TECHNICAL MEMORANDUM

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DATE: April 6, 2004

SUBJECT: Performance Evaluation - ODEQ Laboratories

Introduction

A study has been conducted as part of the QA oversight for the $PM_{2.5}$ Speciation Trends Network (STN). The purpose of this study was to evaluate specific laboratory performance at the Oregon Department of Environmental Quality (ODEQ) Laboratory located in Portland. ODEQ has elected to implement protocols at their own laboratory facilities for gravimetric mass analysis, ions analysis, and elemental analysis by X-Ray fluorescence (XRF). All samples requiring carbon analysis are analyzed at Research Triangle Institute (RTI) which operates under a federal contract to analyze STN samples. Performance Evaluation (PE) samples were prepared at the National Air and Radiation Environmental Laboratory (NAREL) and submitted to ODEQ for analysis. The PE samples consisted of the following components.

- Gravimetric Mass Analysis - ten Teflon® filter samples and two metallic weights
- Ion Chromatography (IC) Analysis - six Nylon® filter samples, three anion spike solutions, and three cation spike solutions.
- XRF Elemental Analysis - five well characterized Teflon® filters.

Detailed instructions for analyzing and reporting the PE samples were provided to ODEQ. Gravimetric and IC analysis of the PE samples or replicates of the samples were performed at the NAREL facility. The Office of Research and Development (ORD) Laboratory located at Research Triangle Park provided XRF analysis results for replicates of the filters used in the study. The five Teflon® filters were also analyzed by RTI and RTI's subcontractor, Chester LabNet, and results of their analyses were available for comparison. This report will discuss the analytical results reported by ODEQ and will compare each result to an expected value.

Mass determination typically proceeds by weighing the Teflon® collection filter before and after the sampling event. The amount of Particulate Matter ($PM_{2.5}$) captured onto the surface of the filter can be calculated by a simple subtraction of the tare mass from the loaded filter mass. ODEQ routinely

provides clean pre-weighed air filters to the various field sites within the network. At the field site, an approved sampling device must be used to deposit the $PM_{2.5}$ onto the collection filter. The filter is then returned to ODEQ where the gravimetric analysis is completed. After the gravimetric measurements are complete, the Teflon® filter is examined further using XRF to determine the elemental composition of the filter deposit.

ODEQ also provides clean Nylon® filters to the various field sites. The Nylon® filter is used to capture $PM_{2.5}$ for subsequent IC analysis. After the loaded filter is returned to the laboratory, the IC analysis typically proceeds by first extracting the filter using an appropriate solvent. The extract must be analyzed using an IC instrument that is optimized to determine the ions of interest. Target anions and target cations must be analyzed on separate separation columns installed in the IC instrument.

ODEQ provides clean quartz filters to the STN field sites in order to collect $PM_{2.5}$ for carbon determination. After sampling, the quartz filters are collected and shipped to RTI for analysis. Because the RTI laboratories are evaluated in a separate study, quartz filters were not included in this PE. The SOP used at ODEQ for cleaning quartz filters is posted on the web. (see reference 2).

Gravimetric Analysis

Ten new filters and two metallic weights were supplied by NAREL for this study. These samples were placed into individual petri slides and shipped by overnight mail to ODEQ with instructions to determine the tare mass of each sample using standard procedures. After tare measurements were completed at ODEQ, the filters and metallic weights were returned to Montgomery and immediately placed into the weighing chamber at NAREL for equilibration and determination of a stable tare mass. Shortly after NAREL's tare measurements were complete, seven of the ten filters were loaded with $PM_{2.5}$ captured from the Montgomery air. A Met One SASS air sampler was used to load seven of the filters, and the remaining three filters were utilized as blanks. Following sample collection, the filters and the metallic weights were returned to the weighing chamber at NAREL and weighed multiple times over the course of several days to demonstrate a stable final mass. Finally, the ten filters and metallic weights were shipped back to ODEQ for their determination of the final mass. It is worth mentioning that the metallic weights were included in this study because they are generally less susceptible to weighing errors due to factors such as electrical static and volatility of filter constituents. ODEQ's SOP for gravimetric mass measurements has been posted on the web for easy viewing (see reference 1).

Gravimetric Results

The results of this study are summarized in Figure 1. The critical information needed by the program is the mass of $PM_{2.5}$ deposited onto the surface of a collection filter, and therefore, $PM_{2.5}$ capture is plotted in Figure 1 for the seven loaded filters, three travel blanks, and two metallic weights.

Figure 2 presents the inter-laboratory differences. Inter-laboratory differences were calculated by subtracting the $PM_{2.5}$ capture value determined at ODEQ from the capture value determined at NAREL. Notice that a negative bar on the Figure 2 graph represents a smaller $PM_{2.5}$ capture value determined at NAREL.

The raw data reported from both laboratories have been tabulated in a table at the end of this report. Table 1 includes the results of ten shared filters, two metallic weights, and one independent chamber blank weighed at each laboratory. Table 1 contains the tare weight, the final loaded weight, and the calculated $PM_{2.5}$ capture for each sample. Table 1 also contains the calculated inter-laboratory difference for measuring the $PM_{2.5}$ capture which is graphed in Figure 2.

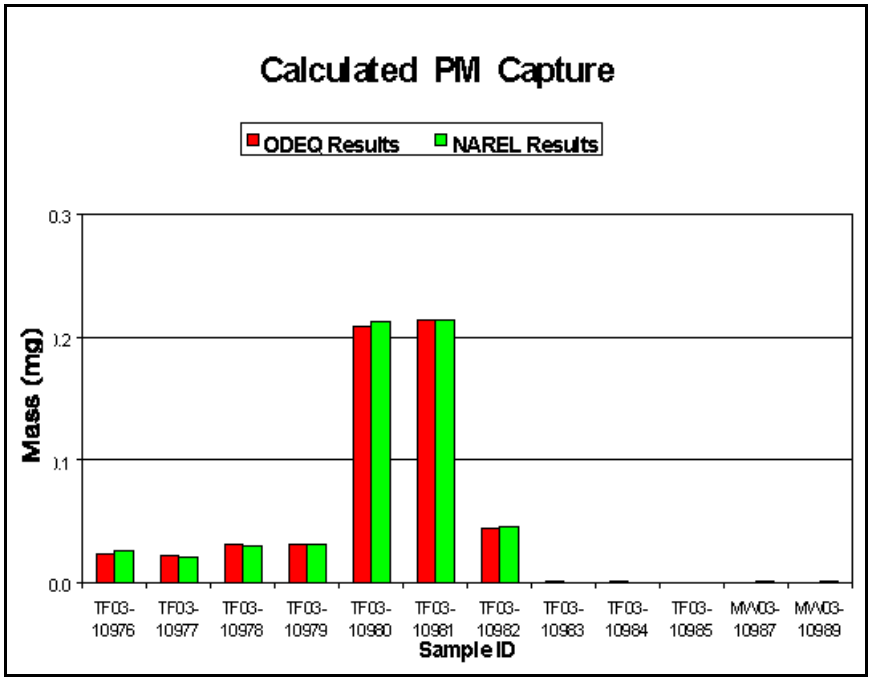

Figure 1

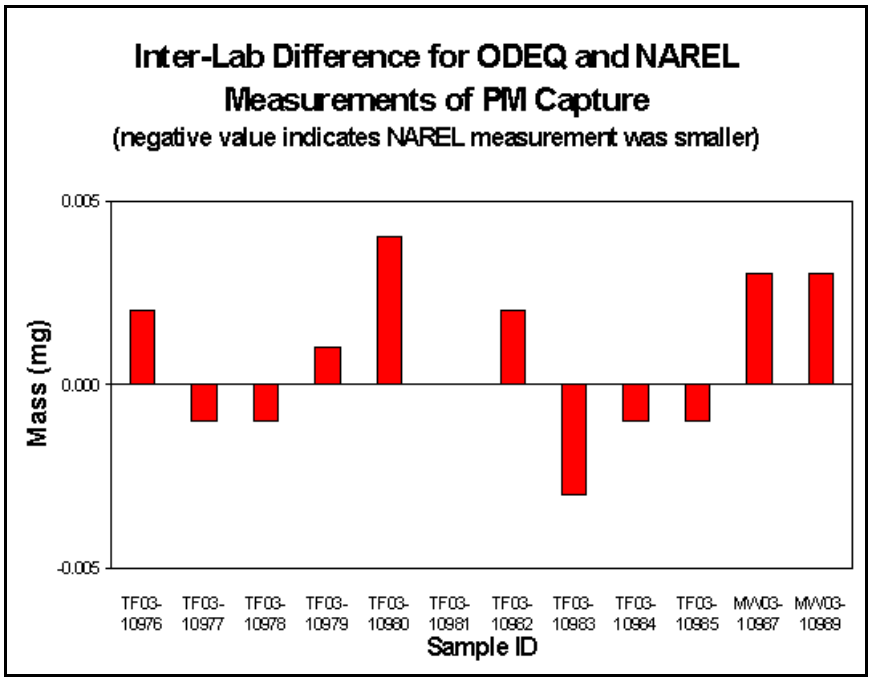

Figure 2

IC Analysis

For this study, Nylon® filters and IC spike solutions were carefully prepared at NAREL and shipped to ODEQ for analysis. The SOPs used at ODEQ for cleaning Nylon® filters, extraction of Nylon® filters, and the analysis of anions and cations are posted on the web for easy viewing (see reference 2 and reference 3).

The procedure used by ODEQ for extracting Nylon® filters is a variation of the procedure used by NAREL. NAREL extracts the entire filter with 25 milliliters of de-ionized water and this extract is used for both anion and cation analysis. The ODEQ extraction procedure cuts each filter into four equal sections using a stainless steel tissue knife and a template to accurately guide the knife. Separate anion and cation extractions are performed by using a quarter of the filter in individual extraction tubes. Nine milliliters of de-ionized water in each tube is used as the solvent. This method saves a portion of each Nylon® filter for quality control use. Theoretically, there is a potential to have more anion and cation contamination using the ODEQ procedure rather than the standard NAREL procedure because the extra handling of the filter and the smaller volume of extraction fluid would tend to concentrate any contaminants. A brief experiment was performed at NAREL to test this theory. Two clean Nylon® filters were quartered using clean scissors. The filter sections were placed into auto-sampler tubes and extracted with five milliliters of de-ionized water following the ODEQ procedure. Five milliliters of de-ionized water was used instead nine due to the size of the auto-sampler tubes. Analysis of the extract showed no anion or cation contamination.

A Met One SuperSASS sampler was used to load four replicate Nylon® filters with $PM_{2.5}$ captured from the Montgomery air during two separate collection events. Two replicate filters from each event were submitted to ODEQ for analysis along with two blank Nylon filters. Replicate filters were retained at NAREL for in-house analysis. Six IC spike solutions were also prepared at NAREL. Each solution was designed for dilution by a factor of ten using reagent water available at the receiving laboratory. After dilution to full volume, each spike solution was utilized as the solvent to extract a clean blank filter also provided by the receiving laboratory. The filter extracts were analyzed using appropriate IC instrumentation available at the receiving laboratory. The results reported for each sample were based upon the concentration of analyte present in the final extract.

The six Nylon® filters submitted to ODEQ consisted of two replicates from a 144-hour collection event started on November 20, two replicates from a 144-hour collection event started on December 1, and two filter blanks. Samples were collected over a long period to insure that all analytes were present at detectable levels. No information was given to ODEQ regarding the history of these filters. Three of the six IC spike solutions were prepared for analysis of the anions, and three solutions were prepared for the analysis of cations. These solutions were designed to offer a mid-level concentration, a low-level concentration, and a blank for each analyte. Replicates of all samples were analyzed at NAREL following the same instructions provided to ODEQ.

IC Results

Results for the mid-level IC spikes are presented as a bar graph in Figure 3. For each analyte, the mid-level concentration of the fully diluted spike solution was between 1 and 4 µg/mL. Figure 3 presents the expected result, the ODEQ result, and the NAREL result for each analyte.

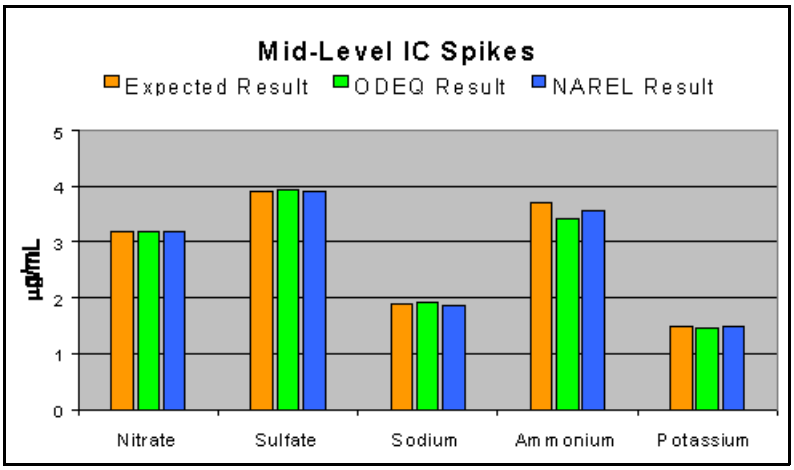

Figure 3

Results for the low-level spikes are presented as a bar graph in Figure 4. For each analyte, the low-level concentration of the fully diluted spike solution was between 0.1 and 0.4 µg/mL. Since the concentrations presented in Figure 4 are low, extra bars were added to this graph showing the Method Detection Limit (MDL) and Method Reporting Limit reported by ODEQ. The results from the IC spike solutions are summarized in Table 2 at the end of this report.

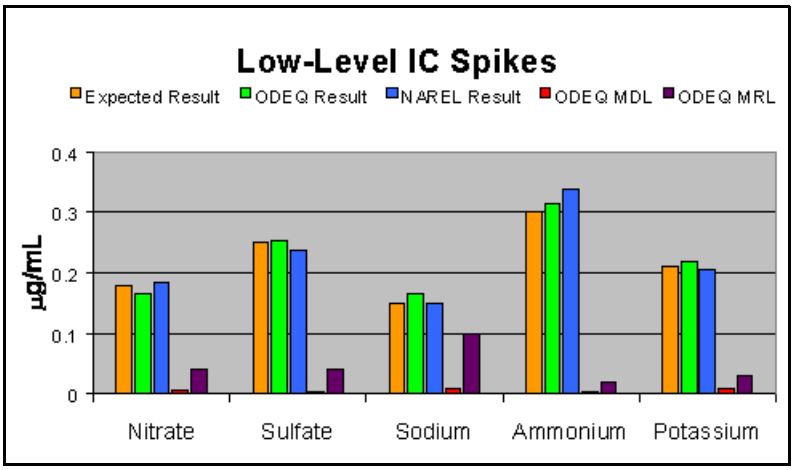

Figure 4

Results of four replicate air samples are presented in Figure 5 and Figure 6. Two of these replicates were submitted to ODEQ for analysis, and the remaining two replicates were extracted and analyzed at NAREL. Nitrate, sulfate, and ammonium were the most abundant analytes captured from the Montgomery air during this [November 20] sampling event, and these ions are plotted in Figure 5. Notice that concentration units have changed from the previous figure, and the new units are micrograms of ion captured per cubic meter of air sampled.

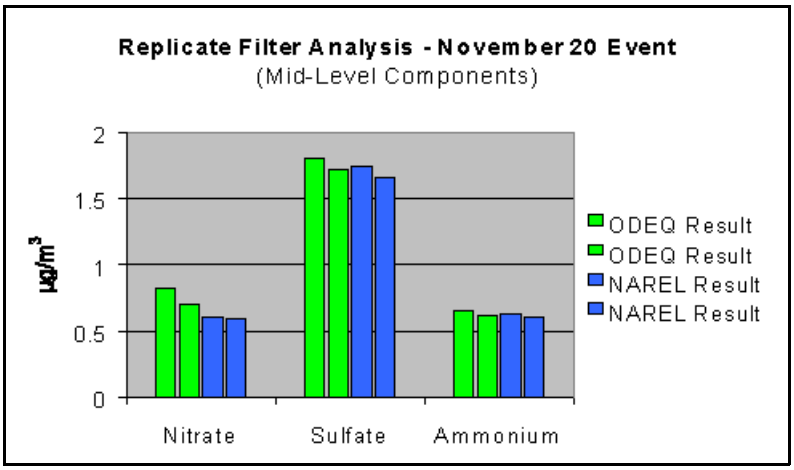

Figure 5

Sodium and potassium were present in the air at relatively low levels, and these ions are plotted in Figure 6. Since the concentrations presented in Figure 6 are low, extra bars were added to this graph to show the reported MDL and MRL expressed as mass per cubic meter of air sampled.

Figure 7 and Figure 8 show the results from replicate samples that were collected on December 1. Two of the replicates were analyzed at ODEQ, and two were extracted and analyzed at NAREL. The nitrate, sulfate, and ammonium are plotted together again in Figure 7. The sodium and potassium were present in the air at relatively low levels again, and they are plotted together in Figure 8.

All of the results from the loaded Nylon® filters are presented in Table 3 and Table 4 at the end of this report.

Four blank Nylon® filters were also analyzed during this study. No significant contamination was reported by either laboratory for any of the blanks. The results from analysis of the blank Nylon® filters are presented in Table 5 at the end of this report. All of the Nylon® filters used for this study were pre-cleaned at NAREL, and the cleaning batch was tested before use.

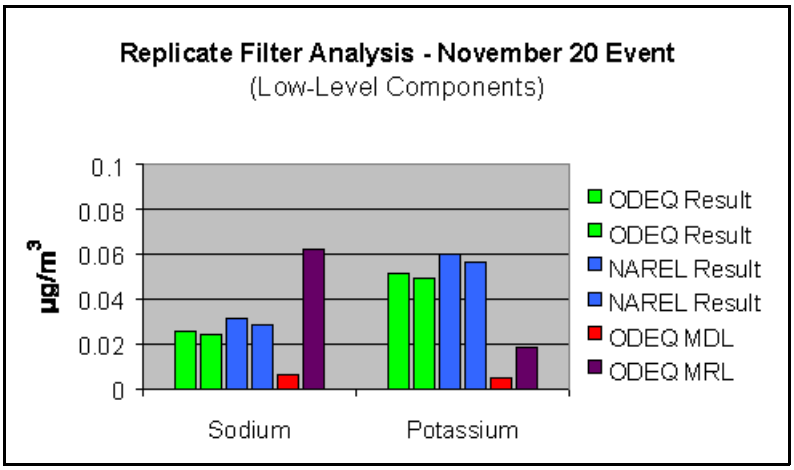

Figure 6

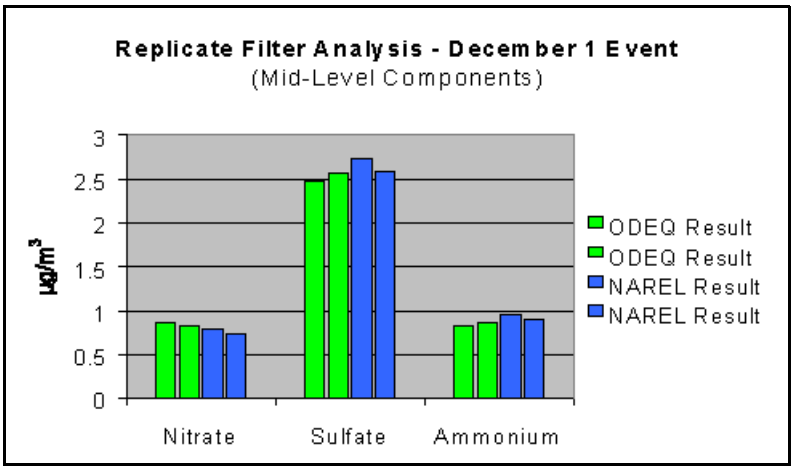

Figure 7

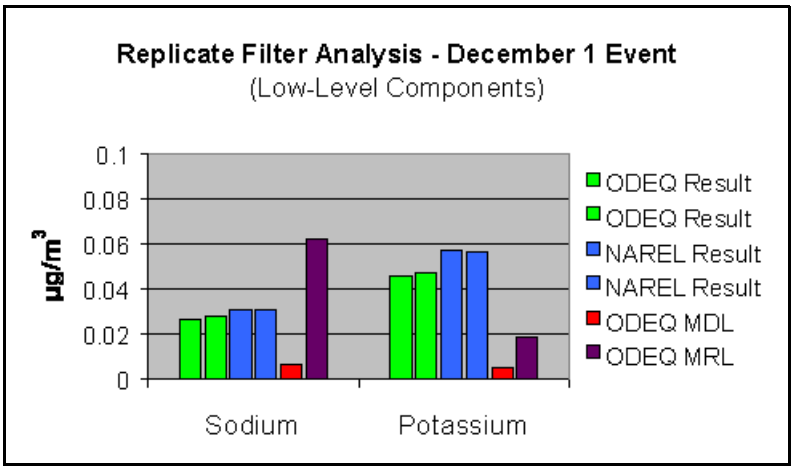

Figure 8

XRF Analysis

NAREL provided a set of five 47 millimeter Teflon® filters for this study. The set consisted of one blank filter and four loaded replicates. Met One SuperSASS samplers were used to load the replicate Teflon® filters with $PM_{2.5}$ captured from the Montgomery air. This set of filters had been previously analyzed at RTI and Chester LabNet and the results were available for comparison with ODEQ results. Replicates of the filter set were also analyzed at an EPA laboratory at Research Triangle Park, North Carolina. The filter set was shipped to ODEQ with a request for elemental analysis using local standard procedures. No information was given to ODEQ regarding the history of these samples. The analysis at all laboratories was based upon energy dispersive XRF, and reasonably good inter-laboratory agreement was expected for the sample set. The results reported for each sample were based upon the mass of analyte per square centimeter of filter area. Each laboratory calculated and reported an uncertainty with each analytical result.

The final results from all instruments were reported as mass of the element per square centimeter of filter material ($\mu g/cm^2$).

XRF Results

The results from all reporting laboratories are included in Table 10 and Table 11 at the end of this report. Table 10 contains results from the loaded filters, and Table 11 contains results from the filter blanks. Table 10 also contains a median value calculated for some of the elements. A median value was calculated only when all of the reporting instruments determined a concentration greater than three times the expressed uncertainty. Seven of the heavy elements (In, Sm, Eu, Tb, Hf, Ta, and Ir) were not included in EPA's analysis, and therefore these EPA results are missing from the tables.

All of the results reported from the ODEQ, EPA, RTI, and three Chester LabNet instruments have been

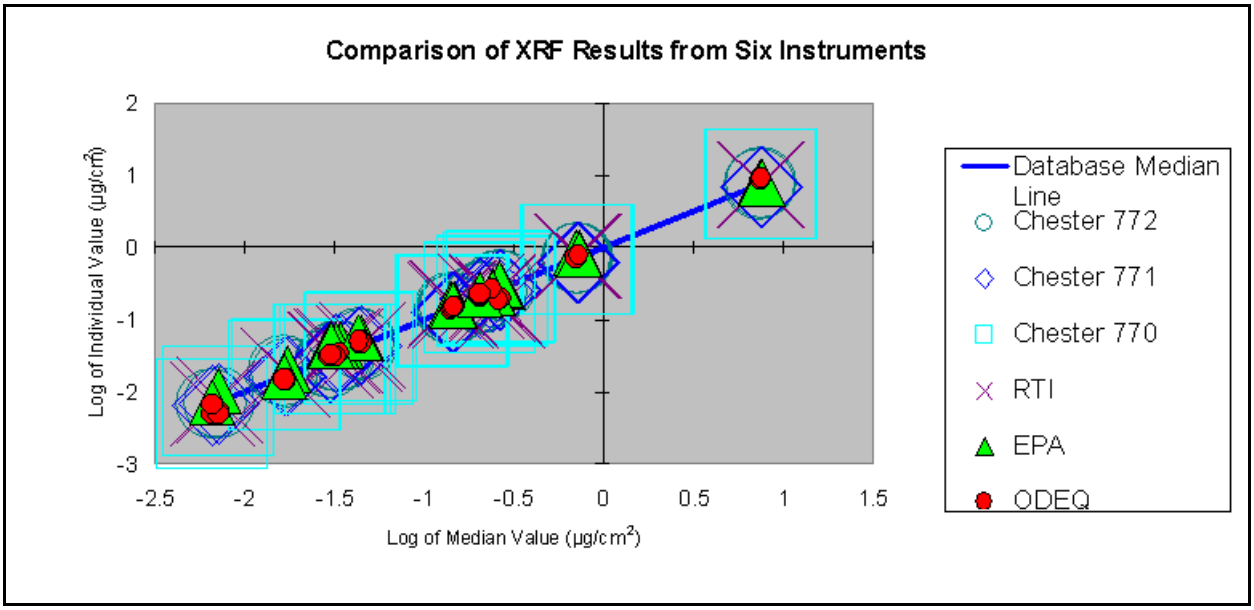

Figure 9

compared to the median values by constructing a scatter plot shown in Figure 9. A log-log plot was constructed with the median values forming a straight line with unity slope. The corresponding results from ODEQ, EPA, RTI, and three Chester LabNet instruments were superimposed on the median line. Most of the results from these three instruments were very near the median indicating good agreement among the instruments. Even though Figure 9 gives a quick visual impression of many results that cover a wide range of concentrations, this scatter plot does not identify the element plotted nor the sample.

The more significant XRF results are presented again as stacked bar graphs in Figures 10 and 11. Analysis by six different instruments were used to produce the data shown in Figure 10 and Figure 11. EPA analyzed two replicates of the filter set. Two filters identified as sample T04-10996 and sample T04-10997 were analyzed by ODEQ and RTI. Two filters identified as sample T04-10998 and T04-10999 were analyzed by ODEQ and by three instruments at Chester LabNet. Figures 10 and 11 presents analysis results for each sample or a replicate of the sample. Each bar segment represents an individual value reported by one of the instruments. Elements are identified along the horizontal axis, and the elements are arranged from left to right in order of decreasing concentration. The vertical axis of each bar graph is a linear scale, and each bar is normalized to the sum of results reported by all instruments identified in the legend. Each bar segment is color coded to identify the instrument and

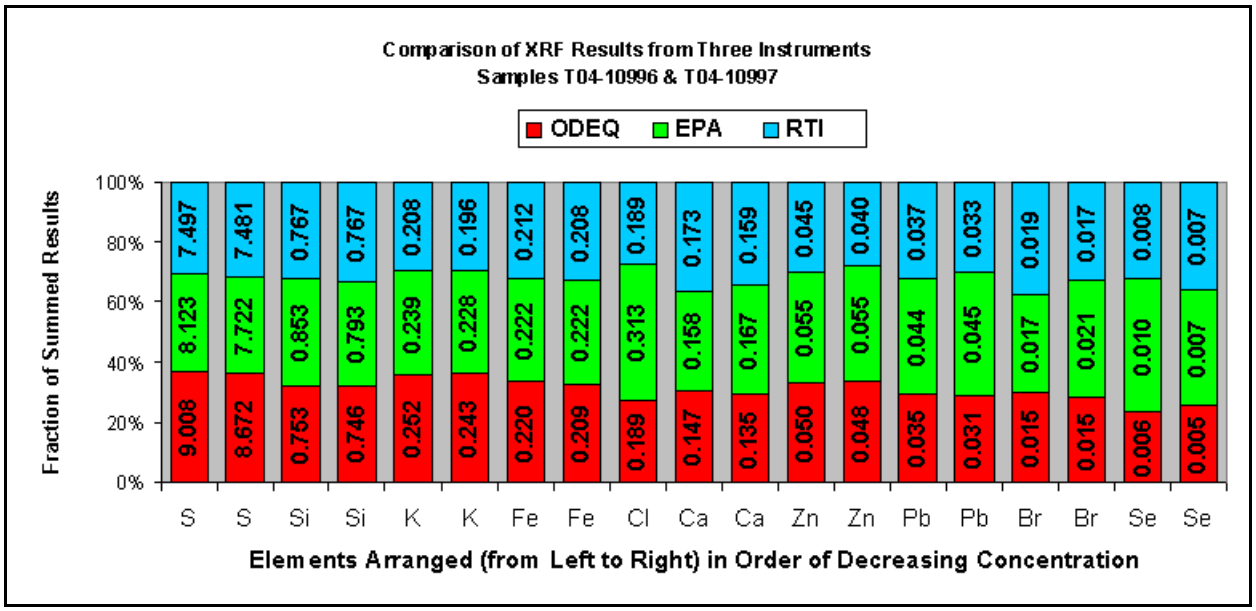

Figure 10

labeled to show the reported concentration value. Again, the only results shown in the graphs are those that are significantly above the reported uncertainty. Those significant results can be identified in Table 10 by looking for a calculated median. Figure 10 presents results from two of the four 47-mm filter replicates analyzed by ODEQ, identified as sample T04-10996 and sample T04-10997 in Table 10. These two filters were also analyzed by RTI and replicates of these filters were analyzed by EPA.

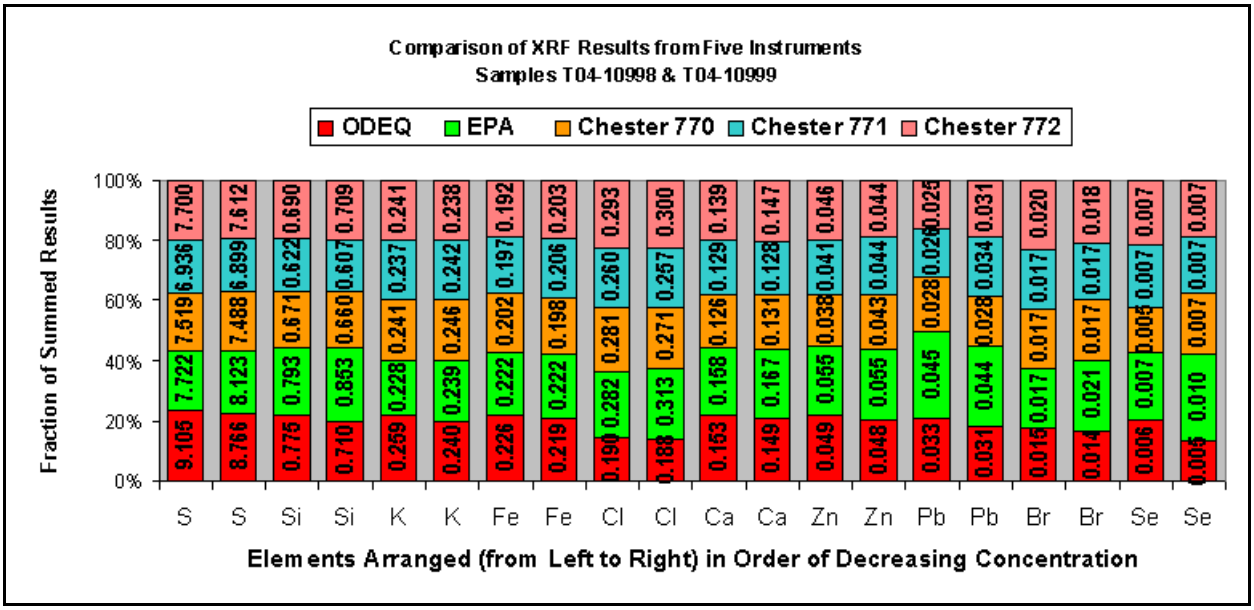

Figure 11

Figure 11 presents results from filters T04-10998 and T04-10999 analyzed by ODEQ and by three instruments at Chester Labnet. The EPA replicate results in Figure 10 are plotted again in Figure 11 for comparison. Figures 10 and 11 show good between-instrument comparability for elements significantly above the reported uncertainty. Figures 10 and 11 also show good precision for the replicate samples analyzed by ODEQ.

Sodium, magnesium, and aluminum are the lightest elements reported by ODEQ. Figure 12 presents

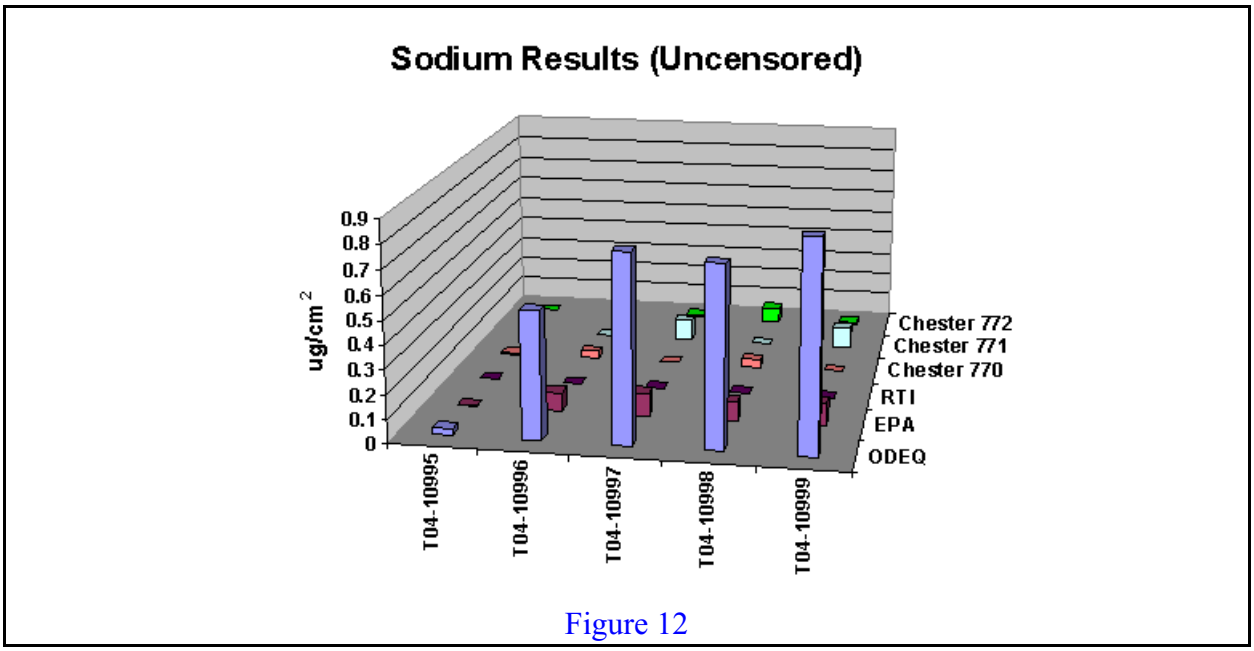

Figure 12

the results reported by all laboratories for sodium. These results are not censored for ODEQ's minimum reporting limit (MRL). According to ODEQ, sodium and magnesium results are routinely reported as estimates due to the limitations of the background modeling and the inter-element corrections for these low Z elements. Figure 13 presents the uncensored results reported by all laboratories for aluminum. Sample T04-10995 is the field blank. The remaining four samples are replicates that collected $PM_{2.5}$ for 144 hours. Figure 13 shows that the EPA results for aluminum on the

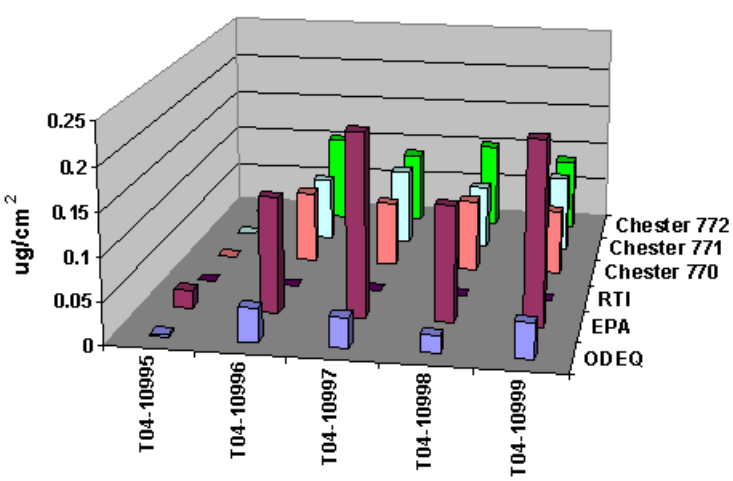

Figure 13

loaded filters are higher than those reported by the remaining laboratories. The differences in concentration observed in Figure 13 may be due to the attenuation of x-rays as they pass through the deposit of $PM_{2.5}$ present on this filter. The replicate filters have a relatively thick capture of approximately 800 µg of mass. The EPA results include correction for x-ray attenuation due to the mass of the deposit. Attenuation correction factors are largest for light elements such as sodium, magnesium, and aluminum in thick deposits.

Many of the elements reported for this sample set were essentially not detected. Every result in Table 10 and Table 11 includes an uncertainty expressed by the laboratory. The concentration uncertainties expressed for the EPA results are one sigma as determined by error propagation using the following sources of random error.

1. Calibration uncertainty (± 5%)
2. Long term system stability (± 5%)
3. Uncertainty in least squares fit
4. Uncertainty in attenuation correction
5. Uncertainty in interference correction

Other laboratories may calculate the uncertainty using a different method. SOP's for the XRF analysis at ODEQ, RTI and Chester LabNet are available on the web (see reference 4, 5, and 6).

Conclusions

Good agreement was observed for all mass measurements performed at ODEQ and at NAREL. The largest inter-laboratory captured mass difference for loaded filters was only four micrograms. There was no appreciable mass capture for field blanks reported by ODEQ or NAREL. Differences in initial and final mass readings for metallic weights did not exceed two micrograms. This study indicates very good performance by the gravimetric laboratory at ODEQ.

Excellent recoveries (92-101%) were obtained at ODEQ and at NAREL for the mid-level IC spikes. Good recoveries (92-113%) were also observed for the low-level spikes. Sample spike solutions identified as A-3 and C-3 were actually blank water. These blanks provided a mechanism to measure laboratory contamination from a variety of sources such as (1) the reagent water used to dilute every sample, (2) the "clean" filter extracted by the test solution which is normally provided to the field for $PM_{2.5}$ capture, and (3) containers used to hold and transfer the sample during the extraction and analysis process. No contamination was reported for the anion blank (A-3) or the cation blank (C-3).

Replicate Nylon® filters from two collection events were available for this study. The longer-than-normal collection period was necessary to provide a sample with all ions sufficiently above the detection threshold. The results reported by ODEQ show excellent agreement with the results produced at NAREL. A difference from the mean value was calculated for each analyte, and this Relative Percent Difference (RPD) is included in Table 3 and Table 4. The largest RPD of the study was 21 percent reported for nitrate in sample N03-10949. All other RPD's were below 15 percent, and this was true even for those ions present in the sample at a low level. Blank Nylon® filters were also prepared for this study, and no contamination was reported by ODEQ or NAREL. This study indicates good performance by the IC laboratory at ODEQ.

A set of five filters that included four loaded replicates and one blank were analyzed by XRF at ODEQ. Replicates of the filters were analyzed by an EPA laboratory. The loaded filters were also analyzed by two additional laboratories during a previous study and results from these analyses were available for comparison. Replicates of the blank filters were analyzed on six different instruments and no significant contamination was reported. Very good precision was generally observed for the loaded filters. Special thanks go to EPA's National Exposure Research Laboratory (NERL) in Research Triangle Park, NC, for their contributions to this study.

Quartz filters were not included in this PE since ODEQ uses RTI, the EPA contract laboratory, for all carbon analyses. A separate PE study was conducted for the RTI laboratories in December, 2003, and a report of the results has been posted on the web for easy viewing (see reference 7).

References

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Table 1. Gravimetric Data

Filter ID	Tare Mass		Final Mass		Captured $PM_{2.5}$		Inter-Lab Difference* of Captured $PM_{2.5}$ (mg)
	ODEQ (mg)	NAREL (mg)	ODEQ (mg)	NAREL (mg)	ODEQ (mg)	NAREL (mg)	
TF03-10976	143.586	143.588	143.610	143.614	0.024	0.026	0.002
TF03-10977	146.622	146.625	146.644	146.646	0.022	0.021	-0.001
TF03-10978	144.469	144.470	144.500	144.500	0.031	0.030	-0.001
TF03-10979	144.755	144.756	144.786	144.788	0.031	0.032	0.001
TF03-10980	144.062	144.060	144.271	144.273	0.209	0.213	0.004
TF03-10981	145.189	145.191	145.403	145.405	0.214	0.214	0.000
TF03-10982	142.962	142.963	143.006	143.009	0.044	0.046	0.002
TF03-10983	143.171	143.173	143.173	143.172	0.002	-0.001	-0.003
TF03-10984	145.344	145.348	145.345	145.348	0.001	0.000	-0.001
TF03-10985	144.677	144.679	144.677	144.678	0.000	-0.001	-0.001
MW03-10987	192.419	192.420	192.418	192.422	-0.001	0.002	0.003
MW03-10989	97.544	97.545	97.542	97.546	-0.002	0.001	0.003
Chamber Blank	148.552	143.949	148.554	143.946	0.002	-0.003	-0.005

* Negative difference indicates a smaller capture determined by NAREL

Table 2. IC Spike Solutions

Sample ID	Analyte	Expected Result (µg/mL)	ODEQ Result (µg/mL)	NAREL Result (µg/mL)	ODEQ Recovery	NAREL Recovery	ODEQ MDL (µg/mL)	ODEQ MRL (µg/mL)
A-1	Nitrate	3.200	3.193	3.190	100%	100%	0.006	0.040
	Sulfate	0.250	0.254	0.238	102%	95%	0.004	0.040
A-2	Nitrate	0.180	0.165	0.184	92%	102%	0.006	0.040
	Sulfate	3.900	3.949	3.894	101%	100%	0.004	0.040
A-3	Nitrate	0.000	0.008	0.000	-----	-----	0.006	0.040
	Sulfate	0.000	0.009	0.000	-----	-----	0.004	0.040
C-1	Sodium	0.150	0.166	0.149	111%	99%	0.010	0.100
	Ammonium	3.700	3.422	3.550	92%	96%	0.003	0.020
	Potassium	1.500	1.470	1.494	98%	100%	0.008	0.030
C-2	Sodium	1.900	1.924	1.873	101%	99%	0.010	0.100
	Ammonium	0.300	0.313	0.338	104%	113%	0.003	0.020
	Potassium	0.210	0.218	0.206	104%	98%	0.008	0.030
C-3	Sodium	0.000	0.012	0.005	-----	-----	0.010	0.100
	Ammonium	0.000	0.003	0.000	-----	-----	0.003	0.020
	Potassium	0.000	0.003	0.000	-----	-----	0.008	0.030

Table 3. IC Analysis of Filter Replicates - November 20 Event

Analyte	Sample ID	ODEQ Result (µg/mL)	NAREL Result (µg/mL)	Air Volume (m^3)	Air Conc. (µg/m^3)	Air Conc. RPD	ODEQ MDL (µg/m^3)	ODEQ MRL (µg/m^3)
Nitrate	N03-10949	1.330	-----	58.1	0.824	21%	0.004	0.025
	N03-10950	1.142	-----	58.1	0.708	4%	-----	-----
	N03-10946	-----	1.405	58.1	0.605	-11%	-----	-----
	N03-10948	-----	1.378	58.1	0.593	-13%	-----	-----
Sulfate	N03-10949	2.903	-----	58.1	1.799	4%	0.002	0.025
	N03-10950	2.773	-----	58.1	1.718	-1%	-----	-----
	N03-10946	-----	4.041	58.1	1.739	1%	-----	-----
	N03-10948	-----	3.849	58.1	1.656	-4%	-----	-----
Sodium	N03-10949	0.042	-----	58.1	0.026	-6%	0.006	0.062
	N03-10950	0.039	-----	58.1	0.024	-12%	-----	-----
	N03-10946	-----	0.073	58.1	0.031	13%	-----	-----
	N03-10948	-----	0.067	58.1	0.029	5%	-----	-----
Ammonium	N03-10949	1.065	-----	58.1	0.660	5%	0.002	0.012
	N03-10950	1.001	-----	58.1	0.620	-1%	-----	-----
	N03-10946	-----	1.462	58.1	0.629	0%	-----	-----
	N03-10948	-----	1.397	58.1	0.601	-4%	-----	-----
Potassium	N03-10949	0.083	-----	58.1	0.051	-5%	0.005	0.019
	N03-10950	0.079	-----	58.1	0.049	-10%	-----	-----
	N03-10946	-----	0.139	58.1	0.060	11%	-----	-----
	N03-10948	-----	0.132	58.1	0.057	4%	-----	-----

Table 4. IC Analysis of Filter Replicates - December 1 Event

Analyte	Sample ID	ODEQ Result (µg/mL)	NAREL Result (µg/mL)	Air Volume (m^3)	Air Conc. (µg/m^3)	Air Conc. RPD	ODEQ MDL (µg/m^3)	ODEQ MRL (µg/m^3)
Nitrate	N03-10957	1.398	-----	58.1	0.866	7%	0.004	0.025
	N03-10958	1.342	-----	58.1	0.832	3%	-----	-----
	N03-10954	-----	1.833	58.2	0.787	-2%	-----	-----
	N03-10956	-----	1.727	58.2	0.742	-8%	-----	-----
Sulfate	N03-10957	4.006	-----	58.1	2.482	-4%	0.002	0.025
	N03-10958	4.152	-----	58.1	2.573	-1%	-----	-----
	N03-10954	-----	6.336	58.2	2.722	5%	-----	-----
	N03-10956	-----	5.991	58.2	2.573	-1%	-----	-----
Sodium	N03-10957	0.042	-----	58.1	0.026	-10%	0.006	0.062
	N03-10958	0.045	-----	58.1	0.028	-3%	-----	-----
	N03-10954	-----	0.071	58.2	0.031	6%	-----	-----
	N03-10956	-----	0.071	58.2	0.031	6%	-----	-----
Ammonium	N03-10957	1.331	-----	58.1	0.825	-7%	0.002	0.012
	N03-10958	1.390	-----	58.1	0.861	-2%	-----	-----
	N03-10954	-----	2.207	58.2	0.948	7%	-----	-----
	N03-10956	-----	2.093	58.2	0.899	2%	-----	-----
Potassium	N03-10957	0.073	-----	58.1	0.045	-12%	0.005	0.019
	N03-10958	0.076	-----	58.1	0.047	-8%	-----	-----
	N03-10954	-----	0.133	58.2	0.057	11%	-----	-----
	N03-10956	-----	0.131	58.2	0.056	9%	-----	-----

Table 5. IC Analysis of Nylon® Filter Blanks

Analyte	Sample ID	ODEQ Result (µg/mL)	NAREL Result (µg/mL)	ODEQ MDL (µg/mL)	ODEQ MRL (µg/mL)
Nitrate	N03-10964	0.005	-----	0.006	0.040
	N03-10965	0.004	-----	-----	-----
	N03-10962	-----	0.000	-----	-----
	N03-10963	-----	0.000	-----	-----
Sulfate	N03-10964	0.005	-----	0.004	0.040
	N03-10965	0.004	-----	-----	-----
	N03-10962	-----	0.000	-----	-----
	N03-10963	-----	0.000	-----	-----
Sodium	N03-10964	0.001	-----	0.010	0.100
	N03-10965	0.000	-----	-----	-----
	N03-10962	-----	0.003	-----	-----
	N03-10963	-----	0.000	-----	-----
Ammonium	N03-10964	0.000	-----	0.003	0.020
	N03-10965	0.000	-----	-----	-----
	N03-10962	-----	0.000	-----	-----
	N03-10963	-----	0.000	-----	-----
Potassium	N03-10964	0.002	-----	0.008	0.030
	N03-10965	0.000	-----	-----	-----
	N03-10962	-----	0.000	-----	-----
	N03-10963	-----	0.000	-----	-----

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10996	11	Na	0.5283 ± 0.2041	0.0799 ± 0.0217	0.0000 ± 0.0213	0.0354 ± 0.0329	0.0000 ± 0.2006	0.0629 ± 0.0490	-----
T04-10996	12	Mg	-0.0075 ± 0.0418	0.0407 ± 0.0136	0.0000 ± 0.0078	0.0000 ± 0.0132	0.0000 ± 0.0467	0.0078 ± 0.0165	-----
T04-10996	13	Al	0.0396 ± 0.0105	0.1363 ± 0.0341	0.0000 ± 0.0064	0.0853 ± 0.0126	0.0749 ± 0.0179	0.1032 ± 0.0142	-----
T04-10996	14	Si	0.7526 ± 0.0661	0.8534 ± 0.0724	0.7669 ± 0.0169	0.6596 ± 0.0773	0.6072 ± 0.0706	0.7085 ± 0.0835	0.7305
T04-10996	15	P	-0.0663 ± 0.0227	-0.0163 ± 0.0292	0.0000 ± 0.0015	0.0000 ± 0.0042	0.0000 ± 0.0055	0.0000 ± 0.0044	-----
T04-10996	16	S	9.0078 ± 0.7243	8.1227 ± 0.5814	7.4970 ± 0.0277	7.4880 ± 0.8473	6.8990 ± 0.7790	7.6120 ± 0.8617	7.5545
T04-10996	17	Cl	0.1618 ± 0.0595	0.2821 ± 0.0242	0.1541 ± 0.0066	0.2806 ± 0.0330	0.2597 ± 0.0310	0.2929 ± 0.0339	-----
T04-10996	19	K	0.2516 ± 0.0207	0.2393 ± 0.0130	0.2082 ± 0.0079	0.2455 ± 0.0279	0.2419 ± 0.0275	0.2379 ± 0.0271	0.2406
T04-10996	20	Ca	0.1354 ± 0.0115	0.1669 ± 0.0094	0.1586 ± 0.0050	0.1307 ± 0.0150	0.1282 ± 0.0147	0.1465 ± 0.0169	0.1410
T04-10996	21	Sc	-0.0021 ± 0.0023	0.0067 ± 0.0020	0.0000 ± 0.0020	0.0000 ± 0.0014	0.0000 ± 0.0014	0.0000 ± 0.0017	-----
T04-10996	22	Ti	0.0164 ± 0.0061	0.0045 ± 0.0039	0.0188 ± 0.0019	0.0138 ± 0.0013	0.0121 ± 0.0013	0.0147 ± 0.0015	-----
T04-10996	23	V	0.0026 ± 0.0020	0.0043 ± 0.0015	0.0017 ± 0.0011	0.0000 ± 0.0007	0.0008 ± 0.0007	0.0020 ± 0.0007	-----
T04-10996	24	Cr	0.0021 ± 0.0009	0.0027 ± 0.0013	0.0027 ± 0.0007	0.0003 ± 0.0006	0.0023 ± 0.0007	0.0016 ± 0.0007	-----
T04-10996	25	Mn	0.0044 ± 0.0016	0.0147 ± 0.0028	0.0000 ± 0.0006	0.0071 ± 0.0011	0.0077 ± 0.0011	0.0083 ± 0.0012	-----
T04-10996	26	Fe	0.2094 ± 0.0170	0.2224 ± 0.0167	0.2083 ± 0.0027	0.1981 ± 0.0103	0.2055 ± 0.0106	0.2030 ± 0.0157	0.2069
T04-10996	27	Co	-0.0021 ± 0.0016	0.0072 ± 0.0024	0.0000 ± 0.0007	0.0000 ± 0.0014	0.0005 ± 0.0012	0.0000 ± 0.0012	-----
T04-10996	28	Ni	0.0090 ± 0.0013	0.0522 ± 0.0046	0.0093 ± 0.0006	0.0007 ± 0.0006	0.0000 ± 0.0005	0.0003 ± 0.0008	-----
T04-10996	29	Cu	0.0080 ± 0.0012	0.0016 ± 0.0017	0.0050 ± 0.0008	0.0045 ± 0.0007	0.0059 ± 0.0008	0.0064 ± 0.0009	-----
T04-10996	30	Zn	0.0496 ± 0.0042	0.0547 ± 0.0058	0.0447 ± 0.0011	0.0426 ± 0.0037	0.0442 ± 0.0024	0.0444 ± 0.0038	0.0445
T04-10996	31	Ga	0.0015 ± 0.0039	0.0051 ± 0.0027	0.0000 ± 0.0007	0.0000 ± 0.0016	0.0000 ± 0.0027	0.0000 ± 0.0019	-----
T04-10996	33	As	0.0048 ± 0.0023	0.0062 ± 0.0039	0.0051 ± 0.0010	0.0060 ± 0.0025	0.0093 ± 0.0032	0.0035 ± 0.0027	-----
T04-10996	34	Se	0.0056 ± 0.0010	0.0104 ± 0.0025	0.0077 ± 0.0006	0.0074 ± 0.0010	0.0067 ± 0.0013	0.0070 ± 0.0010	0.0072
T04-10996	35	Br	0.0151 ± 0.0015	0.0208 ± 0.0031	0.0174 ± 0.0008	0.0173 ± 0.0013	0.0165 ± 0.0016	0.0181 ± 0.0014	0.0173
T04-10996	37	Rb	0.0008 ± 0.0008	0.0024 ± 0.0022	0.0000 ± 0.0004	0.0000 ± 0.0009	0.0004 ± 0.0011	0.0000 ± 0.0010	-----
T04-10996	38	Sr	0.0020 ± 0.0009	-0.0033 ± 0.0057	0.0022 ± 0.0005	0.0000 ± 0.0010	0.0004 ± 0.0013	0.0020 ± 0.0011	-----
T04-10996	39	Y	0.0012 ± 0.0011	0.0003 ± 0.0061	0.0000 ± 0.0006	0.0000 ± 0.0012	0.0000 ± 0.0015	0.0000 ± 0.0013	-----
T04-10996	40	Zr	-0.0008 ± 0.0013	0.0008 ± 0.0047	0.0000 ± 0.0013	0.0000 ± 0.0015	0.0030 ± 0.0018	0.0019 ± 0.0015	-----
T04-10996	41	Nb	-0.0002 ± 0.0015	0.0009 ± 0.0055	0.0000 ± 0.0010	0.0000 ± 0.0017	0.0000 ± 0.0022	0.0000 ± 0.0018	-----

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10996	42	Mo	0.0019 ± 0.0018	-0.0029 ± 0.0053	0.0000 ± 0.0029	0.0000 ± 0.0022	0.0000 ± 0.0028	0.0034 ± 0.0022	-----
T04-10996	47	Ag	0.0029 ± 0.0039	-0.0140 ± 0.0186	0.0000 ± 0.0027	0.0000 ± 0.0041	0.0000 ± 0.0028	0.0081 ± 0.0046	-----
T04-10996	48	Cd	0.0019 ± 0.0041	0.0315 ± 0.0077	0.0106 ± 0.0028	0.0012 ± 0.0043	0.0016 ± 0.0031	0.0021 ± 0.0045	-----
T04-10996	49	In	-0.0004 ± 0.0044	Not Reported	0.0000 ± 0.0041	0.0020 ± 0.0047	0.0000 ± 0.0035	0.0050 ± 0.0050	-----
T04-10996	50	Sn	0.0048 ± 0.0049	0.0246 ± 0.0061	0.0000 ± 0.0053	0.0177 ± 0.0057	0.0000 ± 0.0042	0.0023 ± 0.0057	-----
T04-10996	51	Sb	0.0041 ± 0.0052	0.0170 ± 0.0071	0.0403 ± 0.0073	0.0004 ± 0.0064	0.0039 ± 0.0051	0.0002 ± 0.0063	-----
T04-10996	55	Cs	-0.0012 ± 0.0089	0.0056 ± 0.0043	0.0000 ± 0.0034	0.0000 ± 0.0150	0.0000 ± 0.0138	0.0165 ± 0.0159	-----
T04-10996	56	Ba	-0.0079 ± 0.0120	0.0193 ± 0.0077	0.0000 ± 0.0248	0.0109 ± 0.0190	0.0000 ± 0.0187	0.0036 ± 0.0208	-----
T04-10996	57	La	0.0143 ± 0.0159	0.0021 ± 0.0055	0.0000 ± 0.0033	0.0000 ± 0.0249	0.0000 ± 0.0246	0.0000 ± 0.0266	-----
T04-10996	58	Ce	-0.0198 ± 0.0195	0.0051 ± 0.0043	0.0000 ± 0.0032	0.0219 ± 0.0319	0.0376 ± 0.0341	0.0000 ± 0.0337	-----
T04-10996	62	Sm	0.0405 ± 0.0687	Not Reported	0.0000 ± 0.0016	0.0000 ± 0.0026	0.0000 ± 0.0023	0.0000 ± 0.0026	-----
T04-10996	63	Eu	0.1830 ± 0.1450	Not Reported	0.0000 ± 0.0017	0.0000 ± 0.0035	0.0000 ± 0.0035	0.0000 ± 0.0047	-----
T04-10996	65	Tb	-0.0962 ± 0.2143	Not Reported	0.0000 ± 0.0050	0.0000 ± 0.0073	0.0000 ± 0.0083	0.0000 ± 0.0123	-----
T04-10996	72	Hf	-0.0035 ± 0.0151	Not Reported	0.0000 ± 0.0021	0.0000 ± 0.0028	0.0000 ± 0.0057	0.0014 ± 0.0023	-----
T04-10996	73	Ta	-0.0048 ± 0.0180	Not Reported	0.0000 ± 0.0034	0.0000 ± 0.0030	0.0108 ± 0.0065	0.0000 ± 0.0032	-----
T04-10996	74	W	0.0058 ± 0.0055	0.0144 ± 0.0076	0.0000 ± 0.0023	0.0000 ± 0.0031	0.0104 ± 0.0055	0.0000 ± 0.0028	-----
T04-10996	77	Ir	-0.0013 ± 0.0036	Not Reported	0.0000 ± 0.0021	0.0000 ± 0.0022	0.0000 ± 0.0035	0.0000 ± 0.0018	-----
T04-10996	79	Au	0.0005 ± 0.0024	0.0024 ± 0.0042	0.0027 ± 0.0013	0.0000 ± 0.0024	0.0080 ± 0.0032	0.0000 ± 0.0020	-----
T04-10996	80	Hg	-0.0004 ± 0.0017	0.0077 ± 0.0046	0.0000 ± 0.0014	0.0000 ± 0.0019	0.0072 ± 0.0023	0.0002 ± 0.0014	-----
T04-10996	82	Pb	0.0345 ± 0.0038	0.0443 ± 0.0076	0.0375 ± 0.0018	0.0280 ± 0.0029	0.0336 ± 0.0040	0.0312 ± 0.0029	0.0341
T04-10997	11	Na	0.7783 ± 0.2103	0.0950 ± 0.0234	0.0000 ± 0.0214	0.0000 ± 0.0326	0.0916 ± 0.1993	0.0130 ± 0.0481	-----
T04-10997	12	Mg	0.0150 ± 0.0418	0.0200 ± 0.0139	0.0000 ± 0.0077	0.0075 ± 0.0136	0.0000 ± 0.0463	0.0000 ± 0.0164	-----
T04-10997	13	Al	0.0350 ± 0.0103	0.2159 ± 0.0382	0.0000 ± 0.0065	0.0776 ± 0.0119	0.0913 ± 0.0189	0.0875 ± 0.0125	-----
T04-10997	14	Si	0.7457 ± 0.0655	0.7933 ± 0.0686	0.7674 ± 0.0169	0.6706 ± 0.0786	0.6219 ± 0.0723	0.6899 ± 0.0813	0.7178
T04-10997	15	P	-0.0661 ± 0.0219	0.0780 ± 0.0303	0.0000 ± 0.0016	0.0000 ± 0.0041	0.0000 ± 0.0055	0.0000 ± 0.0043	-----
T04-10997	16	S	8.6724 ± 0.6974	7.7217 ± 0.5530	7.4810 ± 0.0275	7.5190 ± 0.8508	6.9360 ± 0.7832	7.7000 ± 0.8718	7.6095
T04-10997	17	Cl	0.1890 ± 0.0580	0.3131 ± 0.0261	0.1885 ± 0.0069	0.2710 ± 0.0319	0.2567 ± 0.0307	0.2998 ± 0.0346	0.2639
T04-10997	19	K	0.2428 ± 0.0200	0.2275 ± 0.0124	0.1964 ± 0.0078	0.2412 ± 0.0274	0.2365 ± 0.0269	0.2414 ± 0.0275	0.2389

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10997	20	Ca	0.1470 ± 0.0124	0.1584 ± 0.0090	0.1732 ± 0.0053	0.1261 ± 0.0145	0.1286 ± 0.0147	0.1388 ± 0.0160	0.1429
T04-10997	21	Sc	-0.0021 ± 0.0023	0.0019 ± 0.0019	0.0000 ± 0.0021	0.0000 ± 0.0013	0.0003 ± 0.0014	0.0000 ± 0.0017	-----
T04-10997	22	Ti	0.0063 ± 0.0061	-0.0002 ± 0.0038	0.0162 ± 0.0020	0.0116 ± 0.0012	0.0110 ± 0.0012	0.0124 ± 0.0014	-----
T04-10997	23	V	-0.0020 ± 0.0021	0.0023 ± 0.0014	0.0000 ± 0.0011	0.0000 ± 0.0006	0.0030 ± 0.0007	0.0011 ± 0.0007	-----
T04-10997	24	Cr	0.0008 ± 0.0009	0.0013 ± 0.0012	0.0036 ± 0.0007	0.0006 ± 0.0006	0.0000 ± 0.0006	0.0002 ± 0.0007	-----
T04-10997	25	Mn	0.0076 ± 0.0016	0.0138 ± 0.0027	0.0000 ± 0.0006	0.0062 ± 0.0011	0.0076 ± 0.0010	0.0069 ± 0.0011	-----
T04-10997	26	Fe	0.2199 ± 0.0179	0.2215 ± 0.0167	0.2117 ± 0.0028	0.2016 ± 0.0105	0.1969 ± 0.0101	0.1923 ± 0.0150	0.2066
T04-10997	27	Co	-0.0038 ± 0.0016	0.0068 ± 0.0024	0.0000 ± 0.0008	0.0000 ± 0.0014	0.0009 ± 0.0012	0.0002 ± 0.0011	-----
T04-10997	28	Ni	0.0028 ± 0.0010	0.0303 ± 0.0032	0.0014 ± 0.0005	0.0005 ± 0.0006	0.0002 ± 0.0005	0.0009 ± 0.0007	-----
T04-10997	29	Cu	0.0054 ± 0.0011	-0.0002 ± 0.0017	0.0055 ± 0.0008	0.0047 ± 0.0007	0.0063 ± 0.0007	0.0062 ± 0.0009	-----
T04-10997	30	Zn	0.0481 ± 0.0041	0.0546 ± 0.0058	0.0399 ± 0.0011	0.0384 ± 0.0021	0.0414 ± 0.0022	0.0459 ± 0.0026	0.0437
T04-10997	31	Ga	0.0006 ± 0.0039	0.0005 ± 0.0023	0.0000 ± 0.0007	0.0000 ± 0.0016	0.0000 ± 0.0025	0.0000 ± 0.0018	-----
T04-10997	33	As	0.0051 ± 0.0021	0.0086 ± 0.0039	0.0083 ± 0.0010	0.0040 ± 0.0024	0.0092 ± 0.0029	0.0075 ± 0.0024	-----
T04-10997	34	Se	0.0048 ± 0.0009	0.0072 ± 0.0023	0.0067 ± 0.0005	0.0048 ± 0.0009	0.0066 ± 0.0013	0.0067 ± 0.0009	0.0067
T04-10997	35	Br	0.0154 ± 0.0015	0.0167 ± 0.0029	0.0193 ± 0.0008	0.0166 ± 0.0013	0.0168 ± 0.0016	0.0195 ± 0.0014	0.0168
T04-10997	37	Rb	0.0006 ± 0.0008	0.0023 ± 0.0021	0.0000 ± 0.0005	0.0000 ± 0.0009	0.0000 ± 0.0011	0.0000 ± 0.0009	-----
T04-10997	38	Sr	0.0008 ± 0.0009	-0.0040 ± 0.0051	0.0024 ± 0.0005	0.0000 ± 0.0010	0.0014 ± 0.0012	0.0000 ± 0.0010	-----
T04-10997	39	Y	0.0000 ± 0.0011	-0.0012 ± 0.0054	0.0000 ± 0.0006	0.0000 ± 0.0012	0.0000 ± 0.0015	0.0000 ± 0.0012	-----
T04-10997	40	Zr	0.0002 ± 0.0013	0.0062 ± 0.0050	0.0000 ± 0.0013	0.0000 ± 0.0014	0.0000 ± 0.0017	0.0016 ± 0.0015	-----
T04-10997	41	Nb	0.0034 ± 0.0015	0.0071 ± 0.0057	0.0000 ± 0.0010	0.0000 ± 0.0017	0.0000 ± 0.0021	0.0000 ± 0.0017	-----
T04-10997	42	Mo	0.0005 ± 0.0019	-0.0061 ± 0.0053	0.0007 ± 0.0022	0.0001 ± 0.0021	0.0000 ± 0.0028	0.0000 ± 0.0021	-----
T04-10997	47	Ag	-0.0014 ± 0.0039	-0.0092 ± 0.0177	0.0000 ± 0.0024	0.0000 ± 0.0041	0.0023 ± 0.0028	0.0029 ± 0.0045	-----
T04-10997	48	Cd	0.0032 ± 0.0041	0.0380 ± 0.0078	0.0086 ± 0.0029	0.0024 ± 0.0043	0.0000 ± 0.0030	0.0090 ± 0.0046	-----
T04-10997	49	In	0.0038 ± 0.0044	Not Reported	0.0000 ± 0.0038	0.0008 ± 0.0046	0.0000 ± 0.0033	0.0000 ± 0.0049	-----
T04-10997	50	Sn	0.0010 ± 0.0049	0.0226 ± 0.0060	0.0000 ± 0.0052	0.0097 ± 0.0055	0.0000 ± 0.0041	0.0000 ± 0.0055	-----
T04-10997	51	Sb	0.0006 ± 0.0053	0.0273 ± 0.0072	0.0445 ± 0.0077	0.0073 ± 0.0063	0.0000 ± 0.0049	0.0018 ± 0.0061	-----
T04-10997	55	Cs	0.0053 ± 0.0090	0.0037 ± 0.0043	0.0000 ± 0.0032	0.0100 ± 0.0149	0.0059 ± 0.0132	0.0000 ± 0.0151	-----
T04-10997	56	Ba	0.0176 ± 0.0122	0.0374 ± 0.0081	0.0000 ± 0.0254	0.0079 ± 0.0186	0.0353 ± 0.0182	0.0446 ± 0.0205	-----

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10997	57	La	-0.0137 ± 0.0159	0.0089 ± 0.0056	0.0000 ± 0.0032	0.0022 ± 0.0245	0.0152 ± 0.0240	0.0344 ± 0.0261	-----
T04-10997	58	Ce	-0.0116 ± 0.0197	0.0043 ± 0.0043	0.0000 ± 0.0030	0.0000 ± 0.0315	0.0000 ± 0.0329	0.0139 ± 0.0331	-----
T04-10997	62	Sm	0.0859 ± 0.0701	Not Reported	0.0000 ± 0.0016	0.0000 ± 0.0026	0.0000 ± 0.0023	0.0000 ± 0.0025	-----
T04-10997	63	Eu	-0.0307 ± 0.1452	Not Reported	0.0000 ± 0.0016	0.0000 ± 0.0035	0.0000 ± 0.0034	0.0000 ± 0.0044	-----
T04-10997	65	Tb	0.1992 ± 0.2148	Not Reported	0.0000 ± 0.0051	0.0000 ± 0.0074	0.0006 ± 0.0080	0.0000 ± 0.0120	-----
T04-10997	72	Hf	-0.0056 ± 0.0151	Not Reported	0.0000 ± 0.0022	0.0005 ± 0.0028	0.0000 ± 0.0055	0.0021 ± 0.0022	-----
T04-10997	73	Ta	0.0009 ± 0.0180	Not Reported	0.0000 ± 0.0034	0.0000 ± 0.0030	0.0000 ± 0.0061	0.0000 ± 0.0030	-----
T04-10997	74	W	-0.0005 ± 0.0054	0.0023 ± 0.0066	0.0000 ± 0.0022	0.0000 ± 0.0030	0.0000 ± 0.0053	0.0000 ± 0.0027	-----
T04-10997	77	Ir	0.0023 ± 0.0036	Not Reported	0.0000 ± 0.0020	0.0000 ± 0.0023	0.0000 ± 0.0034	0.0000 ± 0.0017	-----
T04-10997	79	Au	-0.0019 ± 0.0024	0.0081 ± 0.0041	0.0029 ± 0.0012	0.0000 ± 0.0023	0.0000 ± 0.0031	0.0000 ± 0.0020	-----
T04-10997	80	Hg	0.0005 ± 0.0017	-0.0009 ± 0.0046	0.0000 ± 0.0014	0.0000 ± 0.0020	0.0000 ± 0.0022	0.0000 ± 0.0014	-----
T04-10997	82	Pb	0.0314 ± 0.0036	0.0445 ± 0.0075	0.0326 ± 0.0018	0.0278 ± 0.0028	0.0256 ± 0.0037	0.0249 ± 0.0026	0.0296
T04-10998	11	Na	0.7481 ± 0.2094	0.0799 ± 0.0217	0.0000 ± 0.0213	0.0354 ± 0.0329	0.0000 ± 0.2006	0.0629 ± 0.0490	-----
T04-10998	12	Mg	-0.0255 ± 0.0418	0.0407 ± 0.0136	0.0000 ± 0.0078	0.0000 ± 0.0132	0.0000 ± 0.0467	0.0078 ± 0.0165	-----
T04-10998	13	Al	0.0203 ± 0.0100	0.1363 ± 0.0341	0.0000 ± 0.0064	0.0853 ± 0.0126	0.0749 ± 0.0179	0.1032 ± 0.0142	-----
T04-10998	14	Si	0.7096 ± 0.0624	0.8534 ± 0.0724	0.7669 ± 0.0169	0.6596 ± 0.0773	0.6072 ± 0.0706	0.7085 ± 0.0835	0.7091
T04-10998	15	P	-0.0683 ± 0.0222	-0.0163 ± 0.0292	0.0000 ± 0.0015	0.0000 ± 0.0042	0.0000 ± 0.0055	0.0000 ± 0.0044	-----
T04-10998	16	S	8.7658 ± 0.7048	8.1227 ± 0.5814	7.4970 ± 0.0277	7.4880 ± 0.8473	6.8990 ± 0.7790	7.6120 ± 0.8617	7.5545
T04-10998	17	Cl	0.1904 ± 0.0586	0.2821 ± 0.0242	0.1541 ± 0.0066	0.2806 ± 0.0330	0.2597 ± 0.0310	0.2929 ± 0.0339	0.2702
T04-10998	19	K	0.2404 ± 0.0199	0.2393 ± 0.0130	0.2082 ± 0.0079	0.2455 ± 0.0279	0.2419 ± 0.0275	0.2379 ± 0.0271	0.2398
T04-10998	20	Ca	0.1490 ± 0.0126	0.1669 ± 0.0094	0.1586 ± 0.0050	0.1307 ± 0.0150	0.1282 ± 0.0147	0.1465 ± 0.0169	0.1478
T04-10998	21	Sc	-0.0013 ± 0.0023	0.0067 ± 0.0020	0.0000 ± 0.0020	0.0000 ± 0.0014	0.0000 ± 0.0014	0.0000 ± 0.0017	-----
T04-10998	22	Ti	0.0135 ± 0.0063	0.0045 ± 0.0039	0.0188 ± 0.0019	0.0138 ± 0.0013	0.0121 ± 0.0013	0.0147 ± 0.0015	-----
T04-10998	23	V	0.0033 ± 0.0021	0.0043 ± 0.0015	0.0017 ± 0.0011	0.0000 ± 0.0007	0.0008 ± 0.0007	0.0020 ± 0.0007	-----
T04-10998	24	Cr	0.0009 ± 0.0009	0.0027 ± 0.0013	0.0027 ± 0.0007	0.0003 ± 0.0006	0.0023 ± 0.0007	0.0016 ± 0.0007	-----
T04-10998	25	Mn	0.0079 ± 0.0016	0.0147 ± 0.0028	0.0000 ± 0.0006	0.0071 ± 0.0011	0.0077 ± 0.0011	0.0083 ± 0.0012	-----
T04-10998	26	Fe	0.2188 ± 0.0178	0.2224 ± 0.0167	0.2083 ± 0.0027	0.1981 ± 0.0103	0.2055 ± 0.0106	0.2030 ± 0.0157	0.2069
T04-10998	27	Co	-0.0022 ± 0.0016	0.0072 ± 0.0024	0.0000 ± 0.0007	0.0000 ± 0.0014	0.0005 ± 0.0012	0.0000 ± 0.0012	-----

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10998	28	Ni	0.0029 ± 0.0010	0.0522 ± 0.0046	0.0093 ± 0.0006	0.0007 ± 0.0006	0.0000 ± 0.0005	0.0003 ± 0.0008	-----
T04-10998	29	Cu	0.0085 ± 0.0012	0.0016 ± 0.0017	0.0050 ± 0.0008	0.0045 ± 0.0007	0.0059 ± 0.0008	0.0064 ± 0.0009	-----
T04-10998	30	Zn	0.0476 ± 0.0040	0.0547 ± 0.0058	0.0447 ± 0.0011	0.0426 ± 0.0037	0.0442 ± 0.0024	0.0444 ± 0.0038	0.0445
T04-10998	31	Ga	0.0004 ± 0.0039	0.0051 ± 0.0027	0.0000 ± 0.0007	0.0000 ± 0.0016	0.0000 ± 0.0027	0.0000 ± 0.0019	-----
T04-10998	33	As	0.0054 ± 0.0021	0.0062 ± 0.0039	0.0051 ± 0.0010	0.0060 ± 0.0025	0.0093 ± 0.0032	0.0035 ± 0.0027	-----
T04-10998	34	Se	0.0049 ± 0.0009	0.0104 ± 0.0025	0.0077 ± 0.0006	0.0074 ± 0.0010	0.0067 ± 0.0013	0.0070 ± 0.0010	0.0072
T04-10998	35	Br	0.0145 ± 0.0014	0.0208 ± 0.0031	0.0174 ± 0.0008	0.0173 ± 0.0013	0.0165 ± 0.0016	0.0181 ± 0.0014	0.0173
T04-10998	37	Rb	0.0012 ± 0.0008	0.0024 ± 0.0022	0.0000 ± 0.0004	0.0000 ± 0.0009	0.0004 ± 0.0011	0.0000 ± 0.0010	-----
T04-10998	38	Sr	0.0004 ± 0.0009	-0.0033 ± 0.0057	0.0022 ± 0.0005	0.0000 ± 0.0010	0.0004 ± 0.0013	0.0020 ± 0.0011	-----
T04-10998	39	Y	-0.0002 ± 0.0011	0.0003 ± 0.0061	0.0000 ± 0.0006	0.0000 ± 0.0012	0.0000 ± 0.0015	0.0000 ± 0.0013	-----
T04-10998	40	Zr	-0.0007 ± 0.0013	0.0008 ± 0.0047	0.0000 ± 0.0013	0.0000 ± 0.0015	0.0030 ± 0.0018	0.0019 ± 0.0015	-----
T04-10998	41	Nb	0.0019 ± 0.0015	0.0009 ± 0.0055	0.0000 ± 0.0010	0.0000 ± 0.0017	0.0000 ± 0.0022	0.0000 ± 0.0018	-----
T04-10998	42	Mo	-0.0018 ± 0.0019	-0.0029 ± 0.0053	0.0000 ± 0.0029	0.0000 ± 0.0022	0.0000 ± 0.0028	0.0034 ± 0.0022	-----
T04-10998	47	Ag	0.0015 ± 0.0040	-0.0140 ± 0.0186	0.0000 ± 0.0027	0.0000 ± 0.0041	0.0000 ± 0.0028	0.0081 ± 0.0046	-----
T04-10998	48	Cd	0.0064 ± 0.0042	0.0315 ± 0.0077	0.0106 ± 0.0028	0.0012 ± 0.0043	0.0016 ± 0.0031	0.0021 ± 0.0045	-----
T04-10998	49	In	-0.0011 ± 0.0044	Not Reported	0.0000 ± 0.0041	0.0020 ± 0.0047	0.0000 ± 0.0035	0.0050 ± 0.0050	-----
T04-10998	50	Sn	0.0042 ± 0.0049	0.0246 ± 0.0061	0.0000 ± 0.0053	0.0177 ± 0.0057	0.0000 ± 0.0042	0.0023 ± 0.0057	-----
T04-10998	51	Sb	0.0006 ± 0.0053	0.0170 ± 0.0071	0.0403 ± 0.0073	0.0004 ± 0.0064	0.0039 ± 0.0051	0.0002 ± 0.0063	-----
T04-10998	55	Cs	-0.0067 ± 0.0092	0.0056 ± 0.0043	0.0000 ± 0.0034	0.0000 ± 0.0150	0.0000 ± 0.0138	0.0165 ± 0.0159	-----
T04-10998	56	Ba	-0.0043 ± 0.0125	0.0193 ± 0.0077	0.0000 ± 0.0248	0.0109 ± 0.0190	0.0000 ± 0.0187	0.0036 ± 0.0208	-----
T04-10998	57	La	-0.0089 ± 0.0163	0.0021 ± 0.0055	0.0000 ± 0.0033	0.0000 ± 0.0249	0.0000 ± 0.0246	0.0000 ± 0.0266	-----
T04-10998	58	Ce	-0.0028 ± 0.0202	0.0051 ± 0.0043	0.0000 ± 0.0032	0.0219 ± 0.0319	0.0376 ± 0.0341	0.0000 ± 0.0337	-----
T04-10998	62	Sm	0.0156 ± 0.0713	Not Reported	0.0000 ± 0.0016	0.0000 ± 0.0026	0.0000 ± 0.0023	0.0000 ± 0.0026	-----
T04-10998	63	Eu	-0.0961 ± 0.1484	Not Reported	0.0000 ± 0.0017	0.0000 ± 0.0035	0.0000 ± 0.0035	0.0000 ± 0.0047	-----
T04-10998	65	Tb	0.1024 ± 0.2194	Not Reported	0.0000 ± 0.0050	0.0000 ± 0.0073	0.0000 ± 0.0083	0.0000 ± 0.0123	-----
T04-10998	72	Hf	-0.0070 ± 0.0151	Not Reported	0.0000 ± 0.0021	0.0000 ± 0.0028	0.0000 ± 0.0057	0.0014 ± 0.0023	-----
T04-10998	73	Ta	-0.0013 ± 0.0180	Not Reported	0.0000 ± 0.0034	0.0000 ± 0.0030	0.0108 ± 0.0065	0.0000 ± 0.0032	-----
T04-10998	74	W	0.0003 ± 0.0054	0.0144 ± 0.0076	0.0000 ± 0.0023	0.0000 ± 0.0031	0.0104 ± 0.0055	0.0000 ± 0.0028	-----

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10998	77	Ir	0.0014 ± 0.0036	Not Reported	0.0000 ± 0.0021	0.0000 ± 0.0022	0.0000 ± 0.0035	0.0000 ± 0.0018	-----
T04-10998	79	Au	-0.0012 ± 0.0024	0.0024 ± 0.0042	0.0027 ± 0.0013	0.0000 ± 0.0024	0.0080 ± 0.0032	0.0000 ± 0.0020	-----
T04-10998	80	Hg	0.0005 ± 0.0018	0.0077 ± 0.0046	0.0000 ± 0.0014	0.0000 ± 0.0019	0.0072 ± 0.0023	0.0002 ± 0.0014	-----
T04-10998	82	Pb	0.0306 ± 0.0036	0.0443 ± 0.0076	0.0375 ± 0.0018	0.0280 ± 0.0029	0.0336 ± 0.0040	0.0312 ± 0.0029	0.0324
T04-10999	11	Na	0.8697 ± 0.2144	0.0950 ± 0.0234	0.0000 ± 0.0214	0.0000 ± 0.0326	0.0916 ± 0.1993	0.0130 ± 0.0481	-----
T04-10999	12	Mg	0.0240 ± 0.0422	0.0200 ± 0.0139	0.0000 ± 0.0077	0.0075 ± 0.0136	0.0000 ± 0.0463	0.0000 ± 0.0164	-----
T04-10999	13	Al	0.0411 ± 0.0106	0.2159 ± 0.0382	0.0000 ± 0.0065	0.0776 ± 0.0119	0.0913 ± 0.0189	0.0875 ± 0.0125	-----
T04-10999	14	Si	0.7754 ± 0.0681	0.7933 ± 0.0686	0.7674 ± 0.0169	0.6706 ± 0.0786	0.6219 ± 0.0723	0.6899 ± 0.0813	0.7286
T04-10999	15	P	-0.0679 ± 0.0230	0.0780 ± 0.0303	0.0000 ± 0.0016	0.0000 ± 0.0041	0.0000 ± 0.0055	0.0000 ± 0.0043	-----
T04-10999	16	S	9.1050 ± 0.7321	7.7217 ± 0.5530	7.4810 ± 0.0275	7.5190 ± 0.8508	6.9360 ± 0.7832	7.7000 ± 0.8718	7.6095
T04-10999	17	Cl	0.1881 ± 0.0606	0.3131 ± 0.0261	0.1885 ± 0.0069	0.2710 ± 0.0319	0.2567 ± 0.0307	0.2998 ± 0.0346	0.2639
T04-10999	19	K	0.2591 ± 0.0213	0.2275 ± 0.0124	0.1964 ± 0.0078	0.2412 ± 0.0274	0.2365 ± 0.0269	0.2414 ± 0.0275	0.2389
T04-10999	20	Ca	0.1529 ± 0.0129	0.1584 ± 0.0090	0.1732 ± 0.0053	0.1261 ± 0.0145	0.1286 ± 0.0147	0.1388 ± 0.0160	0.1458
T04-10999	21	Sc	-0.0029 ± 0.0023	0.0019 ± 0.0019	0.0000 ± 0.0021	0.0000 ± 0.0013	0.0003 ± 0.0014	0.0000 ± 0.0017	-----
T04-10999	22	Ti	0.0162 ± 0.0062	-0.0002 ± 0.0038	0.0162 ± 0.0020	0.0116 ± 0.0012	0.0110 ± 0.0012	0.0124 ± 0.0014	-----
T04-10999	23	V	0.0018 ± 0.0021	0.0023 ± 0.0014	0.0000 ± 0.0011	0.0000 ± 0.0006	0.0030 ± 0.0007	0.0011 ± 0.0007	-----
T04-10999	24	Cr	0.0017 ± 0.0009	0.0013 ± 0.0012	0.0036 ± 0.0007	0.0006 ± 0.0006	0.0000 ± 0.0006	0.0002 ± 0.0007	-----
T04-10999	25	Mn	0.0085 ± 0.0017	0.0138 ± 0.0027	0.0000 ± 0.0006	0.0062 ± 0.0011	0.0076 ± 0.0010	0.0069 ± 0.0011	-----
T04-10999	26	Fe	0.2259 ± 0.0183	0.2215 ± 0.0167	0.2117 ± 0.0028	0.2016 ± 0.0105	0.1969 ± 0.0101	0.1923 ± 0.0150	0.2066
T04-10999	27	Co	-0.0022 ± 0.0016	0.0068 ± 0.0024	0.0000 ± 0.0008	0.0000 ± 0.0014	0.0009 ± 0.0012	0.0002 ± 0.0011	-----
T04-10999	28	Ni	0.0031 ± 0.0010	0.0303 ± 0.0032	0.0014 ± 0.0005	0.0005 ± 0.0006	0.0002 ± 0.0005	0.0009 ± 0.0007	-----
T04-10999	29	Cu	0.0066 ± 0.0012	-0.0002 ± 0.0017	0.0055 ± 0.0008	0.0047 ± 0.0007	0.0063 ± 0.0007	0.0062 ± 0.0009	-----
T04-10999	30	Zn	0.0493 ± 0.0042	0.0546 ± 0.0058	0.0399 ± 0.0011	0.0384 ± 0.0021	0.0414 ± 0.0022	0.0459 ± 0.0026	0.0437
T04-10999	31	Ga	-0.0014 ± 0.0039	0.0005 ± 0.0023	0.0000 ± 0.0007	0.0000 ± 0.0016	0.0000 ± 0.0025	0.0000 ± 0.0018	-----
T04-10999	33	As	0.0043 ± 0.0022	0.0086 ± 0.0039	0.0083 ± 0.0010	0.0040 ± 0.0024	0.0092 ± 0.0029	0.0075 ± 0.0024	-----
T04-10999	34	Se	0.0064 ± 0.0010	0.0072 ± 0.0023	0.0067 ± 0.0005	0.0048 ± 0.0009	0.0066 ± 0.0013	0.0067 ± 0.0009	0.0067
T04-10999	35	Br	0.0148 ± 0.0014	0.0167 ± 0.0029	0.0193 ± 0.0008	0.0166 ± 0.0013	0.0168 ± 0.0016	0.0195 ± 0.0014	0.0168
T04-10999	37	Rb	0.0000 ± 0.0008	0.0023 ± 0.0021	0.0000 ± 0.0005	0.0000 ± 0.0009	0.0000 ± 0.0011	0.0000 ± 0.0009	-----

Table 10. XRF Data - Loaded Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)	Median* (µg/cm²)
T04-10999	38	Sr	0.0007 ± 0.0009	-0.0040 ± 0.0051	0.0024 ± 0.0005	0.0000 ± 0.0010	0.0014 ± 0.0012	0.0000 ± 0.0010	-----
T04-10999	39	Y	-0.0013 ± 0.0010	-0.0012 ± 0.0054	0.0000 ± 0.0006	0.0000 ± 0.0012	0.0000 ± 0.0015	0.0000 ± 0.0012	-----
T04-10999	40	Zr	0.0000 ± 0.0013	0.0062 ± 0.0050	0.0000 ± 0.0013	0.0000 ± 0.0014	0.0000 ± 0.0017	0.0016 ± 0.0015	-----
T04-10999	41	Nb	0.0000 ± 0.0015	0.0071 ± 0.0057	0.0000 ± 0.0010	0.0000 ± 0.0017	0.0000 ± 0.0021	0.0000 ± 0.0017	-----
T04-10999	42	Mo	-0.0003 ± 0.0019	-0.0061 ± 0.0053	0.0007 ± 0.0022	0.0001 ± 0.0021	0.0000 ± 0.0028	0.0000 ± 0.0021	-----
T04-10999	47	Ag	0.0019 ± 0.0039	-0.0092 ± 0.0177	0.0000 ± 0.0024	0.0000 ± 0.0041	0.0023 ± 0.0028	0.0029 ± 0.0045	-----
T04-10999	48	Cd	0.0005 ± 0.0041	0.0380 ± 0.0078	0.0086 ± 0.0029	0.0024 ± 0.0043	0.0000 ± 0.0030	0.0090 ± 0.0046	-----
T04-10999	49	In	-0.0010 ± 0.0043	Not Reported	0.0000 ± 0.0038	0.0008 ± 0.0046	0.0000 ± 0.0033	0.0000 ± 0.0049	-----
T04-10999	50	Sn	0.0044 ± 0.0049	0.0226 ± 0.0060	0.0000 ± 0.0052	0.0097 ± 0.0055	0.0000 ± 0.0041	0.0000 ± 0.0055	-----
T04-10999	51	Sb	-0.0026 ± 0.0053	0.0273 ± 0.0072	0.0445 ± 0.0077	0.0073 ± 0.0063	0.0000 ± 0.0049	0.0018 ± 0.0061	-----
T04-10999	55	Cs	-0.0007 ± 0.0091	0.0037 ± 0.0043	0.0000 ± 0.0032	0.0100 ± 0.0149	0.0059 ± 0.0132	0.0000 ± 0.0151	-----
T04-10999	56	Ba	-0.0055 ± 0.0121	0.0374 ± 0.0081	0.0000 ± 0.0254	0.0079 ± 0.0186	0.0353 ± 0.0182	0.0446 ± 0.0205	-----
T04-10999	57	La	0.0028 ± 0.0160	0.0089 ± 0.0056	0.0000 ± 0.0032	0.0022 ± 0.0245	0.0152 ± 0.0240	0.0344 ± 0.0261	-----
T04-10999	58	Ce	0.0131 ± 0.0197	0.0043 ± 0.0043	0.0000 ± 0.0030	0.0000 ± 0.0315	0.0000 ± 0.0329	0.0139 ± 0.0331	-----
T04-10999	62	Sm	-0.0451 ± 0.0692	Not Reported	0.0000 ± 0.0016	0.0000 ± 0.0026	0.0000 ± 0.0023	0.0000 ± 0.0025	-----
T04-10999	63	Eu	0.0008 ± 0.1440	Not Reported	0.0000 ± 0.0016	0.0000 ± 0.0035	0.0000 ± 0.0034	0.0000 ± 0.0044	-----
T04-10999	65	Tb	0.2508 ± 0.2157	Not Reported	0.0000 ± 0.0051	0.0000 ± 0.0074	0.0006 ± 0.0080	0.0000 ± 0.0120	-----
T04-10999	72	Hf	-0.0050 ± 0.0151	Not Reported	0.0000 ± 0.0022	0.0005 ± 0.0028	0.0000 ± 0.0055	0.0021 ± 0.0022	-----
T04-10999	73	Ta	-0.0113 ± 0.0180	Not Reported	0.0000 ± 0.0034	0.0000 ± 0.0030	0.0000 ± 0.0061	0.0000 ± 0.0030	-----
T04-10999	74	W	-0.0036 ± 0.0054	0.0023 ± 0.0066	0.0000 ± 0.0022	0.0000 ± 0.0030	0.0000 ± 0.0053	0.0000 ± 0.0027	-----
T04-10999	77	Ir	-0.0011 ± 0.0035	Not Reported	0.0000 ± 0.0020	0.0000 ± 0.0023	0.0000 ± 0.0034	0.0000 ± 0.0017	-----
T04-10999	79	Au	-0.0038 ± 0.0024	0.0081 ± 0.0041	0.0029 ± 0.0012	0.0000 ± 0.0023	0.0000 ± 0.0031	0.0000 ± 0.0020	-----
T04-10999	80	Hg	0.0004 ± 0.0017	-0.0009 ± 0.0046	0.0000 ± 0.0014	0.0000 ± 0.0020	0.0000 ± 0.0022	0.0000 ± 0.0014	-----
T04-10999	82	Pb	0.0326 ± 0.0037	0.0445 ± 0.0075	0.0326 ± 0.0018	0.0278 ± 0.0028	0.0256 ± 0.0037	0.0249 ± 0.0026	0.0302

*** Median was calculated only when the result from all reporting labs was greater than three times the uncertainty.**

Table 11. XRF Data - Blank Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)
T04-10995	11	Na	0.0265 ± 0.1875	0.0029 ± 0.0123	0.0000 ± 0.0105	0.0054 ± 0.0098	0.0060 ± 0.0538	0.0000 ± 0.0146
T04-10995	12	Mg	0.0101 ± 0.0386	0.0011 ± 0.0102	0.0000 ± 0.0031	0.0026 ± 0.0047	0.0000 ± 0.0146	0.0000 ± 0.0055
T04-10995	13	Al	0.0026 ± 0.0075	0.0209 ± 0.0157	0.0000 ± 0.0055	0.0000 ± 0.0027	0.0012 ± 0.0056	0.0000 ± 0.0023
T04-10995	14	Si	0.0012 ± 0.0044	0.0608 ± 0.0171	0.0008 ± 0.0053	0.0000 ± 0.0022	0.0020 ± 0.0033	0.0012 ± 0.0018
T04-10995	15	P	0.0023 ± 0.0025	0.0056 ± 0.0099	0.0000 ± 0.0006	0.0029 ± 0.0018	0.0007 ± 0.0018	0.0000 ± 0.0011
T04-10995	16	S	0.0004 ± 0.0043	0.0073 ± 0.0073	0.0000 ± 0.0026	0.0000 ± 0.0023	0.0000 ± 0.0057	0.0000 ± 0.0018
T04-10995	17	Cl	-0.0005 ± 0.0026	0.0031 ± 0.0047	0.0000 ± 0.0021	0.0000 ± 0.0037	0.0000 ± 0.0044	0.0000 ± 0.0031
T04-10995	19	K	0.0031 ± 0.0018	-0.0014 ± 0.0019	0.0000 ± 0.0029	0.0007 ± 0.0010	0.0000 ± 0.0019	0.0000 ± 0.0009
T04-10995	20	Ca	-0.0006 ± 0.0014	0.0022 ± 0.0018	0.0035 ± 0.0018	0.0012 ± 0.0011	0.0024 ± 0.0013	0.0019 ± 0.0014
T04-10995	21	Sc	0.0025 ± 0.0016	0.0024 ± 0.0016	0.0000 ± 0.0021	0.0000 ± 0.0008	0.0005 ± 0.0010	0.0000 ± 0.0009
T04-10995	22	Ti	0.0010 ± 0.0060	-0.0028 ± 0.0034	0.0000 ± 0.0014	0.0001 ± 0.0010	0.0018 ± 0.0010	0.0009 ± 0.0011
T04-10995	23	V	0.0006 ± 0.0020	0.0020 ± 0.0014	0.0000 ± 0.0011	0.0000 ± 0.0006	0.0000 ± 0.0006	0.0000 ± 0.0006
T04-10995	24	Cr	0.0017 ± 0.0009	0.0017 ± 0.0012	0.0009 ± 0.0005	0.0000 ± 0.0005	0.0003 ± 0.0006	0.0000 ± 0.0006
T04-10995	25	Mn	-0.0013 ± 0.0014	0.0068 ± 0.0023	0.0000 ± 0.0005	0.0000 ± 0.0009	0.0000 ± 0.0009	0.0000 ± 0.0009
T04-10995	26	Fe	0.0015 ± 0.0013	-0.0007 ± 0.0018	0.0004 ± 0.0006	0.0000 ± 0.0008	0.0000 ± 0.0007	0.0000 ± 0.0010
T04-10995	27	Co	-0.0008 ± 0.0009	0.0038 ± 0.0019	0.0007 ± 0.0004	0.0000 ± 0.0006	0.0004 ± 0.0006	0.0000 ± 0.0006
T04-10995	28	Ni	0.0016 ± 0.0010	0.0006 ± 0.0016	0.0000 ± 0.0004	0.0000 ± 0.0006	0.0000 ± 0.0005	0.0003 ± 0.0007
T04-10995	29	Cu	0.0009 ± 0.0010	-0.0057 ± 0.0015	0.0004 ± 0.0007	0.0000 ± 0.0006	0.0000 ± 0.0006	0.0004 ± 0.0007
T04-10995	30	Zn	0.0006 ± 0.0008	-0.0034 ± 0.0022	0.0000 ± 0.0008	0.0000 ± 0.0005	0.0000 ± 0.0005	0.0007 ± 0.0007
T04-10995	31	Ga	0.0030 ± 0.0040	0.0006 ± 0.0024	0.0000 ± 0.0006	0.0006 ± 0.0015	0.0000 ± 0.0024	0.0000 ± 0.0017
T04-10995	33	As	0.0002 ± 0.0011	-0.0021 ± 0.0029	0.0000 ± 0.0004	0.0000 ± 0.0008	0.0035 ± 0.0012	0.0000 ± 0.0008
T04-10995	34	Se	0.0002 ± 0.0008	0.0031 ± 0.0019	0.0004 ± 0.0004	0.0000 ± 0.0007	0.0023 ± 0.0011	0.0000 ± 0.0008
T04-10995	35	Br	0.0004 ± 0.0007	-0.0023 ± 0.0019	0.0004 ± 0.0003	0.0002 ± 0.0007	0.0017 ± 0.0010	0.0000 ± 0.0007
T04-10995	37	Rb	0.0003 ± 0.0008	-0.0053 ± 0.0019	0.0006 ± 0.0004	0.0000 ± 0.0007	0.0000 ± 0.0010	0.0001 ± 0.0008
T04-10995	38	Sr	0.0004 ± 0.0009	0.0073 ± 0.0066	0.0005 ± 0.0005	0.0000 ± 0.0009	0.0000 ± 0.0011	0.0010 ± 0.0010
T04-10995	39	Y	0.0008 ± 0.0011	0.0105 ± 0.0069	0.0008 ± 0.0006	0.0000 ± 0.0011	0.0000 ± 0.0014	0.0013 ± 0.0011
T04-10995	40	Zr	0.0002 ± 0.0013	0.0121 ± 0.0056	0.0001 ± 0.0008	0.0000 ± 0.0013	0.0025 ± 0.0017	0.0000 ± 0.0014
T04-10995	41	Nb	-0.0012 ± 0.0015	-0.0007 ± 0.0052	0.0000 ± 0.0010	0.0006 ± 0.0017	0.0000 ± 0.0020	0.0015 ± 0.0017

Table 11. XRF Data - Blank Filters

Sample ID	Z	Element	ODEQ (µg/cm²)	EPA (µg/cm²)	RTI (µg/cm²)	Chester770 (µg/cm²)	Chester771 (µg/cm²)	Chester772 (µg/cm²)
T04-10995	42	Mo	0.0004 ± 0.0019	0.0012 ± 0.0056	0.0000 ± 0.0026	0.0000 ± 0.0020	0.0000 ± 0.0026	0.0000 ± 0.0020
T04-10995	47	Ag	-0.0001 ± 0.0038	-0.0173 ± 0.0150	0.0000 ± 0.0026	0.0000 ± 0.0039	0.0048 ± 0.0028	0.0052 ± 0.0044
T04-10995	48	Cd	0.0027 ± 0.0040	0.0282 ± 0.0065	0.0007 ± 0.0029	0.0000 ± 0.0041	0.0018 ± 0.0029	0.0000 ± 0.0043
T04-10995	49	In	-0.0004 ± 0.0042	Not Reported	0.0000 ± 0.0037	0.0000 ± 0.0045	0.0000 ± 0.0032	0.0000 ± 0.0047
T04-10995	50	Sn	0.0033 ± 0.0048	0.0138 ± 0.0039	0.0024 ± 0.0053	0.0041 ± 0.0052	0.0000 ± 0.0039	0.0045 ± 0.0053
T04-10995	51	Sb	0.0047 ± 0.0051	0.0108 ± 0.0042	0.0000 ± 0.0079	0.0000 ± 0.0060	0.0000 ± 0.0048	0.0000 ± 0.0060
T04-10995	55	Cs	0.0101 ± 0.0092	0.0017 ± 0.0041	0.0000 ± 0.0033	0.0000 ± 0.0143	0.0052 ± 0.0131	0.0032 ± 0.0150
T04-10995	56	Ba	-0.0084 ± 0.0121	0.0141 ± 0.0069	0.0000 ± 0.0027	0.0276 ± 0.0181	0.0195 ± 0.0179	0.0000 ± 0.0196
T04-10995	57	La	0.0010 ± 0.0161	0.0114 ± 0.0054	0.0000 ± 0.0029	0.0000 ± 0.0238	0.0000 ± 0.0236	0.0000 ± 0.0252
T04-10995	58	Ce	0.0040 ± 0.0199	0.0109 ± 0.0040	0.0000 ± 0.0029	0.0000 ± 0.0305	0.0167 ± 0.0323	0.0034 ± 0.0321
T04-10995	62	Sm	-0.0357 ± 0.0704	Not Reported	0.0000 ± 0.0013	0.0000 ± 0.0024	0.0000 ± 0.0022	0.0004 ± 0.0026
T04-10995	63	Eu	0.0147 ± 0.1464	Not Reported	0.0000 ± 0.0011	0.0000 ± 0.0028	0.0000 ± 0.0027	0.0006 ± 0.0036
T04-10995	65	Tb	0.3204 ± 0.2221	Not Reported	0.0000 ± 0.0013	0.0000 ± 0.0026	0.0000 ± 0.0024	0.0000 ± 0.0042
T04-10995	72	Hf	-0.0044 ± 0.0151	Not Reported	0.0000 ± 0.0019	0.0000 ± 0.0026	0.0037 ± 0.0051	0.0005 ± 0.0021
T04-10995	73	Ta	0.0059 ± 0.0181	Not Reported	0.0000 ± 0.0033	0.0000 ± 0.0027	0.0000 ± 0.0060	0.0000 ± 0.0030
T04-10995	74	W	-0.0006 ± 0.0051	-0.0055 ± 0.0056	0.0000 ± 0.0018	0.0024 ± 0.0026	0.0000 ± 0.0047	0.0014 ± 0.0023
T04-10995	77	Ir	-0.0017 ± 0.0036	Not Reported	0.0000 ± 0.0020	0.0000 ± 0.0019	0.0000 ± 0.0033	0.0000 ± 0.0016
T04-10995	79	Au	0.0000 ± 0.0023	-0.0006 ± 0.0037	0.0002 ± 0.0010	0.0027 ± 0.0020	0.0000 ± 0.0028	0.0000 ± 0.0017
T04-10995	80	Hg	0.0007 ± 0.0018	-0.0001 ± 0.0041	0.0002 ± 0.0008	0.0000 ± 0.0018	0.0017 ± 0.0020	0.0019 ± 0.0014
T04-10995	82	Pb	-0.0001 ± 0.0023	0.0071 ± 0.0059	0.0000 ± 0.0009	0.0017 ± 0.0019	0.0000 ± 0.0027	0.0000 ± 0.0017