.120
MN	0.000+-	0.011	0.000+-	0.068	0.000+-	0.031
FE	0.558+-	0.044	3.584+-	0.285	1.626+-	0.149
NI	0.048+-	0.006	0.310+-	0.037	0.141+-	0.018
CU	0.001+-	0.002	0.005+-	0.013	0.002+-	0.006
ZN	0.007+-	0.002	0.046+-	0.012	0.021+-	0.006
GA	0.005+-	0.001	0.030+-	0.009	0.013+-	0.004
AS	0.000+-	0.004	0.000+-	0.029	0.000+-	0.013
SE	0.001+-	0.002	0.005+-	0.011	0.002+-	0.005
BR	0.000+-	0.002	0.000+-	0.015	0.000+-	0.007
RB	0.002+-	0.003	0.014+-	0.017	0.006+-	0.008
SR	0.012+-	0.004	0.075+-	0.022	0.034+-	0.010
Y	0.033+-	0.004	0.212+-	0.029	0.096+-	0.014
ZR	0.014+-	0.015	0.088+-	0.098	0.040+-	0.045
MO	0.000+-	0.012	0.000+-	0.075	0.000+-	0.034
PD	0.013+-	0.009	0.081+-	0.055	0.037+-	0.025
AG	0.000+-	0.014	0.000+-	0.090	0.000+-	0.041
CD	0.003+-	0.018	0.017+-	0.118	0.008+-	0.053
IN	0.016+-	0.022	0.101+-	0.140	0.046+-	0.063
SN	0.000+-	0.026	0.000+-	0.165	0.000+-	0.075
SB	0.026+-	0.048	0.167+-	0.308	0.076+-	0.140
BA	0.061+-	0.119	0.393+-	0.766	0.178+-	0.348
LA	0.725+-	0.205	4.652+-	1.314	2.110+-	0.604
HG	0.000+-	0.003	0.000+-	0.021	0.000+-	0.009
PE	0.024+-	0.007	0.155+-	0.047	0.070+-	0.022

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 38
 PARTICLE SIZE: F
 ANALYSIS ID: AF168 - Teflon
 SHINY FLAKES ON SURFACE
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 7636+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	46.992+-	2.142	301.686+-	13.749	3.951+-	0.180
SI	113.264+-	5.152	727.157+-	33.074	9.523+-	0.433
P	0.000+-	0.906	0.000+-	5.814	0.000+-	0.076
S	56.305+-	2.605	361.481+-	16.727	4.734+-	0.219
CL	0.000+-	0.648	0.000+-	4.161	0.000+-	0.054
K	0.349+-	0.020	2.238+-	0.127	0.029+-	0.002
CA	0.335+-	0.018	2.151+-	0.115	0.028+-	0.002
TI	1.111+-	0.503	7.133+-	3.230	0.093+-	0.042
V	0.000+-	0.221	0.000+-	1.421	0.000+-	0.019
CR	0.000+-	0.091	0.000+-	0.581	0.000+-	0.008
MN	0.000+-	0.030	0.000+-	0.194	0.000+-	0.002
FE	2.317+-	0.109	14.872+-	0.698	0.195+-	0.009
NI	0.258+-	0.014	1.655+-	0.088	0.022+-	0.001
CU	0.009+-	0.003	0.055+-	0.018	0.001+-	0.000
ZN	0.037+-	0.003	0.240+-	0.021	0.003+-	0.000
GA	0.016+-	0.002	0.103+-	0.014	0.001+-	0.000
AS	0.000+-	0.006	0.000+-	0.037	0.000+-	0.000
SE	0.028+-	0.003	0.179+-	0.018	0.002+-	0.000
BR	0.006+-	0.003	0.040+-	0.017	0.001+-	0.000
RE	0.008+-	0.003	0.054+-	0.020	0.001+-	0.000
SR	0.044+-	0.004	0.280+-	0.029	0.004+-	0.000
Y	0.092+-	0.006	0.592+-	0.042	0.008+-	0.001
ZR	0.000+-	0.019	0.000+-	0.119	0.000+-	0.002
MO	0.000+-	0.013	0.000+-	0.084	0.000+-	0.001
PD	0.000+-	0.011	0.000+-	0.072	0.000+-	0.001
AG	0.000+-	0.017	0.000+-	0.111	0.000+-	0.001
CD	0.000+-	0.023	0.000+-	0.145	0.000+-	0.002
IN	0.000+-	0.024	0.000+-	0.156	0.000+-	0.002
SN	0.021+-	0.029	0.137+-	0.189	0.002+-	0.002
SB	0.048+-	0.056	0.306+-	0.362	0.004+-	0.005
BA	0.000+-	0.139	0.000+-	0.889	0.000+-	0.012
LA	2.117+-	0.260	13.589+-	1.670	0.178+-	0.022
HG	0.002+-	0.004	0.010+-	0.028	0.000+-	0.000
PB	0.094+-	0.010	0.603+-	0.064	0.008+-	0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 4A
 PARTICLE SIZE: C
 ANALYSIS ID: AC031 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 319+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	12.594+-	0.915	80.854+-	5.876	25.355+-	2.007
SI	26.558+-	2.042	170.504+-	13.111	53.468+-	4.440
P	0.000+-	0.165	0.000+-	1.059	0.000+-	0.332
S	1.845+-	0.483	11.848+-	3.099	3.715+-	0.979
CL	0.000+-	0.119	0.000+-	0.761	0.000+-	0.239
K	0.073+-	0.009	0.468+-	0.059	0.147+-	0.019
CA	0.114+-	0.010	0.731+-	0.065	0.229+-	0.022
TI	0.148+-	0.141	0.949+-	0.908	0.298+-	0.285
V	0.000+-	0.063	0.000+-	0.404	0.000+-	0.127
CR	0.000+-	0.027	0.000+-	0.176	0.000+-	0.055
MN	0.000+-	0.009	0.000+-	0.059	0.000+-	0.018
FE	0.316+-	0.034	2.030+-	0.219	0.637+-	0.071
NI	0.024+-	0.005	0.151+-	0.030	0.047+-	0.009
CU	0.003+-	0.002	0.022+-	0.012	0.007+-	0.004
ZN	0.007+-	0.002	0.046+-	0.011	0.014+-	0.003
GA	0.005+-	0.001	0.033+-	0.009	0.010+-	0.003
AS	0.000+-	0.003	0.000+-	0.022	0.000+-	0.007
SE	0.003+-	0.001	0.018+-	0.009	0.006+-	0.003
BR	0.000+-	0.002	0.000+-	0.011	0.000+-	0.003
RB	0.002+-	0.002	0.014+-	0.012	0.004+-	0.004
SR	0.007+-	0.003	0.044+-	0.017	0.014+-	0.005
Y	0.014+-	0.003	0.091+-	0.021	0.029+-	0.007
ZR	0.006+-	0.012	0.040+-	0.077	0.013+-	0.024
MO	0.017+-	0.009	0.109+-	0.055	0.034+-	0.017
PD	0.000+-	0.007	0.000+-	0.042	0.000+-	0.013
AG	0.010+-	0.010	0.062+-	0.064	0.019+-	0.020
CD	0.000+-	0.014	0.000+-	0.089	0.000+-	0.028
IN	0.008+-	0.016	0.053+-	0.104	0.017+-	0.033
SN	0.008+-	0.020	0.048+-	0.129	0.015+-	0.041
SB	0.000+-	0.035	0.000+-	0.228	0.000+-	0.071
BA	0.059+-	0.091	0.377+-	0.585	0.118+-	0.184
LA	0.458+-	0.164	2.941+-	1.050	0.922+-	0.330
HG	0.000+-	0.002	0.000+-	0.015	0.000+-	0.005
PB	0.012+-	0.006	0.076+-	0.036	0.024+-	0.011

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 4A
 PARTICLE SIZE: F
 ANALYSIS ID: AF149 - Teflon
 AIR LEAK, SHINY FLAKES ON SURFACE
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 8221+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	48.359+- 2.204	310.464+- 14.148	3.776+- 0.172
SI	121.697+- 5.535	781.297+- 35.535	9.504+- 0.432
P	1.996+- 0.362	12.817+- 2.325	0.156+- 0.028
S	55.820+- 2.583	358.365+- 16.583	4.359+- 0.202
CL	0.000+- 0.643	0.000+- 4.125	0.000+- 0.050
K	0.372+- 0.021	2.389+- 0.133	0.029+- 0.002
CA	0.349+- 0.019	2.243+- 0.119	0.027+- 0.001
TI	1.222+- 0.503	7.847+- 3.230	0.095+- 0.039
V	0.000+- 0.221	0.000+- 1.421	0.000+- 0.017
CR	0.000+- 0.101	0.000+- 0.646	0.000+- 0.008
MN	0.000+- 0.040	0.000+- 0.258	0.000+- 0.003
FE	2.509+- 0.118	16.107+- 0.755	0.196+- 0.009
NI	0.278+- 0.015	1.784+- 0.094	0.022+- 0.001
CU	0.011+- 0.003	0.072+- 0.018	0.001+- 0.000
ZN	0.034+- 0.003	0.219+- 0.019	0.003+- 0.000
GA	0.018+- 0.002	0.115+- 0.014	0.001+- 0.000
AS	0.000+- 0.005	0.000+- 0.035	0.000+- 0.000
SE	0.024+- 0.003	0.155+- 0.016	0.002+- 0.000
BR	0.007+- 0.002	0.044+- 0.016	0.001+- 0.000
RB	0.011+- 0.003	0.070+- 0.018	0.001+- 0.000
SR	0.040+- 0.004	0.256+- 0.026	0.003+- 0.000
Y	0.095+- 0.006	0.612+- 0.041	0.007+- 0.000
ZR	0.000+- 0.017	0.000+- 0.109	0.000+- 0.001
MO	0.000+- 0.012	0.000+- 0.076	0.000+- 0.001
PD	0.011+- 0.010	0.071+- 0.067	0.001+- 0.001
AG	0.000+- 0.016	0.000+- 0.101	0.000+- 0.001
CD	0.000+- 0.020	0.000+- 0.128	0.000+- 0.002
IN	0.016+- 0.022	0.104+- 0.143	0.001+- 0.002
SN	0.030+- 0.027	0.192+- 0.172	0.002+- 0.002
SB	0.029+- 0.051	0.188+- 0.325	0.002+- 0.004
BA	0.000+- 0.125	0.000+- 0.802	0.000+- 0.010
LA	2.621+- 0.258	16.826+- 1.659	0.205+- 0.020
HB	0.003+- 0.004	0.022+- 0.026	0.000+- 0.000
FB	0.098+- 0.010	0.626+- 0.061	0.008+- 0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 4B

PARTICLE SIZE: C

ANALYSIS ID: CC097 Nuclepore

EXPOSED AREA: 6.42 SQUARE CM

MASS: 260+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	20.206+-	1.265	129.724+-	8.122	49.830+-	3.660
SI	47.442+-	2.937	304.576+-	18.854	116.99+-	8.523
P	0.000+-	0.172	0.000+-	1.105	0.000+-	0.424
S	5.240+-	0.627	33.644+-	4.024	12.923+-	1.623
CL	0.000+-	0.155	0.000+-	0.992	0.000+-	0.381
K	0.105+-	0.011	0.674+-	0.068	0.259+-	0.028
CA	0.096+-	0.009	0.616+-	0.059	0.237+-	0.025
TI	0.303+-	0.205	1.947+-	1.318	0.748+-	0.507
V	0.000+-	0.083	0.000+-	0.531	0.000+-	0.204
CR	0.000+-	0.041	0.000+-	0.263	0.000+-	0.101
MN	0.000+-	0.011	0.000+-	0.068	0.000+-	0.026
FE	0.584+-	0.044	3.747+-	0.284	1.439+-	6.122
NI	0.055+-	0.006	0.350+-	0.038	0.135+-	0.016
CU	0.001+-	0.002	0.005+-	0.013	0.002+-	0.005
ZN	0.003+-	0.002	0.017+-	0.011	0.006+-	0.004
GA	0.005+-	0.001	0.031+-	0.009	0.012+-	0.004
AS	0.000+-	0.004	0.000+-	0.028	0.000+-	0.011
SE	0.001+-	0.002	0.003+-	0.010	0.001+-	0.004
BR	0.000+-	0.002	0.000+-	0.015	0.000+-	0.006
RB	0.004+-	0.003	0.027+-	0.017	0.010+-	0.006
SR	0.008+-	0.003	0.048+-	0.022	0.019+-	0.008
Y	0.034+-	0.004	0.220+-	0.028	0.084+-	0.011
ZR	0.000+-	0.015	0.000+-	0.096	0.000+-	0.037
MO	0.032+-	0.011	0.207+-	0.073	0.079+-	0.028
PD	0.011+-	0.008	0.072+-	0.054	0.028+-	0.021
AG	0.000+-	0.014	0.000+-	0.088	0.000+-	0.034
CD	0.003+-	0.018	0.017+-	0.116	0.006+-	0.045
IN	0.000+-	0.020	0.000+-	0.130	0.000+-	0.050
SN	0.001+-	0.026	0.004+-	0.166	0.002+-	0.064
SB	0.030+-	0.047	0.191+-	0.303	0.074+-	0.116
BA	0.027+-	0.117	0.171+-	0.752	0.066+-	0.289
LA	0.728+-	0.202	4.676+-	1.300	1.796+-	0.504
HG	0.000+-	0.003	0.000+-	0.018	0.000+-	0.007
PB	0.027+-	0.007	0.171+-	0.047	0.066+-	0.018

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 4B
 PARTICLE SIZE: F
 ANALYSIS ID: AF170 - Teflon
 NON-UNIFORM COLOR OF DEPOSIT
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 8127+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	44.529+- 2.030	285.879+- 13.031	3.518+- 0.160
SI	100.967+- 4.593	648.205+- 29.486	7.976+- 0.363
P	0.000+- 0.906	0.000+- 5.814	0.000+- 0.072
S	55.313+- 2.560	355.112+- 16.433	4.370+- 0.202
CL	0.000+- 0.637	0.000+- 4.087	0.000+- 0.050
K	0.316+- 0.018	2.031+- 0.117	0.025+- 0.001
CA	0.341+- 0.018	2.188+- 0.116	0.027+- 0.001
TI	0.967+- 0.423	6.206+- 2.713	0.076+- 0.033
V	0.000+- 0.191	0.000+- 1.227	0.000+- 0.015
CR	0.000+- 0.080	0.000+- 0.517	0.000+- 0.006
MN	0.000+- 0.030	0.000+- 0.194	0.000+- 0.002
FE	2.075+- 0.098	13.319+- 0.627	0.164+- 0.008
NI	0.229+- 0.012	1.472+- 0.080	0.018+- 0.001
CU	0.025+- 0.003	0.163+- 0.020	0.002+- 0.000
ZN	0.060+- 0.004	0.386+- 0.027	0.005+- 0.000
GA	0.017+- 0.002	0.106+- 0.014	0.001+- 0.000
AS	0.000+- 0.006	0.000+- 0.036	0.000+- 0.000
SE	0.023+- 0.002	0.151+- 0.016	0.002+- 0.000
BR	0.007+- 0.002	0.047+- 0.015	0.001+- 0.000
RB	0.013+- 0.003	0.086+- 0.018	0.001+- 0.000
SR	0.041+- 0.004	0.262+- 0.026	0.003+- 0.000
Y	0.081+- 0.006	0.523+- 0.037	0.006+- 0.000
ZR	0.000+- 0.016	0.000+- 0.105	0.000+- 0.001
MO	0.000+- 0.012	0.000+- 0.074	0.000+- 0.001
PD	0.000+- 0.010	0.000+- 0.063	0.000+- 0.001
AG	0.000+- 0.015	0.000+- 0.097	0.000+- 0.001
CD	0.000+- 0.020	0.000+- 0.126	0.000+- 0.002
IN	0.032+- 0.022	0.204+- 0.143	0.003+- 0.002
SN	0.011+- 0.026	0.072+- 0.166	0.001+- 0.002
SB	0.000+- 0.048	0.000+- 0.311	0.000+- 0.004
BA	0.000+- 0.123	0.000+- 0.791	0.000+- 0.010
LA	2.184+- 0.241	14.023+- 1.550	0.173+- 0.019
HG	0.001+- 0.004	0.005+- 0.025	0.000+- 0.000
PB	0.118+- 0.010	0.760+- 0.065	0.009+- 0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 5A
 PARTICLE SIZE: C
 ANALYSIS ID: AC032 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 354+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	13.562+-	0.959	87.071+-	6.155	24.627+-	1.875
SI	27.548+-	2.114	176.856+-	13.570	50.022+-	4.091
P	0.000+-	0.183	0.000+-	1.175	0.000+-	0.332
S	2.904+-	0.483	18.641+-	3.103	5.272+-	0.890
CL	0.000+-	0.119	0.000+-	0.761	0.000+-	0.215
K	0.054+-	0.008	0.344+-	0.053	0.097+-	0.015
CA	0.071+-	0.008	0.456+-	0.051	0.129+-	0.015
TI	0.158+-	0.155	1.013+-	0.996	0.286+-	0.282
V	0.000+-	0.069	0.000+-	0.445	0.000+-	0.126
CR	0.000+-	0.028	0.000+-	0.182	0.000+-	0.051
MN	0.000+-	0.011	0.000+-	0.070	0.000+-	0.020
FE	0.324+-	0.035	2.082+-	0.222	0.589+-	0.065
NI	0.038+-	0.005	0.247+-	0.034	0.070+-	0.010
CU	0.005+-	0.002	0.035+-	0.012	0.010+-	0.004
ZN	0.007+-	0.002	0.042+-	0.011	0.012+-	0.003
BA	0.003+-	0.001	0.018+-	0.009	0.005+-	0.002
AS	0.000+-	0.003	0.000+-	0.022	0.000+-	0.006
SE	0.000+-	0.001	0.000+-	0.008	0.000+-	0.002
BR	0.004+-	0.002	0.024+-	0.011	0.007+-	0.003
RB	0.000+-	0.002	0.000+-	0.012	0.000+-	0.003
SR	0.007+-	0.003	0.044+-	0.016	0.012+-	0.005
Y	0.013+-	0.003	0.087+-	0.021	0.024+-	0.006
ZR	0.002+-	0.012	0.013+-	0.074	0.004+-	0.021
MO	0.000+-	0.008	0.000+-	0.052	0.000+-	0.015
PT	0.004+-	0.007	0.027+-	0.046	0.008+-	0.013
AG	0.000+-	0.010	0.000+-	0.067	0.000+-	0.019
CE	0.001+-	0.014	0.008+-	0.091	0.002+-	0.026
IN	0.000+-	0.016	0.000+-	0.102	0.000+-	0.029
SN	0.000+-	0.021	0.000+-	0.132	0.000+-	0.037
SB	0.000+-	0.035	0.000+-	0.224	0.000+-	0.063
BA	0.068+-	0.092	0.437+-	0.590	0.124+-	0.167
LA	0.325+-	0.149	2.089+-	0.957	0.591+-	0.271
HC	0.001+-	0.003	0.005+-	0.018	0.001+-	0.005
FE	0.027+-	0.006	0.173+-	0.038	0.049+-	0.011

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 5A
 PARTICLE SIZE: F
 ANALYSIS ID: AF171 - Teflon
 SHINY FLAKES ON SURFACE
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 7924+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	47.808+-	2.179	306.927+-	13.987	3.873+-	0.177
SI	125.537+-	5.709	805.947+-	36.655	10.170+-	0.463
P	0.000+-	0.805	0.000+-	5.168	0.000+-	0.065
S	49.588+-	2.296	318.354+-	14.740	4.017+-	0.186
CL	0.000+-	0.571	0.000+-	3.665	0.000+-	0.046
K	0.382+-	0.021	2.452+-	0.136	0.031+-	0.002
CA	0.358+-	0.019	2.300+-	0.122	0.029+-	0.002
TI	1.222+-	0.604	7.847+-	3.876	0.099+-	0.049
V	0.000+-	0.241	0.000+-	1.550	0.000+-	0.020
CR	0.000+-	0.101	0.000+-	0.646	0.000+-	0.008
MN	0.000+-	0.040	0.000+-	0.258	0.000+-	0.003
FE	2.521+-	0.118	16.188+-	0.758	0.204+-	0.010
NI	0.281+-	0.015	1.804+-	0.095	0.023+-	0.001
CU	0.012+-	0.003	0.078+-	0.018	0.001+-	0.000
ZN	0.040+-	0.003	0.256+-	0.021	0.003+-	0.000
GA	0.016+-	0.002	0.102+-	0.014	0.001+-	0.000
AS	0.000+-	0.006	0.000+-	0.036	0.000+-	0.000
SE	0.025+-	0.003	0.160+-	0.017	0.002+-	0.000
BR	0.005+-	0.002	0.034+-	0.016	0.000+-	0.000
RB	0.009+-	0.003	0.057+-	0.018	0.001+-	0.000
SR	0.044+-	0.004	0.280+-	0.027	0.004+-	0.000
Y	0.103+-	0.007	0.664+-	0.043	0.008+-	0.001
ZR	0.000+-	0.017	0.000+-	0.109	0.000+-	0.001
MO	0.000+-	0.012	0.000+-	0.078	0.000+-	0.001
PD	0.000+-	0.010	0.000+-	0.066	0.000+-	0.001
AG	0.000+-	0.016	0.000+-	0.102	0.000+-	0.001
CD	0.000+-	0.021	0.000+-	0.134	0.000+-	0.002
IN	0.011+-	0.023	0.072+-	0.145	0.001+-	0.002
SN	0.010+-	0.027	0.065+-	0.172	0.001+-	0.002
SB	0.000+-	0.049	0.000+-	0.316	0.000+-	0.004
BA	0.000+-	0.127	0.000+-	0.815	0.000+-	0.010
LA	2.290+-	0.250	14.702+-	1.608	0.186+-	0.020
HG	0.004+-	0.004	0.026+-	0.027	0.000+-	0.000
PB	0.095+-	0.010	0.612+-	0.061	0.008+-	0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 5B
 PARTICLE SIZE: C
 ANALYSIS ID: CC098 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 374+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	24.707+-	1.497	158.621+-	9.611	42.374+-	2.806
SI	56.639+-	3.446	363.621+-	22.124	97.138+-	6.455
P	0.000+-	0.189	0.000+-	1.211	0.000+-	0.324
S	6.123+-	0.670	39.307+-	4.301	10.500+-	1.183
CL	0.000+-	0.165	0.000+-	1.062	0.000+-	0.284
K	0.139+-	0.012	0.892+-	0.080	0.238+-	0.022
CA	0.111+-	0.010	0.716+-	0.065	0.191+-	0.018
TI	0.379+-	0.256	2.432+-	1.644	0.650+-	0.440
V	0.000+-	0.102	0.000+-	0.658	0.000+-	0.176
CR	0.000+-	0.051	0.000+-	0.327	0.000+-	0.087
MN	0.000+-	0.020	0.000+-	0.130	0.000+-	0.035
FE	0.768+-	0.054	4.933+-	0.349	1.318+-	0.100
NI	0.082+-	0.007	0.525+-	0.047	0.140+-	0.013
CU	0.004+-	0.002	0.022+-	0.014	0.006+-	0.004
ZN	0.008+-	0.002	0.050+-	0.012	0.013+-	0.003
GA	0.007+-	0.002	0.048+-	0.010	0.013+-	0.003
AS	0.000+-	0.005	0.000+-	0.029	0.000+-	0.008
SE	0.002+-	0.002	0.010+-	0.011	0.003+-	0.003
BR	0.000+-	0.002	0.000+-	0.015	0.000+-	0.004
RB	0.004+-	0.003	0.028+-	0.017	0.008+-	0.005
SR	0.010+-	0.003	0.064+-	0.022	0.017+-	0.006
Y	0.042+-	0.005	0.268+-	0.031	0.072+-	0.008
ZR	0.020+-	0.016	0.129+-	0.100	0.034+-	0.027
MO	0.000+-	0.012	0.000+-	0.075	0.000+-	0.020
PD	0.020+-	0.009	0.126+-	0.058	0.034+-	0.015
AG	0.000+-	0.014	0.000+-	0.090	0.000+-	0.024
CD	0.002+-	0.019	0.011+-	0.119	0.003+-	0.032
IN	0.020+-	0.022	0.129+-	0.143	0.034+-	0.038
SN	0.011+-	0.027	0.069+-	0.173	0.018+-	0.046
SB	0.006+-	0.048	0.037+-	0.308	0.010+-	0.082
BA	0.000+-	0.119	0.000+-	0.766	0.000+-	0.205
LA	0.759+-	0.209	4.874+-	1.340	1.302+-	0.360
HG	0.002+-	0.003	0.015+-	0.020	0.004+-	0.005
PB	0.020+-	0.007	0.131+-	0.047	0.035+-	0.013

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 5B
 PARTICLE SIZE: F
 ANALYSIS ID: AF172 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 7907+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	46.143+-	2.103	296.235+-	13.501	3.747+-	0.171
SI	110.358+-	5.020	708.501+-	32.227	8.961+-	0.408
P	0.000+-	0.906	0.000+-	5.814	0.000+-	0.074
S	55.738+-	2.579	357.837+-	16.559	4.526+-	0.210
CL	0.000+-	0.642	0.000+-	4.119	0.000+-	0.052
K	0.350+-	0.020	2.245+-	0.127	0.028+-	0.002
CA	0.345+-	0.018	2.215+-	0.118	0.028+-	0.001
TI	1.111+-	0.503	7.133+-	3.230	0.090+-	0.041
V	0.000+-	0.201	0.000+-	1.292	0.000+-	0.016
CR	0.000+-	0.091	0.000+-	0.581	0.000+-	0.007
MN	0.000+-	0.030	0.000+-	0.194	0.000+-	0.002
FE	2.258+-	0.106	14.494+-	0.681	0.183+-	0.009
NI	0.234+-	0.013	1.505+-	0.081	0.019+-	0.001
CU	0.011+-	0.003	0.068+-	0.017	0.001+-	0.000
ZN	0.037+-	0.003	0.239+-	0.020	0.003+-	0.000
GA	0.016+-	0.002	0.105+-	0.014	0.001+-	0.000
AS	0.000+-	0.005	0.000+-	0.035	0.000+-	0.000
SE	0.024+-	0.003	0.153+-	0.016	0.002+-	0.000
BR	0.007+-	0.002	0.044+-	0.016	0.001+-	0.000
RE	0.010+-	0.003	0.066+-	0.019	0.001+-	0.000
SR	0.035+-	0.004	0.225+-	0.026	0.003+-	0.000
Y	0.095+-	0.006	0.608+-	0.041	0.008+-	0.001
ZR	0.000+-	0.017	0.000+-	0.109	0.000+-	0.001
MO	0.000+-	0.012	0.000+-	0.078	0.000+-	0.001
PD	0.004+-	0.010	0.027+-	0.067	0.000+-	0.001
AG	0.000+-	0.016	0.000+-	0.100	0.000+-	0.001
CD	0.000+-	0.021	0.000+-	0.132	0.000+-	0.002
IN	0.018+-	0.023	0.114+-	0.146	0.001+-	0.002
SN	0.029+-	0.027	0.187+-	0.175	0.002+-	0.002
SB	0.000+-	0.050	0.000+-	0.324	0.000+-	0.004
BA	0.000+-	0.126	0.000+-	0.808	0.000+-	0.010
LA	2.318+-	0.251	14.882+-	1.614	0.188+-	0.020
HG	0.000+-	0.004	0.000+-	0.025	0.000+-	0.000
PB	0.089+-	0.009	0.568+-	0.060	0.007+-	0.001

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 6A
 PARTICLE SIZE: C
 ANALYSIS ID: AC033 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 612+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	21.023+-	1.344	134.969+-	8.628	22.042+-	1.454
SI	41.261+-	3.020	264.896+-	19.391	43.260+-	3.245
P	0.000+-	0.260	0.000+-	1.669	0.000+-	0.273
S	6.191+-	0.645	39.745+-	4.141	6.491+-	0.685
CL	0.000+-	0.159	0.000+-	1.021	0.000+-	0.167
K	0.119+-	0.012	0.762+-	0.079	0.125+-	0.013
CA	0.126+-	0.012	0.812+-	0.074	0.133+-	0.012
TI	0.196+-	0.252	1.255+-	1.616	0.205+-	0.264
V	0.000+-	0.102	0.000+-	0.657	0.000+-	0.107
CR	0.000+-	0.044	0.000+-	0.282	0.000+-	0.046
MN	0.000+-	0.015	0.000+-	0.097	0.000+-	0.016
FE	0.542+-	0.051	3.482+-	0.328	0.569+-	0.054
NI	0.052+-	0.007	0.336+-	0.044	0.055+-	0.007
CU	0.005+-	0.002	0.029+-	0.013	0.005+-	0.002
ZN	0.008+-	0.002	0.049+-	0.014	0.008+-	0.002
GA	0.006+-	0.002	0.037+-	0.010	0.006+-	0.002
AS	0.000+-	0.004	0.000+-	0.025	0.000+-	0.004
SE	0.003+-	0.001	0.020+-	0.009	0.003+-	0.001
BR	0.002+-	0.002	0.012+-	0.010	0.002+-	0.002
RB	0.003+-	0.002	0.019+-	0.013	0.003+-	0.002
SR	0.010+-	0.003	0.067+-	0.018	0.011+-	0.003
Y	0.028+-	0.004	0.183+-	0.025	0.030+-	0.004
ZR	0.020+-	0.012	0.127+-	0.077	0.021+-	0.013
MO	0.000+-	0.008	0.000+-	0.054	0.000+-	0.009
PD	0.002+-	0.007	0.011+-	0.046	0.002+-	0.008
AG	0.007+-	0.011	0.045+-	0.070	0.007+-	0.011
CD	0.009+-	0.015	0.056+-	0.094	0.009+-	0.015
IN	0.000+-	0.016	0.000+-	0.101	0.000+-	0.016
SN	0.000+-	0.021	0.000+-	0.134	0.000+-	0.022
SB	0.080+-	0.039	0.514+-	0.250	0.084+-	0.041
BA	0.010+-	0.093	0.065+-	0.595	0.011+-	0.097
LA	0.716+-	0.166	4.598+-	1.068	0.751+-	0.175
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.003
PB	0.037+-	0.007	0.238+-	0.043	0.039+-	0.007

SAMPLE ID: BP/CATALYTIC CRACKER - TEST NO. 6A
 PARTICLE SIZE: F
 ANALYSIS ID: AF173 - Teflon
 SHINY FLAKES ON SURFACE, BUILD UP AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 10087+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	51.165+-	2.331	328.482+-	14.966	3.257+-	0.148
SI	165.122+-	7.508	1060.09+-	48.204	10.510+-	0.478
P	0.000+-	0.906	0.000+-	5.814	0.000+-	0.058
S	51.571+-	2.387	331.083+-	15.327	3.282+-	0.152
CL	0.000+-	0.594	0.000+-	3.812	0.000+-	0.038
K	0.502+-	0.027	3.223+-	0.172	0.032+-	0.002
CA	0.489+-	0.025	3.140+-	0.160	0.031+-	0.002
TI	2.444+-	1.107	15.693+-	7.105	0.156+-	0.070
V	0.000+-	0.322	0.000+-	2.067	0.000+-	0.020
CR	0.000+-	0.141	0.000+-	0.904	0.000+-	0.009
MN	0.000+-	0.050	0.000+-	0.323	0.000+-	0.003
FE	3.479+-	0.162	22.335+-	1.039	0.221+-	0.010
NI	0.394+-	0.020	2.529+-	0.128	0.025+-	0.001
CU	0.021+-	0.003	0.134+-	0.022	0.001+-	0.000
ZN	0.081+-	0.005	0.518+-	0.033	0.005+-	0.000
GA	0.019+-	0.003	0.124+-	0.016	0.001+-	0.000
AS	0.000+-	0.007	0.000+-	0.045	0.000+-	0.000
SE	0.028+-	0.003	0.181+-	0.019	0.002+-	0.000
BR	0.010+-	0.003	0.064+-	0.019	0.001+-	0.000
RE	0.010+-	0.003	0.066+-	0.021	0.001+-	0.000
SR	0.065+-	0.005	0.417+-	0.034	0.004+-	0.000
Y	0.136+-	0.008	0.872+-	0.053	0.009+-	0.001
ZR	0.000+-	0.020	0.000+-	0.126	0.000+-	0.001
MO	0.023+-	0.014	0.150+-	0.092	0.001+-	0.001
PD	0.000+-	0.012	0.000+-	0.074	0.000+-	0.001
AG	0.000+-	0.018	0.000+-	0.117	0.000+-	0.001
CD	0.000+-	0.024	0.000+-	0.154	0.000+-	0.002
IN	0.010+-	0.026	0.062+-	0.168	0.001+-	0.002
SN	0.000+-	0.031	0.000+-	0.198	0.000+-	0.002
SB	0.000+-	0.059	0.000+-	0.378	0.000+-	0.004
BA	0.000+-	0.148	0.000+-	0.947	0.000+-	0.009
LA	3.217+-	0.305	20.650+-	1.957	0.205+-	0.019
HG	0.000+-	0.005	0.000+-	0.029	0.000+-	0.000
PB	0.187+-	0.013	1.200+-	0.087	0.012+-	0.001

SAMPLE ID: BP/CATALYTIC CRACKER - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: AC077 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.012	0.000+-	0.080
SI	0.000+-	0.009	0.000+-	0.056
P	0.004+-	0.004	0.025+-	0.025
S	0.000+-	0.020	0.000+-	0.126
CL	0.000+-	0.006	0.000+-	0.039
K	0.000+-	0.003	0.000+-	0.017
CA	0.000+-	0.002	0.000+-	0.012
TI	0.000+-	0.001	0.000+-	0.008
V	0.001+-	0.001	0.003+-	0.006
CR	0.001+-	0.001	0.006+-	0.007
MN	0.000+-	0.001	0.000+-	0.008
FE	0.003+-	0.003	0.019+-	0.019
NI	0.001+-	0.001	0.005+-	0.008
CU	0.000+-	0.001	0.002+-	0.009
ZN	0.001+-	0.001	0.005+-	0.006
GA	0.001+-	0.001	0.008+-	0.005
AS	0.002+-	0.003	0.011+-	0.017
SE	0.000+-	0.001	0.000+-	0.006
BR	0.000+-	0.001	0.000+-	0.009
RB	0.000+-	0.002	0.000+-	0.011
SR	0.000+-	0.002	0.000+-	0.014
Y	0.000+-	0.002	0.000+-	0.016
ZR	0.000+-	0.011	0.000+-	0.069
MO	0.000+-	0.007	0.000+-	0.047
PD	0.000+-	0.006	0.000+-	0.040
AG	0.000+-	0.009	0.000+-	0.059
CD	0.024+-	0.013	0.154+-	0.083
IN	0.000+-	0.015	0.000+-	0.094
SN	0.012+-	0.019	0.076+-	0.121
SB	0.000+-	0.033	0.000+-	0.214
BA	0.156+-	0.085	1.004+-	0.546
LA	0.130+-	0.131	0.837+-	0.839
HG	0.000+-	0.002	0.000+-	0.013
PB	0.000+-	0.004	0.000+-	0.029

SAMPLE ID: BP/CATALYTIC CRACKER - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF242 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.013	0.000+-	0.084
SI	0.000+-	0.009	0.000+-	0.057
P	0.000+-	0.004	0.000+-	0.028
S	0.000+-	0.025	0.000+-	0.163
CL	0.000+-	0.009	0.000+-	0.058
K	0.002+-	0.003	0.010+-	0.020
CA	0.000+-	0.002	0.000+-	0.014
TI	0.001+-	0.001	0.008+-	0.010
V	0.000+-	0.001	0.000+-	0.007
CR	0.000+-	0.001	0.000+-	0.009
MN	0.000+-	0.002	0.000+-	0.010
FE	0.000+-	0.004	0.000+-	0.023
NI	0.001+-	0.002	0.009+-	0.010
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.000+-	0.001	0.000+-	0.007
GA	0.001+-	0.001	0.003+-	0.006
AS	0.000+-	0.004	0.000+-	0.023
SE	0.000+-	0.001	0.002+-	0.008
BR	0.001+-	0.002	0.006+-	0.011
RB	0.000+-	0.002	0.000+-	0.014
SR	0.005+-	0.003	0.033+-	0.018
Y	0.000+-	0.003	0.000+-	0.021
ZR	0.000+-	0.014	0.000+-	0.087
MO	0.003+-	0.010	0.017+-	0.063
PD	0.000+-	0.009	0.000+-	0.055
AG	0.016+-	0.012	0.103+-	0.078
CD	0.008+-	0.017	0.051+-	0.108
IN	0.014+-	0.018	0.088+-	0.118
SN	0.037+-	0.022	0.238+-	0.142
SB	0.020+-	0.041	0.128+-	0.265
BA	0.000+-	0.102	0.000+-	0.657
LA	0.000+-	0.161	0.000+-	1.033
HG	0.003+-	0.002	0.018+-	0.016
PB	0.001+-	0.006	0.005+-	0.038

SAMPLE ID: BP/CATALYTIC CRACKER - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC122 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.025	0.000+-	0.158
SI	0.000+-	0.019	0.000+-	0.120
P	0.000+-	0.010	0.000+-	0.061
S	0.000+-	0.023	0.000+-	0.145
CL	0.004+-	0.010	0.027+-	0.062
K	0.000+-	0.003	0.000+-	0.019
CA	0.000+-	0.002	0.000+-	0.014
TI	0.001+-	0.001	0.009+-	0.009
V	0.001+-	0.001	0.008+-	0.006
CR	0.000+-	0.002	0.000+-	0.011
MN	0.000+-	0.001	0.000+-	0.009
FE	0.006+-	0.004	0.039+-	0.025
NI	0.000+-	0.001	0.000+-	0.009
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.001+-	0.001	0.008+-	0.007
GA	0.000+-	0.001	0.001+-	0.006
AS	0.006+-	0.004	0.040+-	0.025
SE	0.000+-	0.001	0.000+-	0.009
BR	0.002+-	0.002	0.015+-	0.014
RB	0.003+-	0.002	0.019+-	0.015
SR	0.000+-	0.003	0.000+-	0.019
Y	0.000+-	0.003	0.000+-	0.021
ZR	0.000+-	0.014	0.000+-	0.089
MO	0.001+-	0.010	0.008+-	0.067
PD	0.001+-	0.009	0.007+-	0.058
AG	0.008+-	0.011	0.052+-	0.074
CD	0.000+-	0.017	0.000+-	0.112
IN	0.000+-	0.019	0.000+-	0.124
SN	0.000+-	0.024	0.000+-	0.156
SB	0.000+-	0.044	0.000+-	0.280
BA	0.103+-	0.110	0.658+-	0.706
LA	0.000+-	0.171	0.000+-	1.097
HG	0.000+-	0.003	0.000+-	0.017
PB	0.000+-	0.006	0.000+-	0.041

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC034 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 24+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.172+-	0.020	1.105+-	0.130	4.602+-	1.992
SI	0.216+-	0.019	1.389+-	0.123	5.786+-	2.465
P	0.010+-	0.007	0.063+-	0.047	0.263+-	0.224
S	0.000+-	0.045	0.000+-	0.289	0.000+-	1.206
CL	0.850+-	0.054	5.457+-	0.347	22.737+-	9.583
K	0.139+-	0.024	0.891+-	0.152	3.712+-	1.671
CA	0.044+-	0.005	0.285+-	0.032	1.187+-	0.513
TI	0.008+-	0.002	0.049+-	0.010	0.203+-	0.094
V	0.001+-	0.001	0.004+-	0.006	0.018+-	0.026
CR	0.007+-	0.001	0.043+-	0.008	0.177+-	0.082
MN	0.000+-	0.001	0.000+-	0.007	0.000+-	0.030
FE	0.080+-	0.007	0.515+-	0.045	2.148+-	0.914
NI	0.006+-	0.001	0.036+-	0.010	0.152+-	0.075
CU	0.007+-	0.002	0.045+-	0.011	0.189+-	0.091
ZN	0.011+-	0.002	0.073+-	0.013	0.306+-	0.138
GA	0.000+-	0.001	0.001+-	0.006	0.003+-	0.024
AS	0.000+-	0.003	0.000+-	0.017	0.000+-	0.072
SE	0.001+-	0.001	0.007+-	0.006	0.030+-	0.029
BR	0.002+-	0.001	0.012+-	0.009	0.050+-	0.042
RE	0.000+-	0.002	0.000+-	0.010	0.000+-	0.041
SR	0.000+-	0.002	0.000+-	0.013	0.000+-	0.052
Y	0.000+-	0.002	0.000+-	0.014	0.000+-	0.059
ZR	0.020+-	0.010	0.132+-	0.064	0.548+-	0.351
MO	0.000+-	0.007	0.000+-	0.044	0.000+-	0.185
PD	0.000+-	0.006	0.000+-	0.037	0.000+-	0.154
AG	0.000+-	0.008	0.000+-	0.054	0.000+-	0.227
CD	0.008+-	0.012	0.054+-	0.079	0.226+-	0.340
IN	0.005+-	0.014	0.032+-	0.088	0.132+-	0.370
SN	0.000+-	0.018	0.000+-	0.115	0.000+-	0.480
SB	0.033+-	0.032	0.213+-	0.203	0.889+-	0.924
BA	0.000+-	0.076	0.000+-	0.489	0.000+-	2.037
LA	0.238+-	0.120	1.531+-	0.771	6.379+-	4.171
HG	0.000+-	0.002	0.000+-	0.013	0.000+-	0.056
PE	0.008+-	0.004	0.051+-	0.028	0.214+-	0.147

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. 1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF174 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 110+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.398+-	0.028	2.553+-	0.181	2.321+-	0.268
SI	0.409+-	0.024	2.627+-	0.153	2.389+-	0.258
P	0.160+-	0.030	1.025+-	0.190	0.932+-	0.193
S	7.045+-	0.336	45.226+-	2.158	41.114+-	4.221
CL	0.630+-	0.089	4.044+-	0.573	3.676+-	0.619
K	2.097+-	0.099	13.465+-	0.637	12.241+-	1.254
CA	0.036+-	0.008	0.233+-	0.050	0.212+-	0.047
TI	0.003+-	0.001	0.020+-	0.009	0.018+-	0.008
V	0.003+-	0.001	0.017+-	0.007	0.015+-	0.006
CR	0.000+-	0.001	0.000+-	0.008	0.000+-	0.007
MN	0.003+-	0.001	0.016+-	0.009	0.015+-	0.008
FE	0.023+-	0.004	0.149+-	0.027	0.135+-	0.028
NI	0.002+-	0.001	0.013+-	0.009	0.011+-	0.008
CU	0.017+-	0.002	0.108+-	0.014	0.098+-	0.016
ZN	0.041+-	0.003	0.261+-	0.020	0.237+-	0.028
GA	0.002+-	0.001	0.010+-	0.007	0.009+-	0.007
AS	0.004+-	0.004	0.025+-	0.023	0.023+-	0.021
SE	0.000+-	0.001	0.003+-	0.008	0.002+-	0.007
BR	0.009+-	0.002	0.055+-	0.012	0.050+-	0.012
RE	0.000+-	0.002	0.001+-	0.013	0.001+-	0.012
SR	0.002+-	0.002	0.013+-	0.016	0.012+-	0.014
Y	0.000+-	0.003	0.000+-	0.019	0.000+-	0.017
ZR	0.000+-	0.012	0.000+-	0.078	0.000+-	0.071
MO	0.000+-	0.009	0.000+-	0.056	0.000+-	0.051
PD	0.010+-	0.008	0.062+-	0.051	0.056+-	0.046
AG	0.000+-	0.012	0.000+-	0.074	0.000+-	0.068
CD	0.000+-	0.015	0.000+-	0.099	0.000+-	0.090
IN	0.036+-	0.017	0.228+-	0.110	0.207+-	0.102
SN	0.040+-	0.020	0.259+-	0.130	0.235+-	0.120
SB	0.096+-	0.040	0.617+-	0.255	0.561+-	0.238
BA	0.168+-	0.096	1.076+-	0.617	0.978+-	0.568
LA	0.106+-	0.147	0.678+-	0.943	0.617+-	0.859
HG	0.000+-	0.003	0.000+-	0.017	0.000+-	0.015
PB	0.020+-	0.006	0.131+-	0.037	0.119+-	0.035

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: AC035 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 153+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	1.154+- 0.075	7.410+- 0.479	4.857+- 0.447
SI	2.733+- 0.175	17.545+- 1.125	11.501+- 1.055
P	0.089+- 0.027	0.571+- 0.170	0.374+- 0.114
S	0.465+- 0.054	2.988+- 0.347	1.959+- 0.261
CL	4.217+- 0.349	27.073+- 2.244	17.746+- 1.875
K	2.446+- 0.181	15.705+- 1.160	10.295+- 1.017
CA	0.182+- 0.018	1.166+- 0.115	0.764+- 0.090
TI	0.027+- 0.003	0.171+- 0.019	0.112+- 0.015
V	0.002+- 0.001	0.016+- 0.008	0.010+- 0.005
CR	0.015+- 0.002	0.096+- 0.012	0.063+- 0.009
MN	0.009+- 0.002	0.056+- 0.010	0.037+- 0.007
FE	0.313+- 0.020	2.012+- 0.128	1.319+- 0.120
NI	0.012+- 0.002	0.079+- 0.014	0.052+- 0.010
CU	0.025+- 0.003	0.159+- 0.018	0.104+- 0.014
ZN	0.048+- 0.004	0.308+- 0.027	0.202+- 0.022
GA	0.000+- 0.001	0.000+- 0.006	0.000+- 0.004
AS	0.001+- 0.003	0.008+- 0.021	0.005+- 0.014
SE	0.003+- 0.001	0.020+- 0.008	0.013+- 0.005
BR	0.009+- 0.002	0.059+- 0.013	0.039+- 0.009
RB	0.000+- 0.002	0.000+- 0.011	0.000+- 0.007
SR	0.001+- 0.002	0.004+- 0.014	0.003+- 0.009
Y	0.000+- 0.002	0.000+- 0.015	0.000+- 0.010
ZR	0.009+- 0.011	0.060+- 0.068	0.039+- 0.044
MO	0.000+- 0.007	0.000+- 0.048	0.000+- 0.032
PD	0.007+- 0.007	0.048+- 0.044	0.031+- 0.029
AG	0.014+- 0.010	0.093+- 0.066	0.061+- 0.043
CD	0.020+- 0.014	0.126+- 0.087	0.083+- 0.057
IN	0.013+- 0.015	0.085+- 0.095	0.056+- 0.063
SN	0.000+- 0.019	0.000+- 0.120	0.000+- 0.079
SB	0.084+- 0.038	0.539+- 0.244	0.353+- 0.162
BA	0.000+- 0.082	0.000+- 0.529	0.000+- 0.347
LA	0.000+- 0.130	0.000+- 0.832	0.000+- 0.545
HG	0.000+- 0.002	0.000+- 0.015	0.000+- 0.010
PE	0.022+- 0.005	0.143+- 0.034	0.094+- 0.023

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. 2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF175 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 604+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.362+-	0.074	8.746+-	0.476	1.447+-	0.082
SI	6.037+-	0.279	38.760+-	1.791	6.412+-	0.315
P	0.351+-	0.064	2.252+-	0.412	0.373+-	0.068
S	2.714+-	0.140	17.426+-	0.896	2.883+-	0.156
CL	21.854+-	1.009	140.302+-	6.480	23.212+-	1.139
K	9.448+-	0.434	60.655+-	2.786	10.035+-	0.490
CA	0.074+-	0.028	0.478+-	0.178	0.079+-	0.030
TI	0.023+-	0.003	0.150+-	0.020	0.025+-	0.003
V	0.006+-	0.001	0.036+-	0.009	0.006+-	0.001
CR	0.027+-	0.003	0.172+-	0.016	0.028+-	0.003
MN	0.010+-	0.002	0.061+-	0.013	0.010+-	0.002
FE	0.236+-	0.014	1.516+-	0.089	0.251+-	0.015
NI	0.031+-	0.003	0.200+-	0.020	0.033+-	0.003
CU	0.039+-	0.003	0.251+-	0.021	0.042+-	0.004
ZN	0.074+-	0.005	0.477+-	0.031	0.079+-	0.005
GA	0.000+-	0.001	0.001+-	0.009	0.000+-	0.001
AS	0.010+-	0.005	0.067+-	0.032	0.011+-	0.005
SE	0.015+-	0.002	0.095+-	0.012	0.016+-	0.002
BR	0.062+-	0.004	0.395+-	0.026	0.065+-	0.004
RB	0.003+-	0.002	0.021+-	0.016	0.004+-	0.003
SR	0.004+-	0.003	0.029+-	0.019	0.005+-	0.003
Y	0.014+-	0.003	0.091+-	0.022	0.015+-	0.004
ZR	0.002+-	0.014	0.011+-	0.090	0.002+-	0.015
MO	0.000+-	0.010	0.000+-	0.064	0.000+-	0.011
PD	0.000+-	0.008	0.000+-	0.054	0.000+-	0.009
AG	0.019+-	0.013	0.123+-	0.083	0.020+-	0.014
CD	0.000+-	0.018	0.000+-	0.115	0.000+-	0.019
IN	0.004+-	0.019	0.023+-	0.122	0.004+-	0.020
SN	0.045+-	0.023	0.286+-	0.150	0.047+-	0.025
SB	0.562+-	0.063	3.606+-	0.404	0.597+-	0.068
BA	0.034+-	0.107	0.216+-	0.685	0.036+-	0.113
LA	0.000+-	0.168	0.000+-	1.076	0.000+-	0.178
HG	0.000+-	0.003	0.000+-	0.018	0.000+-	0.003
PB	0.074+-	0.008	0.476+-	0.052	0.079+-	0.009

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. 2B
 PARTICLE SIZE: C
 ANALYSIS ID: CC100 - Nuclepore
 PAIRED W/ QUARTZ
 EXPOSED AREA: 6.42 SQUARE CM
 MASS OF DEPOSIT: 208+- 21 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.564+-	0.091	10.040+-	0.585	4.827+-	0.563
SI	2.008+-	0.107	12.892+-	0.689	6.198+-	0.708
P	0.133+-	0.029	0.853+-	0.185	0.410+-	0.098
S	1.009+-	0.066	6.479+-	0.422	3.115+-	0.374
CL	9.857+-	0.506	63.280+-	3.250	30.423+-	3.446
K	3.840+-	0.197	24.655+-	1.263	11.853+-	1.342
CA	0.214+-	0.020	1.374+-	0.130	0.661+-	0.091
TI	0.041+-	0.004	0.262+-	0.024	0.126+-	0.017
V	0.002+-	0.001	0.014+-	0.009	0.007+-	0.004
CR	0.007+-	0.002	0.043+-	0.013	0.021+-	0.006
MN	0.010+-	0.002	0.062+-	0.011	0.030+-	0.006
FE	0.301+-	0.018	1.931+-	0.117	0.928+-	0.109
NI	0.008+-	0.002	0.050+-	0.013	0.024+-	0.007
CU	0.028+-	0.003	0.180+-	0.019	0.087+-	0.013
ZN	0.061+-	0.004	0.394+-	0.029	0.189+-	0.024
GA	0.001+-	0.001	0.005+-	0.007	0.002+-	0.003
AS	0.000+-	0.004	0.000+-	0.028	0.000+-	0.013
SE	0.009+-	0.002	0.057+-	0.011	0.027+-	0.006
BR	0.019+-	0.003	0.125+-	0.018	0.060+-	0.011
RB	0.008+-	0.003	0.051+-	0.017	0.024+-	0.008
SR	0.000+-	0.003	0.000+-	0.019	0.000+-	0.009
Y	0.004+-	0.003	0.028+-	0.022	0.014+-	0.010
ZR	0.005+-	0.014	0.035+-	0.091	0.017+-	0.044
MO	0.007+-	0.011	0.042+-	0.068	0.020+-	0.033
PD	0.001+-	0.008	0.005+-	0.049	0.002+-	0.023
AG	0.002+-	0.013	0.011+-	0.085	0.005+-	0.041
CD	0.000+-	0.017	0.000+-	0.110	0.000+-	0.053
IN	0.014+-	0.020	0.093+-	0.132	0.044+-	0.063
SN	0.020+-	0.025	0.125+-	0.161	0.060+-	0.078
SB	0.207+-	0.051	1.328+-	0.324	0.639+-	0.169
BA	0.042+-	0.112	0.267+-	0.720	0.128+-	0.346
LA	0.000+-	0.175	0.000+-	1.122	0.000+-	0.539
HB	0.004+-	0.003	0.026+-	0.020	0.012+-	0.009
PB	0.036+-	0.007	0.228+-	0.045	0.110+-	0.024

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. RS-1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC042 - Teflon
 ATLANTIC BAGHOUSE RESUSPENSION
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 4939+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	1.100	0.000+-	7.063	0.000+-	0.143
SI	0.000+-	0.720	0.000+-	4.623	0.000+-	0.094
P	0.000+-	0.360	0.000+-	2.312	0.000+-	0.047
S	21.412+-	1.140	137.464+-	7.320	2.783+-	0.148
CL	274.377+-	14.000	1761.50+-	89.880	35.662+-	1.821
K	65.078+-	4.318	546.200+-	27.719	11.058+-	0.562
CA	1.014+-	0.232	6.510+-	1.488	0.132+-	0.030
TI	0.076+-	0.006	0.490+-	0.037	0.010+-	0.001
V	0.019+-	0.002	0.121+-	0.014	0.002+-	0.000
CR	0.022+-	0.003	0.143+-	0.016	0.003+-	0.000
MN	0.051+-	0.004	0.330+-	0.024	0.007+-	0.000
FE	0.355+-	0.021	2.282+-	0.136	0.046+-	0.003
NI	0.031+-	0.003	0.201+-	0.022	0.004+-	0.000
CU	0.133+-	0.008	0.853+-	0.053	0.017+-	0.001
ZN	0.384+-	0.021	2.467+-	0.134	0.050+-	0.003
GA	0.000+-	0.009	0.000+-	0.060	0.000+-	0.001
AS	0.000+-	0.037	0.000+-	0.236	0.000+-	0.005
SE	0.029+-	0.010	0.188+-	0.066	0.004+-	0.001
BR	0.263+-	0.016	1.688+-	0.103	0.034+-	0.002
RB	0.074+-	0.006	0.477+-	0.036	0.010+-	0.001
SR	0.059+-	0.005	0.381+-	0.033	0.008+-	0.001
Y	0.009+-	0.009	0.057+-	0.060	0.001+-	0.001
ZR	0.000+-	0.021	0.000+-	0.134	0.000+-	0.003
MO	0.152+-	0.014	0.976+-	0.091	0.020+-	0.002
PD	0.045+-	0.011	0.289+-	0.074	0.006+-	0.001
AG	0.037+-	0.015	0.240+-	0.096	0.005+-	0.002
CD	0.093+-	0.020	0.598+-	0.132	0.012+-	0.003
IN	0.035+-	0.020	0.222+-	0.131	0.004+-	0.003
SN	0.082+-	0.027	0.526+-	0.172	0.011+-	0.003
SB	0.320+-	0.057	2.053+-	0.366	0.042+-	0.007
BA	0.000+-	0.119	0.000+-	0.762	0.000+-	0.015
LA	0.188+-	0.183	1.207+-	1.175	0.024+-	0.024
HG	0.015+-	0.006	0.093+-	0.040	0.002+-	0.001
PB	6.119+-	0.314	39.286+-	2.018	0.795+-	0.041

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. RS-1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF183- Teflon
 ATLANTIC METALS B. H. RESUSP.
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 624+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.382	0.000+-	2.455	0.000+-	0.393
SI	0.000+-	0.241	0.000+-	1.550	0.000+-	0.248
P	0.000+-	0.181	0.000+-	1.163	0.000+-	0.186
S	4.173+-	0.217	26.790+-	1.394	4.291+-	0.234
CL	38.787+-	1.786	249.013+-	11.466	39.882+-	1.944
K	13.714+-	0.628	88.045+-	4.034	14.101+-	0.684
CA	0.158+-	0.036	1.013+-	0.232	0.162+-	0.037
TI	0.012+-	0.002	0.078+-	0.012	0.013+-	0.002
V	0.003+-	0.001	0.021+-	0.006	0.003+-	0.001
CR	0.002+-	0.001	0.014+-	0.007	0.002+-	0.001
MN	0.005+-	0.001	0.035+-	0.008	0.006+-	0.001
FE	0.085+-	0.007	0.545+-	0.042	0.087+-	0.007
NI	0.005+-	0.001	0.032+-	0.009	0.005+-	0.001
CU	0.032+-	0.003	0.205+-	0.018	0.033+-	0.003
ZN	0.069+-	0.004	0.444+-	0.028	0.071+-	0.005
GA	0.002+-	0.004	0.013+-	0.022	0.002+-	0.004
AS	0.038+-	0.016	0.243+-	0.101	0.039+-	0.016
SE	0.009+-	0.003	0.058+-	0.019	0.009+-	0.003
BR	0.035+-	0.003	0.225+-	0.021	0.036+-	0.003
RE	0.009+-	0.002	0.055+-	0.012	0.009+-	0.002
SR	0.008+-	0.002	0.051+-	0.013	0.008+-	0.002
Y	0.005+-	0.004	0.032+-	0.023	0.005+-	0.004
ZR	0.000+-	0.011	0.000+-	0.068	0.000+-	0.011
MO	0.011+-	0.007	0.068+-	0.042	0.011+-	0.007
PD	0.009+-	0.006	0.057+-	0.041	0.009+-	0.007
AG	0.017+-	0.009	0.110+-	0.058	0.018+-	0.009
CD	0.033+-	0.012	0.209+-	0.077	0.033+-	0.012
IN	0.021+-	0.013	0.133+-	0.081	0.021+-	0.013
SN	0.032+-	0.016	0.205+-	0.104	0.033+-	0.017
SB	0.139+-	0.034	0.890+-	0.219	0.142+-	0.035
BA	0.000+-	0.076	0.000+-	0.490	0.000+-	0.079
LA	0.000+-	0.120	0.000+-	0.771	0.000+-	0.124
HG	0.004+-	0.003	0.023+-	0.020	0.004+-	0.003
PB	1.740+-	0.081	11.168+-	0.523	1.789+-	0.089

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. RS-2A
 PARTICLE SIZE: C
 ANALYSIS ID: CC111 - Teflon
 ATLANTIC METALS BH DUST RESUSPENSION
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 2916+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	0.000+- 1.400	0.000+- 8.988	0.000+- 0.308
SI	0.000+- 0.880	0.000+- 5.650	0.000+- 0.194
P	0.000+- 0.660	0.000+- 4.237	0.000+- 0.145
S	13.881+- 0.738	89.116+- 4.737	3.056+- 0.163
CL	171.732+- 8.765	1102.52+- 56.270	37.805+- 1.934
K	55.632+- 2.818	357.157+- 18.093	12.247+- 0.622
CA	0.555+- 0.150	3.565+- 0.963	0.122+- 0.033
TI	0.048+- 0.004	0.311+- 0.026	0.011+- 0.001
V	0.008+- 0.002	0.049+- 0.011	0.002+- 0.000
CR	0.007+- 0.002	0.044+- 0.014	0.002+- 0.000
MIN	0.022+- 0.003	0.141+- 0.016	0.005+- 0.001
FE	0.180+- 0.012	1.156+- 0.080	0.040+- 0.003
NI	0.016+- 0.003	0.104+- 0.017	0.004+- 0.001
CU	0.071+- 0.005	0.455+- 0.034	0.016+- 0.001
ZN	0.216+- 0.012	1.387+- 0.080	0.048+- 0.003
GA	0.004+- 0.006	0.028+- 0.037	0.001+- 0.001
AS	0.000+- 0.024	0.000+- 0.153	0.000+- 0.005
SE	0.021+- 0.006	0.137+- 0.037	0.005+- 0.001
BR	0.146+- 0.009	0.938+- 0.061	0.032+- 0.002
RB	0.045+- 0.004	0.288+- 0.027	0.010+- 0.001
SR	0.024+- 0.004	0.157+- 0.026	0.005+- 0.001
Y	0.000+- 0.006	0.000+- 0.040	0.000+- 0.001
ZR	0.000+- 0.018	0.000+- 0.118	0.000+- 0.004
MO	0.070+- 0.013	0.449+- 0.085	0.015+- 0.003
PD	0.000+- 0.011	0.000+- 0.068	0.000+- 0.002
AG	0.020+- 0.016	0.128+- 0.102	0.004+- 0.004
CD	0.000+- 0.021	0.000+- 0.135	0.000+- 0.005
IN	0.000+- 0.024	0.000+- 0.156	0.000+- 0.005
SN	0.000+- 0.027	0.000+- 0.176	0.000+- 0.006
SB	0.109+- 0.054	0.697+- 0.345	0.024+- 0.012
BA	0.071+- 0.127	0.456+- 0.817	0.016+- 0.028
LA	0.000+- 0.198	0.000+- 1.271	0.000+- 0.044
HG	0.007+- 0.005	0.042+- 0.032	0.001+- 0.001
PB	3.124+- 0.163	20.054+- 1.048	0.688+- 0.036

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - TEST NO. RS-2A
 PARTICLE SIZE: F
 ANALYSIS ID: AF184 - Teflon
 ATLANTIC METALS B. H. RESUSP.
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 187+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.000+-	0.131	0.000+-	0.840	0.000+-	0.450
SI	0.000+-	0.074	0.000+-	0.478	0.000+-	0.256
P	0.000+-	0.061	0.000+-	0.394	0.000+-	0.211
S	1.251+-	0.082	8.029+-	0.529	4.302+-	0.365
CL	12.214+-	0.567	78.412+-	3.642	42.011+-	2.979
K	3.300+-	0.205	21.184+-	1.318	11.350+-	0.932
CA	0.061+-	0.013	0.392+-	0.086	0.210+-	0.047
TI	0.004+-	0.001	0.024+-	0.008	0.013+-	0.004
V	0.002+-	0.001	0.012+-	0.006	0.006+-	0.003
CR	0.000+-	0.001	0.000+-	0.007	0.000+-	0.004
MN	0.001+-	0.001	0.009+-	0.008	0.005+-	0.004
FE	0.031+-	0.004	0.200+-	0.027	0.107+-	0.016
NI	0.003+-	0.001	0.020+-	0.009	0.011+-	0.005
CU	0.010+-	0.002	0.061+-	0.011	0.033+-	0.006
ZN	0.023+-	0.002	0.147+-	0.014	0.079+-	0.008
GA	0.000+-	0.002	0.000+-	0.014	0.000+-	0.003
AS	0.017+-	0.010	0.111+-	0.066	0.059+-	0.036
SE	0.002+-	0.002	0.013+-	0.011	0.007+-	0.006
BR	0.012+-	0.002	0.078+-	0.013	0.042+-	0.007
RB	0.003+-	0.002	0.020+-	0.012	0.010+-	0.006
SR	0.006+-	0.002	0.036+-	0.014	0.019+-	0.003
Y	0.005+-	0.003	0.031+-	0.019	0.017+-	0.010
ZR	0.030+-	0.011	0.193+-	0.071	0.104+-	0.038
MO	0.019+-	0.008	0.121+-	0.050	0.065+-	0.027
PD	0.002+-	0.007	0.014+-	0.045	0.008+-	0.024
AG	0.000+-	0.010	0.000+-	0.061	0.000+-	0.033
CD	0.029+-	0.013	0.186+-	0.086	0.100+-	0.047
IN	0.048+-	0.015	0.310+-	0.099	0.166+-	0.054
SN	0.003+-	0.018	0.019+-	0.114	0.010+-	0.061
SB	0.000+-	0.033	0.000+-	0.213	0.000+-	0.114
BA	0.135+-	0.087	0.865+-	0.557	0.464+-	0.299
LA	0.107+-	0.130	0.685+-	0.832	0.367+-	0.446
HG	0.000+-	0.003	0.002+-	0.017	0.001+-	0.009
PB	0.776+-	0.038	4.980+-	0.242	2.668+-	0.193

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF241 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.003+-	0.014	0.022+-	0.087
SI	0.000+-	0.009	0.000+-	0.055
P	0.000+-	0.004	0.000+-	0.029
S	0.000+-	0.026	0.000+-	0.165
CL	0.000+-	0.010	0.002+-	0.062
K	0.004+-	0.003	0.026+-	0.021
CA	0.000+-	0.002	0.000+-	0.015
TI	0.000+-	0.001	0.000+-	0.009
V	0.001+-	0.001	0.009+-	0.007
CR	0.000+-	0.001	0.000+-	0.008
MN	0.000+-	0.002	0.000+-	0.010
FE	0.000+-	0.004	0.000+-	0.024
NI	0.000+-	0.001	0.000+-	0.008
CU	0.000+-	0.002	0.000+-	0.011
ZN	0.000+-	0.001	0.000+-	0.007
GA	0.000+-	0.001	0.002+-	0.006
AS	0.000+-	0.004	0.000+-	0.024
SE	0.001+-	0.001	0.009+-	0.009
BR	0.001+-	0.002	0.006+-	0.011
RB	0.000+-	0.002	0.001+-	0.015
SR	0.006+-	0.003	0.039+-	0.018
Y	0.000+-	0.003	0.000+-	0.021
ZR	0.000+-	0.014	0.000+-	0.089
MO	0.000+-	0.010	0.000+-	0.064
PD	0.000+-	0.009	0.000+-	0.055
AG	0.011+-	0.012	0.069+-	0.078
CD	0.006+-	0.017	0.038+-	0.109
IN	0.026+-	0.019	0.165+-	0.122
SN	0.019+-	0.022	0.125+-	0.142
SB	0.026+-	0.042	0.168+-	0.271
BA	0.000+-	0.104	0.000+-	0.670
LA	0.000+-	0.166	0.000+-	1.068
HG	0.001+-	0.002	0.009+-	0.015
PB	0.007+-	0.006	0.043+-	0.039

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: AC076 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.005+-	0.013	0.034+-	0.082
SI	0.000+-	0.009	0.000+-	0.058
P	0.000+-	0.004	0.000+-	0.024
S	0.000+-	0.019	0.000+-	0.125
CL	0.001+-	0.006	0.009+-	0.041
K	0.000+-	0.002	0.000+-	0.016
CA	0.000+-	0.002	0.000+-	0.011
TI	0.000+-	0.001	0.000+-	0.008
V	0.000+-	0.001	0.002+-	0.006
CR	0.001+-	0.001	0.007+-	0.007
MN	0.000+-	0.001	0.000+-	0.008
FE	0.001+-	0.003	0.006+-	0.019
NI	0.001+-	0.001	0.008+-	0.008
CU	0.000+-	0.001	0.000+-	0.008
ZN	0.000+-	0.001	0.000+-	0.005
GA	0.000+-	0.001	0.000+-	0.005
AS	0.000+-	0.003	0.000+-	0.018
SE	0.000+-	0.001	0.000+-	0.007
BR	0.000+-	0.001	0.000+-	0.009
RB	0.001+-	0.002	0.009+-	0.011
SR	0.000+-	0.002	0.001+-	0.014
Y	0.000+-	0.003	0.000+-	0.016
ZR	0.000+-	0.011	0.000+-	0.070
MO	0.000+-	0.008	0.000+-	0.049
PD	0.001+-	0.007	0.004+-	0.043
AG	0.000+-	0.009	0.000+-	0.060
CD	0.029+-	0.013	0.189+-	0.085
IN	0.000+-	0.015	0.000+-	0.096
SN	0.002+-	0.019	0.015+-	0.120
SB	0.000+-	0.034	0.000+-	0.216
BA	0.094+-	0.084	0.606+-	0.542
LA	0.094+-	0.131	0.601+-	0.840
HG	0.002+-	0.002	0.011+-	0.016
PB	0.009+-	0.005	0.055+-	0.031

SAMPLE ID: ATLANTIC METALS/SEC. ALUMINUM SMELTER - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC121 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.002+-	0.025	0.010+-	0.160
SI	0.000+-	0.019	0.000+-	0.122
P	0.000+-	0.010	0.000+-	0.062
S	0.000+-	0.023	0.000+-	0.145
CL	0.000+-	0.009	0.000+-	0.060
K	0.000+-	0.003	0.000+-	0.019
CA	0.000+-	0.002	0.000+-	0.014
TI	0.001+-	0.001	0.007+-	0.009
V	0.001+-	0.001	0.003+-	0.006
CR	0.000+-	0.002	0.000+-	0.011
MN	0.000+-	0.002	0.000+-	0.010
FE	0.000+-	0.004	0.003+-	0.023
NI	0.001+-	0.001	0.005+-	0.009
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.002+-	0.001	0.015+-	0.007
GA	0.001+-	0.001	0.004+-	0.007
AS	0.006+-	0.004	0.039+-	0.025
SE	0.000+-	0.001	0.000+-	0.009
BR	0.003+-	0.002	0.019+-	0.014
RB	0.003+-	0.002	0.022+-	0.015
SR	0.000+-	0.003	0.000+-	0.019
Y	0.000+-	0.003	0.000+-	0.021
ZR	0.000+-	0.014	0.000+-	0.089
MO	0.000+-	0.010	0.000+-	0.067
PD	0.000+-	0.009	0.000+-	0.057
AG	0.019+-	0.012	0.120+-	0.076
CD	0.000+-	0.018	0.000+-	0.113
IN	0.002+-	0.020	0.014+-	0.128
SN	0.003+-	0.025	0.022+-	0.157
SB	0.000+-	0.044	0.000+-	0.282
BA	0.090+-	0.110	0.576+-	0.706
LA	0.000+-	0.171	0.000+-	1.098
HG	0.000+-	0.003	0.000+-	0.017
PB	0.000+-	0.006	0.000+-	0.041

SAMPLE ID: E.C. INCINERATOR - TEST NO. 1A
 PARTICLE SIZE: C
 ANALYSIS ID: AC036 - Teflon
 BUILD UP OF DEPOSIT AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 131+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	1.431+- 0.099	9.188+- 0.636	6.990+- 0.719
SI	2.094+- 0.136	13.446+- 0.872	10.230+- 1.023
P	0.228+- 0.074	1.463+- 0.475	1.113+- 0.371
S	0.769+- 0.107	4.940+- 0.690	3.758+- 0.598
CL	2.849+- 0.422	18.289+- 2.708	13.914+- 2.316
K	1.123+- 0.181	7.208+- 1.162	5.483+- 0.977
CA	1.451+- 0.080	9.317+- 0.514	7.088+- 0.666
TI	0.273+- 0.016	1.750+- 0.101	1.331+- 0.127
V	0.002+- 0.002	0.014+- 0.015	0.011+- 0.011
CR	0.062+- 0.004	0.398+- 0.027	0.303+- 0.031
MN	0.026+- 0.003	0.170+- 0.016	0.129+- 0.016
FE	0.479+- 0.029	3.077+- 0.188	2.341+- 0.228
NI	0.031+- 0.003	0.200+- 0.022	0.152+- 0.020
CU	0.025+- 0.004	0.163+- 0.026	0.124+- 0.022
ZN	0.845+- 0.167	5.424+- 1.075	4.126+- 0.976
GA	0.006+- 0.004	0.038+- 0.027	0.029+- 0.021
AS	0.016+- 0.013	0.101+- 0.084	0.077+- 0.064
SE	0.003+- 0.002	0.020+- 0.015	0.015+- 0.012
BR	0.037+- 0.007	0.236+- 0.045	0.179+- 0.037
RB	0.000+- 0.002	0.001+- 0.013	0.001+- 0.010
SR	0.009+- 0.002	0.061+- 0.014	0.046+- 0.012
Y	0.000+- 0.003	0.000+- 0.020	0.000+- 0.015
ZR	0.012+- 0.010	0.080+- 0.065	0.061+- 0.050
MO	0.003+- 0.007	0.016+- 0.044	0.012+- 0.034
PD	0.000+- 0.006	0.001+- 0.039	0.001+- 0.029
AG	0.009+- 0.009	0.057+- 0.059	0.044+- 0.045
CD	0.018+- 0.015	0.116+- 0.093	0.088+- 0.071
IN	0.000+- 0.013	0.000+- 0.083	0.000+- 0.063
SN	0.006+- 0.022	0.042+- 0.140	0.032+- 0.107
SB	0.000+- 0.031	0.000+- 0.196	0.000+- 0.149
BA	0.036+- 0.076	0.233+- 0.487	0.177+- 0.371
LA	0.000+- 0.121	0.000+- 0.776	0.000+- 0.590
HB	0.000+- 0.003	0.000+- 0.018	0.000+- 0.014
PB	0.299+- 0.065	1.923+- 0.417	1.463+- 0.336

SAMPLE ID: E.C. INCINERATOR - TEST NO. 1A
 PARTICLE SIZE: F
 ANALYSIS ID: AF176 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1016+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.520+-	0.179	16.180+-	1.147	1.593+-	0.114
SI	4.640+-	0.215	29.787+-	1.383	2.933+-	0.139
P	1.188+-	0.216	7.629+-	1.385	0.751+-	0.137
S	6.091+-	0.395	39.103+-	2.535	3.850+-	0.252
CL	42.137+-	1.909	270.517+-	12.259	26.637+-	1.235
K	18.633+-	0.863	119.626+-	5.538	11.779+-	0.558
CA	0.488+-	0.061	3.132+-	0.389	0.308+-	0.038
TI	0.087+-	0.006	0.556+-	0.037	0.055+-	0.004
V	0.009+-	0.002	0.057+-	0.010	0.006+-	0.001
CR	0.029+-	0.002	0.189+-	0.015	0.019+-	0.002
MN	0.039+-	0.003	0.248+-	0.017	0.024+-	0.002
FE	0.417+-	0.022	2.680+-	0.141	0.264+-	0.014
NI	0.050+-	0.004	0.323+-	0.025	0.032+-	0.003
CU	0.236+-	0.012	1.512+-	0.078	0.149+-	0.008
ZN	18.804+-	0.856	120.720+-	5.496	11.887+-	0.554
GA	0.023+-	0.015	0.147+-	0.094	0.014+-	0.009
AS	0.025+-	0.038	0.157+-	0.245	0.015+-	0.024
SE	0.003+-	0.010	0.016+-	0.067	0.002+-	0.007
BR	0.644+-	0.031	4.136+-	0.200	0.407+-	0.020
RE	0.031+-	0.004	0.199+-	0.026	0.020+-	0.003
SR	0.013+-	0.003	0.084+-	0.020	0.008+-	0.002
Y	0.000+-	0.009	0.000+-	0.059	0.000+-	0.006
ZR	0.048+-	0.016	0.308+-	0.105	0.030+-	0.010
MO	0.000+-	0.007	0.000+-	0.048	0.000+-	0.005
PD	0.031+-	0.007	0.199+-	0.048	0.020+-	0.005
AG	0.035+-	0.010	0.227+-	0.065	0.022+-	0.006
CD	0.412+-	0.030	2.644+-	0.190	0.260+-	0.019
IN	0.000+-	0.015	0.000+-	0.094	0.000+-	0.009
SN	0.998+-	0.056	6.408+-	0.362	0.631+-	0.036
SB	0.264+-	0.042	1.692+-	0.268	0.167+-	0.026
BA	0.000+-	0.080	0.000+-	0.512	0.000+-	0.050
LA	0.000+-	0.131	0.000+-	0.840	0.000+-	0.083
HG	0.017+-	0.006	0.108+-	0.038	0.011+-	0.004
PB	7.233+-	0.332	46.437+-	2.128	4.573+-	0.214

SAMPLE ID: E.C. INCINERATOR - TEST NO. 2A
 PARTICLE SIZE: C
 ANALYSIS ID: AC037 - Teflon
 BUILD UP OF DEPOSIT AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 220+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.780+-	0.119	11.425+-	0.761	5.191+-	0.418
SI	2.345+-	0.146	15.052+-	0.937	6.838+-	0.527
P	0.297+-	0.099	1.906+-	0.639	0.866+-	0.293
S	1.255+-	0.166	8.060+-	1.068	3.662+-	0.513
CL	4.511+-	0.662	28.958+-	4.252	13.156+-	2.022
K	1.377+-	0.232	8.840+-	1.489	4.016+-	0.701
CA	2.349+-	0.131	15.082+-	0.844	6.852+-	0.494
TI	0.331+-	0.019	2.123+-	0.121	0.964+-	0.070
V	0.003+-	0.003	0.021+-	0.017	0.010+-	0.008
CR	0.070+-	0.005	0.450+-	0.031	0.204+-	0.017
MN	0.028+-	0.003	0.179+-	0.018	0.082+-	0.009
FE	0.645+-	0.040	4.142+-	0.254	1.882+-	0.144
NI	0.034+-	0.004	0.219+-	0.024	0.099+-	0.012
CU	0.028+-	0.006	0.178+-	0.036	0.081+-	0.017
ZN	0.915+-	0.210	5.874+-	1.349	2.668+-	0.625
GA	0.000+-	0.006	0.000+-	0.038	0.000+-	0.017
AS	0.000+-	0.020	0.000+-	0.130	0.000+-	0.059
SE	0.002+-	0.005	0.012+-	0.029	0.006+-	0.013
BR	0.030+-	0.006	0.190+-	0.038	0.086+-	0.018
RE	0.002+-	0.002	0.011+-	0.014	0.005+-	0.007
SR	0.015+-	0.003	0.095+-	0.017	0.043+-	0.008
Y	0.000+-	0.005	0.000+-	0.030	0.000+-	0.014
ZR	0.017+-	0.012	0.110+-	0.077	0.050+-	0.035
MO	0.002+-	0.008	0.013+-	0.049	0.006+-	0.022
PD	0.000+-	0.007	0.001+-	0.044	0.000+-	0.020
AG	0.000+-	0.010	0.000+-	0.062	0.000+-	0.028
CD	0.021+-	0.017	0.137+-	0.106	0.062+-	0.048
IN	0.009+-	0.015	0.056+-	0.095	0.025+-	0.043
SN	0.032+-	0.030	0.206+-	0.192	0.094+-	0.088
SB	0.035+-	0.036	0.228+-	0.231	0.103+-	0.105
BA	0.025+-	0.083	0.158+-	0.530	0.072+-	0.241
LA	0.000+-	0.129	0.000+-	0.828	0.000+-	0.376
HG	0.009+-	0.004	0.057+-	0.026	0.026+-	0.012
PB	0.545+-	0.139	3.497+-	0.890	1.589+-	0.411

SAMPLE ID: E.C. INCINERATOR - TEST NO. 2A

PARTICLE SIZE: F

ANALYSIS ID: AF177 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 1579+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT
AL	3.298+-	0.189	21.174+-	1.210	1.341+- 0.077
SI	4.225+-	0.197	27.126+-	1.263	1.718+- 0.081
P	1.673+-	0.304	10.740+-	1.949	0.680+- 0.124
S	7.147+-	0.691	45.883+-	4.434	2.906+- 0.281
CL	65.910+-	3.050	423.142+-	19.584	26.800+- 1.252
K	24.030+-	1.120	154.273+-	7.187	9.771+- 0.459
CA	1.008+-	0.099	6.470+-	0.634	0.410+- 0.040
TI	0.114+-	0.007	0.735+-	0.047	0.047+- 0.003
V	0.020+-	0.002	0.128+-	0.015	0.008+- 0.001
CR	0.040+-	0.003	0.254+-	0.020	0.016+- 0.001
MN	0.059+-	0.004	0.382+-	0.025	0.024+- 0.002
FE	0.784+-	0.039	5.036+-	0.249	0.319+- 0.016
NI	0.065+-	0.005	0.415+-	0.031	0.026+- 0.002
CU	0.438+-	0.021	2.811+-	0.138	0.178+- 0.009
ZN	24.505+-	1.115	157.320+-	7.160	9.964+- 0.458
GA	0.025+-	0.024	0.163+-	0.154	0.010+- 0.010
AS	0.034+-	0.071	0.216+-	0.454	0.014+- 0.029
SE	0.000+-	0.023	0.000+-	0.149	0.000+- 0.009
BR	0.405+-	0.026	2.599+-	0.166	0.165+- 0.011
RB	0.047+-	0.005	0.301+-	0.035	0.019+- 0.002
SR	0.025+-	0.006	0.158+-	0.037	0.010+- 0.002
Y	0.000+-	0.019	0.000+-	0.123	0.000+- 0.008
ZR	0.000+-	0.031	0.000+-	0.202	0.000+- 0.013
MO	0.000+-	0.012	0.000+-	0.076	0.000+- 0.005
PD	0.084+-	0.012	0.538+-	0.078	0.034+- 0.005
AG	0.051+-	0.015	0.330+-	0.094	0.021+- 0.006
CD	0.605+-	0.041	3.882+-	0.263	0.246+- 0.017
IN	0.039+-	0.021	0.247+-	0.133	0.016+- 0.008
SN	2.145+-	0.110	13.774+-	0.705	0.872+- 0.045
SB	0.537+-	0.064	3.450+-	0.414	0.219+- 0.026
BA	0.054+-	0.112	0.344+-	0.722	0.022+- 0.046
LA	0.174+-	0.181	1.119+-	1.165	0.071+- 0.074
HG	0.000+-	0.010	0.000+-	0.062	0.000+- 0.004
PB	16.296+-	0.744	104.623+-	4.778	6.626+- 0.305

SAMPLE ID: E.C. INCINERATOR - TEST NO. 2B
 PARTICLE SIZE: C
 ANALYSIS ID: CC101 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 168+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.431+-	0.104	9.187+-	0.667	5.476+-	0.514
SI	1.815+-	0.123	11.655+-	0.787	6.947+-	0.626
P	0.159+-	0.080	1.021+-	0.515	0.608+-	0.309
S	0.895+-	0.155	5.745+-	0.998	3.424+-	0.629
CL	1.850+-	0.607	11.879+-	3.898	7.080+-	2.361
K	0.433+-	0.213	2.777+-	1.365	1.655+-	0.819
CA	2.190+-	0.120	14.059+-	0.772	8.380+-	0.679
TI	0.254+-	0.015	1.632+-	0.096	0.973+-	0.081
V	0.002+-	0.002	0.014+-	0.015	0.009+-	0.009
CR	0.061+-	0.005	0.394+-	0.029	0.235+-	0.022
MN	0.021+-	0.003	0.135+-	0.017	0.080+-	0.011
FE	0.515+-	0.033	3.308+-	0.213	1.971+-	0.173
NI	0.023+-	0.003	0.149+-	0.021	0.089+-	0.014
CU	0.005+-	0.005	0.031+-	0.033	0.019+-	0.019
ZN	0.001+-	0.194	0.009+-	1.244	0.005+-	0.742
GA	0.002+-	0.005	0.014+-	0.035	0.008+-	0.021
AS	0.016+-	0.018	0.100+-	0.119	0.060+-	0.071
SE	0.001+-	0.004	0.006+-	0.027	0.004+-	0.016
BR	0.015+-	0.006	0.099+-	0.037	0.059+-	0.022
RB	0.000+-	0.003	0.000+-	0.018	0.000+-	0.011
SR	0.007+-	0.003	0.047+-	0.021	0.028+-	0.013
Y	0.006+-	0.005	0.039+-	0.032	0.023+-	0.019
ZR	0.000+-	0.015	0.000+-	0.096	0.000+-	0.057
MO	0.017+-	0.011	0.112+-	0.070	0.066+-	0.042
PD	0.004+-	0.008	0.023+-	0.052	0.014+-	0.031
AG	0.000+-	0.013	0.000+-	0.085	0.000+-	0.051
CD	0.000+-	0.020	0.000+-	0.127	0.000+-	0.075
IN	0.001+-	0.020	0.007+-	0.130	0.004+-	0.077
SN	0.000+-	0.032	0.000+-	0.206	0.000+-	0.123
SB	0.038+-	0.047	0.242+-	0.303	0.144+-	0.181
BA	0.078+-	0.113	0.498+-	0.724	0.297+-	0.432
LA	0.000+-	0.175	0.000+-	1.123	0.000+-	0.669
HG	0.012+-	0.005	0.075+-	0.029	0.045+-	0.018
PB	0.000+-	0.126	0.000+-	0.806	0.000+-	0.480

SAMPLE ID: E.C. INCINERATOR - TEST NO. 28

PARTICLE SIZE: F

ANALYSIS ID: AF178 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 1672+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	3.289+-	0.194	21.113+-	1.248	1.263+-	0.075
SI	4.552+-	0.213	29.224+-	1.365	1.748+-	0.082
P	1.880+-	0.341	12.067+-	2.189	0.722+-	0.131
S	8.574+-	0.776	55.044+-	4.983	3.292+-	0.299
CL	74.002+-	3.407	475.092+-	21.875	28.411+-	1.319
K	26.774+-	1.246	171.892+-	8.002	10.279+-	0.482
CA	0.801+-	0.097	5.143+-	0.623	0.308+-	0.037
TI	0.100+-	0.007	0.642+-	0.043	0.038+-	0.003
V	0.016+-	0.002	0.100+-	0.014	0.006+-	0.001
CR	0.038+-	0.003	0.243+-	0.020	0.015+-	0.001
MN	0.060+-	0.004	0.385+-	0.025	0.023+-	0.002
FE	0.774+-	0.038	4.972+-	0.247	0.297+-	0.015
NI	0.073+-	0.005	0.472+-	0.034	0.028+-	0.002
CU	0.498+-	0.024	3.196+-	0.155	0.191+-	0.009
ZN	27.144+-	1.235	174.262+-	7.930	10.421+-	0.478
GA	0.043+-	0.026	0.278+-	0.169	0.017+-	0.010
AS	0.058+-	0.077	0.372+-	0.493	0.022+-	0.030
SE	0.006+-	0.026	0.035+-	0.165	0.002+-	0.010
BR	0.445+-	0.028	2.856+-	0.183	0.171+-	0.011
RE	0.062+-	0.006	0.399+-	0.040	0.024+-	0.002
SR	0.031+-	0.006	0.197+-	0.040	0.012+-	0.002
Y	0.000+-	0.021	0.000+-	0.135	0.000+-	0.008
ZR	0.000+-	0.035	0.000+-	0.222	0.000+-	0.013
MO	0.084+-	0.013	0.540+-	0.080	0.032+-	0.005
PD	0.073+-	0.012	0.470+-	0.078	0.028+-	0.005
AG	0.077+-	0.016	0.496+-	0.105	0.030+-	0.006
CD	0.664+-	0.044	4.260+-	0.283	0.255+-	0.017
IN	0.010+-	0.022	0.067+-	0.139	0.004+-	0.008
SN	2.332+-	0.119	14.972+-	0.762	0.895+-	0.046
SB	0.517+-	0.067	3.320+-	0.428	0.199+-	0.026
BA	0.081+-	0.121	0.519+-	0.777	0.031+-	0.046
LA	0.000+-	0.191	0.000+-	1.228	0.000+-	0.073
HG	0.040+-	0.011	0.255+-	0.068	0.015+-	0.004
PE	18.033+-	0.823	115.771+-	5.285	6.923+-	0.319

SAMPLE ID: E.C. INCINERATOR - TEST NO. 3A

PARTICLE SIZE: C

ANALYSIS ID: AC038 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 287+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.883+-	0.192	18.510+-	1.232	6.457+-	0.485
SI	4.022+-	0.246	25.823+-	1.576	9.008+-	0.633
P	0.453+-	0.153	2.911+-	0.982	1.016+-	0.345
S	1.586+-	0.237	10.181+-	1.520	3.552+-	0.545
CL	8.073+-	1.147	51.831+-	7.362	18.080+-	2.645
K	2.137+-	0.309	13.717+-	1.983	4.785+-	0.712
CA	2.951+-	0.165	18.946+-	1.062	6.609+-	0.436
TI	0.504+-	0.031	3.233+-	0.199	1.128+-	0.080
V	0.016+-	0.004	0.100+-	0.025	0.035+-	0.009
CR	0.083+-	0.006	0.536+-	0.035	0.187+-	0.014
MN	0.049+-	0.004	0.317+-	0.025	0.110+-	0.010
FE	1.106+-	0.070	7.103+-	0.450	2.478+-	0.179
NI	0.051+-	0.005	0.325+-	0.031	0.113+-	0.011
CU	0.030+-	0.007	0.193+-	0.044	0.067+-	0.016
ZN	1.118+-	0.284	7.177+-	1.826	2.504+-	0.643
GA	0.001+-	0.007	0.009+-	0.047	0.003+-	0.016
AS	0.008+-	0.024	0.049+-	0.155	0.017+-	0.054
SE	0.001+-	0.006	0.003+-	0.037	0.001+-	0.013
BR	0.057+-	0.011	0.366+-	0.069	0.128+-	0.025
RB	0.004+-	0.003	0.026+-	0.017	0.009+-	0.006
SR	0.014+-	0.003	0.089+-	0.018	0.031+-	0.006
Y	0.000+-	0.006	0.000+-	0.036	0.000+-	0.013
ZR	0.025+-	0.013	0.161+-	0.081	0.056+-	0.028
MO	0.000+-	0.007	0.000+-	0.048	0.000+-	0.017
PD	0.000+-	0.006	0.000+-	0.041	0.000+-	0.014
AG	0.005+-	0.010	0.029+-	0.063	0.010+-	0.022
CD	0.022+-	0.019	0.139+-	0.124	0.048+-	0.043
IN	0.013+-	0.014	0.085+-	0.092	0.030+-	0.032
SN	0.021+-	0.035	0.133+-	0.224	0.047+-	0.078
SB	0.088+-	0.040	0.563+-	0.257	0.197+-	0.090
BA	0.036+-	0.080	0.229+-	0.517	0.080+-	0.180
LA	0.215+-	0.123	1.377+-	0.792	0.480+-	0.277
HG	0.019+-	0.005	0.120+-	0.032	0.042+-	0.011
PB	0.658+-	0.182	4.226+-	1.170	1.474+-	0.411

SAMPLE ID: E.C. INCINERATOR - TEST NO. 3A
 PARTICLE SIZE: F
 ANALYSIS ID: AF179 - Teflon
 VERY HEAVY DEPOSIT-> NON-UNIFORM
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 2783+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	6.046+- 0.347	38.817+- 2.230	1.395+- 0.080
SI	7.122+- 0.329	45.720+- 2.114	1.643+- 0.076
P	2.615+- 0.474	16.789+- 3.045	0.603+- 0.109
S	14.380+- 1.033	92.317+- 6.629	3.317+- 0.238
CL	113.460+- 5.217	728.412+- 33.492	26.170+- 1.207
K	30.233+- 1.412	194.098+- 9.065	6.974+- 0.327
CA	1.089+- 0.125	6.991+- 0.802	0.251+- 0.029
TI	0.194+- 0.011	1.248+- 0.073	0.045+- 0.003
V	0.030+- 0.003	0.193+- 0.019	0.007+- 0.001
CR	0.056+- 0.004	0.357+- 0.025	0.013+- 0.001
MN	0.092+- 0.005	0.589+- 0.034	0.021+- 0.001
FE	2.083+- 0.098	13.373+- 0.630	0.480+- 0.023
NI	0.099+- 0.006	0.634+- 0.041	0.023+- 0.001
CU	0.611+- 0.029	3.922+- 0.188	0.141+- 0.007
ZN	33.921+- 1.543	217.770+- 9.907	7.824+- 0.357
GA	0.052+- 0.032	0.331+- 0.203	0.012+- 0.007
AS	0.018+- 0.090	0.115+- 0.578	0.004+- 0.021
SE	0.005+- 0.031	0.035+- 0.199	0.001+- 0.007
BR	0.962+- 0.050	6.173+- 0.322	0.222+- 0.012
RB	0.077+- 0.007	0.495+- 0.043	0.018+- 0.002
SR	0.039+- 0.007	0.250+- 0.047	0.009+- 0.002
Y	0.000+- 0.025	0.000+- 0.162	0.000+- 0.006
ZR	0.000+- 0.040	0.000+- 0.260	0.000+- 0.009
MO	0.132+- 0.014	0.845+- 0.089	0.030+- 0.003
PD	0.099+- 0.013	0.635+- 0.086	0.023+- 0.003
AG	0.096+- 0.017	0.618+- 0.111	0.022+- 0.004
CD	1.139+- 0.065	7.310+- 0.414	0.263+- 0.015
IN	0.000+- 0.024	0.000+- 0.155	0.000+- 0.006
SN	3.092+- 0.153	19.853+- 0.983	0.713+- 0.035
SB	1.082+- 0.088	6.945+- 0.567	0.250+- 0.020
BA	0.233+- 0.126	1.498+- 0.812	0.054+- 0.029
LA	0.000+- 0.196	0.000+- 1.258	0.000+- 0.045
HG	0.000+- 0.012	0.000+- 0.077	0.000+- 0.003
PB	21.852+- 0.597	140.287+- 6.401	5.040+- 0.231

SAMPLE ID: E.C. INCINERATOR - TEST NO. 4A
 PARTICLE SIZE: C
 ANALYSIS ID: AC039 - Teflon
 BUILD UP OF DEPOSIT AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 128+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	0.646+-	0.084	4.147+-	0.539	3.234+-	0.490
SI	2.303+-	0.136	14.788+-	0.876	11.533+-	1.129
P	0.176+-	0.062	1.133+-	0.399	0.883+-	0.319
S	0.593+-	0.110	3.810+-	0.704	2.971+-	0.596
CL	3.283+-	0.434	21.077+-	2.786	16.438+-	2.523
K	0.906+-	0.133	5.817+-	0.852	4.537+-	0.753
CA	1.023+-	0.060	6.566+-	0.388	5.120+-	0.501
TI	0.138+-	0.012	0.886+-	0.077	0.691+-	0.081
V	0.000+-	0.002	0.000+-	0.014	0.000+-	0.011
CR	0.037+-	0.003	0.239+-	0.020	0.186+-	0.021
MN	0.018+-	0.002	0.117+-	0.014	0.091+-	0.013
FE	0.401+-	0.026	2.577+-	0.165	2.010+-	0.203
NI	0.042+-	0.004	0.271+-	0.026	0.211+-	0.026
CU	0.019+-	0.004	0.123+-	0.025	0.096+-	0.021
ZN	0.876+-	0.147	5.623+-	0.941	4.385+-	0.810
GA	0.000+-	0.005	0.000+-	0.029	0.000+-	0.023
AS	0.008+-	0.016	0.050+-	0.105	0.039+-	0.082
SE	0.004+-	0.003	0.026+-	0.021	0.021+-	0.017
BR	0.020+-	0.005	0.130+-	0.032	0.101+-	0.026
RB	0.002+-	0.002	0.014+-	0.013	0.011+-	0.010
SR	0.002+-	0.002	0.014+-	0.014	0.011+-	0.011
Y	0.000+-	0.004	0.000+-	0.024	0.000+-	0.019
ZR	0.003+-	0.011	0.022+-	0.068	0.017+-	0.053
MO	0.000+-	0.007	0.000+-	0.045	0.000+-	0.035
PD	0.000+-	0.006	0.000+-	0.038	0.000+-	0.030
AG	0.000+-	0.009	0.000+-	0.058	0.000+-	0.045
CD	0.028+-	0.015	0.182+-	0.095	0.142+-	0.075
IN	0.000+-	0.014	0.000+-	0.087	0.000+-	0.068
SN	0.028+-	0.025	0.181+-	0.158	0.141+-	0.124
SB	0.024+-	0.033	0.152+-	0.213	0.118+-	0.167
BA	0.215+-	0.083	1.379+-	0.530	1.076+-	0.422
LA	0.263+-	0.122	1.688+-	0.784	1.316+-	0.620
HG	0.006+-	0.004	0.036+-	0.023	0.028+-	0.018
PB	0.501+-	0.095	3.220+-	0.611	2.511+-	0.515

Test No. 4

SAMPLE ID: E.C. INCINERATOR - TEST NO. 4A
 PARTICLE SIZE: F
 ANALYSIS ID: AF180 - Teflon
 NON-UNIFORM DEPOSIT
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 1028+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	6.557+-	0.317	42.099+-	2.036	4.096+-	0.202
SI	2.967+-	0.140	19.046+-	0.896	1.853+-	0.089
P	1.106+-	0.201	7.099+-	1.290	0.691+-	0.126
S	4.461+-	0.430	28.639+-	2.764	2.787+-	0.270
CL	40.839+-	1.883	262.183+-	12.092	25.510+-	1.202
K	12.739+-	0.597	81.784+-	3.833	7.957+-	0.381
CA	0.573+-	0.058	3.681+-	0.374	0.358+-	0.037
TI	0.070+-	0.005	0.449+-	0.033	0.044+-	0.003
V	0.013+-	0.002	0.086+-	0.012	0.008+-	0.001
CR	0.032+-	0.003	0.205+-	0.018	0.020+-	0.002
MN	0.032+-	0.003	0.202+-	0.018	0.020+-	0.002
FE	0.480+-	0.025	3.080+-	0.160	0.300+-	0.016
NI	0.056+-	0.004	0.358+-	0.028	0.035+-	0.003
CU	0.259+-	0.013	1.662+-	0.085	0.162+-	0.008
ZN	15.620+-	0.711	100.278+-	4.567	9.757+-	0.454
GA	0.014+-	0.016	0.088+-	0.103	0.009+-	0.010
AS	0.000+-	0.050	0.000+-	0.319	0.000+-	0.031
SE	0.027+-	0.015	0.176+-	0.096	0.017+-	0.009
BR	0.382+-	0.021	2.455+-	0.137	0.239+-	0.014
RB	0.028+-	0.004	0.179+-	0.028	0.017+-	0.003
SR	0.016+-	0.004	0.105+-	0.028	0.010+-	0.003
Y	0.000+-	0.013	0.000+-	0.082	0.000+-	0.008
ZR	0.000+-	0.023	0.000+-	0.147	0.000+-	0.014
MO	0.070+-	0.011	0.450+-	0.073	0.044+-	0.007
PD	0.030+-	0.010	0.193+-	0.064	0.019+-	0.006
AG	0.027+-	0.014	0.171+-	0.088	0.017+-	0.009
CD	0.330+-	0.030	2.116+-	0.192	0.206+-	0.019
IN	0.008+-	0.020	0.053+-	0.128	0.005+-	0.012
SN	1.324+-	0.073	8.498+-	0.470	0.827+-	0.046
SB	0.399+-	0.059	2.559+-	0.380	0.249+-	0.037
BA	0.120+-	0.112	0.773+-	0.721	0.075+-	0.070
LA	0.000+-	0.176	0.000+-	1.129	0.000+-	0.110
HG	0.010+-	0.007	0.063+-	0.046	0.006+-	0.004
PB	10.362+-	0.474	66.525+-	3.043	6.473+-	0.303

SAMPLE ID: E.C. INCINERATOR - TEST NO. 4B
 PARTICLE SIZE: C
 ANALYSIS ID: CC102 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 105+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.106+-	0.083	7.101+-	0.535	6.784+-	0.825
SI	2.068+-	0.126	13.276+-	0.806	12.684+-	1.436
P	0.137+-	0.058	0.877+-	0.374	0.838+-	0.366
S	0.673+-	0.119	4.319+-	0.767	4.127+-	0.832
CL	2.774+-	0.473	17.808+-	3.035	17.014+-	3.324
K	0.692+-	0.143	4.443+-	0.915	4.245+-	0.964
CA	1.284+-	0.072	8.245+-	0.464	7.878+-	0.874
TI	0.203+-	0.012	1.304+-	0.078	1.246+-	0.140
V	0.008+-	0.002	0.049+-	0.015	0.047+-	0.015
CR	0.038+-	0.003	0.241+-	0.022	0.230+-	0.030
MN	0.015+-	0.002	0.099+-	0.014	0.095+-	0.016
FE	0.419+-	0.027	2.692+-	0.173	2.572+-	0.296
NI	0.033+-	0.004	0.209+-	0.024	0.200+-	0.030
CU	0.013+-	0.004	0.081+-	0.026	0.077+-	0.026
ZN	0.524+-	0.155	3.365+-	0.997	3.215+-	1.001
GA	0.003+-	0.005	0.021+-	0.031	0.020+-	0.029
AS	0.000+-	0.017	0.000+-	0.107	0.000+-	0.102
SE	0.008+-	0.004	0.049+-	0.024	0.047+-	0.023
BR	0.019+-	0.006	0.123+-	0.037	0.117+-	0.037
RB	0.003+-	0.003	0.022+-	0.018	0.021+-	0.017
SR	0.006+-	0.003	0.036+-	0.021	0.035+-	0.020
Y	0.000+-	0.005	0.000+-	0.029	0.000+-	0.028
ZR	0.000+-	0.015	0.000+-	0.093	0.000+-	0.089
MO	0.000+-	0.011	0.000+-	0.069	0.000+-	0.066
PD	0.016+-	0.008	0.106+-	0.054	0.101+-	0.053
AG	0.000+-	0.013	0.000+-	0.084	0.000+-	0.080
CD	0.017+-	0.020	0.108+-	0.126	0.103+-	0.121
IN	0.012+-	0.020	0.078+-	0.130	0.075+-	0.125
SN	0.010+-	0.031	0.066+-	0.196	0.063+-	0.187
SB	0.030+-	0.047	0.193+-	0.300	0.184+-	0.287
BA	0.000+-	0.109	0.000+-	0.699	0.000+-	0.668
LA	0.000+-	0.173	0.000+-	1.107	0.000+-	1.058
HG	0.008+-	0.004	0.053+-	0.027	0.051+-	0.026
PB	0.255+-	0.101	1.637+-	0.646	1.564+-	0.635

SAMPLE ID: E.C. INCINERATOR - TEST NO. 4B

PARTICLE SIZE: F

ANALYSIS ID: AF181 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 1143+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.267+-	0.150	14.554+-	0.965	1.273+-	0.085
SI	2.907+-	0.137	18.664+-	0.879	1.632+-	0.078
P	1.207+-	0.219	7.746+-	1.407	0.678+-	0.123
S	5.443+-	0.528	34.945+-	3.388	3.056+-	0.298
CL	49.628+-	2.288	318.612+-	14.686	27.867+-	1.307
K	15.380+-	0.721	98.740+-	4.626	8.636+-	0.412
CA	0.457+-	0.062	2.932+-	0.399	0.256+-	0.035
TI	0.058+-	0.005	0.371+-	0.030	0.032+-	0.003
V	0.012+-	0.002	0.078+-	0.012	0.007+-	0.001
CR	0.029+-	0.003	0.184+-	0.017	0.016+-	0.002
MIN	0.036+-	0.003	0.234+-	0.019	0.020+-	0.002
FE	0.521+-	0.027	3.344+-	0.172	0.292+-	0.015
NI	0.058+-	0.004	0.373+-	0.029	0.033+-	0.003
CU	0.290+-	0.015	1.860+-	0.094	0.163+-	0.008
ZN	18.927+-	0.862	121.509+-	5.532	10.628+-	0.493
GA	0.023+-	0.019	0.146+-	0.122	0.013+-	0.011
AS	0.007+-	0.057	0.045+-	0.369	0.004+-	0.032
SE	0.027+-	0.018	0.175+-	0.116	0.015+-	0.010
BR	0.456+-	0.025	2.928+-	0.163	0.256+-	0.014
RB	0.039+-	0.005	0.249+-	0.032	0.022+-	0.003
SR	0.015+-	0.005	0.094+-	0.031	0.008+-	0.003
Y	0.000+-	0.015	0.000+-	0.097	0.000+-	0.009
ZR	0.000+-	0.026	0.000+-	0.168	0.000+-	0.015
MO	0.000+-	0.011	0.000+-	0.073	0.000+-	0.006
PD	0.040+-	0.011	0.257+-	0.068	0.022+-	0.006
AG	0.031+-	0.014	0.200+-	0.091	0.017+-	0.008
CD	0.549+-	0.039	3.526+-	0.249	0.308+-	0.022
IN	0.004+-	0.020	0.025+-	0.131	0.002+-	0.011
SN	1.648+-	0.088	10.583+-	0.563	0.926+-	0.050
SB	0.536+-	0.065	3.443+-	0.418	0.301+-	0.037
BA	0.076+-	0.115	0.490+-	0.738	0.043+-	0.065
LA	0.000+-	0.180	0.000+-	1.154	0.000+-	0.101
HG	0.024+-	0.008	0.152+-	0.053	0.013+-	0.005
PB	12.531+-	0.573	80.449+-	3.677	7.036+-	0.327

SAMPLE ID: E.C. INCINERATOR - TEST NO. 5A

PARTICLE SIZE: C

ANALYSIS ID: AC046 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 313+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.839+-	0.208	18.224+-	1.337	5.827+-	0.466
SI	4.175+-	0.250	26.805+-	1.604	8.570+-	0.581
P	0.436+-	0.145	2.796+-	0.932	0.894+-	0.299
S	1.699+-	0.288	10.907+-	1.847	3.487+-	0.601
CL	8.125+-	1.028	52.164+-	6.599	16.678+-	2.176
K	2.188+-	0.304	14.048+-	1.950	4.491+-	0.640
CA	2.860+-	0.162	18.359+-	1.037	5.870+-	0.381
TI	0.535+-	0.029	3.432+-	0.186	1.097+-	0.069
V	0.012+-	0.004	0.075+-	0.024	0.024+-	0.008
CR	0.054+-	0.004	0.348+-	0.027	0.111+-	0.009
MN	0.044+-	0.004	0.285+-	0.025	0.091+-	0.008
FE	0.913+-	0.056	5.863+-	0.358	1.874+-	0.129
NI	0.042+-	0.005	0.266+-	0.030	0.085+-	0.010
CU	0.026+-	0.007	0.167+-	0.046	0.053+-	0.015
ZN	1.955+-	0.443	12.548+-	2.842	4.012+-	0.918
GA	0.000+-	0.011	0.000+-	0.069	0.000+-	0.022
AS	0.000+-	0.035	0.000+-	0.222	0.000+-	0.071
SE	0.002+-	0.010	0.010+-	0.062	0.003+-	0.020
BR	0.183+-	0.027	1.174+-	0.174	0.375+-	0.057
RE	0.002+-	0.004	0.016+-	0.025	0.005+-	0.008
SR	0.011+-	0.004	0.071+-	0.025	0.023+-	0.008
Y	0.000+-	0.009	0.000+-	0.057	0.000+-	0.018
ZR	0.000+-	0.019	0.000+-	0.121	0.000+-	0.039
MO	0.002+-	0.011	0.010+-	0.071	0.003+-	0.023
PD	0.000+-	0.010	0.000+-	0.062	0.000+-	0.020
AG	0.000+-	0.013	0.000+-	0.086	0.000+-	0.027
CD	0.012+-	0.024	0.075+-	0.154	0.024+-	0.049
IN	0.000+-	0.021	0.000+-	0.134	0.000+-	0.043
SN	0.002+-	0.043	0.013+-	0.278	0.004+-	0.089
SB	0.042+-	0.055	0.269+-	0.354	0.086+-	0.113
BA	0.000+-	0.118	0.000+-	0.758	0.000+-	0.242
LA	0.000+-	0.174	0.000+-	1.119	0.000+-	0.358
HG	0.005+-	0.006	0.035+-	0.038	0.011+-	0.012
PB	1.183+-	0.306	7.595+-	1.965	2.428+-	0.633

SAMPLE ID: E.C. INCINERATOR - TEST NO. 5A
 PARTICLE SIZE: F
 ANALYSIS ID: AF182 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 2882+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	3.676+-	0.523	23.603+-	3.358	0.819+-	0.117
SI	6.475+-	0.299	41.571+-	1.920	1.442+-	0.067
P	2.437+-	0.442	15.648+-	2.838	0.543+-	0.098
S	8.559+-	1.353	54.947+-	8.684	1.906+-	0.301
CL	95.619+-	4.411	613.875+-	28.316	21.299+-	0.985
K	29.019+-	1.364	186.301+-	8.755	6.464+-	0.305
CA	1.003+-	0.136	6.441+-	0.873	0.223+-	0.030
TI	0.054+-	0.012	0.350+-	0.076	0.012+-	0.003
V	0.000+-	0.003	0.000+-	0.019	0.000+-	0.001
CR	0.068+-	0.004	0.435+-	0.027	0.015+-	0.001
MN	0.082+-	0.005	0.527+-	0.032	0.018+-	0.001
FE	1.253+-	0.060	8.043+-	0.387	0.279+-	0.013
NI	0.144+-	0.009	0.927+-	0.055	0.032+-	0.002
CU	0.664+-	0.032	4.262+-	0.204	0.148+-	0.007
ZN	51.642+-	2.349	331.540+-	15.078	11.503+-	0.525
GA	0.071+-	0.050	0.455+-	0.318	0.016+-	0.011
AS	0.000+-	0.140	0.000+-	0.901	0.000+-	0.031
SE	0.014+-	0.052	0.090+-	0.331	0.003+-	0.011
BR	2.529+-	0.122	16.238+-	0.783	0.563+-	0.027
RB	0.073+-	0.011	0.468+-	0.068	0.016+-	0.002
SR	0.040+-	0.011	0.257+-	0.069	0.009+-	0.002
Y	0.000+-	0.041	0.000+-	0.263	0.000+-	0.009
ZR	0.000+-	0.064	0.000+-	0.408	0.000+-	0.014
MO	0.163+-	0.015	1.045+-	0.095	0.036+-	0.003
PD	0.252+-	0.020	1.617+-	0.127	0.056+-	0.004
AG	0.000+-	0.019	0.000+-	0.120	0.000+-	0.004
CD	1.275+-	0.070	8.182+-	0.452	0.284+-	0.016
IN	0.151+-	0.025	0.971+-	0.164	0.034+-	0.006
SN	3.720+-	0.182	23.884+-	1.166	0.829+-	0.041
SB	1.984+-	0.125	12.737+-	0.804	0.442+-	0.028
BA	0.507+-	0.130	3.254+-	0.836	0.113+-	0.029
LA	0.089+-	0.198	0.573+-	1.268	0.020+-	0.044
HG	0.039+-	0.017	0.253+-	0.109	0.009+-	0.004
PB	36.438+-	1.661	233.934+-	10.665	8.116+-	0.371

SAMPLE ID: E.C. INCINERATOR - TEST NO. 6A
 PARTICLE SIZE: C
 ANALYSIS ID: AC047 - Teflon
 BUILD UP OF DEPOSIT AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 138+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.181+-	0.083	7.582+-	0.531	5.512+-	0.556
SI	1.473+-	0.096	9.458+-	0.614	6.876+-	0.670
P	0.158+-	0.060	1.017+-	0.385	0.739+-	0.285
S	0.491+-	0.106	3.150+-	0.678	2.290+-	0.520
CL	2.819+-	0.413	18.100+-	2.651	13.158+-	2.151
K	0.842+-	0.149	5.404+-	0.955	3.928+-	0.751
CA	1.280+-	0.072	8.218+-	0.462	5.974+-	0.549
TI	0.207+-	0.012	1.326+-	0.080	0.964+-	0.091
V	0.002+-	0.002	0.016+-	0.014	0.012+-	0.010
CR	0.022+-	0.002	0.141+-	0.015	0.102+-	0.013
MN	0.016+-	0.002	0.101+-	0.014	0.074+-	0.012
FE	0.372+-	0.025	2.388+-	0.160	1.736+-	0.172
NI	0.015+-	0.003	0.099+-	0.017	0.072+-	0.013
CU	0.011+-	0.003	0.069+-	0.022	0.050+-	0.016
ZN	0.609+-	0.129	3.913+-	0.830	2.845+-	0.638
GA	0.000+-	0.004	0.000+-	0.027	0.000+-	0.019
AS	0.023+-	0.015	0.145+-	0.097	0.105+-	0.071
SE	0.002+-	0.003	0.010+-	0.019	0.007+-	0.014
BR	0.025+-	0.005	0.160+-	0.031	0.116+-	0.024
RB	0.001+-	0.002	0.004+-	0.015	0.003+-	0.011
SR	0.006+-	0.003	0.039+-	0.018	0.028+-	0.013
Y	0.002+-	0.004	0.010+-	0.025	0.007+-	0.019
ZR	0.000+-	0.013	0.000+-	0.082	0.000+-	0.059
MG	0.000+-	0.009	0.000+-	0.058	0.000+-	0.042
PD	0.000+-	0.007	0.000+-	0.047	0.000+-	0.034
AG	0.000+-	0.011	0.000+-	0.073	0.000+-	0.053
CD	0.000+-	0.017	0.000+-	0.109	0.000+-	0.080
IN	0.010+-	0.018	0.067+-	0.112	0.049+-	0.082
SN	0.000+-	0.028	0.000+-	0.177	0.000+-	0.128
SB	0.000+-	0.039	0.000+-	0.253	0.000+-	0.184
BA	0.000+-	0.097	0.000+-	0.622	0.000+-	0.452
LA	0.072+-	0.148	0.461+-	0.953	0.335+-	0.693
HG	0.002+-	0.004	0.012+-	0.024	0.008+-	0.017
PB	0.302+-	0.083	1.939+-	0.531	1.410+-	0.399

SAMPLE ID: E.C. INCINERATOR - TEST NO. 6A

PARTICLE SIZE: F

ANALYSIS ID: AF192 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 944+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.194+-	0.132	14.083+-	0.847	1.491+-	0.091
SI	3.008+-	0.141	19.312+-	0.907	2.045+-	0.098
P	1.146+-	0.208	7.356+-	1.336	0.779+-	0.142
S	5.393+-	0.441	34.622+-	2.832	3.666+-	0.302
CL	40.766+-	1.880	261.716+-	12.071	27.711+-	1.311
K	15.483+-	0.724	99.403+-	4.649	10.525+-	0.505
CA	0.500+-	0.061	3.210+-	0.395	0.340+-	0.042
TI	0.087+-	0.006	0.556+-	0.037	0.059+-	0.004
V	0.010+-	0.002	0.064+-	0.010	0.007+-	0.001
CR	0.022+-	0.002	0.140+-	0.013	0.015+-	0.001
MN	0.039+-	0.003	0.253+-	0.018	0.027+-	0.002
FE	0.605+-	0.030	3.883+-	0.196	0.411+-	0.021
NI	0.042+-	0.004	0.269+-	0.022	0.028+-	0.002
CU	0.219+-	0.011	1.406+-	0.073	0.149+-	0.008
ZN	14.733+-	0.671	94.588+-	4.308	10.015+-	0.468
GA	0.017+-	0.015	0.109+-	0.098	0.012+-	0.010
AS	0.047+-	0.047	0.302+-	0.304	0.032+-	0.032
SE	0.003+-	0.014	0.018+-	0.089	0.002+-	0.009
BR	0.325+-	0.019	2.085+-	0.120	0.221+-	0.013
RB	0.030+-	0.004	0.191+-	0.024	0.020+-	0.003
SR	0.013+-	0.004	0.081+-	0.023	0.009+-	0.002
Y	0.000+-	0.012	0.003+-	0.076	0.000+-	0.008
ZR	0.041+-	0.019	0.262+-	0.125	0.028+-	0.013
MO	0.038+-	0.007	0.242+-	0.047	0.026+-	0.005
PD	0.037+-	0.008	0.239+-	0.049	0.025+-	0.005
AG	0.025+-	0.009	0.161+-	0.060	0.017+-	0.006
CD	0.462+-	0.032	2.965+-	0.203	0.314+-	0.022
IN	0.000+-	0.014	0.000+-	0.092	0.000+-	0.010
SN	1.527+-	0.080	9.801+-	0.515	1.038+-	0.056
SB	0.420+-	0.047	2.695+-	0.305	0.285+-	0.032
BA	0.000+-	0.076	0.000+-	0.490	0.000+-	0.052
LA	0.000+-	0.121	0.000+-	0.774	0.000+-	0.082
HG	0.023+-	0.007	0.147+-	0.045	0.016+-	0.005
PB	9.727+-	0.445	62.449+-	2.857	6.612+-	0.311

SAMPLE ID: E.C. INCINERATOR - TEST NO. 6B

PARTICLE SIZE: C

ANALYSIS ID: CC103 - Nuclepore

EXPOSED AREA: 6.42 SQUARE CM

MASS: 101+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	1.034+-	0.079	6.638+-	0.507	6.551+-	0.817
SI	1.398+-	0.093	8.973+-	0.599	8.855+-	1.055
P	0.151+-	0.060	0.970+-	0.385	0.957+-	0.391
S	0.643+-	0.110	4.125+-	0.705	4.071+-	0.803
CL	3.051+-	0.435	19.586+-	2.795	19.328+-	3.354
K	0.728+-	0.149	4.674+-	0.955	4.613+-	1.047
CA	1.332+-	0.074	8.551+-	0.478	8.439+-	0.957
TI	0.189+-	0.011	1.215+-	0.074	1.199+-	0.139
V	0.004+-	0.002	0.025+-	0.013	0.025+-	0.014
CR	0.014+-	0.002	0.093+-	0.015	0.091+-	0.018
MN	0.016+-	0.002	0.106+-	0.014	0.104+-	0.017
FE	0.366+-	0.025	2.351+-	0.159	2.320+-	0.277
NI	0.013+-	0.003	0.084+-	0.017	0.083+-	0.018
CU	0.009+-	0.003	0.060+-	0.022	0.059+-	0.023
ZN	0.474+-	0.129	3.046+-	0.830	3.005+-	0.871
GA	0.000+-	0.004	0.003+-	0.027	0.003+-	0.026
AS	0.001+-	0.015	0.004+-	0.097	0.004+-	0.096
SE	0.000+-	0.003	0.003+-	0.020	0.003+-	0.019
BR	0.032+-	0.005	0.203+-	0.035	0.201+-	0.040
RE	0.002+-	0.003	0.015+-	0.017	0.015+-	0.017
SR	0.007+-	0.003	0.042+-	0.021	0.041+-	0.021
Y	0.003+-	0.004	0.021+-	0.028	0.021+-	0.027
ZR	0.000+-	0.014	0.000+-	0.093	0.000+-	0.091
MO	0.000+-	0.011	0.000+-	0.070	0.000+-	0.069
PD	0.000+-	0.008	0.002+-	0.049	0.002+-	0.049
AG	0.000+-	0.013	0.000+-	0.085	0.000+-	0.084
CD	0.041+-	0.020	0.266+-	0.131	0.262+-	0.132
IN	0.002+-	0.020	0.011+-	0.130	0.011+-	0.128
SN	0.018+-	0.031	0.118+-	0.197	0.117+-	0.194
SB	0.031+-	0.047	0.199+-	0.299	0.196+-	0.296
BA	0.134+-	0.113	0.860+-	0.728	0.848+-	0.723
LA	0.150+-	0.177	0.966+-	1.138	0.953+-	1.127
HG	0.005+-	0.004	0.032+-	0.024	0.031+-	0.024
PB	0.241+-	0.084	1.547+-	0.541	1.526+-	0.554

SAMPLE ID: E.C. INCINERATOR - TEST NO. 6B

PARTICLE SIZE: F

ANALYSIS ID: AF193 - Teflon

EXPOSED AREA: 6.42 SQUARE CM

MASS: 937+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.091+-	0.131	13.426+-	0.840	1.433+-	0.091
SI	3.009+-	0.141	19.321+-	0.907	2.063+-	0.099
P	1.170+-	0.212	7.508+-	1.363	0.802+-	0.146
S	5.345+-	0.457	34.315+-	2.936	3.664+-	0.316
CL	42.544+-	1.962	273.132+-	12.596	29.160+-	1.380
K	16.119+-	0.754	103.483+-	4.843	11.048+-	0.530
CA	0.380+-	0.059	2.440+-	0.379	0.260+-	0.041
TI	0.061+-	0.005	0.392+-	0.030	0.042+-	0.003
V	0.009+-	0.002	0.057+-	0.010	0.006+-	0.001
CR	0.023+-	0.002	0.148+-	0.013	0.016+-	0.001
MN	0.039+-	0.003	0.251+-	0.017	0.027+-	0.002
FE	0.606+-	0.031	3.889+-	0.196	0.415+-	0.021
NI	0.043+-	0.004	0.275+-	0.023	0.029+-	0.002
CU	0.226+-	0.012	1.449+-	0.075	0.155+-	0.008
ZN	15.514+-	0.707	99.598+-	4.536	10.633+-	0.497
GA	0.010+-	0.016	0.063+-	0.102	0.007+-	0.011
AS	0.022+-	0.049	0.141+-	0.317	0.015+-	0.034
SE	0.000+-	0.015	0.000+-	0.094	0.000+-	0.010
BR	0.347+-	0.020	2.230+-	0.128	0.238+-	0.014
RB	0.033+-	0.004	0.209+-	0.025	0.022+-	0.003
SR	0.010+-	0.004	0.063+-	0.023	0.007+-	0.002
Y	0.000+-	0.012	0.000+-	0.080	0.000+-	0.009
ZR	0.026+-	0.020	0.166+-	0.129	0.018+-	0.014
MO	0.043+-	0.007	0.277+-	0.048	0.030+-	0.005
PD	0.029+-	0.007	0.187+-	0.046	0.020+-	0.005
AG	0.034+-	0.010	0.218+-	0.063	0.023+-	0.007
CD	0.503+-	0.033	3.230+-	0.215	0.345+-	0.023
IN	0.037+-	0.014	0.240+-	0.089	0.026+-	0.009
SN	1.589+-	0.083	10.199+-	0.533	1.089+-	0.058
SB	0.433+-	0.048	2.779+-	0.308	0.297+-	0.033
BA	0.000+-	0.075	0.000+-	0.481	0.000+-	0.051
LA	0.000+-	0.122	0.000+-	0.781	0.000+-	0.083
HG	0.000+-	0.007	0.000+-	0.047	0.000+-	0.005
PB	10.290+-	0.471	66.062+-	3.022	7.053+-	0.331

SAMPLE ID: E.C. INCINERATOR - TEST NO. 7A
 PARTICLE SIZE: C
 ANALYSIS ID: AC048 - Teflon
 BUILD UP OF DEPOSIT AT PERIMETER
 EXPOSED AREA: 6.42 SQUARE CM
 MASS: 263+- 10 MICROGRAMS

ELEMENT	UG/CM2		UG/FILTER		PERCENT	
AL	2.724+-	0.181	17.488+-	1.161	6.652+-	0.509
SI	3.816+-	0.239	24.498+-	1.536	9.319+-	0.683
P	0.426+-	0.142	2.732+-	0.913	1.039+-	0.349
S	1.794+-	0.233	11.516+-	1.494	4.381+-	0.592
CL	8.388+-	1.103	53.854+-	7.079	20.485+-	2.803
K	1.978+-	0.271	12.701+-	1.741	4.831+-	0.687
CA	2.367+-	0.134	15.199+-	0.862	5.782+-	0.395
TI	0.368+-	0.024	2.365+-	0.156	0.900+-	0.069
V	0.000+-	0.003	0.000+-	0.022	0.000+-	0.008
CR	0.048+-	0.004	0.306+-	0.024	0.116+-	0.010
MN	0.034+-	0.003	0.215+-	0.021	0.082+-	0.009
FE	0.653+-	0.043	4.192+-	0.277	1.595+-	0.122
NI	0.019+-	0.004	0.122+-	0.024	0.046+-	0.009
CU	0.031+-	0.007	0.197+-	0.045	0.075+-	0.017
ZN	3.244+-	0.672	20.825+-	4.314	7.922+-	1.668
GA	0.000+-	0.011	0.000+-	0.069	0.000+-	0.026
AS	0.022+-	0.026	0.139+-	0.169	0.053+-	0.064
SE	0.000+-	0.007	0.000+-	0.042	0.000+-	0.016
BR	0.091+-	0.014	0.586+-	0.088	0.223+-	0.035
RB	0.005+-	0.003	0.029+-	0.018	0.011+-	0.007
SR	0.013+-	0.003	0.084+-	0.019	0.032+-	0.007
Y	0.000+-	0.006	0.000+-	0.040	0.000+-	0.015
ZR	0.013+-	0.014	0.083+-	0.087	0.032+-	0.033
MO	0.006+-	0.008	0.038+-	0.050	0.014+-	0.019
PD	0.000+-	0.007	0.000+-	0.045	0.000+-	0.017
AG	0.008+-	0.011	0.054+-	0.070	0.021+-	0.027
CD	0.028+-	0.017	0.180+-	0.111	0.069+-	0.042
IN	0.014+-	0.016	0.093+-	0.100	0.035+-	0.038
SN	0.108+-	0.036	0.695+-	0.232	0.265+-	0.089
SB	0.042+-	0.038	0.267+-	0.242	0.102+-	0.092
BA	0.240+-	0.086	1.540+-	0.554	0.586+-	0.212
LA	0.219+-	0.131	1.406+-	0.843	0.535+-	0.321
HG	0.012+-	0.005	0.075+-	0.033	0.029+-	0.012
PB	1.004+-	0.205	6.447+-	1.315	2.452+-	0.509

SAMPLE ID: E.C. INCINERATOR - TEST NO. 7A
 PARTICLE SIZE: F
 ANALYSIS ID: AF194 - Teflon

EXPOSED AREA: 6.42 SQUARE CM
 MASS: 3321+- 10 MICROGRAMS

ELEMENT	UG/CM2	UG/FILTER	PERCENT
AL	4.687+- 0.326	30.094+- 2.095	0.906+- 0.063
SI	7.797+- 0.360	50.055+- 2.309	1.507+- 0.070
P	2.398+- 0.435	15.395+- 2.792	0.464+- 0.084
S	9.520+- 0.947	61.116+- 6.077	1.840+- 0.183
CL	105.045+- 4.831	674.386+- 31.015	20.306+- 0.936
K	25.247+- 1.183	162.084+- 7.598	4.880+- 0.229
CA	0.936+- 0.104	6.006+- 0.669	0.181+- 0.020
TI	0.166+- 0.010	1.063+- 0.062	0.032+- 0.002
V	0.029+- 0.003	0.185+- 0.017	0.006+- 0.001
CR	0.074+- 0.004	0.472+- 0.028	0.014+- 0.001
MN	0.103+- 0.006	0.659+- 0.036	0.020+- 0.001
FE	1.340+- 0.064	8.606+- 0.412	0.258+- 0.012
NI	0.181+- 0.010	1.162+- 0.065	0.035+- 0.002
CU	0.619+- 0.030	3.976+- 0.191	0.120+- 0.006
ZN	76.863+- 3.495	493.461+- 22.438	14.858+- 0.677
GA	0.221+- 0.049	1.418+- 0.315	0.043+- 0.009
AS	0.000+- 0.094	0.000+- 0.605	0.000+- 0.018
SE	0.020+- 0.033	0.131+- 0.210	0.004+- 0.006
BR	1.185+- 0.060	7.607+- 0.384	0.229+- 0.012
RB	0.049+- 0.007	0.315+- 0.045	0.009+- 0.001
SR	0.040+- 0.007	0.255+- 0.046	0.008+- 0.001
Y	0.000+- 0.026	0.000+- 0.169	0.000+- 0.005
ZR	0.055+- 0.041	0.354+- 0.263	0.011+- 0.008
MO	0.116+- 0.011	0.748+- 0.069	0.023+- 0.002
PD	0.204+- 0.016	1.313+- 0.105	0.040+- 0.003
AG	0.137+- 0.015	0.877+- 0.099	0.026+- 0.003
CD	0.814+- 0.048	5.226+- 0.307	0.157+- 0.009
IN	0.085+- 0.018	0.545+- 0.114	0.016+- 0.003
SN	2.778+- 0.138	17.837+- 0.883	0.537+- 0.027
SB	0.575+- 0.056	3.691+- 0.362	0.111+- 0.011
BA	0.000+- 0.094	0.000+- 0.606	0.000+- 0.018
LA	0.000+- 0.144	0.000+- 0.926	0.000+- 0.028
HG	0.064+- 0.013	0.412+- 0.081	0.012+- 0.002
PB	23.060+- 1.052	148.045+- 6.754	4.458+- 0.204

SAMPLE ID: E.C. INCINERATOR - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: ACO75 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.000+-	0.015	0.000+-	0.096
SI	0.000+-	0.011	0.000+-	0.070
P	0.000+-	0.005	0.000+-	0.029
S	0.000+-	0.024	0.000+-	0.155
CL	0.000+-	0.008	0.000+-	0.051
K	0.000+-	0.003	0.000+-	0.022
CA	0.002+-	0.002	0.014+-	0.016
TI	0.000+-	0.002	0.000+-	0.010
V	0.000+-	0.001	0.000+-	0.007
CR	0.001+-	0.001	0.009+-	0.009
MN	0.001+-	0.002	0.005+-	0.010
FE	0.002+-	0.004	0.016+-	0.024
NI	0.001+-	0.001	0.005+-	0.010
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.000+-	0.001	0.000+-	0.006
GA	0.000+-	0.001	0.002+-	0.006
AS	0.000+-	0.003	0.000+-	0.022
SE	0.000+-	0.001	0.003+-	0.009
BR	0.001+-	0.002	0.008+-	0.012
RB	0.000+-	0.002	0.000+-	0.014
SR	0.002+-	0.003	0.013+-	0.018
Y	0.001+-	0.003	0.009+-	0.021
ZR	0.000+-	0.013	0.000+-	0.087
MO	0.005+-	0.010	0.035+-	0.062
PD	0.000+-	0.008	0.000+-	0.053
AG	0.000+-	0.012	0.000+-	0.078
CD	0.010+-	0.016	0.067+-	0.100
IN	0.000+-	0.019	0.000+-	0.119
SN	0.000+-	0.023	0.000+-	0.147
SB	0.000+-	0.041	0.000+-	0.266
BA	0.000+-	0.104	0.000+-	0.666
LA	0.111+-	0.165	0.713+-	1.059
HG	0.002+-	0.003	0.013+-	0.020
PB	0.004+-	0.006	0.024+-	0.037

SAMPLE ID: E.C. INCINERATOR - FIELD BLANK
 PARTICLE SIZE: F
 ANALYSIS ID: AF240 - Teflon
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.002+-	0.014	0.014+-	0.087
SI	0.000+-	0.009	0.000+-	0.057
P	0.000+-	0.005	0.000+-	0.029
S	0.000+-	0.026	0.000+-	0.165
CL	0.000+-	0.009	0.000+-	0.058
K	0.002+-	0.003	0.015+-	0.021
CA	0.000+-	0.002	0.000+-	0.015
TI	0.001+-	0.001	0.006+-	0.010
V	0.001+-	0.001	0.004+-	0.007
CR	0.002+-	0.001	0.014+-	0.009
MN	0.001+-	0.002	0.007+-	0.010
FE	0.000+-	0.004	0.000+-	0.023
NI	0.000+-	0.001	0.003+-	0.010
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.000+-	0.001	0.000+-	0.007
GA	0.000+-	0.001	0.001+-	0.006
AS	0.000+-	0.004	0.000+-	0.024
SE	0.002+-	0.001	0.011+-	0.009
BR	0.000+-	0.002	0.000+-	0.011
RB	0.000+-	0.002	0.002+-	0.014
SR	0.005+-	0.003	0.032+-	0.018
Y	0.000+-	0.003	0.000+-	0.021
ZR	0.000+-	0.014	0.000+-	0.087
MO	0.000+-	0.010	0.000+-	0.063
PD	0.000+-	0.009	0.000+-	0.055
AG	0.000+-	0.011	0.000+-	0.072
CD	0.003+-	0.017	0.018+-	0.108
IN	0.020+-	0.019	0.126+-	0.121
SN	0.022+-	0.022	0.143+-	0.142
SB	0.000+-	0.040	0.000+-	0.259
BA	0.064+-	0.106	0.411+-	0.681
LA	0.000+-	0.165	0.000+-	1.058
HG	0.001+-	0.002	0.009+-	0.015
PB	0.007+-	0.006	0.044+-	0.039

SAMPLE ID: E.C. INCINERATOR - FIELD BLANK
 PARTICLE SIZE: C
 ANALYSIS ID: CC120 - Nuclepore
 FIELD BLANK
 EXPOSED AREA: 6.42 SQUARE CM

ELEMENT	UG/CM2		UG/FILTER	
AL	0.007+-	0.025	0.045+-	0.162
SI	0.031+-	0.020	0.201+-	0.127
P	0.000+-	0.010	0.000+-	0.062
S	0.000+-	0.023	0.000+-	0.147
CL	0.000+-	0.009	0.000+-	0.061
K	0.006+-	0.003	0.039+-	0.022
CA	0.000+-	0.002	0.000+-	0.014
TI	0.000+-	0.001	0.000+-	0.009
V	0.002+-	0.001	0.010+-	0.007
CR	0.000+-	0.002	0.000+-	0.011
MN	0.000+-	0.002	0.000+-	0.010
FE	0.006+-	0.004	0.037+-	0.025
NI	0.001+-	0.001	0.005+-	0.009
CU	0.000+-	0.002	0.000+-	0.010
ZN	0.000+-	0.001	0.000+-	0.006
GA	0.000+-	0.001	0.000+-	0.007
AS	0.000+-	0.004	0.000+-	0.026
SE	0.000+-	0.001	0.000+-	0.009
BR	0.000+-	0.002	0.000+-	0.014
RB	0.003+-	0.002	0.022+-	0.016
SR	0.000+-	0.003	0.000+-	0.019
Y	0.000+-	0.003	0.000+-	0.022
ZR	0.000+-	0.014	0.000+-	0.090
MO	0.006+-	0.011	0.039+-	0.068
PD	0.000+-	0.009	0.000+-	0.057
AG	0.009+-	0.012	0.056+-	0.075
CD	0.000+-	0.017	0.000+-	0.112
IN	0.000+-	0.020	0.000+-	0.128
SN	0.000+-	0.024	0.000+-	0.156
SB	0.007+-	0.045	0.047+-	0.287
BA	0.169+-	0.112	1.087+-	0.722
LA	0.335+-	0.179	2.148+-	1.151
HG	0.001+-	0.003	0.006+-	0.018
PB	0.002+-	0.007	0.011+-	0.043