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SUBJECT: $PM_{2.5}$ Speciation Trends Network Special Study

Introduction

A special study has been conducted as part of the QA oversight for the $PM_{2.5}$ Speciation Trends Network (STN). Samples collected as part of the $PM_{2.5}$ Speciation Mini-Trends Network and originally analyzed at the Research Triangle Institute (RTI) were removed from refrigerated storage at RTI and submitted to the QA laboratory for re-analysis. The USEPA National Air and Radiation Environmental Laboratory (NAREL) located in Montgomery, Alabama serves as the lead quality assurance laboratory for the $PM_{2.5}$ STN and is supported by the USEPA New England Regional Laboratory (NERL) located in Lexington, Massachusetts. The primary goal of this study has been to produce independent laboratory results of selected program samples so that inter-laboratory comparisons can be made. Furthermore, this study is expected to provide information regarding the physical and chemical stability of samples held in refrigerated storage.

The samples selected for this study were collected at Boston, New York, or Phoenix during the months of February and March 2000. All three of these sites operated co-located samplers during the collection events selected for this study. Samples that were re-analyzed at the QA laboratories included trip blanks, field blanks, and routine samples.

Sample Analysis

The gravimetric and the ion chromatographic re-analyses were performed at NAREL. Teflon® filters containing captured particulate matter were equilibrated within a constant temperature and humidity chamber and re-weighed. Extracts from Nylon filters were re-analyzed for nitrate, sulfate, sodium, ammonium, and potassium using ion chromatography. For this study, the carbon re-analyses were performed at NERL. Quartz filters were re-analyzed for captured organic, elemental, carbonate, and total carbon using a thermal/optical carbon analyzer. The details of the determinations made for this study are described below.

Mass Determination

Mass determination typically proceeds by weighing the Teflon® collection filter before and after the sampling event. The amount of Particulate Matter (PM) captured onto the surface of the filter can be calculated by a simple subtraction of the tare weight from the loaded filter weight. For this study, however, NAREL was not able to weigh the filter before sample collection. Therefore, only the loaded filter weights were measured.

Filters received at NAREL were placed into a weighing chamber which satisfies conditions of cleanliness, constant temperature, and constant humidity required by the program (see reference 1 and 2). All other program requirements were met such as routine balance calibration checks using Class 1 mass reference standards traceable to the National Institute of Standards and Technology (NIST). Each filter was weighed repeatedly until constant mass was achieved as reflected by at least two measurements on separate days.

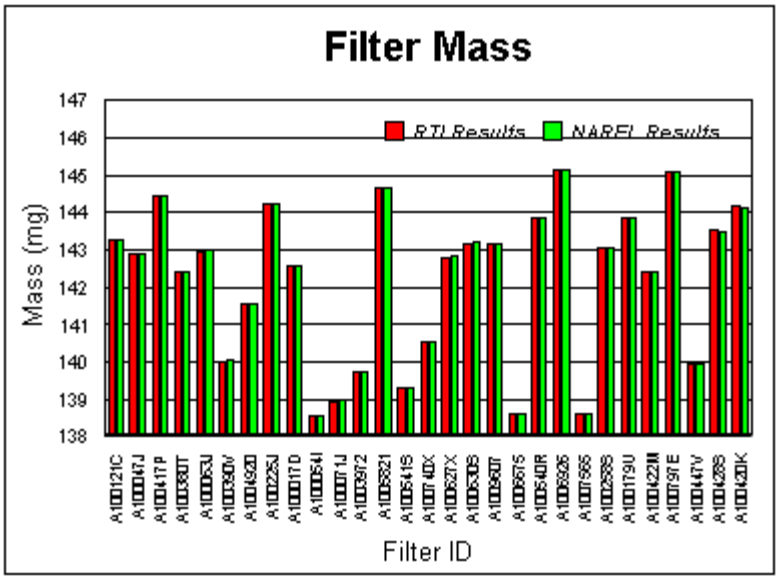

Figure 1

A first look comparing the filter mass data from RTI and NAREL is shown in Figure 1. This graph has limited utility beyond showing good agreement between results from the two laboratories at a gross level of inspection. The vertical scale of the graph showing measured mass does not provide enough sensitivity to visually discern laboratory differences as small as 0.001 milligrams. And measurements at the 0.001-milligram level are required for the program.

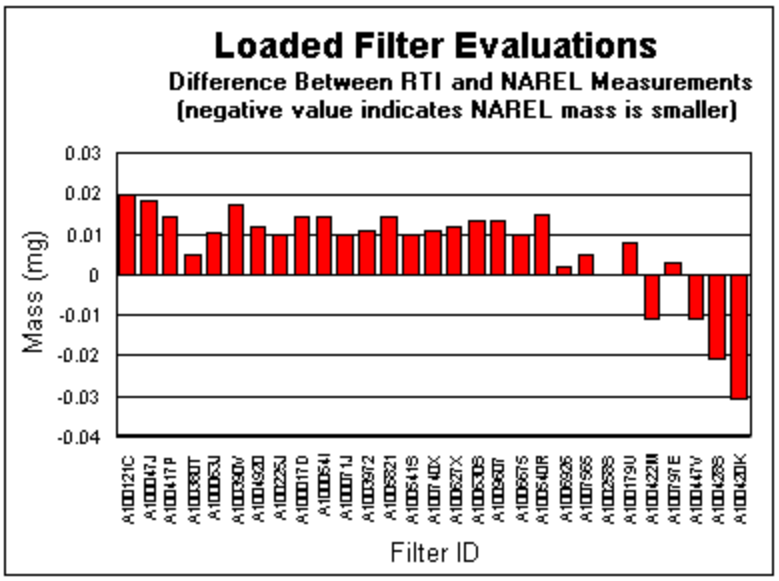

Figure 2

The filter mass determined at RTI was subtracted from the filter mass determined at NAREL, and this measurement difference is presented in Figure 2 as a bar graph and Figure 3 as a scatter plot. Measurement differences between the two laboratories were so small that all samples may be plotted together on

one graph using a very sensitive vertical scale to express the mass range. The largest difference between RTI and NAREL measured mass values was only 0.031 milligrams. After careful examination of the mass data, a trend was discovered. In Figure 2, the filter identifications have been intentionally plotted along the horizontal axis of the graph from left to right in order of increasing PM captured during the sampling event. Therefore the filter plotted on the extreme right of the bar graph (A100420K) captured the most PM from the air sampled. Figure 3 is a scatter plot which more clearly shows the trend between measurement difference and captured PM. Most filters appear to have gained mass after measurement at RTI, but filters having the largest capture of PM appear to have lost mass since measurement at RTI.. Is it likely that some of the captured PM slowly evaporates from the filter during storage or perhaps some of the PM was lost during the subsequent x-ray examination of each filter which follows the gravimetric analysis?

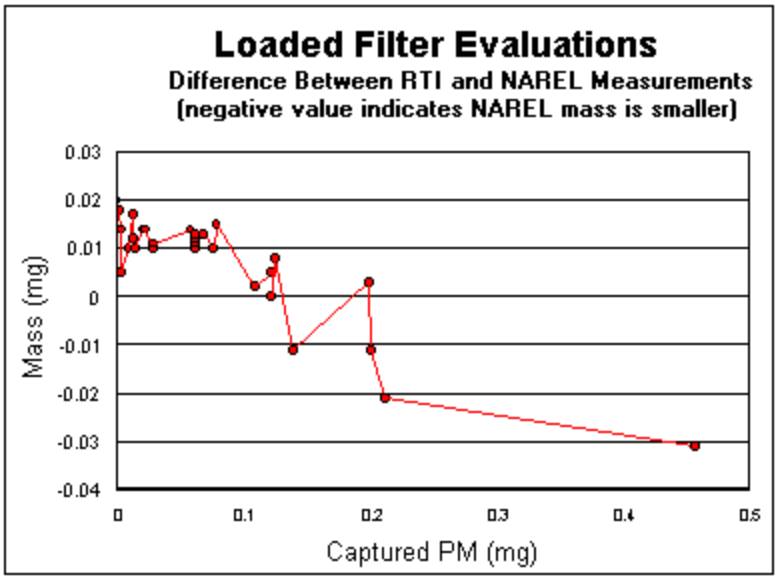

Figure 3

Is there an explanation for the apparent gain in mass of most filters tested during this study? At least some of the inter-laboratory bias observed in this study may have a simple and fundamental explanation. According to program requirements, each balance used for mass measurement must offer excellent precision as verified by frequent calibration checks using mass reference standards. Each calibration check using a metallic reference standard must not deviate more than 0.003 mg from its constant expected value. A small inaccuracy present in the balance is normally not critical if the same balance is used to tare the filter and also used to weigh the loaded filter. The critical information needed by the program is the mass of the captured PM, and as stated earlier, this value is determined by subtracting the tare mass from the loaded filter mass. For this special study, the absolute filter weights determined at RTI are compared directly to the absolute weights determined at NAREL. Therefore, any bias observed in the mass data may certainly reflect a difference in accuracy of the balances utilized at different laboratories. The actual data plotted in Figure 1 through Figure 3 are available in Table 1 at the end of this report.

Summary of Gravimetric Results

No QC problems were observed during this study for the gravimetric determinations performed at NAREL. Mass values determined at RTI and at NAREL show good agreement, especially considering the period of approximately six months separating the analysis at each laboratory. It is probable that the measurement bias observed between the two laboratories is the result of more than one source of variability. A positive bias was observed in NAREL measurements for trip blanks,

field blanks, and routine filters having the smallest PM capture. This positive bias may be due to a fundamental difference in accuracy of the two balances used to make the measurements. This source of bias would have no dependence upon the physical or chemical stability of the filter itself, and would present a relatively constant source of bias. A second opposing process such as PM evaporation, may be responsible for a gradual loss in mass of the filter over time, and this process would logically be more pronounced for those filters with the largest PM capture. Following the gravimetric analysis, filters are subjected to an elemental analysis using X-Ray Fluorescence (XRF). It is possible that some filters may loose mass during the XRF analysis, and the amount of mass lost would depend upon the stability of the captured PM components.

Ion Chromatography Extracts

For most samples in this study, three cations and two anions were determined by Ion Chromatography (IC). Target ions captured onto the surface of a collection filter must first be extracted into a suitable solvent, and then the extract may be analyzed using the IC technique. The IC analysis requires extraction of the entire collection filter using 25 mL of solvent. Deionized water was used to extract the filter if both cation analysis and anion analysis were required, although some samples in this study did not require analysis of cations, and those filters were extracted with a sodium carbonate/bicarbonate buffer.

Separate IC instruments are required to determine the cations and the anions. Each IC must be optimized for sensitivity as required by the program. Usually a 5-mL aliquot of the filter extract is consumed for each injection into an IC instrument, but less volume was used at NAREL during this study to conserve extract that was in short supply. Since RTI had previously analyzed all of the samples in this study, all samples were extracted at the RTI laboratory approximately six months ago, and after the required analyses had been completed, the remaining portion of each extract was placed into cold storage at RTI. Available extracts were removed from cold storage and shipped to NAREL for this study.

Cations Determined by Ion Chromatography

The cation targets for this project were sodium, ammonium, and potassium, and results for these three analytes are presented in Figure 4 through Figure 6. Rubidium was used as an internal standard at NAREL during the course of this study to monitor the quality of each chromatographic acquisition and to calculate results based upon relative retention times and relative response factors. Seven point calibration curves were established over a

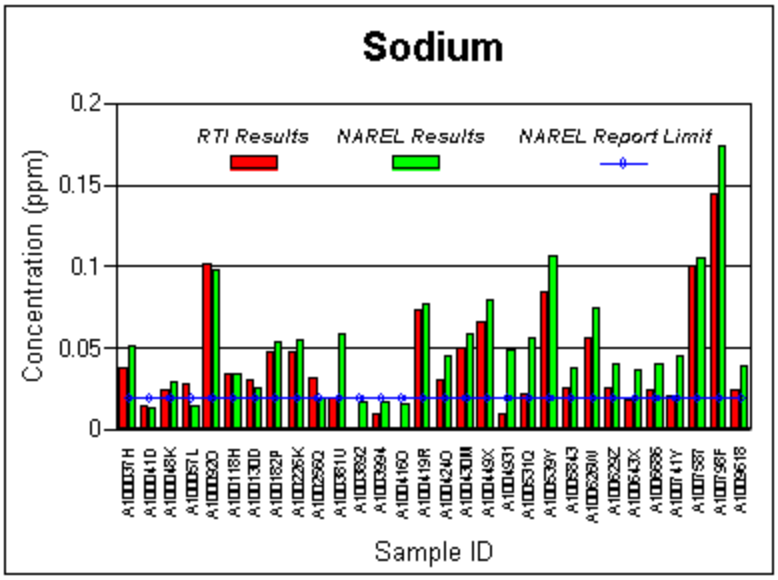

Figure 4

concentration range of approximately 0.02-2 µg/mL injected at the instrument. All IC results for this study are reported as concentration of target found in the extract expressed in units of µg/mL (ppm). The lowest concentration reported for this study corresponds to the lowest point analyzed as part of the calibration curve. Due to the low level of target present in many of the samples analyzed, frequent calibration checks were made at the low end of the calibration curve. None of the extracts required dilution and all of the samples were free from chromatographic interference.

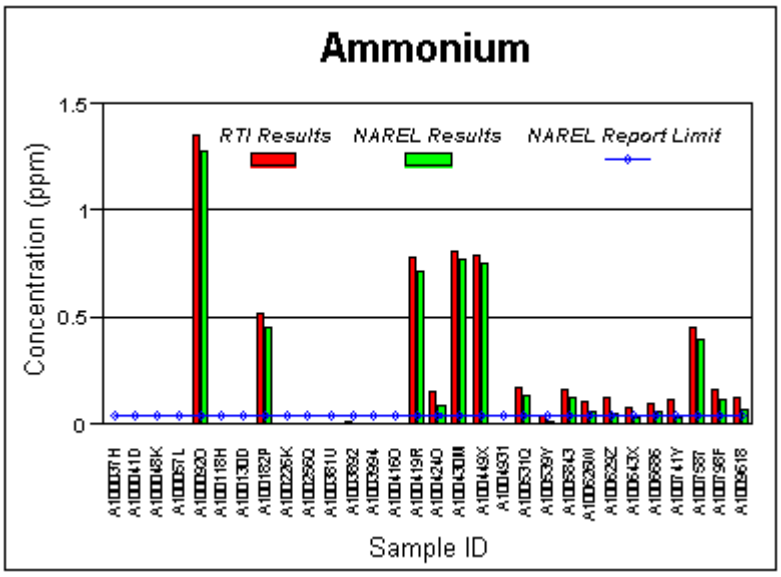

Figure 5

Good agreement was generally observed between results reported by RTI and those determined approximately six months later at NAREL. Analysis of the RTI calibration solutions provided good agreement with NAREL calibrations.

The cation data plotted in Figure 4 through Figure 6 are available in Table 2 at the end of this report.

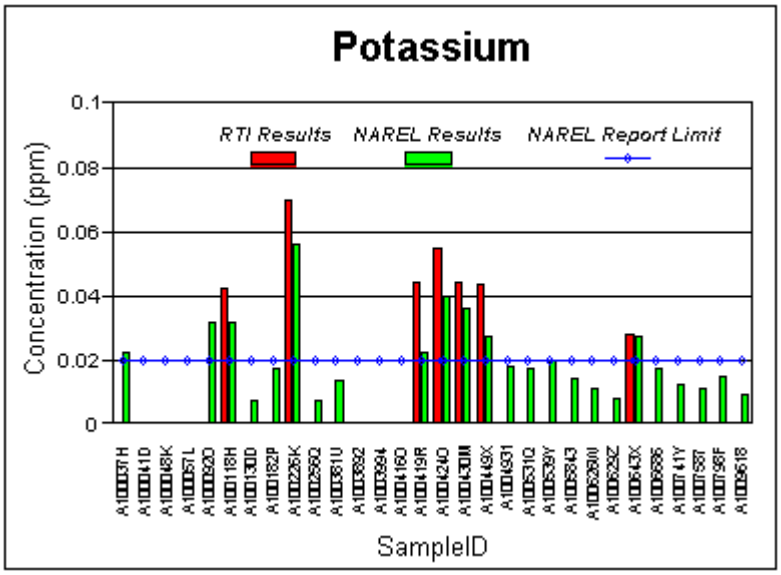

Figure 6

Anions Determined by Ion Chromatography

The anion targets for this project were nitrate and sulfate. The results for these two analytes are presented in Figure 7 and Figure 8. The analysis of anions proceeded with virtually the same quality controls as those used for the analysis of cations. The selenite ion and the selenate ion were used as dual internal standards for the analysis of anions. Seven point calibration curves were established

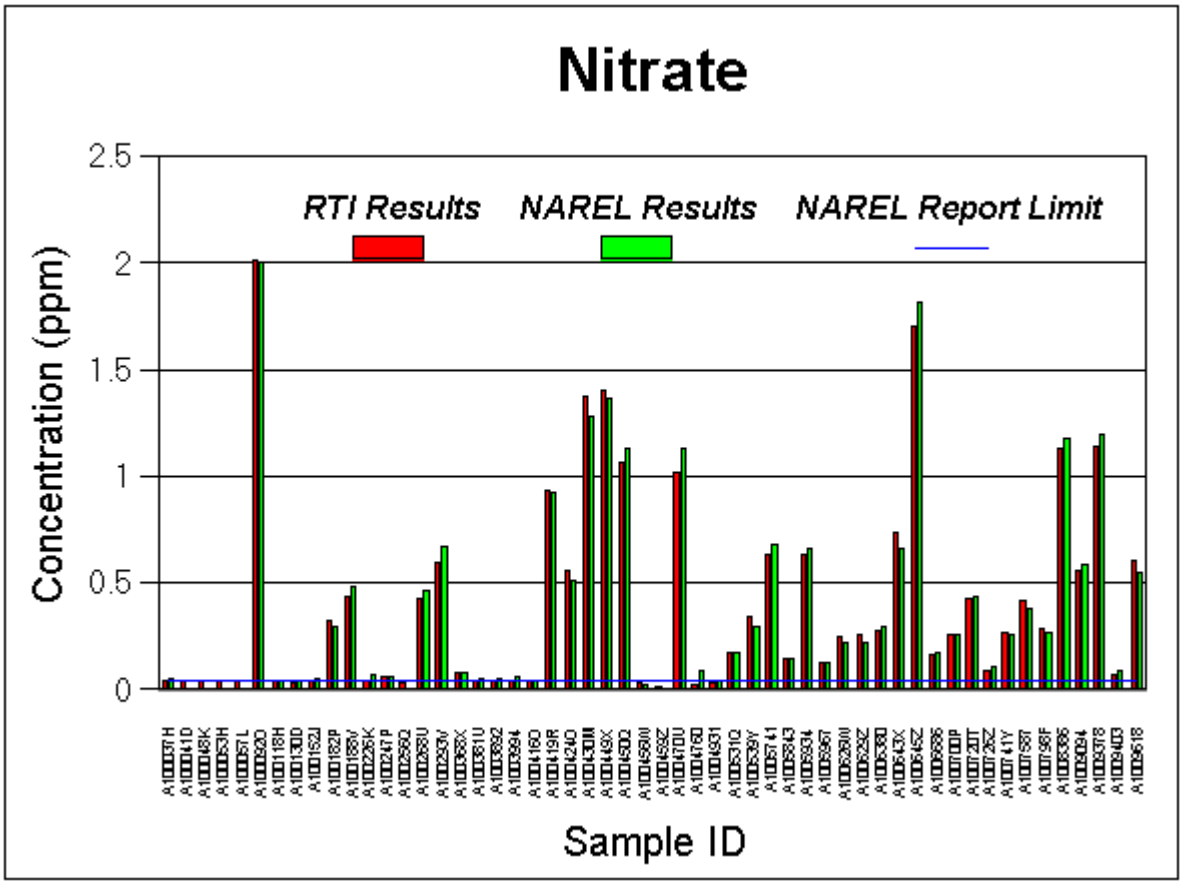

Figure 7

over a concentration range of approximately 0.04-4 µg/mL injected at the instrument. Once again, none of the extracts required dilution, and all of the samples were free from chromatographic interference.

Good inter-laboratory agreement was observed for sulfate and for nitrate determinations. Analysis of the RTI calibration solutions provided good agreement with NAREL calibrations. The anion data plotted in Figure 7 and Figure 8 are available in Table 3 at the end of this report.

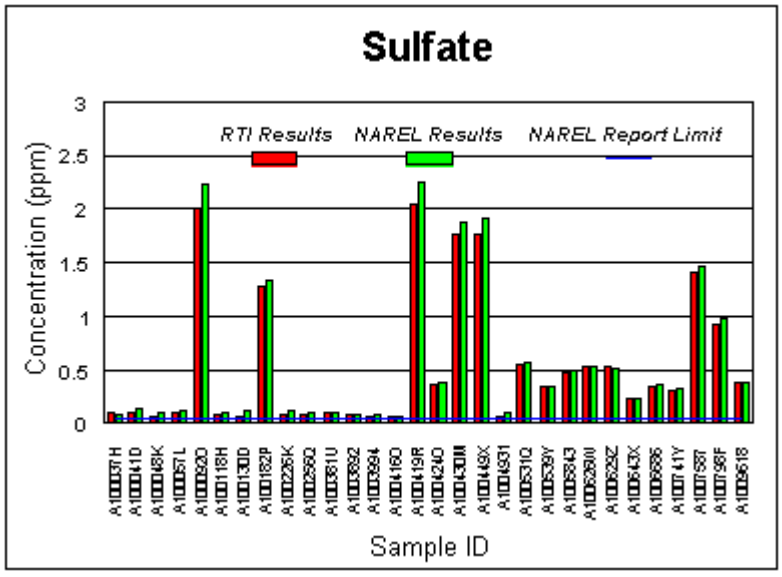

Figure 8

Summary of Ion Chromatography Results

The primary goal of this study has been to produce independent laboratory results of selected program samples so that inter-laboratory comparisons can be made. Table 2 and Table 3 not only contain raw data for IC analyses but also contain calculations of the absolute difference and the Relative Percent Difference (RPD) between RTI and NAREL results for each analyte. The RPD was calculated using Equation 1.

$$RPD = \frac{|C_1 - C_2|}{C_1 + C_2} \times 2 \qquad \text{Equation 1}$$

The RPD is a useful comparison of two results as long as those results are significantly above the detection limit of the measurement system. A low value for the RPD always indicates good agreement between the two results, but a high value for the RPD, greater than 20%, does not always indicate poor agreement.

> *For example, how good is the agreement between two measurements such as 3 ppm and 5 ppm which produces an absolute difference of 2 ppm and an RPD of 50%? If the detection limit of the measurement system is 1 ppm, the two measurements have good agreement, but if the detection limit of the system is 0.1 ppm, the two measurements have poor agreement.*

For this study, the inter-laboratory agreement was assessed by placing all IC results into one of two pools: (1) those results with acceptable RPDs and (2) those results with RPDs greater than 20%. As shown in the IC Summary Table below, those results with RPDs greater than 20% were compared to the NAREL report limit. Notice that all of the inter-laboratory differences are less than two times the NAREL report limit.

IC Summary Table

	Acceptable RPDs			RPDs Greater than 20%			
	Average Inter-Lab RPD	**Maximum Inter-Lab RPD**	**Number of Samples in RPD Pool**	**Average Inter-Lab Difference* (μg/mL)**	**Maximum Inter-Lab Difference* (μg/mL)**	**Number of Samples in Difference* Pool**	**NAREL Report Limit (μg/mL)**
Sodium	10%	20%	10	0.018	0.039	20	0.02
Ammonium	3%	13%	18	0.046	0.079	12	0.04
Potassium	0%	1%	7	0.015	0.031	23	0.02
Sulfate	6%	15%	23	0.034	0.051	7	0.04
Nitrate	7%	18%	40	0.029	0.068	14	0.04

**** The absolute value of measurement difference was used for calculations.***

Every result with a large RPD offered a relatively small inter-laboratory difference. Furthermore, every result with a large RPD was a low sample concentration smaller than 0.2 ppm. Other combinations of RPD and difference criteria could be used to identify precision failure, but the

limits used to assess this IC data set seem reasonable. All results were first assessed by using a global RPD limit of 20%. Those results exceeding the RPD limit were re-examined by comparing the measurement difference to the analyte-specific sensitivity of the measurement system. For this data set, all inter-laboratory differences smaller than two times the NAREL report limit were accepted as good inter-laboratory agreement.

This study was also expected to provide information regarding the physical and chemical stability of samples held in refrigerated storage. Strong evidence has been provided by this study to suggest that IC extracts are quite stable over a six month period of time. The most significant trend in the data was observed for ammonium. For positive samples, the ammonium concentrations determined at NAREL were consistently lower than those determined approximately six-months earlier at RTI. In all cases the difference in the ammonium concentration was very small. It is worth noting that if samples were held in storage for longer periods or if samples were subjected to additional handling, more dramatic changes in the ammonium concentration might be observed. Further investigation should provide a better understanding of the ammonium ion stability in stored extracts.

Carbon Analysis

The carbon determination is comprised of organic carbon (OC), elemental carbon (EC), and carbonate carbon (CC). Together they equal the total carbon (TC). A measured aliquot punched from the sample filter is consumed during the analysis which proceeds essentially in two stages. During the first stage, the filter aliquot is purged with a helium atmosphere while the temperature is programmed to 900 °C. The OC released from the sample is oxidized to carbon dioxide and then converted to methane which is measured by a flame ionization detector. The CC (if present) also appears in this fraction, and the CC peak is identified by its calibrated time in the thermogram. The purge gas is switched to a 5% oxygen atmosphere for the second stage of the analysis which releases the EC from the sample. The optical transmittance of the sample is monitored during both stages of analysis and is used to determine the split time separating the EC into the last fraction. The instrument used at RTI and NERL for this study was a Total Organic Analyzer manufactured by Sunset Laboratory.

The parameters used for this study were a modification of NIOSH Method 5040, Elemental Carbon (Diesel Particulate) [see reference 3]. The parameters were decided during a meeting with EPA and RTI on September 21, 2000. On December 5, 2000, there was a second meeting, and the second OC temperature step was changed from 340 °C to 400 °C because of Sunset instrument limitations. Both sets of parameters were used in this evaluation with no measurable differences. The method used to control the operating parameters is called SPEC.PAR and is presented in the following table.

SPEC.PAR (Operating Parameters)

Helium, 10, 1	purge for 10 sec
Helium, 65, 250	OC temperature ramp, 65 sec, 250°C
Helium, 45, 400	OC temperature ramp, 45 sec, 400°C
Helium, 70, 550	OC temperature ramp, 70 sec, 550°C
Helium, 100, 900	OC temperature ramp, 100 sec, 900°C (OCX)

Helium, 55, 0	Cool the oven to approximately 550°C
Oxygen, 35, 550	EC temperature ramp, 35 sec, 550°C
Oxygen, 35, 650	EC temperature ramp, 35 sec, 650°C
Oxygen, 35, 750	EC temperature ramp, 35 sec, 750°C
Oxygen, 35, 850	EC temperature ramp, 35 sec, 850°C
Oxygen, 110, 900	EC temperature ramp, 110 sec, 900°C
CalibrationOx, 30, 1	Methane Calibration
CalibrationOx, 80, 0	Methane Calibration
Offline, 1, 0	End of sample analysis

The last peak, OCX, in the OC thermogram must be evaluated to calculate the CC. The CC results are not reported for this study because RTI did not report CC until later in the year when the software became available. None of the samples analyzed for this study contained CC significantly above the OCX background.

Initial calibration was performed weekly using four standards with a secondary source standard. Each day an instrument blank, mid-calibration standard, two quality control samples, and duplicates were analyzed. Calcium carbonate was run each week to look for CC, and a 5% carbon dioxide sample was used to check the methane conversion. During the first week of this study, the initial calibration range was 58-5.8 $\mu g/cm^2$, and during the second week, the range was decreased to 29-2.9 $\mu g/cm^2$ because of the low sample values. The acceptance criteria was a linear regression coefficient greater than 0.99 with a forced fit through the origin (0,0). The daily standard was within 5% of the true value except for one day when the first standard was -5.2 % and the second standard run at the end of the day was -4.5%. That same day the potassium hydrogen phthalate (KHP) QC sample was -3.2% of the true value. According to the NERL SOP, this data was acceptable because the KHP was within 5% of its true value. The instrument blanks were below 0.3 $\mu g/cm^2$.

Summary of the Carbon Results

There is a 1-2 $\mu g/cm^2$ bias observed in the OC results from the two laboratories. The OC values reported by EPA average 1.2 $\mu g/cm^2$ higher than OC values reported by RTI. This is illustrated in Figure 9. From the 46 field samples analyzed during this study, only two of the OC values reported by RTI are higher than the EPA result. The EC results are lower than the OC results, and the EC results do not show this consistent positive bias. Duplicate analyses were performed for RTI's calibration standard included in the study and for the trip blank sent with the samples. Good recovery (95.3% and 99.4%) was observed for the RTI standard analyzed on separate days at NERL, so the positive bias was not due to the standards. Higher than expected OC values (1.39 and 1.15 $\mu g/cm^2$) were observed from the trip blank also analyzed on separate days at NERL. Figure 9 plots the 1 $\mu g/cm^2$ level which was a critical value for evaluating the trip blank for this study. The study trip blank may represent the source of the observed bias. Quartz filters will readily absorb background volatile organic compounds. The field samples for this study were collected in

February and March, analyzed in March and April by RTI, kept in refrigerated storage at RTI, and shipped to NERL for re-analysis in November and December. This eight-month delay before re-analyzing the samples may increase the OC of the samples, and this is another possible reason for the inter-laboratory bias.

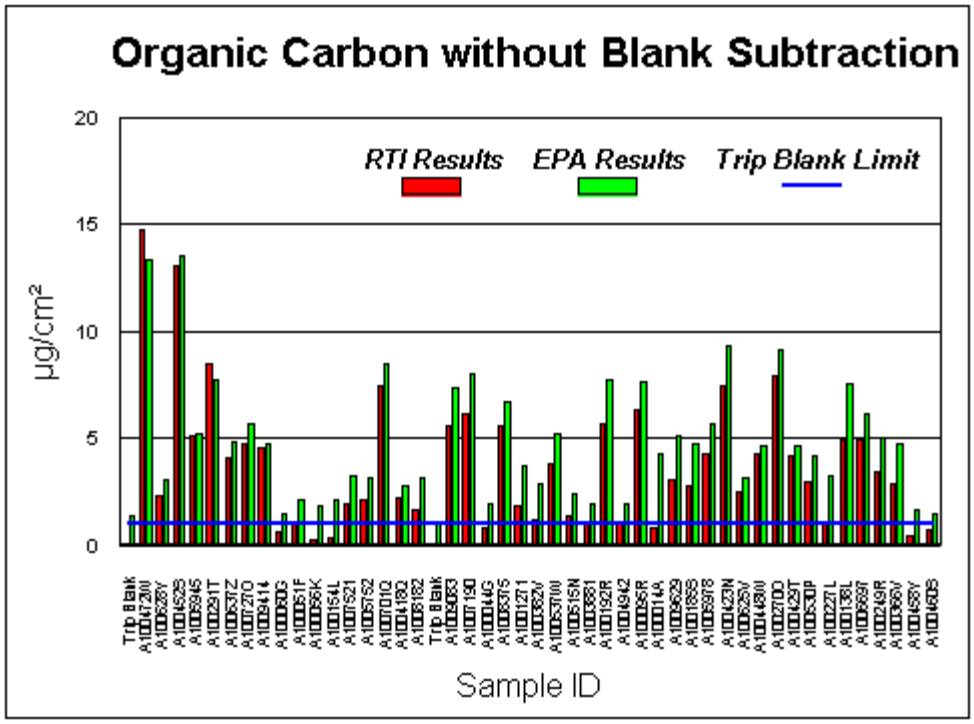

Figure 9

Because of this apparent low-level OC background contamination, the trip blank for this study was subtracted from the EPA values before comparisons were made with the original RTI values. Results of the OC, EC, and TC analyses are presented in Figures 10, 11, and 12 respectively. All of the carbon data plotted in Figure 9 through Figure 12 are available in Table 4 through Table 6 at the end of this report. The tabulated carbon data also includes NERL results before the blank subtraction.

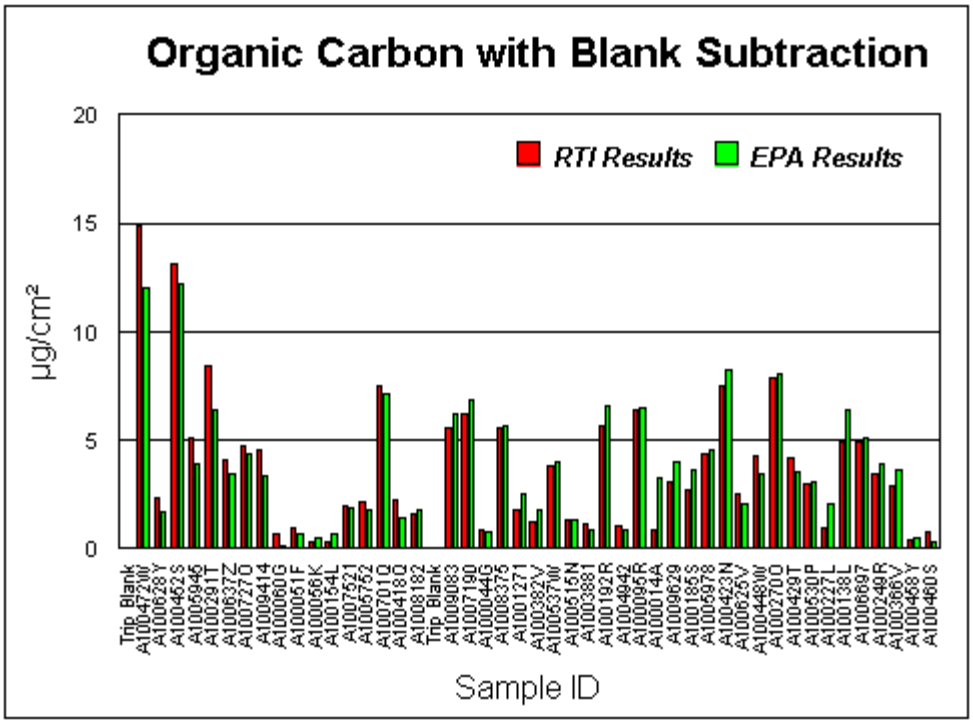

Figure 10

All results have been reported in terms of µg/cm^2, but these results may be converted to µg/filter by multiplying the supplied result by 11.68 cm^2/filter. Sample A100124F, trip blank from Roxbury, was lost and is not included in this report. This sample was used to test a procedure proposed by Dr Max Petersen of RTI, and there was insufficient sample for a re-analysis to include in this report.

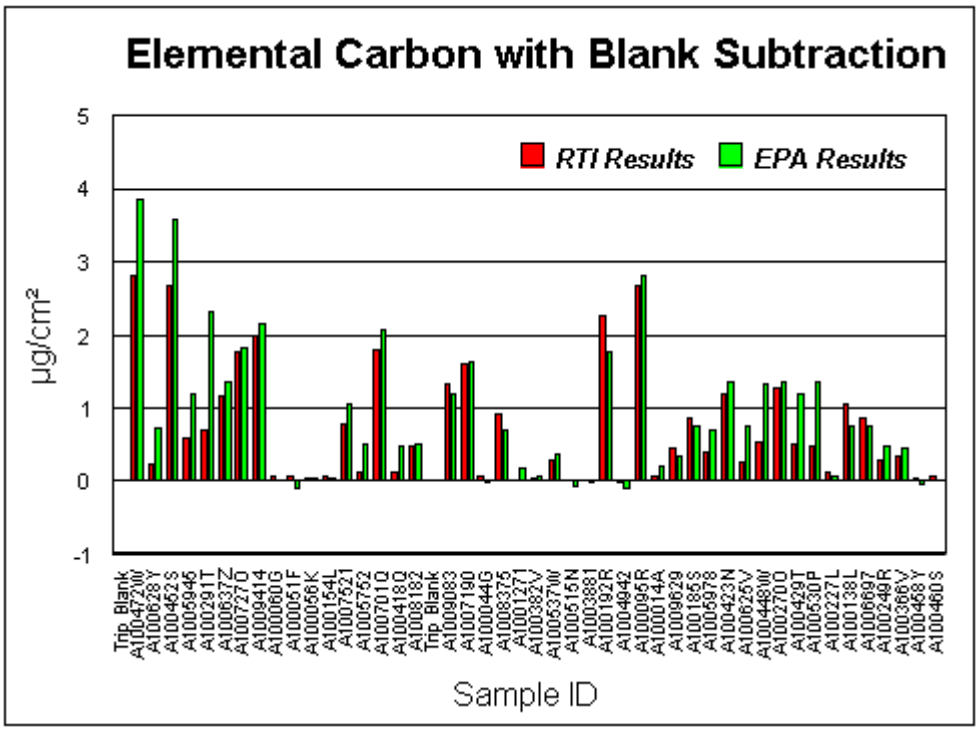

Figure 11

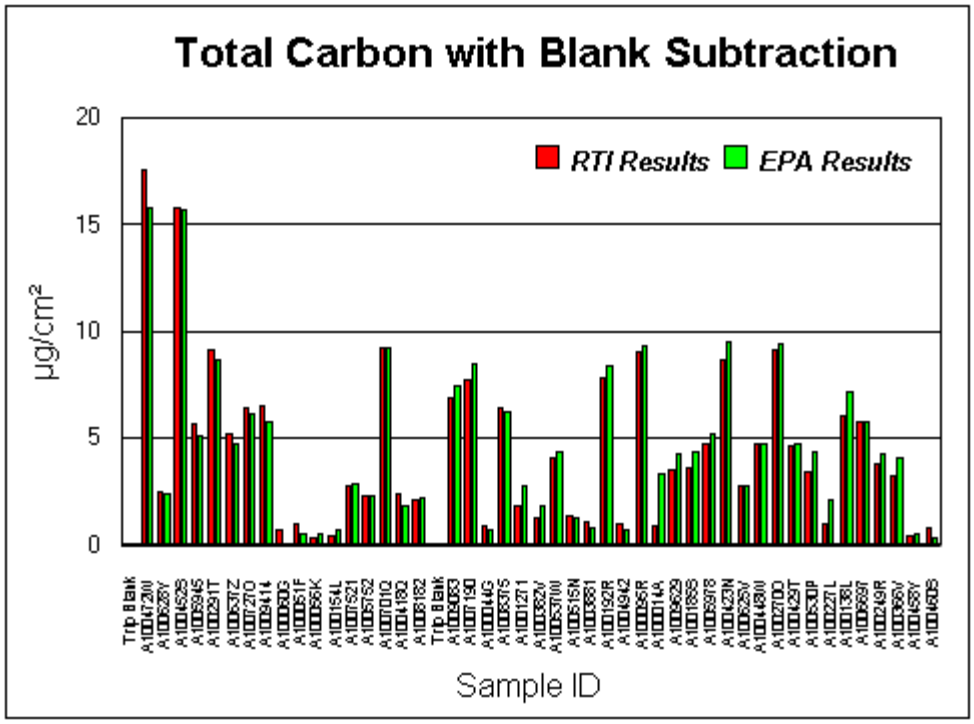

Figure 12

The criteria used for the inter-laboratory comparison of results were the same as the initial round robin study completed in November, 1999. As shown in the table below, the acceptance criterion will change for the archived samples according to the concentration of carbon present in the sample. For higher concentrations, RPD criteria were used to evaluate the inter-laboratory precision. For low-level samples having less than 5 μg/cm^2, the inter-laboratory precision was evaluated by comparing the absolute difference between results from the two laboratories.

Acceptance Criteria

Sample Type	Concentration Range (μg/cm^2)	Criteria
Archived Samples	less than 5	Difference ≤ 1 μg/cm^2
	5 to 10	RPD ≤ 20 %
	greater than 10	RPD ≤ 15 %
Trip Blank		< 1 μg/cm^2
Spike Standard from RTI (True Value = 4.207 μg/μL)		95-105 % Recovery

Very good inter-laboratory agreement was observed for this study with the trip blank corrections applied to the NERL results. Overall there are 127 of the 138 total data points (92%) within the acceptance criteria listed above. Individually the OC, EC, and TC had 85%, 96%, and 93% of the inter-laboratory results within criteria, respectively. Without the trip blank correction, however, the OC agreements drops to 43% because there are 21 data points below 5 μg/cm^2 that are outside of the 1 μg/cm^2 criterion.

A followup effort was made to investigate the inter-laboratory bias observed in the carbon data. Before samples were shipped to NERL for this study, a punch was removed from each sample filter that remained in storage at RTI as a preserved aliquot. At EPA's request, three sample reserves were scheduled for re-analysis by RTI. The three samples having the lowest OC were selected for the re-analysis because those samples should provide the best information regarding low-level OC contamination. The following table presents the results for the three re-analyses, as well as the original RTI analysis and the EPA analysis.

Samples Re-analyzed for OC

Sample ID	RTI Analysis (μg/cm^2)		EPA Analysis (μg/cm^2)	
	Original	Re-analysis	before blank subtraction	after blank subtraction
A100056I	0.27	0.86	1.85	0.46
A100154K	0.34	0.71	2.11	0.72
A100458Y	0.40	0.76	1.70	0.55

Results of the carbon re-analyses performed at RTI agree very well with the EPA results after blank subtraction. It is possible that the inter-laboratory bias observed in the carbon data was largely due to low-level contamination received by all samples before the analysis at NERL. Only one trip blank was used for this study, and it was analyzed twice at NERL with similar results. The trip blank was not an old filter, and it was not held in storage along with the other samples. The trip blank should have been a clean filter that received its contamination during the latter days of this study. The trip blank should represent contamination received by all of the samples as a result of "extra exposure and handling" required for this study.

Although blank subtraction was used in this study to compare old carbon data to recent data, blank subtraction is not recommended for the routine carbon analysis performed at RTI. Future studies will be designed and optimized to provide more information about samples with low-level carbon. The following two recommendations are offered to help improve our safeguards for low-level contamination in the future:

- The daily instrument blanks that are used at RTI for batch blanks should be stored along with field samples.

- The Gelman air tight petri dish (7242 or 7232) should be evaluated for use as the filter container. The Gelman petri dish was successfully used for two prior studies. The trip blank in the November, 1999 initial study using the Gelman petri dish gave a result of only 0.14 $\mu g/cm^2$ OC.

Study Conclusions

Selected program samples were removed from cold storage at RTI and were re-analyzed at an EPA laboratory. RTI completed the original analysis and archival of all samples before this study was announced. Therefore, the samples selected for this study received no special treatment as they were processed through the preparation, analysis, reporting, and storage at RTI in a routine manner. The results from the EPA re-analyses generally show good agreement with the original results reported by RTI. Furthermore, this study has demonstrated good stability of samples held in cold storage for six to eight months.

References

1. EPA. 1997. Reference method for the determination of fine particulate matter as $PM_{2.5}$ in the atmosphere. U.S. Environmental Protection Agency. 40 CFR Part 50, Appendix L.

2. EPA. 1998. Quality Assurance Guidance Document 2.12; Monitoring $PM_{2.5}$ in Ambient Air Using Designated Reference or Class I Equivalent Methods. U.S. Environmental Protection Agency. Office of Research and Development, Research Triangle Park, NC.

3. NIOSH. 1999. Method 5040, Issue 3, Elemental Carbon (Diesel Particulate), NIOSH Manual of Analytical Methods, Fourth Edition. National Institute for Occupational Safety & Health, Cincinnati, OH.

Table 1

Location Name	Field Date	Sample Type	Sample ID	RTI Final Mass (mg)	NAREL Final Mass (mg)	Mass Difference (mg)	Captured* PM (mg)
Boston	02/09/00	Trip Blank	A100121C	143.264	143.284	0.020	0.000
Boston	02/09/00	Trip Blank	A100047J	142.887	142.905	0.018	0.003
Boston	02/27/00	Field Blank	A100417P	144.430	144.444	0.014	0.004
New York	02/27/00	Field Blank	A100380T	142.401	142.406	0.005	0.005
New York	02/09/00	Trip Blank	A100063J	142.957	142.967	0.010	0.010
Boston	02/27/00	Field Blank	A100390V	140.023	140.040	0.017	0.013
Phoenix	02/27/00	Field Blank	A1004920	141.558	141.570	0.012	0.014
New York	02/15/00	Field Blank	A100225J	144.232	144.242	0.010	0.016
Boston	02/09/00	Trip Blank	A100017D	142.551	142.565	0.014	0.021
New York	02/09/00	Trip Blank	A100054I	138.538	138.552	0.014	0.023
New York	02/09/00	Routine	A100071J	138.941	138.951	0.010	0.029
New York	02/27/00	Field Blank	A1003972	139.709	139.720	0.011	0.030
New York	03/04/00	Routine	A1005821	144.630	144.644	0.014	0.059
New York	03/04/00	Routine	A100541S	139.303	139.313	0.010	0.063
Phoenix	03/22/00	Routine	A100740X	140.506	140.517	0.011	0.063
New York	03/10/00	Routine	A100627X	142.815	142.827	0.012	0.063
New York	03/10/00	Routine	A100630S	143.186	143.199	0.013	0.063
Phoenix	03/28/00	Routine	A1009607	143.161	143.174	0.013	0.069
Phoenix	03/16/00	Routine	A1006675	138.595	138.605	0.010	0.077
Phoenix	03/04/00	Routine	A100540R	143.841	143.856	0.015	0.079
Phoenix	03/10/00	Routine	A1006926	145.124	145.126	0.002	0.110
New York	03/22/00	Routine	A1007565	138.623	138.628	0.005	0.123
New York	02/21/00	Field Blank	A100258S	143.032	143.032	0.000	0.123
New York	02/15/00	Routine	A100179U	143.823	143.831	0.008	0.126
Phoenix	02/27/00	Routine	A100422M	142.413	142.402	-0.011	0.140
Boston	03/28/00	Routine	A100797E	145.085	145.088	0.003	0.200
New York	02/27/00	Routine	A100447V	139.966	139.955	-0.011	0.201
New York	02/27/00	Routine	A100428S	143.513	143.492	-0.021	0.212
Boston	02/27/00	Routine	A100420K	144.177	144.146	-0.031	0.457

**** The captured PM listed here was determined at RTI within the required holding time.***

Table 2

Location Name	Field Date	Sample Type	Sample ID	Analyte Name	RTI Result (µg/mL)	NAREL Result (µg/mL)	Inter-Lab RPD	Inter-Lab Difference (µg/mL)	NAREL Report Limit (µg/mL)	Inter-Lab Assessment
Boston	02/09/00	Trip Blank	A1000117	Potassium	0.000	No Sample	----------	----------	----------	----------
New York	02/09/00	Routine	A100037H	Potassium	0.000	0.023	200%	0.023	0.02	Difference Ok
Boston	02/09/00	Trip Blank	A100041D	Potassium	0.000	0.000	0%	0.000	0.02	RPD Ok
New York	02/09/00	Trip Blank	A100048K	Potassium	0.000	0.000	0%	0.000	0.02	RPD Ok
New York	02/09/00	Trip Blank	A100057L	Potassium	0.000	0.000	0%	0.000	0.02	RPD Ok
New York	02/09/00	Routine	A100092O	Potassium	0.000	0.031	200%	0.031	0.02	Difference Ok
Boston	02/09/00	Trip Blank	A100118H	Potassium	0.042	0.031	29%	0.011	0.02	Difference Ok
Boston	02/09/00	Trip Blank	A100130D	Potassium	0.000	0.007	200%	0.007	0.02	Difference Ok
New York	02/15/00	Routine	A100182P	Potassium	0.000	0.017	200%	0.017	0.02	Difference Ok
New York	02/15/00	Field Blank	A100226K	Potassium	0.070	0.056	22%	0.014	0.02	Difference Ok
New York	02/21/00	Field Blank	A100256Q	Potassium	0.000	0.007	200%	0.007	0.02	Difference Ok
New York	02/27/00	Field Blank	A100381U	Potassium	0.000	0.014	200%	0.014	0.02	Difference Ok
Boston	02/27/00	Field Blank	A1003892	Potassium	0.000	0.000	0%	0.000	0.02	RPD Ok
New York	02/27/00	Field Blank	A1003994	Potassium	0.000	0.000	0%	0.000	0.02	RPD Ok
Boston	02/27/00	Field Blank	A100416O	Potassium	0.000	0.000	0%	0.000	0.02	RPD Ok
Boston	02/27/00	Routine	A100419R	Potassium	0.044	0.022	64%	0.021	0.02	Difference Ok
Phoenix	02/27/00	Routine	A100424O	Potassium	0.055	0.039	32%	0.015	0.02	Difference Ok
New York	02/27/00	Routine	A100430M	Potassium	0.044	0.036	21%	0.008	0.02	Difference Ok
New York	02/27/00	Routine	A100449X	Potassium	0.043	0.027	146%	0.016	0.02	Difference Ok
Phoenix	02/27/00	Field Blank	A1004931	Potassium	0.000	0.018	200%	0.018	0.02	Difference Ok
New York	03/04/00	Routine	A100531Q	Potassium	0.000	0.017	200%	0.017	0.02	Difference Ok
Phoenix	03/04/00	Routine	A100539Y	Potassium	0.000	0.020	200%	0.020	0.02	Difference Ok
New York	03/04/00	Routine	A1005843	Potassium	0.000	0.014	200%	0.014	0.02	Difference Ok
New York	03/10/00	Routine	A100626W	Potassium	0.000	0.010	200%	0.010	0.02	Difference Ok
New York	03/10/00	Routine	A100629Z	Potassium	0.000	0.008	200%	0.008	0.02	Difference Ok
Phoenix	03/10/00	Routine	A100643X	Potassium	0.028	0.027	1%	0.000	0.02	RPD Ok
Phoenix	03/16/00	Routine	A1006686	Potassium	0.000	0.017	200%	0.017	0.02	Difference Ok
Phoenix	03/22/00	Routine	A100741Y	Potassium	0.000	0.012	200%	0.012	0.02	Difference Ok
New York	03/22/00	Routine	A1007587	Potassium	0.000	0.011	200%	0.011	0.02	Difference Ok
Boston	03/28/00	Routine	A100798F	Potassium	0.000	0.014	200%	0.014	0.02	Difference Ok
Phoenix	03/28/00	Routine	A1009618	Potassium	0.000	0.009	200%	0.009	0.02	Difference Ok
----------	----------	RTI Standard	----------	Potassium	----------	0.095 (95%)	----------	----------	0.02	----------
Boston	02/09/00	Trip Blank	A1000117	Sodium	0.032	No Sample	----------	----------	----------	----------
New York	02/09/00	Routine	A100037H	Sodium	0.039	0.052	29%	0.013	0.02	Difference Ok

Location Name	Field Date	Sample Type	Sample ID	Analyte Name	RTI Result (µg/mL)	NAREL Result (µg/mL)	Inter-Lab RPD	Inter-Lab Difference (µg/mL)	NAREL Report Limit (µg/mL)	Inter-Lab Assessment
Boston	02/09/00	Trip Blank	A100041D	Sodium	0.015	0.014	7%	0.001	0.02	RPD Ok
New York	02/09/00	Trip Blank	A100048K	Sodium	0.025	0.030	20%	0.005	0.02	Difference Ok
New York	02/09/00	Trip Blank	A100057L	Sodium	0.028	0.015	62%	0.013	0.02	Difference Ok
New York	02/09/00	Routine	A100092O	Sodium	0.101	0.098	3%	0.003	0.02	RPD Ok
Boston	02/09/00	Trip Blank	A100118H	Sodium	0.034	0.034	2%	0.001	0.02	RPD Ok
Boston	02/09/00	Trip Blank	A100130D	Sodium	0.031	0.025	21%	0.006	0.02	Difference Ok
New York	02/15/00	Routine	A100182P	Sodium	0.048	0.054	12%	0.006	0.02	RPD Ok
New York	02/15/00	Field Blank	A100226K	Sodium	0.048	0.055	14%	0.007	0.02	RPD Ok
New York	02/21/00	Field Blank	A100256Q	Sodium	0.032	0.020	47%	0.012	0.02	Difference Ok
New York	02/27/00	Field Blank	A100381U	Sodium	0.020	0.059	98%	0.039	0.02	Difference Ok
Boston	02/27/00	Field Blank	A1003892	Sodium	0.000	0.017	200%	0.017	0.02	Difference Ok
New York	02/27/00	Field Blank	A1003994	Sodium	0.009	0.018	62%	0.008	0.02	Difference Ok
Boston	02/27/00	Field Blank	A100416O	Sodium	0.000	0.016	200%	0.016	0.02	Difference Ok
Boston	02/27/00	Routine	A100419R	Sodium	0.074	0.077	5%	0.003	0.02	RPD Ok
Phoenix	02/27/00	Routine	A100424O	Sodium	0.031	0.045	37%	0.014	0.02	Difference Ok
New York	02/27/00	Routine	A100430M	Sodium	0.050	0.059	16%	0.009	0.02	RPD Ok
New York	02/27/00	Routine	A100449X	Sodium	0.066	0.080	20%	0.014	0.02	RPD Ok
Phoenix	02/27/00	Field Blank	A1004931	Sodium	0.010	0.049	130%	0.038	0.02	Difference Ok
New York	03/04/00	Routine	A100531Q	Sodium	0.023	0.056	85%	0.034	0.02	Difference Ok
Phoenix	03/04/00	Routine	A100539Y	Sodium	0.085	0.107	23%	0.022	0.02	Difference Ok
New York	03/04/00	Routine	A1005843	Sodium	0.025	0.038	40%	0.013	0.02	Difference Ok
New York	03/10/00	Routine	A100626W	Sodium	0.057	0.075	27%	0.018	0.02	Difference Ok
New York	03/10/00	Routine	A100629Z	Sodium	0.025	0.041	49%	0.016	0.02	Difference Ok
Phoenix	03/10/00	Routine	A100643X	Sodium	0.019	0.036	64%	0.018	0.02	Difference Ok
Phoenix	03/16/00	Routine	A1006686	Sodium	0.024	0.041	52%	0.017	0.02	Difference Ok
Phoenix	03/22/00	Routine	A100741Y	Sodium	0.021	0.046	73%	0.025	0.02	Difference Ok
New York	03/22/00	Routine	A1007587	Sodium	0.100	0.106	6%	0.006	0.02	RPD Ok
Boston	03/28/00	Routine	A100798F	Sodium	0.146	0.175	18%	0.030	0.02	RPD Ok
Phoenix	03/28/00	Routine	A1009618	Sodium	0.024	0.039	46%	0.015	0.02	Difference Ok
----------	----------	RTI Standard	----------	Sodium	----------	0.104 (104%)	----------	----------	0.02	----------
Boston	02/09/00	Trip Blank	A1000117	Ammonium	0.007	No Sample	----------	----------	----------	----------
New York	02/09/00	Routine	A100037H	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100041D	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
New York	02/09/00	Trip Blank	A100048K	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
New York	02/09/00	Trip Blank	A100057L	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok

Location Name	Field Date	Sample Type	Sample ID	Analyte Name	RTI Result (µg/mL)	NAREL Result (µg/mL)	Inter-Lab RPD	Inter-Lab Difference (µg/mL)	NAREL Report Limit (µg/mL)	Inter-Lab Assessment
New York	02/09/00	Routine	A100092O	Ammonium	1.354	1.276	6%	0.078	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100118H	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100130D	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
New York	02/15/00	Routine	A100182P	Ammonium	0.516	0.453	13%	0.063	0.04	RPD Ok
New York	02/15/00	Field Blank	A100226K	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
New York	02/21/00	Field Blank	A100256Q	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
New York	02/27/00	Field Blank	A100381U	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
Boston	02/27/00	Field Blank	A1003892	Ammonium	0.013	0.000	200%	0.013	0.04	Difference Ok
New York	02/27/00	Field Blank	A1003994	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
Boston	02/27/00	Field Blank	A100416O	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
Boston	02/27/00	Routine	A100419R	Ammonium	0.781	0.711	9%	0.071	0.04	RPD Ok
Phoenix	02/27/00	Routine	A100424O	Ammonium	0.156	0.094	50%	0.062	0.04	Difference Ok
New York	02/27/00	Routine	A100430M	Ammonium	0.815	0.768	6%	0.047	0.04	RPD Ok
New York	02/27/00	Routine	A100449X	Ammonium	0.795	0.758	5%	0.037	0.04	RPD Ok
Phoenix	02/27/00	Field Blank	A1004931	Ammonium	0.000	0.000	0%	0.000	0.04	RPD Ok
New York	03/04/00	Routine	A100531Q	Ammonium	0.173	0.138	23%	0.035	0.04	Difference Ok
Phoenix	03/04/00	Routine	A100539Y	Ammonium	0.039	0.012	106%	0.027	0.04	Difference Ok
New York	03/04/00	Routine	A1005843	Ammonium	0.167	0.121	32%	0.045	0.04	Difference Ok
New York	03/10/00	Routine	A100626W	Ammonium	0.108	0.062	55%	0.047	0.04	Difference Ok
New York	03/10/00	Routine	A100629Z	Ammonium	0.119	0.054	76%	0.066	0.04	Difference Ok
Phoenix	03/10/00	Routine	A100643X	Ammonium	0.080	0.028	97%	0.052	0.04	Difference Ok
Phoenix	03/16/00	Routine	A1006686	Ammonium	0.097	0.062	45%	0.036	0.04	Difference Ok
Phoenix	03/22/00	Routine	A100741Y	Ammonium	0.115	0.036	104%	0.079	0.04	Difference Ok
New York	03/22/00	Routine	A1007587	Ammonium	0.451	0.401	12%	0.050	0.04	RPD Ok
Boston	03/28/00	Routine	A100798F	Ammonium	0.164	0.119	32%	0.045	0.04	Difference Ok
Phoenix	03/28/00	Routine	A1009618	Ammonium	0.122	0.072	51%	0.049	0.04	Difference Ok
----------	----------	RTI Standard	----------	Ammonium	----------	0.096 (96%)	----------	----------	0.04	----------

Table 3

Location Name	Field Date	Sample Type	Sample ID	Analyte Name	RTI Result (µg/mL)	NAREL Result (µg/mL)	Inter-Lab RPD	Inter-Lab Difference (µg/mL)	NAREL Report Limit (µg/mL)	Inter-Lab Assessment
Boston	02/09/00	Trip Blank	A1000117	Nitrate	0.053	No Sample	----------	----------	----------	----------
New York	02/09/00	Routine	A100037H	Nitrate	0.048	0.056	16%	0.008	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100041D	Nitrate	0.041	0.000	200%	0.041	0.04	Difference Ok
New York	02/09/00	Trip Blank	A100048K	Nitrate	0.041	0.000	200%	0.041	0.04	Difference Ok
Boston	02/09/00	Trip Blank	A100053H	Nitrate	0.045	0.000	200%	0.045	0.04	Difference Ok
New York	02/09/00	Trip Blank	A100057L	Nitrate	0.040	0.000	200%	0.040	0.04	Difference Ok
New York	02/09/00	Routine	A100092O	Nitrate	2.019	2.009	0%	0.010	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100118H	Nitrate	0.043	0.041	5%	0.002	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100130D	Nitrate	0.033	0.051	44%	0.018	0.04	Difference Ok
Boston	02/09/00	Trip Blank	A100152J	Nitrate	0.043	0.054	23%	0.011	0.04	Difference Ok
New York	02/15/00	Routine	A100182P	Nitrate	0.330	0.307	7%	0.022	0.04	RPD Ok
Boston	02/15/00	Routine	A100188V	Nitrate	0.440	0.485	10%	0.045	0.04	RPD Ok
New York	02/15/00	Field Blank	A100226K	Nitrate	0.050	0.073	38%	0.023	0.04	Difference Ok
Phoenix	02/21/00	Routine	A100247P	Nitrate	0.069	0.066	3%	0.002	0.04	RPD Ok
New York	02/21/00	Field Blank	A100256Q	Nitrate	0.035	0.000	200%	0.035	0.04	Difference Ok
Boston	02/21/00	Routine	A100268U	Nitrate	0.433	0.463	7%	0.030	0.04	RPD Ok
Boston	02/27/00	Routine	A100293V	Nitrate	0.606	0.670	10%	0.064	0.04	RPD Ok
Phoenix	02/21/00	Routine	A100368X	Nitrate	0.082	0.081	1%	0.001	0.04	RPD Ok
New York	02/27/00	Field Blank	A100381U	Nitrate	0.043	0.056	27%	0.013	0.04	Difference Ok
Boston	02/27/00	Field Blank	A1003892	Nitrate	0.045	0.059	28%	0.014	0.04	Difference Ok
New York	02/27/00	Field Blank	A1003994	Nitrate	0.050	0.062	22%	0.012	0.04	Difference Ok
Boston	02/27/00	Field Blank	A100416O	Nitrate	0.039	0.045	13%	0.005	0.04	RPD Ok
Boston	02/27/00	Routine	A100419R	Nitrate	0.933	0.926	1%	0.007	0.04	RPD Ok
Phoenix	02/27/00	Routine	A100424O	Nitrate	0.562	0.519	8%	0.043	0.04	RPD Ok
New York	02/27/00	Routine	A100430M	Nitrate	1.378	1.282	7%	0.096	0.04	RPD Ok
New York	02/27/00	Routine	A100449X	Nitrate	1.411	1.374	3%	0.038	0.04	RPD Ok
Phoenix	02/27/00	Routine	A100450Q	Nitrate	1.070	1.136	6%	0.066	0.04	RPD Ok
Boston	02/27/00	Field Blank	A100456W	Nitrate	0.032	0.029	8%	0.003	0.04	RPD Ok
Phoenix	02/27/00	Field Blank	A100459Z	Nitrate	0.023	0.000	200%	0.023	0.04	Difference Ok
Phoenix	02/27/00	Routine	A100470U	Nitrate	1.029	1.132	10%	0.103	0.04	RPD Ok
Phoenix	02/27/00	Field Blank	A1004760	Nitrate	0.029	0.098	107%	0.068	0.04	Difference Ok
Phoenix	02/27/00	Field Blank	A1004931	Nitrate	0.036	0.042	16%	0.006	0.04	RPD Ok
New York	03/04/00	Routine	A100531Q	Nitrate	0.175	0.178	1%	0.002	0.04	RPD Ok
Phoenix	03/04/00	Routine	A100539Y	Nitrate	0.348	0.293	17%	0.054	0.04	RPD Ok

Location Name	Field Date	Sample Type	Sample ID	Analyte Name	RTI Result (µg/mL)	NAREL Result (µg/mL)	Inter-Lab RPD	Inter-Lab Difference (µg/mL)	NAREL Report Limit (µg/mL)	Inter-Lab Assessment
Phoenix	03/04/00	Routine	A1005741	Nitrate	0.638	0.688	8%	0.050	0.04	RPD Ok
New York	03/04/00	Routine	A1005843	Nitrate	0.149	0.149	0%	0.000	0.04	RPD Ok
Phoenix	03/04/00	Routine	A1005934	Nitrate	0.632	0.669	6%	0.036	0.04	RPD Ok
Boston	03/04/00	Routine	A1005967	Nitrate	0.126	0.127	1%	0.001	0.04	RPD Ok
New York	03/10/00	Routine	A100626W	Nitrate	0.250	0.224	11%	0.025	0.04	RPD Ok
New York	03/10/00	Routine	A100629Z	Nitrate	0.261	0.227	14%	0.034	0.04	RPD Ok
Boston	03/10/00	Routine	A1006380	Nitrate	0.280	0.294	5%	0.014	0.04	RPD Ok
Phoenix	03/10/00	Routine	A100643X	Nitrate	0.745	0.668	11%	0.077	0.04	RPD Ok
Phoenix	03/10/00	Routine	A100645Z	Nitrate	1.705	1.818	6%	0.113	0.04	RPD Ok
Phoenix	03/16/00	Routine	A1006686	Nitrate	0.167	0.170	2%	0.003	0.04	RPD Ok
Phoenix	03/16/00	Routine	A100700P	Nitrate	0.264	0.269	2%	0.005	0.04	RPD Ok
Boston	03/16/00	Routine	A100720T	Nitrate	0.435	0.440	1%	0.006	0.04	RPD Ok
Boston	03/22/00	Routine	A100726Z	Nitrate	0.094	0.113	18%	0.019	0.04	RPD Ok
Phoenix	03/22/00	Routine	A100741Y	Nitrate	0.273	0.264	3%	0.008	0.04	RPD Ok
New York	03/22/00	Routine	A1007587	Nitrate	0.416	0.384	8%	0.031	0.04	RPD Ok
Boston	03/28/00	Routine	A100798F	Nitrate	0.292	0.275	6%	0.018	0.04	RPD Ok
Phoenix	03/28/00	Routine	A1008386	Nitrate	1.132	1.181	4%	0.049	0.04	RPD Ok
Phoenix	03/22/00	Routine	A1009094	Nitrate	0.564	0.589	4%	0.025	0.04	RPD Ok
Phoenix	03/28/00	Routine	A1009378	Nitrate	1.145	1.196	4%	0.051	0.04	RPD Ok
Boston	03/28/00	Routine	A1009403	Nitrate	0.072	0.090	22%	0.018	0.04	Difference Ok
Phoenix	03/28/00	Routine	A1009618	Nitrate	0.609	0.554	9%	0.054	0.04	RPD Ok
----------	----------	RTI Standard	----------	Nitrate	----------	1.007 (101%)	----------	----------	0.04	----------
Boston	02/09/00	Trip Blank	A1000117	Sulfate	0.083	No Sample	----------	----------	----------	----------
New York	02/09/00	Routine	A100037H	Sulfate	0.093	0.085	9%	0.008	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100041D	Sulfate	0.091	0.129	35%	0.038	0.04	Difference Ok
New York	02/09/00	Trip Blank	A100048K	Sulfate	0.071	0.090	23%	0.018	0.04	Difference Ok
New York	02/09/00	Trip Blank	A100057L	Sulfate	0.106	0.114	7%	0.008	0.04	RPD Ok
New York	02/09/00	Routine	A100092O	Sulfate	2.016	2.229	10%	0.214	0.04	RPD Ok
Boston	02/09/00	Trip Blank	A100118H	Sulfate	0.083	0.107	26%	0.024	0.04	Difference Ok
Boston	02/09/00	Trip Blank	A100130D	Sulfate	0.074	0.114	43%	0.040	0.04	Difference Ok
New York	02/15/00	Routine	A100182P	Sulfate	1.285	1.336	4%	0.051	0.04	RPD Ok
New York	02/15/00	Field Blank	A100226K	Sulfate	0.080	0.115	36%	0.035	0.04	Difference Ok
New York	02/21/00	Field Blank	A100256Q	Sulfate	0.079	0.091	15%	0.013	0.04	RPD Ok
New York	02/27/00	Field Blank	A100381U	Sulfate	0.090	0.098	9%	0.008	0.04	RPD Ok
Boston	02/27/00	Field Blank	A1003892	Sulfate	0.076	0.085	11%	0.009	0.04	RPD Ok

Location Name	Field Date	Sample Type	Sample ID	Analyte Name	RTI Result (µg/mL)	NAREL Result (µg/mL)	Inter-Lab RPD	Inter-Lab Difference (µg/mL)	NAREL Report Limit (µg/mL)	Inter-Lab Assessment
New York	02/27/00	Field Blank	A1003994	Sulfate	0.052	0.082	45%	0.030	0.04	Difference Ok
Boston	02/27/00	Field Blank	A100416O	Sulfate	0.072	0.067	7%	0.005	0.04	RPD Ok
Boston	02/27/00	Routine	A100419R	Sulfate	2.049	2.253	9%	0.204	0.04	RPD Ok
Phoenix	02/27/00	Routine	A100424O	Sulfate	0.370	0.388	5%	0.018	0.04	RPD Ok
New York	02/27/00	Routine	A100430M	Sulfate	1.767	1.885	6%	0.118	0.04	RPD Ok
New York	02/27/00	Routine	A100449X	Sulfate	1.767	1.916	8%	0.150	0.04	RPD Ok
Phoenix	02/27/00	Field Blank	A1004931	Sulfate	0.059	0.110	61%	0.051	0.04	Difference Ok
New York	03/04/00	Routine	A100531Q	Sulfate	0.558	0.573	3%	0.015	0.04	RPD Ok
Phoenix	03/04/00	Routine	A100539Y	Sulfate	0.345	0.348	1%	0.004	0.04	RPD Ok
New York	03/04/00	Routine	A1005843	Sulfate	0.472	0.491	4%	0.019	0.04	RPD Ok
New York	03/10/00	Routine	A100626W	Sulfate	0.527	0.533	1%	0.006	0.04	RPD Ok
New York	03/10/00	Routine	A100629Z	Sulfate	0.531	0.523	2%	0.008	0.04	RPD Ok
Phoenix	03/10/00	Routine	A100643X	Sulfate	0.226	0.235	4%	0.009	0.04	RPD Ok
Phoenix	03/16/00	Routine	A1006686	Sulfate	0.347	0.355	2%	0.008	0.04	RPD Ok
Phoenix	03/22/00	Routine	A100741Y	Sulfate	0.304	0.332	9%	0.027	0.04	RPD Ok
New York	03/22/00	Routine	A1007587	Sulfate	1.418	1.471	4%	0.053	0.04	RPD Ok
Boston	03/28/00	Routine	A100798F	Sulfate	0.928	0.983	6%	0.056	0.04	RPD Ok
Phoenix	03/28/00	Routine	A1009618	Sulfate	0.377	0.385	2%	0.007	0.04	RPD Ok
----------	----------	RTI Standard	----------	Sulfate	----------	1.013 (101%)	----------	----------	0.04	----------

Table 4

			No Trip Blank Subtraction					*With Trip Blank Subtraction*				
Sample	**Type**	**RTI OC (µg/cm²)**	**EPA OC (µg/cm²)**	**Average OC (µg/cm²)**	**Inter-Lab Difference (µg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**	**EPA OC (µg/cm²)**	**Average OC (µg/cm²)**	**Inter-Lab Difference (µg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**
Trip Blank	----------	----------	1.39	----------	----------	----------	----------	0.00	----------	----------	----------	----------
A100472W	routine-Phoenix	14.84	13.40	14.1	-1.4	-10.2%	RPD Ok	12.01	13.4	-2.8	-21.1%	Outlier
A100628Y	routine-NY	2.33	3.11	2.7	0.8	28.7%	Difference Ok	1.72	2.0	-0.6	-30.1%	Difference Ok
A100452S	routine-Phoenix	13.12	13.57	13.3	0.5	3.4%	RPD Ok	12.18	12.7	-0.9	-7.4%	RPD Ok
A1005945	routine-Phoenix	5.08	5.31	5.2	0.2	4.4%	RPD Ok	3.92	4.5	-1.2	-25.8%	Outlier
A100291T	routine-Roxbury	8.49	7.76	8.1	-0.7	-9.0%	RPD Ok	6.37	7.4	-2.1	-28.5%	Outlier
A100637Z	routine-Roxbury	4.12	4.88	4.5	0.8	16.9%	RPD Ok	3.49	3.8	-0.6	-16.6%	RPD Ok
A100727O	routine-Roxbury	4.70	5.71	5.2	1.0	19.4%	RPD Ok	4.32	4.5	-0.4	-8.4%	RPD Ok
A1009414	routine-Roxbury	4.56	4.73	4.6	0.2	3.7%	RPD Ok	3.34	4.0	-1.2	-30.9%	Outlier
A100060G	trip blk-NY	0.69	1.52	1.1	0.8	75.1%	Difference Ok	0.13	0.4	-0.6	-136.6%	Difference Ok
A100051F	trip blk-NY	0.95	2.11	1.5	1.2	75.8%	Outlier	0.72	0.8	-0.2	-27.5%	Difference Ok
A100056K	trip blk-Phoenix	0.27	1.85	1.1	1.6	149.1%	Outlier	0.46	0.4	0.2	52.1%	Difference Ok
A100154L	trip blk-Phoenix	0.34	2.11	1.2	1.8	144.5%	Outlier	0.72	0.5	0.4	71.7%	Difference Ok
A1007521	routine-NY	2.01	3.24	2.6	1.2	46.9%	Outlier	1.85	1.9	-0.2	-8.3%	RPD Ok
A1005752	routine-Phoenix	2.17	3.18	2.7	1.0	37.8%	Difference Ok	1.79	2.0	-0.4	-19.2%	RPD Ok
A100701Q	routine-Phoenix	7.48	8.55	8.0	1.1	13.3%	RPD Ok	7.16	7.3	-0.3	-4.4%	RPD Ok
A100418Q	routine-Roxbury	2.24	2.78	2.5	0.5	21.5%	Difference Ok	1.39	1.8	-0.9	-46.8%	Difference Ok
A1008182	routine-Roxbury	1.65	3.14	2.4	1.5	62.2%	Outlier	1.75	1.7	0.1	5.9%	RPD Ok
Trip Blank	----------	----------	1.15	----------	----------	----------	----------	0.00	----------	----------	----------	----------
A1009083	routine-Phoenix	5.60	7.41	6.5	1.8	27.8%	Outlier	6.26	5.9	0.7	11.1%	RPD Ok
A1007190	routine-Roxbury	6.16	8.01	7.1	1.9	26.1%	Outlier	6.86	6.5	0.7	10.8%	RPD Ok
A100044G	trip blk-Roxbury	0.84	1.90	1.4	1.1	77.4%	Outlier	0.75	0.8	-0.1	-11.3%	RPD Ok
A1008375	routine-Phoenix	5.56	6.79	6.2	1.2	19.9%	RPD Ok	5.64	5.6	0.1	1.4%	RPD Ok
A1001271	trip blk-Roxbury	1.82	3.72	2.8	1.9	68.6%	Outlier	2.57	2.2	0.8	34.2%	Difference Ok
A100382V	field blk-NY	1.21	2.88	2.0	1.7	81.7%	Outlier	1.73	1.5	0.5	35.4%	Difference Ok
A100537W	routine-Phoenix	3.81	5.17	4.5	1.4	30.3%	Outlier	4.02	3.9	0.2	5.4%	RPD Ok
A100515N	field blk-Roxbury	1.34	2.47	1.9	1.1	59.3%	Outlier	1.32	1.3	-0.0	-1.5%	RPD Ok
A1003881	fieldblk-Roxbury	1.11	1.98	1.5	0.9	56.3%	Difference Ok	0.83	1.0	-0.3	-28.9%	Difference Ok
A100192R	routine-Roxbury	5.63	7.74	6.7	2.1	31.6%	Outlier	6.59	6.1	1.0	15.7%	RPD Ok
A1004942	field blk-Phoenix	1.10	1.97	1.5	0.9	56.7%	Difference Ok	0.82	1.0	-0.3	-29.2%	Difference Ok
A100095R	routine-NY	6.36	7.67	7.0	1.3	18.7%	RPD Ok	6.52	6.4	0.2	2.5%	RPD Ok
A100014A	trip blk-Roxbury	0.84	4.37	2.6	3.5	135.5%	Outlier	3.22	2.0	2.4	117.2%	Outlier
A1009629	routine-Phoenix	3.11	5.13	4.1	2.0	49.0%	Outlier	3.98	3.5	0.9	24.5%	Difference Ok

			No Trip Blank Subtraction					*With Trip Blank Subtraction*				
Sample	**Type**	**RTI OC ($\mu g/cm^2$)**	**EPA OC ($\mu g/cm^2$)**	**Average OC ($\mu g/cm^2$)**	**Inter-Lab Difference ($\mu g/cm^2$)**	**Inter-Lab RPD**	**Inter-Lab Assessment**	**EPA OC ($\mu g/cm^2$)**	**Average OC ($\mu g/cm^2$)**	**Inter-Lab Difference ($\mu g/cm^2$)**	**Inter-Lab RPD**	**Inter-Lab Assessment**
A100185S	routine-NY	2.74	4.80	3.8	2.1	54.6%	Outlier	3.65	3.2	0.9	28.5%	Difference Ok
A1005978	routine-Roxbury	4.34	5.70	5.0	1.4	27.1%	Outlier	4.55	4.4	0.2	4.7%	RPD Ok
A100423N	routine-Phoenix	7.49	9.34	8.4	1.9	22.0%	Outlier	8.19	7.8	0.7	8.9%	RPD Ok
A100625V	routine-NY	2.55	3.19	2.9	0.6	22.3%	Difference Ok	2.04	2.3	-0.5	-22.2%	Difference Ok
A100448W	routine-NY	4.28	4.63	4.5	0.3	7.9%	RPD Ok	3.48	3.9	-0.8	-20.6%	Difference Ok
A100270O	routine-Roxbury	7.92	9.16	8.5	1.2	14.5%	RPD Ok	8.01	8.0	0.1	1.1%	RPD Ok
A100429T	routine-NY	4.18	4.67	4.4	0.5	11.1%	RPD Ok	3.52	3.9	-0.7	-17.1%	RPD Ok
A100530P	routine-NY	3.00	4.18	3.6	1.2	32.9%	Outlier	3.03	3.0	0.0	1.0%	RPD Ok
A100227L	field blk-NY	0.98	3.21	2.1	2.2	106.4%	Outlier	2.06	1.5	1.1	71.1%	Outlier
A100138L	routine-NY	4.97	7.60	6.3	2.6	41.8%	Outlier	6.45	5.7	1.5	25.9%	Outlier
A1006697	routine-Phoenix	4.96	6.23	5.6	1.3	22.7%	Outlier	5.08	5.0	0.1	2.4%	RPD Ok
A100249R	routine-Phoenix	3.50	5.04	4.3	1.5	36.1%	Outlier	3.89	3.7	0.4	10.6%	RPD Ok
A100366V	routine-Phoenix	2.88	4.80	3.8	1.9	50.0%	Outlier	3.65	3.3	0.8	23.6%	Difference Ok
A100458Y	field blk-Roxbury	0.40	1.70	1.1	1.3	123.8%	Outlier	0.55	0.5	0.2	31.6%	Difference Ok
A100460S	field blk-Phoenix	0.76	1.49	1.1	0.7	64.9%	Difference Ok	0.34	0.6	-0.4	-76.4%	Difference Ok

Table 5

			No Trip Blank Subtraction					*With Trip Blank Subtraction*				
Sample	**Type**	**RTI EC (µg/cm²)**	**EPA EC (µg/cm²)**	**Average EC (µg/cm²)**	**Inter-Lab Difference (µg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**	**EPA EC (µg/cm²)**	**Average EC (µg/cm²)**	**Inter-Lab Difference (µg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**
Trip Blank	----------	----------	0.06	----------	----------	----------	----------	0.00	----------	----------	----------	----------
A100472W	routine-Phoenix	2.81	3.90	3.4	1.1	32.5%	Outlier	3.84	3.3	1.0	31.0%	Difference Ok
A100628Y	routine-NY	0.24	0.78	0.5	0.5	105.9%	Difference Ok	0.72	0.5	0.5	100.0%	Difference Ok
A100452S	routine-Phoenix	2.68	3.65	3.2	1.0	30.6%	Difference Ok	3.59	3.1	0.9	29.0%	Difference Ok
A1005945	routine-Phoenix	0.60	1.27	0.9	0.7	71.7%	Difference Ok	1.21	0.9	0.6	67.4%	Difference Ok
A100291T	routine-Roxbury	0.68	2.38	1.5	1.7	111.1%	Outlier	2.32	1.5	1.6	109.3%	Outlier
A100637Z	routine-Roxbury	1.17	1.42	1.3	0.3	19.3%	RPD Ok	1.36	1.3	0.2	15.0%	RPD Ok
A100727O	routine-Roxbury	1.76	1.89	1.8	0.1	7.1%	RPD Ok	1.83	1.8	0.1	3.9%	RPD Ok
A1009414	routine-Roxbury	2.00	2.20	2.1	0.2	9.5%	RPD Ok	2.14	2.1	0.1	6.8%	RPD Ok
A100060G	trip blk-NY	0.06	0.06	0.1	0.0	0.0%	RPD Ok	0.00	0.0	-0.1	-200.0%	Difference Ok
A100051F	trip blk-NY	0.08	-0.04	0.0	-0.1	-600.0%	Difference Ok	-0.10	-0.0	-0.2	1800.0%	Difference Ok
A100056K	trip blk-Phoenix	0.05	0.11	0.1	0.1	75.0%	Difference Ok	0.05	0.1	0.0	0.0%	RPD Ok
A100154L	trip blk-Phoenix	0.07	0.10	0.1	0.0	35.3%	Difference Ok	0.04	0.1	-0.0	-54.5%	Difference Ok
A1007521	routine-NY	0.79	1.12	1.0	0.3	34.6%	Difference Ok	1.06	0.9	0.3	29.2%	Difference Ok
A1005752	routine-Phoenix	0.12	0.56	0.3	0.4	129.4%	Difference Ok	0.50	0.3	0.4	122.6%	Difference Ok
A100701Q	routine-Phoenix	1.80	2.14	2.0	0.3	17.3%	RPD Ok	2.08	1.9	0.3	14.4%	RPD Ok
A100418Q	routine-Roxbury	0.13	0.55	0.3	0.4	123.5%	Difference Ok	0.49	0.3	0.4	116.1%	Difference Ok
A1008182	routine-Roxbury	0.46	0.57	0.5	0.1	21.4%	Difference Ok	0.51	0.5	0.1	10.3%	RPD Ok
Trip Blank	----------	----------	0.16	----------	----------	----------	----------	0.00	----------	----------	----------	----------
A1009083	routine-Phoenix	1.33	1.36	1.3	0.0	2.2%	RPD Ok	1.20	1.3	-0.1	-10.3%	RPD Ok
A1007190	routine-Roxbury	1.60	1.79	1.7	0.2	11.2%	RPD Ok	1.63	1.6	0.0	1.9%	RPD Ok
A100044G	trip blk-Roxbury	0.06	0.15	0.1	0.1	85.7%	Difference Ok	-0.01	0.0	-0.1	-280.0%	Difference Ok
A1008375	routine-Phoenix	0.91	0.84	0.9	-0.1	-8.0%	RPD Ok	0.68	0.8	-0.2	-28.9%	Difference Ok
A1001271	trip blk-Roxbury	0.03	0.35	0.2	0.3	168.4%	Difference Ok	0.19	0.1	0.2	145.5%	Difference Ok
A100382V	field blk-NY	0.05	0.24	0.1	0.2	131.0%	Difference Ok	0.08	0.1	0.0	46.2%	Difference Ok
A100537W	routine-Phoenix	0.28	0.54	0.4	0.3	63.4%	Difference Ok	0.38	0.3	0.1	30.3%	Difference Ok
A100515N	field blk-Roxbury	0.03	0.09	0.1	0.1	100.0%	Difference Ok	-0.07	-0.0	-0.1	500.0%	Difference Ok
A1003881	field blk-Roxbury	0.03	0.15	0.1	0.1	133.3%	Difference Ok	-0.01	0.0	-0.0	-400.0%	Difference Ok
A100192R	routine-Roxbury	2.26	1.93	2.1	-0.3	-15.8%	RPD Ok	1.77	2.0	-0.5	-24.3%	Difference Ok
A1004942	field blk-Phoenix	-0.01	0.06	0.0	0.1	280.0%	Difference Ok	-0.10	-0.1	-0.1	163.6%	Difference Ok
A100095R	routine-NY	2.69	2.98	2.8	0.3	10.2%	RPD Ok	2.82	2.8	0.1	4.7%	RPD Ok
A100014A	trip blk-Roxbury	0.07	0.37	0.2	0.3	136.4%	Difference Ok	0.21	0.1	0.1	100.0%	Difference Ok
A1009629	routine-Phoenix	0.44	0.51	0.5	0.1	14.7%	RPD Ok	0.35	0.4	-0.1	-22.8%	Difference Ok

			No Trip Blank Subtraction					*With Trip Blank Subtraction*				
Sample	**Type**	**RTI EC (μg/cm²)**	**EPA EC (μg/cm²)**	**Average EC (μg/cm²)**	**Inter-Lab Difference (μg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**	**EPA EC (μg/cm²)**	**Average EC (μg/cm²)**	**Inter-Lab Difference (μg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**
A100185S	routine-NY	0.88	0.90	0.9	0.0	2.2%	RPD Ok	0.74	0.8	-0.1	-17.3%	RPD Ok
A1005978	routine-Roxbury	0.39	0.87	0.6	0.5	76.2%	Difference Ok	0.71	0.6	0.3	58.2%	Difference Ok
A100423N	routine-Phoenix	1.20	1.51	1.4	0.3	22.9%	Difference Ok	1.35	1.3	0.2	11.8%	RPD Ok
A100625V	routine-NY	0.27	0.90	0.6	0.6	107.7%	Difference Ok	0.74	0.5	0.5	93.1%	Difference Ok
A100448W	routine-NY	0.55	1.49	1.0	0.9	92.2%	Difference Ok	1.33	0.9	0.8	83.0%	Difference Ok
A100270O	routine-Roxbury	1.28	1.54	1.4	0.3	18.4%	RPD Ok	1.38	1.3	0.1	7.5%	RPD Ok
A100429T	routine-NY	0.51	1.35	0.9	0.8	90.3%	Difference Ok	1.19	0.9	0.7	80.0%	Difference Ok
A100530P	routine-NY	0.46	1.53	1.0	1.1	107.5%	Outlier	1.37	0.9	0.9	99.5%	Difference Ok
A100227L	field blk-NY	0.11	0.23	0.2	0.1	70.6%	Difference Ok	0.07	0.1	-0.0	-44.4%	Difference Ok
A100138L	routine-NY	1.05	0.91	1.0	-0.1	-14.3%	RPD Ok	0.75	0.9	-0.3	-33.3%	Difference Ok
A1006697	routine-Phoenix	0.87	0.90	0.9	0.0	3.4%	RPD Ok	0.74	0.8	-0.1	-16.1%	RPD Ok
A100249R	routine-Phoenix	0.28	0.63	0.5	0.4	76.9%	Difference Ok	0.47	0.4	0.2	50.7%	Difference Ok
A100366V	routine-Phoenix	0.34	0.61	0.5	0.3	56.8%	Difference Ok	0.45	0.4	0.1	27.8%	Difference Ok
A100458Y	field blk-Roxbury	0.05	0.11	0.1	0.1	73.3%	Difference Ok	-0.05	0.0	-0.1	-20200.0%	Difference Ok
A100460S	field blk-Phoenix	0.07	0.16	0.1	0.1	78.3%	Difference Ok	0.00	0.0	-0.1	-200.0%	Difference Ok

Table 6

			No Trip Blank Subtraction					*With Trip Blank Subtraction*				
Sample	**Type**	**RTI TC (µg/cm²)**	**EPA TC (µg/cm²)**	**Average TC (µg/cm²)**	**Inter-Lab Difference (µg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**	**EPA TC (µg/cm²)**	**Average TC (µg/cm²)**	**Inter-Lab Difference (µg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**
Trip Blank	----------	----------	1.46	----------	----------	----------	----------	0.00	----------	----------	----------	----------
A100472W	routine-Phoenix	17.65	17.30	17.5	-0.3	-2.0%	RPD Ok	15.84	16.7	-1.8	-10.8%	RPD Ok
A100628Y	routine-NY	2.57	3.89	3.2	1.3	40.9%	Outlier	2.43	2.5	-0.1	-5.6%	RPD Ok
A100452S	routine-Phoenix	15.80	17.21	16.5	1.4	8.5%	RPD Ok	15.75	15.8	-0.1	-0.3%	RPD Ok
A1005945	routine-Phoenix	5.68	6.58	6.1	0.9	14.7%	RPD Ok	5.12	5.4	-0.6	-10.4%	RPD Ok
A100291T	routine-Roxbury	9.16	10.14	9.7	1.0	10.2%	RPD Ok	8.68	8.9	-0.5	-5.4%	RPD Ok
A100637Z	routine-Roxbury	5.28	6.30	5.8	1.0	17.6%	RPD Ok	4.84	5.1	-0.4	-8.7%	RPD Ok
A100727O	routine-Roxbury	6.46	7.60	7.0	1.1	16.2%	RPD Ok	6.14	6.3	-0.3	-5.1%	RPD Ok
A1009414	routine-Roxbury	6.56	7.30	6.9	0.7	10.7%	RPD Ok	5.84	6.2	-0.7	-11.6%	RPD Ok
A100060G	trip blk-NY	0.75	1.58	1.2	0.8	71.2%	Difference Ok	0.12	0.4	-0.6	-144.8%	Difference Ok
A100051F	trip blk-NY	1.03	2.07	1.5	1.0	67.1%	Difference Ok	0.61	0.8	-0.4	-51.2%	Difference Ok
A100056K	trip blk-Phoenix	0.33	1.96	1.1	1.6	142.4%	Outlier	0.50	0.4	0.2	41.0%	Difference Ok
A100154L	trip blk-Phoenix	0.40	2.21	1.3	1.8	138.7%	Outlier	0.75	0.6	0.4	60.9%	Difference Ok
A1007521	routine-NY	2.80	4.35	3.6	1.6	43.4%	Outlier	2.89	2.8	0.1	3.2%	RPD Ok
A1005752	routine-Phoenix	2.29	3.75	3.0	1.5	48.3%	Outlier	2.29	2.3	0.0	0.0%	RPD Ok
A100701Q	routine-Phoenix	9.29	10.68	10.0	1.4	13.9%	RPD Ok	9.22	9.3	-0.1	-0.8%	RPD Ok
A100418Q	routine-Roxbury	2.37	3.33	2.8	1.0	33.7%	Difference Ok	1.87	2.1	-0.5	-23.6%	Difference Ok
A1008182	routine-Roxbury	2.11	3.70	2.9	1.6	54.7%	Outlier	2.24	2.2	0.1	6.0%	RPD Ok
Trip Blank	----------	----------	1.31	----------	----------	----------	----------	0.00	----------	----------	----------	----------
A1009083	routine-Phoenix	6.93	8.77	7.8	1.8	23.4%	Outlier	7.46	7.2	0.5	7.4%	RPD Ok
A1007190	routine-Roxbury	7.76	9.80	8.8	2.0	23.2%	Outlier	8.49	8.1	0.7	9.0%	RPD Ok
A100044G	trip blk-Roxbury	0.90	2.05	1.5	1.2	78.0%	Outlier	0.74	0.8	-0.2	-19.5%	RPD Ok
A1008375	routine-Phoenix	6.47	7.63	7.0	1.2	16.5%	RPD Ok	6.32	6.4	-0.1	-2.3%	RPD Ok
A1001271	trip blk-Roxbury	1.85	4.07	3.0	2.2	75.0%	Outlier	2.76	2.3	0.9	39.5%	Difference Ok
A100382V	field blk-NY	1.26	3.12	2.2	1.9	84.9%	Outlier	1.81	1.5	0.6	35.8%	Difference Ok
A100537W	routine-Phoenix	4.09	5.72	4.9	1.6	33.2%	Outlier	4.41	4.3	0.3	7.5%	RPD Ok
A100515N	field blk-Roxbury	1.37	2.56	2.0	1.2	60.6%	Outlier	1.25	1.3	-0.1	-9.2%	RPD Ok
A1003881	field blk-Roxbury	1.15	2.13	1.6	1.0	59.8%	Difference Ok	0.82	1.0	-0.3	-33.5%	Difference Ok
A100192R	routine-Roxbury	7.89	9.67	8.8	1.8	20.3%	Outlier	8.36	8.1	0.5	5.8%	RPD Ok
A1004942	field blk-Phoenix	1.09	2.03	1.6	0.9	60.3%	Difference Ok	0.72	0.9	-0.4	-40.9%	Difference Ok
A100095R	routine-NY	9.05	10.65	9.8	1.6	16.2%	RPD Ok	9.34	9.2	0.3	3.2%	RPD Ok
A100014A	trip blk-Roxbury	0.91	4.74	2.8	3.8	135.6%	Outlier	3.43	2.2	2.5	116.1%	Outlier
A1009629	routine-Phoenix	3.55	5.65	4.6	2.1	45.7%	Outlier	4.34	3.9	0.8	20.0%	Difference Ok

			No Trip Blank Subtraction					*With Trip Blank Subtraction*				
Sample	**Type**	**RTI TC (μg/cm²)**	**EPA TC (μg/cm²)**	**Average TC (μg/cm²)**	**Inter-Lab Difference (μg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**	**EPA TC (μg/cm²)**	**Average TC (μg/cm²)**	**Inter-Lab Difference (μg/cm²)**	**Inter-Lab RPD**	**Inter-Lab Assessment**
A100185S	routine-NY	3.62	5.70	4.7	2.1	44.6%	Outlier	4.39	4.0	0.8	19.2%	RPD Ok
A1005978	routine-Roxbury	4.73	6.57	5.6	1.8	32.6%	Outlier	5.26	5.0	0.5	10.6%	RPD Ok
A100423N	routine-Phoenix	8.69	10.85	9.8	2.2	22.1%	Outlier	9.54	9.1	0.9	9.3%	RPD Ok
A100625V	routine-NY	2.81	4.09	3.5	1.3	37.1%	Outlier	2.78	2.8	-0.0	-1.1%	RPD Ok
A100448W	routine-NY	4.83	6.12	5.5	1.3	23.6%	Outlier	4.81	4.8	-0.0	-0.4%	RPD Ok
A100270O	routine-Roxbury	9.20	10.70	9.9	1.5	15.1%	RPD Ok	9.39	9.3	0.2	2.0%	RPD Ok
A100429T	routine-NY	4.68	6.02	5.4	1.3	25.0%	Outlier	4.71	4.7	0.0	0.6%	RPD Ok
A100530P	routine-NY	3.45	5.71	4.6	2.3	49.3%	Outlier	4.40	3.9	1.0	24.2%	Difference Ok
A100227L	field blk-NY	1.09	3.45	2.3	2.4	104.0%	Outlier	2.14	1.6	1.1	65.0%	Outlier
A100138L	routine-NY	6.02	8.51	7.3	2.5	34.3%	Outlier	7.20	6.6	1.2	17.9%	RPD Ok
A1006697	routine-Phoenix	5.83	7.13	6.5	1.3	20.1%	Outlier	5.82	5.8	-0.0	-0.2%	RPD Ok
A100249R	routine-Phoenix	3.78	5.67	4.7	1.9	40.0%	Outlier	4.36	4.1	0.6	14.3%	RPD Ok
A100366V	routine-Phoenix	3.22	5.41	4.3	2.2	50.8%	Outlier	4.10	3.7	0.9	24.0%	Difference Ok
A100458Y	field blk-Roxbury	0.45	1.81	1.1	1.4	120.4%	Outlier	0.50	0.5	0.1	10.5%	RPD Ok
A100460S	field blk-Phoenix	0.82	1.64	1.2	0.8	66.7%	Difference Ok	0.33	0.6	-0.5	-85.2%	Difference Ok
RTI Std	----------	----------	4.01(96%)	----------	----------	----------	----------	----------	----------	----------	----------	----------
RTI Std	----------	----------	4.18(99%)	----------	----------	----------	----------	----------	----------	----------	----------	----------