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Intercomparison Program for Organic Speciation in PM2.5 Air Particulate Matter: Description and Results for Trials I and II

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Table of Contents

Introduction 1

Sources and Preparation of Materials Used in the Intercomparison Trials 2

Evaluation of Results 3

Reported Results 4

Performance Scores 4

Accuracy Assessment (z-score) 5

Precision Assessment (p-score) 6

Discussion 6

Conclusion and Recommendations 10

References 10

Tables .....

Table 1. Air Particulate Extract I: Laboratory means of three replicates and exercise assigned values 12

Table 2. Air Particulate I: Laboratory means of three replicates and exercise assigned values 14

Table 3. SRM 1649a results reported with Trial I: Laboratory means of three replicates and certificate values 18

Table 4. Air Particulate Extract I: z-scores (25 %) 22

Table 5. Air Particulate Extract I: z-scores (s) 23

Table 6. Air Particulate I: z-scores (25%) 24

Table 7. Air Particulate I: z-scores (s) 25

Table 8. p-scores (15 %) for all reported compounds in Air Particulate Extract I, Air Particulate I, and SRM 1649a 26

Table 9. PM 2.5 Interim RM: Laboratory means of three replicates and exercise assigned values 31

Table 10. SRM 1649a results reported with Trial II: Laboratory means of three replicates and certificate values 34

Table 11. PM 2.5 Interim RM: z scores (25 %) 37

Table 12. PM 2.5 Interim RM: z scores (s) 38

Table 13. p-scores (15 %) for all reported compounds in PM 2.5 Interim RM and SRM 1649a 39

Table 14. Summary of percent z- and p-scores (absolute value) in ranges from <1 to >3 42

Table 15. SRM 1649a means and standard deviations of a single measurement for the data sets from Trial I and Trial II (limited data excluded) 46

Table 16. Values assigned for the Interim RM collected from Baltimore for PAHs and nitrated-PAHs 48

Appendices

Appendix A: Description of Materials and and Reporting Instructions Accompanying Samples A-1

Appendix B: Laboratory Notes Accompanying Data B-1

Appendix C: Laboratory Methods Used C-1

Appendix D: Charts of Air Particulate Extract I (QA01EXT01) and SRM 1649a: Results by Analyte D-1

Appendix E: Charts of Air Particulate I (QA01APT01) and SRM 1649a: Results by Analyte E-1

Appendix F: Charts of PM 2.5 Interim RM and SRM 1649a: Results by Analyte F-1

Appendix G: List of Participants in Alphabetical Order by Institute G-1

Abstract

A working group of investigators, who are characterizing and quantifying the organic compounds in particulate matter (PM) as part of the US EPA's PM 2.5 research program and related studies, was established to advance the quality and comparability of data on the organic composition of PM. This group has completed two interlaboratory comparison studies. The first study used a subset of SRM 1649a (Urban Dust, sieved to <123 μm) that had been sieved to <63 μm (Air Particulate I) as an unknown PM sample. In addition to Air Particulate I, the participants received a dichloromethane extract of Air Particulate I as a second unknown sample and a sample of SRM 1649a for use as a control material. For the second study, the participants received a sample of PM2.5 collected recently in Baltimore, MD along with a sample of SRM 1649a. The target analytes include polycyclic aromatic hydrocarbons (PAHs), nitrated PAHs, alkanes (including hopanes and cholestanes), sterols, carbonyl compounds (ketones and aldehydes), acids (alkanoic and resin), phenols, and sugars. Because this is a performance-based study, laboratories are encouraged to use the methods that they are routinely using in their laboratories to analyze similar samples. The consensus values, accuracy and precision assessments, and the methods used by each laboratory are summarized in this report.

Introduction

Organic chemicals adsorbed to fine particulate matter (PM) in the ambient air account for a major component of the PM mass and include source tracers as well as toxic compounds that may contribute to adverse human health effects. A working group of PM investigators from the US Environmental Protection Agency (EPA) Supersites and related research programs was established to improve the quality and comparability of data on the organic composition of aerosols. The working group is known as the PM2.5 Organic Speciation Working Group and includes researchers involved in the EPA PM Supersites and related sites, EPA PM centers, national laboratories and other research centers, as well as regional and state laboratories. The goal of the working group is to improve the characterization and quantification of organic compounds associated with fine PM through participation in interlaboratory comparison exercises and provide input for the development of appropriate SRMs. Improvements in the quality of organic measuerments will allow the comparison of organic species across geographic regions and will aid in source receptor modeling, in relating toxicity and health outcomes to specific organic species, and in assessing human exposure to specific organic species and sources.

To aid in this effort, the National Institute of Standards and Technology (NIST) is coordinating a series of interlaboratory trials using interim reference materials through the Intercomparison Exercise Program for Organic Contaminants in PM2.5 Air Particulate Matter. The initial interlaboratory trial utilized PM from a bulk portion of Standard Reference Material (SRM) 1649a Urban Dust, that had been sieved to less than 63 μm, and an extract of these particles. The original SRM 1649, collected in Washington, DC and issued in 1982, was reissued as SRM 1649a in 2000. SRM 1649 and SRM 1649a were sieved to less than 123 μm when prepared. The second interlaboratory trial utilized a PM2.5 (2.5 μm, aerodynamic diameter) sample recently collected in Baltimore MD. Results from these trials will provide the basis for improved quality assurance (QA) measures and methods for characterizing the PM-associated organic matter. The target organic analytes vary among the participants and include: alkanes (including hopanes and cholestanes), alkenes, aromatic and polycyclic aromatic hydrocarbons (PAHs), nitrated PAHs, sterols, carbonyl compounds (e.g., ketones and aldehydes), acids (alkanoic and resin acids), phenols, methoxyphenols, and sugars. The participating laboratories are not constrained by a specific analytical method; however, the laboratories are requested to summarize the methods used so that the results from different methods can be compared.

The first interlaboratory comparison study (Trial I) of the PM2.5 Organic Speciation Working Group was initiated in February 2001. The purpose of the interlaboratory study was to: (1) determine the comparability of measurements for various organic analytes among the participants and (2) establish consensus reference values for the interim reference materials and SRM 1649a for species not previously value assigned by NIST. A secondary objective was to determine if the interlaboratory variability was decreased by providing a solvent extract of the particles compared to analysis of the particles. Trial I used existing SRM 1649a bulk material that had been sieved to less than 63 μm and a solvent extract of this material. SRM 1649a was analyzed as the control sample. The trial results from 14 participating laboratories and summary statistics were first reported at an Organic Speciation Working Group meeting held during the American Association for Aerosol Research (AAAR)

Conference in October 2001. Because it was a requirement that all participants return data on the particulate sample used for the first trial prior to receiving the materials for the second trial (a sample of PM2.5 collected in Baltimore, MD plus SRM 1649a as a control), an additional nine laboratories have returned data for Trial I since the October 2001 meeting.

The second interlaboratory comparison study (Trial II) using a Baltimore sample of PM2.5 collected during 1998, 1999, and 2001 and SRM 1649a as a control was initiated in March 2002. As mentioned above, these samples were sent only to those participants who returned data for the particulate sample used in Trial I. A brief discussion of percent differences among the seven laboratories who had reported results for Trial II by October 2002 was held at the Organic Speciation Working Group meeting convened during the AAAR Conference in October 2002. Since then, an additional 11 laboratories have reported data for Trial II. The Trial I and Trial II results and summary statistics for all of the laboratories reporting results to date are detailed in this report.

Sources and Preparation of Materials used in Intercomparison Trial I

The air particulate extract was prepared from bulk SRM 1649 Urban Dust that has been resieved to <63 μm. The original SRM 1649 (currently available as SRM 1649a) was collected in the Washington, DC area over a period in excess of 12 months using a baghouse. The material was removed from the baghouse filter bags and combined in a single lot. The lot was passed through a 125 μm sieve. The sieved material was mixed in a V-blender.

For the extract, each of 10 pressurized fluid extraction cells was filled with Hydromatrix mixed with 1 g of air particulate matter and fitted with three filters on the exit side. The extractions were performed using the following conditions:

Solvent:	dichloromethane
Heat:	100 °C for 5 min
Pressure:	2000 psi
Static cycles:	three at 5 min each
Flush:	90 % volume
Purge:	180 s

The extracts from the 10 cells were combined and concentrated to 100 mL, and the extractions were performed for a second set of 10 cells. The combined extract (200 mL) was then ampouled with approximately 1.2 mL of extract per ampoule. Each 1 mL of extract represented approximately 0.1 g of air particulate matter. This extract was labeled as QA01EXT01-Air Particulate Extract I. Some of the bulk air particulate used to make the extract was bottled (500 mg per bottle) and labeled as QA01APT01-Air Particulate I. In addition, SRM 1649a was rebottled with approximately 500 mg per bottle. One bottle each of QA01APT01 and SRM 1649a and five ampoules of QA01EXT01 were sent to each of the laboratories participating in the Intercomparison Exercise Program for Organic Contaminants in PM2.5 Air Particulate Matter. The instructions and data sheet that accompanied the samples are provided in Appendix A. In the letter accompanying each shipment, each participant was asked to analyze each of three replicate samples and to concurrently analyze the NIST SRM 1649a Urban Dust.

Sources and Preparation of Material used in Intercomparison Trial II

The PM2.5 material was collected in Baltimore City, MD at the location of the primary sampling site for the Baltimore PM Supersite [1] in the vicinity of major Baltimore industries, e.g., incinerators and factories to the south and southwest and also several major highways to the west and east. The bulk of the material (approximately 90 %) was collected in the winter of 1998-1999 with the remainder being collected in January 2001. The sampling apparatus is an Ultra-High-Volume Sampler (UHVS), consisting of an air inlet, cyclone separator, filter cassettes, and a regenerative blower. The fine particles (2.5 μm, aerodynamic diameter) were separated in the high volume cyclone sampler and collected onto an array of Teflon membrane filters. At the end of each collection, the filters were exchanged in a trailer with temperature and humidity control. The loaded filters were brought back to NIST where the air particulate was brushed off the filter inside a plexiglass glove box. The total amount of air particulate collected for use as the PM2.5 Interim Reference Material (RM) was 21.93 g. This material was placed in a 1 L glass bottle and mixed for 3 h on a bottle roller. The material was then aliquoted into approximately 100 mg portions in amber bottles with Teflon-lined lids. A total of 198 bottles of PM 2.5 Interim RM were prepared. One bottle each of PM 2.5 Interim RM and SRM 1649a (approximately 500 mg) were sent to each of the laboratories participating in Trial II. The instructions and data sheet that accompanied the samples are provided in Appendix A. In the letter accompanying each shipment, each participant was asked to analyze each of three replicate samples and to concurrently analyze the NIST SRM 1649a, Urban Dust. Twelve aliquots of the material were analyzed by instrumental neutron activation analysis for elemental composition. The iron was found to be very high (195 g/kg with a standard deviation of 4 g/kg for the 12 aliquots). [2]

Evaluation of Exercise Results

Establishment of the Assigned Values

The following guidelines were used by the NIST exercise coordinators for the establishment of the exercise "Assigned Values" for these exercises. The laboratory's performance on concurrent reference material analyses was used to determine if that laboratory's results would be included in the calculation of the exercise assigned value for the unknown material for a particular analyte. The results reported for the unknown materials from laboratories that did not report results for the reference materials were not used in these calculations. After the exercise assigned values, standard deviations, and 95 % confidence limits had been calculated, **all** reported results for the Air Particulate Extract I, Air Particulate I, and PM2.5 Interim RM materials were evaluated relative to these exercise assigned values.

Laboratory data submission: Each participating laboratory was to submit data from three replicate determinations of the unknown materials (Air Particulate Extract I, Air Particulate I, and PM2.5 Interim RM) and were requested to report results of concurrent analyses of NIST SRM 1649a. Laboratories were requested to report these results to three significant figures and to provide brief descriptions of their extraction, cleanup, and analytical procedures.

Determination of laboratory analyte means: For each laboratory, the laboratory analyte mean of the three sample results (S1, S2, and S3) was calculated for each analyte. Non-numerical data were treated as follows: A mean "<value" was used when three "<values" were reported; NA (not analyzed/determined) was used for three reported NAs, etc.; and, if the reported results were of mixed type, e.g., S1 and S2 were numerical values and S3 was reported as "<value", the two similar "types" were used to either determine the mean or to set a non-numerical descriptor.

Determination of assigned values: For a particular analyte, the performance on the reference material was deemed acceptable for the purpose of these exercises if the laboratory result was within 30 % of the upper and lower limits of the confidence interval for analytes listed as certified or reference values in the Certificate of Analysis for SRM 1649a. For each analyte of interest not listed as a certified or reference value in SRM 1649a, no target concentration was used. If a laboratory demonstrated acceptable performance on a particular analyte in the reference material, the laboratory's results for that analyte in the corresponding "unknown" exercise material were then used in the calculation of the analyte's exercise assigned value unless the mean was deemed an "outlier." For evaluation of potential outliers, statistical tests and expert analyst judgement were used after viewing both normal and log plots of the data. This judgement utilized knowledge of potential coeluters based on the laboratory's reported methods.

Reported Results

Laboratories were assigned numerical identification codes in order of receipt of data for Trial I with the exception of NIST-Gaithersburg, which is Laboratory 1 in these exercises, and NIST-Charleston which is Laboratory 13 in these exercises. A laboratory was assigned the same code for each material, including the PM2.5 Interim RM in Trial II. A list of participating laboratories in alphabetical order is given in Appendix G. In this report, the laboratory mean replicate data are shown in Tables 1, 2, and 3 for Air Particulate Extract I, Air Particulate I, and SRM 1649a reported with Trial I, respectively, and in Tables 9 and 10 for PM2.5 Interim RM and SRM 1649a reported with Trial II, respectively. Included in these tables are the exercise assigned values, the standard deviation of the assigned value, and the percent relative standard deviation (% RSD). Notes included by a laboratory with its data are listed in Appendix B. Summaries of the methods used by each laboratory are in Appendix C.

In Appendices D (Air Particulate Extract I), E (Air Particulate I), and F (PM2.5 Interim RM), charts of the mean reported numerical results by laboratory for **each analyte** for which more than two laboratories reported data are shown for the exercise material and the corresponding reference material.

Performance Scores

The exercise coordinators recognize that different programs have different data quality needs. The acceptability of the results submitted by a particular laboratory will be decided by the individual program(s) for which the particular laboratory provides data. Typically, the program will use these exercise results in conjunction with the laboratory's performance in the analysis of certified reference materials and/or control materials, and of other quality assurance samples. These exercise results are

shown in a number of ways in this report to facilitate their use by these programs in their acceptability assessments.

IUPAC guidelines [3] describe the use of z-scores and p-scores for assessment of accuracy and precision in intercomparison exercises such as those described in this report. These indices assess the difference between the result of the laboratory and the exercise assigned value and can be used, with caution, to compare performance on different analytes and on different materials.

Accuracy Assessment (z-score)

The z-score is a bias estimate divided by a performance criterion so that $z = (x - X)/\sigma$ where x is the individual laboratory result, X is the "Exercise Assigned Value," and σ is the target value for standard deviation. As described in the IUPAC guidelines, the choice of σ is dependent upon data quality objectives of a particular program. It can be "fixed" and arrived at by perception, prescription, or reference to validated methodology (e.g., $\sigma = 0.025$ X, X is the analyte concentration), or it can be an estimate of the actual variation (e.g., the calculated standard deviation, s, from the exercise data). The "fixed" performance criterion is more useful in the comparison of a laboratory's performance on different materials while the use of the actual variation may be more useful within a given exercise, for example, if the determination of a particular analyte is more problematic than usual.

We have calculated and reported z-scores using both approaches for each analyte for each laboratory. At a previous workshop, it was decided to use "25 % of the exercise assigned value" as the fixed target value for standard deviation for this program, at least for the initial exercises. We also calculated z-scores based on "one assigned-value standard deviation, s." The z-scores calculated for these exercises can thus be interpreted as shown in the following examples:

z-score (25 % X):

+1	laboratory result is 25 % higher than the assigned value
-2	laboratory result is 50 % lower than the assigned value

z-score (s):

+1	laboratory result is one "exercise standard deviation" higher than the assigned value
-2	laboratory result is "two exercise standard deviations" lower than the assigned value

From a scientific point of view, IUPAC does not recommend the classification of z-scores but allows that it is possible to classify scores, e.g.:

$\|z\| \leq 2$	Satisfactory
$2 < \|z\| < 3$	Questionable
$\|z\| \geq 3$	Unsatisfactory

Tables 4 and 5 show the z-scores using 25 % and s, respectively, for the Air Particulate Extract I, Tables 6 and 7 show the z-scores using 25 % and s, respectively, for the Air Particulate I, and Tables 11 and 12 show the z-scores using 25 % and s, respectively, for the PM2.5 Interim RM.

Precision Assessment (p-score)

The p-score is defined as an individual laboratory's coefficient of variation (relative standard deviation for three measurements) divided by a target coefficient of variation (CV). Participating laboratories analyzed the three replicate samples for an exercise with the same sample set, i.e., one set of samples with the same blank, calibration curve, etc. applicable for each. Since the repeatability for replicates within a set is generally better than for replicates in different sets, this does not result in data that are very useful for precision (repeatability) assessment. For the calculation of p-scores for this program, the current target CV for the three replicates is 15 % so a p-score of 1 indicates that the laboratory's CV for the three subsamples was 15 %. Table 8 shows the calculated p-scores for each laboratory for each reported analyte for Trial I, and Table 13 shows the calculated p-scores for each laboratory for each reported analyte in Trial II.

Discussion

Trial Results

Laboratories were requested to quantify a wide variety of analytes in this study (See Table 1 in Appendix A). Twenty-three laboratories submitted data for Trial I, nine of those laboratories after the original meeting in October 2001, with the most extensive data set for the PAHs. The nine laboratories (identified as 15 through 23) reporting after the October 2001 meeting were not requested to report data for the Air Particulate Extract I, although one laboratory (16) did report data for two nitrated-PAHs in Extract I. Laboratories were requested to report their results in ng/g extract for Air Particulate Extract I and in ng/g particulate matter for Air Particulate I and SRM 1649a. Laboratories 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, and 14 used a density to convert their results to ng/g extract for Air Particulate Extract I. The densities used ranged from 1.33 g/mL to 1.36 g/mL except for laboratory 12 which used the density of acetonitrile, 0.786 g/mL. The exercise coordinator converted their data using a density of 1.33 g/mL to make the data comparable to the other results. Laboratory 6 reported their data in terms of 0.1 g of particulate so the exercise coordinator converted their data by multiplying by 10. Laboratory 5 reported their data in terms of ng/mg so the exercise coordinator converted their data by multiplying by 1000. Laboratory 14 reported their data for the extract in terms of µg/mL and in terms of µg/g for the particulate and SRM 1649a in terms of µg/g. The exercise coordinator used a density of 1.33 g/mL to convert the extract concentration on a mass per volume basis to a per gram basis and multiplied all the data by 1000 to convert to ng/g. No other changes were made by the exercise coordinator for the Air Particulate I or SRM 1649a data.

The agreement among the laboratories is similar for both Particulate I and Extract I; therefore, only a particulate sample will be used in future exercises. For Extract I, 78 % of the PAH data are within 25 % of the assigned value (Table 4) while for Particulate I, 74 % of the PAH data are within 25 % of the assigned value (Table 6). With three or fewer laboratories reporting data for the other compounds, z-scores were not calculated. The precision data are presented in Table 8. Since the laboratories, in general, ran the samples in one batch the p-scores only indicate a within-batch

precision, which is generally better than an inter-batch precision.

Laboratories were requested to quantify a similar set of analytes in Trial II as in Trial I (See Appendix A for the list). Eighteen laboratories submitted data. Because laboratories were required to submit data for the particulate sample used in Trial I prior to receiving the samples for Trial II, the assigned laboratory numbers for the two exercises are the same. No changes were made by the exercise coordinator to the data submitted.

The z-scores and p-scores for both trials are summarized by laboratory in Table 14 by laboratory along with the number of compounds measured by each laboratory. Overall, there were 70 % of the z-scores (25 %) that were ≤ 1 for the Air Particulate Extract I, 65 % for the Air Particulate I, and 47 % for the PM2.5 Interim RM. The largest discrepancies among laboratories were for those compound classes for which only a limited number of laboratories reported results. In general, the p-scores tracked from the "unknown" samples to SRM 1649a. In other words, the laboratories that had a high percentage of p-scores ≥ 3 for the "unknown" samples also tended to have a high percentage of p-scores ≥ 3 for SRM 1649a.

In Table 15, the results for SRM 1649a from Trial I and Trial II are compared to the certified and reference concentrations for the PAHs, to values assigned for the nitrated-PAHs based on the data from Trials I and II along with data from Bamford and coworkers [7], and to each other for the remaining compound classes. The agreement for the PAHs is relatively good. For the other compound classes, however, there are high standard deviations within each trial and large differences between the trials as high as 100 %. To help address these differences, calibration solution SRMs are under development for a number of the compound classes based on a priority list established by the working group. The first of these calibration solutions, i.e. aliphatic hydrocarbons, will be available for the third trial set that began in Summer 2004.

Intercomparison exercises provide an important mechanism for assessing the comparability, accuracy, and reproducibility of results from the participating laboratories. Exercise materials similar in matrix, form, and analyte concentration to typical samples routinely analyzed by the laboratories are most useful for demonstrating the level of comparability and for revealing potential problem areas. Minimizing the between-laboratory bias so that the analytical variability is significantly less than the sampling variability should be an achievable goal.

Problems and Potential Solutions for Improving Quantification of Target Analytes

PAHs: Nineteen laboratories returned data for selected PAHs in Trial I while fourteen laboratories returned data for selected PAHs in Trial II. This is the largest data set received for any of the analyte groups. PAH analysis is fairly well-established with a number of commercial sources for neat chemicals of stated purity as well as a number of commercial sources of reliable calibration solutions. In addition, SRMs exist for PAHs in solution as well as natural matrices such as air particulate matter and sediment. Some problems were noted for individual analytes, however. There was a wide variation in the data received for naphthalene, ranging from 100 ng/g to 7400 ng/g in the Air Particulate I sample and from 40 ng/g to 2500 ng/g in the PM2.5 Interim RM sample. Naphthalene is a volatile compound, so it is important to have an internal standard/surrogate added

to the samples that will mimic the behavior of naphthalene during the sample preparation steps, preferably carbon-13 or deuterium labeled naphthalene. The majority of the laboratories reporting data for chrysene neglected to note a coelution with triphenylene. These isomers coelute on most gas chromatographic phases, but they can be partially separated using a 60 m nonpolar column (5% mole fraction) phenyl methylpolysiloxane phase) and almost baseline separated using a 60 m proprietary phase (DB-XLB), both with a slow temperature program. [4] A number of laboratories also misidentified the benzofluoranthene isomers. There are three isomers that elute close to one another, the *b*, *j*, and *k* isomers. Typically, benzo[*b*]fluoranthene and benzo[*j*]fluoranthene coelute on the nonpolar columns, including the DB-XLB mentioned above. A moderately polar 50% phenyl methylpolysilxoane phase, however, will separate the isomers, changing the elution order for the benzo[*j*] and benzo[*k*]fluoranthenes. [4] A combined concentration for dibenz[*a,h*]anthracene and dibenz[*a,c*]anthracene was also commonly reported by the participants as only dibenz[*a,h*]anthracene. These two isomers coelute on the non-polar phases but can be separated on the moderately polar phases. There were only very limited data (five sets or less) received for some of the potentially more interesting PAHs, including the methylphenanthrenes, retene, coronene, and dibenzo[*a,e*]pyrene. As calibration solutions become available for these additional compounds, it is hoped that more laboratories will include them in their analyses.

Nitrated-PAHs: Only three laboratories returned data for the nitrated-PAHs in Trial I (one of those laboratories returned two data sets), and four laboratories returned data for the nitrated-PAHs in Trial II. Except for 6-nitrobenzo[*a*]pyrene, the agreement was good with the laboratory means agreeing to within 15 % of each other for all of the nitrated-PAHs targeted except 7-nitrobenz[*a*]anthracene in the PM2.5 Interim RM (relative standard deviation for the laboratory means of 25 %). Two laboratories returned data for 6-nitrobenzo[*a*]pyrene. For Air Particulate I and SRM 1649a, laboratory 1 reported values lower than their detection limit while laboratory 6 reported two sets of data, the first one more than an order of magnitude higher in concentration than the second value. For the PM 2.5 Interim RM used in Trial II, however, laboratory 1 reported a mean value of 312 ng/g while laboratory 6 reported a mean value of 24.3 ng/g. Hopefully, additional laboratories will return data for the nitrated-PAHs in future intercomparison exercises.

Alkanes and alkenes: Ten and eleven laboratories, respectively, returned data for selected alkanes in Trials I and II. No data sets were returned for the alkenes. It should be noted that prior to starting Trial II, the target analyte list for the alkanes was increased to include odd chain length alkanes from C21 through C31. Only even chain length alkanes were included in the Trial I target analyte list. For both trials, there was a large spread in the data reported for the alkanes with relative standard deviations of the consensus means ranging from 30 % for *n*-C20 in Air Particualate 1 to 130% for *n*-C28 in PM2.5 Interim RM. This spread in the alkane data is probably due to the non-specificity of the mass spectral ion/ions that are used to monitor alkanes. The alkanes tend to fragment in the mass spectrometer resulting in low relative molecular mass (<100) fragments that are commonly used to identify and quantify the alkanes. Other substituted alkanes, however, may fragment to a similar pattern resulting in misidentification. In addition, alkanes are commonly found in laboratory blanks so overestimation of the alkane concentrations is a possibility if blanks are not monitored.

Hopanes, cholestanes, and sterols: As with the alkanes, the target analyte list for the hopanes, cholestanes, and sterols was expanded from 13 to 15 analytes between Trial I and Trial II. Seven

laboratories (not the same seven in both trials) reported data for this class of compounds in the two trials. The spread of the data for the two trials is from 14 % relative standard deviation for 17a(H),21b(H)-29-norhopane in the Air Particulate I sample to 75 % for 17a(H),21b(H)-29-hopane in the PM2.5 Interim RM. As for the alkanes, there is one mass spectral fragment ion that is typically used to quantify the hopanes (191) and two that are typically used to quantify the steranes (217 and 218). Due to the lack of available standards, the correct identification of the hopanes and steranes is an issue.

Carbonyls and acids: Seven laboratories returned data for selected carbonyls and acids in Trial I and four laboratories in Trial II. For a majority of the analytes, only one or two laboratories returned data so standard deviations for consensus values could only be calculated for four compounds in Trial I and two compounds in Trial II. For those compounds, however, the relative standard deviations of the consensus values were all > 50 %. Due to the polarity of these compounds, there are additional analytical challenges, both in extraction and isolation from the matrix. Many of these compounds need to be derivatized prior to gas chromatographic analysis.

Phenols and sugars: Only one laboratory reported values (all less than their detection limits) for the phenols in Air Particulate I while for the PM2.5 Interim RM, one laboratory reported data for isoeugenol (4129 ng/g), and another laboratory reported data for all of the phenols on the list (with isoeugenol at <159 ng/g). The only sugar on the target analyte list currently is levoglucosan. For Air Particulate I, one laboratory reported a value of 10427 ng/g while another laboratory reported < 2000000 ng/g. For the PM2.5 Interim RM, three laboratories reported data for levoglucosan, but the relative standard deviation of the consensus value is large (83 %). These polar compounds present challenges similar to those of the carbonyls and acids.

PM2.5 Interim RM

The particulate matter used in Trial II is intended for use as a control material for laboratories conducting ongoing PM2.5 analyses until a larger collection of PM2.5 is completed and processed as an SRM. To this end, the data from Trial II were used to value assign concentrations for the majority of the PAHs and nitrated-PAHs as shown in Table 16. The data used in the value assignment included the values from the NIST laboratories (designated as laboratory 1 and laboratory 13) as single sets of data along with the assigned values from the interlaboratory study (excluding the NIST values) as an additional data set. As discussed above for the remaining compounds, either very few laboratories returned data, or there was a large spread in the data received. There were two compounds with relative uncertainties of the assigned values of less than 1 %: indeno[1,2,3-*cd*]pyrene and 2-nitrofluoranthene. This small uncertainty is probably not realistic and would be expanded if the material were going to become an SRM. At the other end of the spectrum, there were six compounds with relative uncertainties of the assigned values greater than 30 %: naphthalene, 1-methylphenanthrene, 3-methylphenanthrene, dibenz[*a,h*]anthracene, coronene, and 7-nitrobenz[*a*]anthracene. The interlaboratory data for naphthalene tended to be scattered and lower than the data obtained in the NIST analyses. The 1-methylphenanthrene and 3-methylphenanthrene values are a combination of three NIST values. For both of the compounds, two of the values agreed well with each other while the third was 50 % to 75 % higher than the other two values. For dibenz[*a,h*]anthracene, the interlaboratory data were sparse due to reported coelutions with

dibenz[*a,c*]anthracene. The laboratories not reporting coelutions tended to be 60 % lower than the values determined at NIST. For the 7-nitrobenz[*a*]anthracene, there were only three values reported, not agreeing with each other. The assigned values will be useful for those laboratories who want to use the PM2.5 Interim RM as a control material. As more laboratories generate data, the assigned values will be revised, and additional analytes will be value assigned.

Conclusions and Recommendations

Comparing the data received for the Air Particulate Extract and Air Particulate I, the extraction of samples was not a point of major differences among the laboratories so extracts will not be included for future studies. For the PAHs and nitrated-PAHs, the agreement among the laboratories submitting data was generally good except for those compounds with known coelutions. Neat chemicals of known purity and well-characterized solutions are available for the PAHs. For the nitrated-PAHs, only a limited number of laboratories experienced in this area submitted data. The data received for the remaining classes of compounds showed a wide variation. This variation is probably due to a number of factors, including modifications needed in the extraction and isolation methods used for more polar compounds, mass spectral fragmentation, and chromatographic interferences. For a number of these compounds, there is also a lack of commercially available neat compounds or solutions of the compounds of known purity. An effort is currently underway at NIST to produce calibration solution SRMs for a number of the compounds and labeled analogues. As they become available, these calibration solutions will be provided to the participants. Analytical methods are also being discussed at the working group meetings. As more calibration solutions become available and as methods improve, more laboratories will submit data for the additional compound classes.

Acknowledgments

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Disclaimer

Certain commercial equipment, instruments, or materials are identified in this report to specify adequately the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are the best available for the purpose.

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Table 1. Air Particulate Extract I Laboratory means of three replicates and exercise assigned values

ng/g extract (reported as if three figures were significant)

Density correction, if used																				
Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
g/mL		1.336	1.3266	1.3255	1.33	1 mL DCM	1.326	1.3255	1.28		1.36	0.786		NA	NA		NA			
PAHs						is 0.1 g part.						acetonitrile								
					divide by 1000	divide by 10						Correct to 1.33		Correct to 1.33				Exercise Assigned		
Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Assigned	s	%RSD
naphthalene	56.6	NA	54.0	45.3	78.9	NA	62.1	51.6	112	71.7	NA	351	53.0	NA	NA	NA	NA	59.4	10.3	17.3
fluorene	12.0	NA	5.93	10.06	14.5	20.0	21.7	15.3	15.0	9.11	35.6	31.2	18.6	NA	NA	NA	NA	21.2	8.2	38.8
phenanthrene	286	NA	319	269	353	335	307	275	267	321	262	381	340	381	NA	NA	NA	319	43	14
anthracene	26.4	NA	36.8	45	43.6	28.7	48.9	49.5	57	51.9	37.8	62.2	28.2	NA	NA	NA	NA	38.5	13.1	34.1
1-methylphenanthrene	31.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	31.4	40.8	29.3	NA	NA	NA	NA	33.2	5.2	15.6
2-methylphenanthrene	61.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	56.4	82.0	NA	NA	NA	NA	NA	66.7	13.5	20.3
3-methylphenanthrene	43.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	42.6	NA	NA	NA	NA	NA	NA	43.3	not calc.	
9-methylphenanthrene	29.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	29.1		
9+4-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28.2	NA	NA	NA	NA	NA	NA	28.2		
retene	NA	NA	NA	NA	NA	13.7	NA	NA	NA	NA	NA	10.6	NA	NA	NA	NA	NA	No assigned value		
4H-cyclopenta(*def*)phenanthrene	22.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.4		
fluoranthene	438	NA	452	400	568	511	500	510	391	468	442	682	509	596	NA	NA	NA	500	85	17
pyrene	365	NA	410	327	485	397	404	342	321	563	369	469	398	494	NA	NA	NA	398	52	13
benzo[*ghi*]fluoranthene	65.7	NA	NA	NA	129	78.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	72.2	9.2	12.7
cyclopenta[*cd*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benz[*a*]anthracene	145	NA	155	143	NA	172	298	210	265	184	217	197	166	NA	NA	NA	NA	176	29	16
chrysene	208	NA	229	277	NA	246	333	315	299	318	NA	NA	NA	NA	NA	NA	NA	227	27	12
triphenylene	84.6	NA	NA	NA	NA	111	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.7	not calc.	
chrysene+triphenylene	NA	NA	NA	NA	271	NA	NA	NA	NA	NA	380	470	350	NA	NA	NA	NA	367	82	22
benzo[*b*]fluoranthene	431	427	395	380	278	683	705	NA	NA	658	NA	NA	448	NA	NA	NA	NA	496	138	28
benzo[*j*]fluoranthene	86.4	NA	NA	NA	39.0	NA	NA	NA	NA	NA	NA	NA	108	NA	NA	NA	NA	97.4	not calc.	
benzo[*k*]fluoranthene	108	127	131	78.0	NA	165	201	NA	NA	193	NA	NA	135	NA	NA	NA	NA	124	29	24
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	2913	NA	785	819	NA	NA	NA	NA	NA	No assigned value		
benzo[*b+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	616	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benzo[*b+j*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	753	NA	NA	NA	No assigned value		
benzo[*e*]pyrene	195	NA	NA	NA	310	315	NA	203	220	NA	241	289	240	NA	NA	NA	NA	252	47	19
benzo[*a*]pyrene	146	175	153	186	197	210	281	178	150	121	243	229	222	223	NA	NA	NA	201	42	21
perylene	37.5	NA	NA	NA	50.7	49.0	NA	39.0	36	NA	60.2	54.0	38.1	NA	NA	NA	NA	45.5	9.1	20.1
indeno[1,2,3-*cd*]pyrene	186	256	194	201	309	279	290	304	98	235	316	260	261	341	NA	NA	NA	253	67	27
benzo[*ghi*]perylene	293	283	279	214	408	374	434	315	225	306	348	278	325	422	NA	NA	NA	323	71	22
dibenz[*a,h*]anthracene	19.2	19.3	29.4	25.1	NA	45.0	135	38.9	76	49.9	NA	NA	24.8	NA	NA	NA	NA	23.2	4.9	21.2
dibenz[*a,c*]anthracene	13.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.5	NA	NA	NA	NA	12.9	not calc.	
dibenz[a,h+*a,c*+*a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	46.4	NA	NA	NA	NA	NA	NA	No assigned value		
dibenz[a,h+*a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39.0	NA	NA	NA	NA	NA	No assigned value		
benzo[*b*]chrysene	22.5	NA	NA	NA	NA	27.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24.9	not calc.	
coronene	NA	NA	NA	194	NA	NA	NA	NA	NA	NA	628	316	NA	NA	NA	NA	NA	No assigned value		
dibenzo[*a,e*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	54.6	NA	NA	NA	NA	NA	NA	No assigned value		

Nitro-PAH ANALYSES																				
																		Exercise Assigned		
Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Assigned	s	%RSD
9-nitroanthracene	2.86	NA	NA	NA	NA	2.47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.66	not calc.	
1-nitropyrene	6.14	NA	NA	NA	NA	6.67	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.42	NA	5.75	1.18	
2-nitrofluoranthene	23.5	NA	NA	NA	NA	28.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	19.3	NA	23.8	4.6	
3-nitrofluoranthene	<1	NA	NA	NA	NA	0.128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.128		
7-nitrobenz[*a*]anthracene	2.14	NA	NA	NA	NA	2.51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.32	not calc.	
6-nitrochrysene	<1	NA	NA	NA	NA	0.392	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.392		
6-nitrobenz[*a*]pyrene	<1	NA	NA	NA	NA	14.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.2		

Note: Bolded values were not used in the calculation of the exercise assigned values.

Table 1. Continued																		Exercise Assigned		
Alkanes and Alkenes																				
Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Assigned	s	%RSD
n-C20	NA	NA	NA	80.5	<1E2	NA	NA	105	NA	**6.96**	NA	NA	NA	NA	NA	NA	NA	92.6	not calc.	
n-C22	NA	NA	NA	NA	258	NA	NA	348	NA	**514**	389	NA	NA	NA	NA	NA	NA	332	67	20
n-C24	NA	NA	NA	1602	2751	NA	NA	1707	NA	**3648**	3522	NA	NA	2343.0	NA	NA	NA	2385	791	33
n-C26	NA	NA	NA	NA	10590	NA	NA	5353	NA	**10039**	7361	NA	NA	6524.0	NA	NA	NA	7457	2245	30
n-C28	NA	NA	NA	2784	6138	NA	NA	2917	NA	**5817**	4445	NA	NA	3256.0	NA	NA	NA	3908	1408	36
n-C30	NA	NA	NA	1167	4002	NA	NA	1600	NA	**4192**	3294	NA	NA	1759.0	NA	NA	NA	2364	1218	52
n-C32	NA	NA	NA	651	**3530**	NA	NA	973	NA	**1626**	NA	NA	NA	920.0	NA	NA	NA	848	172	20
n-C36	NA	NA	NA	NA	<1E2	NA	NA	NA	NA	**838.6**	NA	NA	NA	NA	NA	NA	NA	No assigned value		
n-C40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
n-C44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
squalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
1-octadecene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Hopanes, Cholestanes, Sterols																		Exercise Assigned		
Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Assigned	s	%RSD
22, 29, 30-trisnorhopane	NA	NA	NA	241	366	NA	NA	NA	NA	NA	NA	79.9	NA	NA	NA	NA	NA	229	not calc.	
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	1663	NA	NA	NA	NA	NA	847	NA	NA	NA	NA	NA	NA	1255	not calc.	
17a(H), 21b(H)-29-hopane	NA	NA	NA	1549	2802	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
20R-5a(H), 14a(H), 17b(H)-cholestane	NA	NA	NA	NA	563	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
ABB-20R-C28-methylcholestane	NA	NA	NA	236	242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	239	not calc.	
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	946	NA	NA	NA	NA	NA	266	335	NA	NA	NA	NA	NA	516	374	73
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	776	NA	NA	NA	NA	NA	203	229	NA	NA	NA	NA	NA	403	324	80
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	571	NA	NA	NA	NA	NA	162	178	NA	NA	NA	NA	NA	304	232	76
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	442	NA	NA	NA	NA	NA	120	201	NA	NA	NA	NA	NA	254	167	66
pristane	NA	NA	NA	NA	NA	NA	NA	26.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
phytane	NA	NA	NA	NA	NA	NA	NA	22.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
cholesterol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
stigmasterol	NA	NA	NA	326	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Carbonyls and Acids																		Exercise Assigned		
Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Assigned	s	%RSD
benzanthrone	NA	NA	NA	NA	192	NA	NA	NA	NA	NA	254	<40	NA	NA	NA	NA	NA	223	not calc.	
9-fluorenone	NA	NA	NA	93.0	101	NA	NA	NA	NA	NA	NA	<40	NA	NA	NA	NA	NA	97.2	not calc.	
anthroquinone	NA	NA	NA	121	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benz[*a*]anthracene-7, 12-dione	NA	NA	NA	NA	206	NA	NA	NA	NA	NA	209	NA	NA	NA	NA	NA	NA	208	not calc.	
G-nonanoic lactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
syringaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
isopimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
hexadecanoic acid	NA	NA	NA	NA	NA	NA	43793	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
nopinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pinionaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
caronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		

Table 2. Air Particulate I	Laboratory means of three replicates and exercise assigned values															
ng/g (reported as if three figures were significant)																
PAHs																
Laboratory No.																
(* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
naphthalene	866	NA	198	**9042**	880	NA	NA	772	214	other	366	NA	**7405**	799	NA	**7214**
fluorene	156	NA	36.3	566	1330	149	131	195	145	143	**213**	271	225	237	NA	258
phenanthrene	3997	NA	3029	**6484**	3491	3774	3500	4120	3263	3407	**4087**	3263	4442	4874	3990	4667
anthracene	412	NA	327	**1021**	526	324	347	**704**	473	**893**	**593**	535	416	480	NA	422
1-methylphenanthrene	343	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	379	392	420	NA	NA
2-methylphenanthrene	647	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	669	777	NA	NA	NA
3-methylphenanthrene	453	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	501	NA	NA	NA	NA
9-methylphenanthrene	299	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
9+4-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	346	NA	NA	NA	NA
retene	NA	NA	NA	NA	NA	236	126	NA	NA	NA	**NA**	NA	147	NA	NA	NA
4H-cyclopenta(*def*)phenanthrene	289	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
fluoranthene	6110	NA	5112	7391	5979	5638	5933	6537	7030	5353	**5977**	5431	6976	7156	6100	6203
pyrene	5066	NA	4527	5662	5090	4396	5080	5303	4777	4463	6788	4625	5312	5585	5080	4910
benzo[*ghi*]fluoranthene	840	NA	NA	NA	1378	942	1064	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
cyclopenta[*cd*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
benz[*a*]anthracene	2097	NA	1722	2677	NA	1970	2234	**3083**	2880	**4240**	**2351**	2051	2308	2376	NA	1930
chrysene	2943	NA	2608	4712	NA	2898	3155	**4593**	4373	**4573**	4510	NA	NA	NA	NA	**4307**
triphenylene	1184	NA	NA	NA	NA	982	1442	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
chrysene+triphenylene	NA	NA	NA	NA	3335	NA	NA	NA	NA	NA	NA	3574	5528	4817	NA	NA
benzo[*b*]fluoranthene	5835	5833	4032	5990	**3043**	7456	6015	7823	NA	NA	7550	NA	NA	6600	NA	6680
benzo[*j*]fluoranthene	1158	NA	NA	NA	**362**	NA	NA	NA	NA	NA	**NA**	NA	NA	1658	NA	NA
benzo[*k*]fluoranthene	1792	1683	1600	1147	NA	1777	1739	3043	NA	NA	2501	NA	NA	2093	NA	1900
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	10667	NA	11047	10445	NA	NA	NA
benzo[*b+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	10433	NA	NA	NA	NA	NA	NA	NA
benzo[*b+j*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7290	NA
benzo[*e*]pyrene	2860	NA	NA	NA	2824	3399	3221	NA	2943	4330	**NA**	3862	3369	3484	NA	3527
benzo[*a*]pyrene	2492	2347	1948	**4329**	1966	2747	2536	3060	2607	3360	**1589**	3360	2499	3212	2270	2223
perylene	617	NA	NA	NA	467	633	615	NA	569	832	**NA**	768	501	588	NA	644
indeno[1,2,3-*cd*]pyrene	2723	3060	2319	3439	2256	3090	3582	2930	4127	2240	3062	2695	2627	3980	3160	3217
benzo[*ghi*]perylene	4305	3500	2709	3567	2448	4038	4265	4527	4373	5617	4052	3163	4543	4806	3780	3610
dibenz[*a,h*]anthracene	289	275	306	NA	NA	527	341	**631**	**549**	**1847**	**742**	NA	NA	355	NA	479
dibenz[*a,c*]anthracene	201	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	209	NA	NA
dibenz[*a,h+a,c+a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	787	NA	NA	NA	NA
dibenz[*a,h+a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	211	NA	NA	NA
benzo[*b*]chrysene	287	NA	NA	NA	NA	329	275	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
coronene	NA	NA	NA	3187	NA	NA	NA	NA	NA	NA	**NA**	5392	4718	NA	NA	NA
dibenzo[*a,e*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	593	NA	NA	NA	NA
Nitro-PAH ANALYSES																
Laboratory No.																
(* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
9-nitroanthracene	35.0	NA	NA	NA	NA	6.87	14.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-nitropyrene	73.2	NA	NA	NA	NA	61.5	66.7	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-nitrofluoranthene	310	NA	NA	NA	NA	223	310	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-nitrofluoranthene	8.93	NA	NA	NA	NA	3.26	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
7-nitrobenz[*a*]anthracene	23.4	NA	NA	NA	NA	19.6	21.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
6-nitrochrysene	<5	NA	NA	NA	NA	3.34	3.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
6-nitrobenzo[*a*]pyrene	<5	NA	NA	NA	NA	117	8.40	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkanes and Alkenes																
Laboratory No.																
(* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
n-C20	NA	NA	NA	1777	<1E3	NA	NA	NA	1367	NA	1372	NA	NA	NA	NA	NA
n-C22	NA	NA	NA	NA	4385	NA	NA	NA	7193	NA	3238	6397	NA	NA	NA	NA
n-C24	NA	NA	NA	38649	49315	NA	NA	NA	30667	NA	**44688**	31350	NA	NA	24200	NA
n-C26	NA	NA	NA	NA	**215609**	NA	NA	NA	87267	NA	**126426**	106713	NA	NA	68000	NA
n-C28	NA	NA	NA	104565	132067	NA	NA	NA	51900	NA	**80416**	78822	NA	NA	62500	NA
n-C30	NA	NA	NA	53714	**95339**	NA	NA	NA	26500	NA	43913	44228	NA	NA	15800	NA
n-C32	NA	NA	NA	27097	66311	NA	NA	NA	18200	NA	23371	NA	NA	NA	8890	NA
n-C36	NA	NA	NA	NA	<1E3	NA	NA	NA	NA	NA	**9575**	NA	NA	NA	NA	NA
n-C40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
n-C44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
squalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA
1-octadecene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**NA**	NA	NA	NA	NA	NA

Note: Bolded values were not used in the calculation of the exercise assigned values.

Table 2. Air Particulate I											
ng/g (reported as if three figures were significant)											
PAHs											
Laboratory No.									Exercise Assigned		
received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
naphthalene	NA	**119**	NA	<906	NA	NA	NA	NA	622	324	52
fluorene	NA	**190**	NA	<582	NA	NA	NA	NA	191	53	28
phenanthrene	NA	3470	NA	<4450	NA	NA	NA	NA	3806	563	15
anthracene	NA	387	NA	<1870	NA	NA	NA	NA	420	69	17
1-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	383	32	8
2-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	698	70	10
3-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	477	34	7
9-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
9+4-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
retene	NA	NA	NA	NA	**1615**	NA	NA	DL	169	59	not calc
4H-cyclopenta(*def*)phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
fluoranthene	NA	6389	NA	**9540**	NA	NA	NA	5700	6190	681	11
pyrene	NA	5058	NA	5810	NA	NA	NA	4800	5032	415	8
benzo[*ghi*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	**7900**	949	112	12
cyclopenta[*cd*]pyrene	NA	NA	NA	NA	NA	NA	NA	DL	No assigned value		
benz[*a*]anthracene	NA	2124	NA	2100	NA	NA	NA	2200	2203	321	15
chrysene	NA	3090	NA	3280	NA	NA	NA	NA	2996	236	8
triphenylene	NA	NA	NA	NA	NA	NA	NA	NA	1202	231	19
chrysene+triphenylene	NA	NA	NA	NA	NA	NA	NA	4700	4391	915	21
benzo[*b*]fluoranthene	NA	6490	NA	5840	**3043**	NA	NA	5800	6199	955	15
benzo[*j*]fluoranthene	NA	NA	NA	**4200**	NA	NA	NA	DL	1408	not calc.	
benzo[*k*]fluoranthene	NA	1855	NA	1870	**3313**	NA	NA	**2050**	1746	282	16
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	10720	305	3
benzo[*b+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benzo[*b+j*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benzo[*e*]pyrene	NA	NA	NA	3340	2797	NA	NA	3700	3358	447	13
benzo[*a*]pyrene	NA	2292	NA	2220	NA	NA	NA	1840	2528	478	19
perylene	NA	NA	NA	NA	NA	NA	NA	DL	624	110	18
indeno[1,2,3-*cd*]pyrene	NA	3324	NA	2860	NA	NA	NA	3700	3074	557	18
benzo[*ghi*]perylene	NA	3870	NA	4090	3685	NA	NA	4500	3968	742	19
dibenz[*a,h*]anthracene	NA	NA	NA	291	NA	NA	NA	**1120**	303	31	10
dibenz[*a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	205	not calc.	
dibenz[*a,h+a,c+a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
dibenz[*a,h+a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benzo[*b*]chrysene	NA	NA	NA	NA	NA	NA	NA	NA	297	28	10
coronene	NA	NA	NA	NA	**2285**	NA	NA	4700	4499	932	21
dibenzo[*a,e*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Nitro-PAH ANALYSES											
Laboratory No.									Exercise Assigned		
received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
9-nitroanthracene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
1-nitropyrene	**58.8**	NA	NA	NA	NA	NA	NA	NA	67.2	6	9
2-nitrofluoranthene	**250**	NA	NA	NA	NA	NA	NA	NA	281.0	44	16
3-nitrofluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	6.09	not calc.	
7-nitrobenz[*a*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	21.7	2	9
6-nitrochrysene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
6-nitrobenzo[*a*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Alkanes and Alkenes									Exercise Assigned		
Laboratory No.											
received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
n-C20	NA	NA	NA	NA	NA	806	1433	NA	1346	402	30
n-C22	NA	NA	NA	NA	NA	1680	4033	NA	4738	2165	46
n-C24	NA	NA	NA	NA	10790	10100	32933	19500	27501	12803	47
n-C26	NA	NA	NA	NA	17130	50765	99733	67750	71051	30813	43
n-C28	NA	NA	NA	NA	13640	23843	56233	34500	62008	38227	62
n-C30	NA	NA	NA	NA	14430	10265	32900	25000	27855	15152	54
n-C32	NA	NA	NA	NA	10810	4349	17700	34500	17364	10594	61
n-C36	NA	NA	NA	NA	NA	1275	4467	11500	5747	5231	91
n-C40	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
n-C44	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
squalene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
1-octadecene	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Note: Bolded values were not used in the calculation of the exercise assigned values.											

Table 2. Continued																
Hopanes, Cholestanes, Sterols																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
22, 29, 30-trisnorhopane	NA	NA	NA	2807	4234	NA	NA	NA	NA	NA	NA	NA	2033	NA	NA	NA
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	17803	NA	NA	NA	NA	NA	NA	13199	NA	NA	NA	NA
17a(H), 21b(H)-29-hopane	NA	NA	NA	15803	30701	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20R-5a(H), 14a(H), 17b(H)-cholestane	NA	NA	NA	NA	7583	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ABB-20R-C28-methylcholestane	NA	NA	NA	1401	3353	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	10212	NA	NA	NA	NA	NA	NA	4818	4228	NA	NA	NA
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	8055	NA	NA	NA	NA	NA	NA	3320	2292	NA	NA	NA
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	5828	NA	NA	NA	NA	NA	NA	3119	1852	NA	NA	NA
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	4367	NA	NA	NA	NA	NA	NA	2690	4919	NA	NA	NA
pristane	NA	NA	NA	NA	NA	NA	NA	NA	406	NA	NA	NA	NA	NA	NA	NA
phytane	NA	NA	NA	NA	NA	NA	NA	NA	389	NA	NA	NA	NA	NA	NA	NA
cholesterol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
stigmasterol	NA	NA	NA	5490	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonyls and Acids																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
benzanthrone	NA	NA	NA	NA	3559	NA	NA	NA	NA	NA	NA	2326	<40	NA	NA	NA
9-fluorenone	NA	NA	NA	2933	1580	NA	NA	NA	NA	NA	NA	NA	<40	NA	NA	NA
anthroquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
benz[a]anthracene-7, 12-dione	NA	NA	NA	NA	3477	NA	NA	NA	NA	NA	NA	2114	NA	NA	NA	NA
G-nonanoic lactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
syringaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
isopimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
hexadecanoic acid	NA	NA	NA	NA	NA	NA	NA	222333	NA	NA	NA	NA	NA	NA	NA	NA
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
nopinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pinionaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
caronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
syringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-ethylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
isoeugenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
propionylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
butyrylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
guaiacol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-ethylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sugars																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
levoglucosan	NA	NA	NA	10427	<2E6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2. Continued											
Hopanes, Cholestanes, Sterols											
Laboratory No.									Exercise Assigned		
' received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
22, 29, 30-trisnorhopane	NA	NA	NA	NA	<167	NA	3290	4250	3323	951	29
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	NA	NA	13833	14000	14709	2091	14
17a(H), 21b(H)-29-hopane	NA	NA	NA	NA	15300	NA	19300	25000	21221	6562	31
20R-5a(H), 14a(H), 17b(H)-cholestane	NA	NA	NA	NA	1200	NA	3533	NA	No assigned value		
ABB-20R-C28-methylcholestane	NA	NA	NA	NA	NA	NA	1867	1100	1930	1000	52
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	8833	6750	6968	2558	37
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	6833	5550	5210	2394	46
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	5667	4500	4193	1701	41
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	3933	3200	3822	892	23
pristane	NA	NA	NA	NA	NA	NA	600	NA	503	not calc.	
phytane	NA	NA	NA	NA	NA	NA	467	NA	428	not calc.	
cholesterol	NA	NA	NA	NA	NA	NA	NA	DL	No assigned value		
stigmasterol	NA	NA	NA	NA	NA	NA	NA	DL	No assigned value		
Carbonyls and Acids											
Laboratory No.									Exercise Assigned		
' received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
benzanthrone	NA	NA	NA	NA	**61210**	532	NA	1660	2019	1266	63
9-fluorenone	NA	NA	NA	NA	NA	309	NA	NA	1607	1312	82
anthroquinone	NA	NA	NA	NA	NA	533	NA	990	762	not calc.	
benz[*a*]anthracene-7, 12-dione	NA	NA	NA	NA	**41865**	887	NA	6700	3295	2505	76
G-nonanoic lactone	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
syringaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pimaric acid	NA	NA	NA	NA	<708	NA	NA	DL	No assigned value		
isopimaric acid	NA	NA	NA	NA	<2380	NA	NA	DL	No assigned value		
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
hexadecanoic acid	NA	NA	NA	NA	NA	170353	NA	555000	315896	208695	66
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
nopinone	NA	NA	NA	NA	NA	0	NA	NA	No assigned value		
pinionaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
caronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Phenols											
Laboratory No.									Exercise Assigned		
' received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
syringol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
4-ethylsyringol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
isoeugenol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
propionylsyringol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
butyrylsyringol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
guaiacol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
4-methylguaiacol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
4-ethylguaiacol	NA	NA	<20	NA	NA	NA	NA	NA	No assigned value		
Sugars											
Laboratory No.									Exercise Assigned		
' received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	Assigned	s	%RSD
levoglucosan	NA	NA	NA	NA	NA	NA	NA	DL	No assigned value		

Table 3. SRM 1649a (Trial I)	Laboratory means of three replicates and certificate values															
ng/g (reported as if three figures were significant)																
PAHs																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
naphthalene	926	NA	101	7123	826	NA	NA	600	213	other	NA	NA	9219	875	NA	966
fluorene	197	NA	79	555	1869	131	143	193	144	132	NA	295	212	254	NA	263
phenanthrene	4204	NA	3302	6724	5007	3358	3577	4097	3010	3687	NA	3824	4671	4919	4250	4010
anthracene	455	NA	394	1135	866	282	373	697	468	832	NA	602	505	491	NA	426
1-methylphenanthrene	398	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	414	383	414	NA	NA
2-methylphenanthrene	745	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	723	731	NA	NA	NA
3-methylphenanthrene	512	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	544	NA	NA	NA	NA
9-methylphenanthrene	342	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9+4-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	378	NA	NA	NA	NA
retene	NA	NA	NA	NA	NA	178	116	NA	NA	NA	NA	NA	136	NA	NA	NA
4H-cyclopenta(*def*)phenanthrene	327	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
fluoranthene	6328	NA	5150	7815	8521	5008	6205	6560	6730	5433	NA	5858	7417	7145	6480	5710
pyrene	5322	NA	4704	6209	7385	3945	5281	5323	4550	4547	NA	4904	5349	5607	5380	4707
benzo[*ghi*]fluoranthene	893	NA	NA	NA	1942	758	1096	NA	NA	NA	NA	NA	NA	NA	NA	NA
cyclopenta[*cd*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
benz[*a*]anthracene	2184	NA	1780	2768	NA	1743	2400	3083	2683	4477	NA	2042	2276	2436	NA	1833
chrysene	2990	NA	2771	5405	NA	2490	3231	4697	4123	4583	NA	NA	NA	NA	NA	4157
triphenylene	1268	NA	NA	NA	NA	962	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA
chrysene+triphenylene	NA	NA	NA	NA	4690	NA	NA	NA	NA	NA	NA	3987	5524	4816	NA	NA
benzo[*b*]fluoranthene	6488	5847	3975	5428	3505	6358	6279	8143	NA	NA	NA	NA	NA	6400	NA	6217
benzo[*j*]fluoranthene	1217	NA	NA	NA	447	NA	NA	NA	NA	NA	NA	NA	NA	1540	NA	NA
benzo[*k*]fluoranthene	1858	1677	1748	1254	NA	1602	1863	2807	NA	NA	NA	NA	NA	1910	NA	1710
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	10347	NA	9250	9957	NA	NA	NA
benzo[*b+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	9543	NA	NA	NA	NA	NA	NA	NA
benzo[*b+j*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7610	NA
benzo[*e*]pyrene	2962	NA	NA	NA	3401	2921	3281	NA	2677	4267	NA	3006	3485	3374	NA	3220
benzo[*a*]pyrene	2698	2413	2011	4164	2356	2429	2651	3063	2507	3380	NA	2877	2924	3113	2490	2127
perylene	660	NA	NA	NA	636	553	629	NA	524	809	NA	618	579	602	NA	544
indeno[1,2,3-*cd*]pyrene	2746	2957	2233	3643	2164	2596	3646	2923	3673	2160	NA	2784	2709	3910	3250	2820
benzo[*ghi*]perylene	4319	3627	2707	3415	2297	3436	4316	4503	4047	5217	NA	3431	4162	4773	3910	3350
dibenz[*a,h*]anthracene	289	238	293	NA	NA	448	348	636	488	1800	NA	NA	NA	357	NA	410
dibenz[*a,c*]anthracene	201	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	224	NA	NA
dibenz[*a,h+a,c+a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	774	NA	NA	NA	NA
dibenz[*a,h+a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	406	NA	NA	NA
benzo[*b*]chrysene	316	NA	NA	NA	NA	275	284	NA	NA	NA	NA	NA	NA	NA	NA	NA
coronene	NA	NA	NA	3921	NA	NA	NA	NA	NA	NA	NA	5624	4332	NA	NA	NA
dibenzo[*a,e*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	659	NA	NA	NA	NA
Nitro-PAH ANALYSES																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
9-nitroanthracene	33.9	NA	NA	NA	NA	6.40	14.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-nitropyrene	79.5	NA	NA	NA	NA	60.8	64.6	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-nitrofluoranthene	324	NA	NA	NA	NA	225	300	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-nitrofluoranthene	10.8	NA	NA	NA	NA	<0.03	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
7-nitrobenz[*a*]anthracene	29.5	NA	NA	NA	NA	19.3	20.5	NA	NA	NA	NA	NA	NA	NA	NA	NA
6-nitrochrysene	<5	NA	NA	NA	NA	3.89	3.10	NA	NA	NA	NA	NA	NA	NA	NA	NA
6-nitrobenzo[*a*]pyrene	<5	NA	NA	NA	NA	122	8.03	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkanes and Alkenes																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
n-C20	NA	NA	NA	1464	<1E3	NA	NA	NA	1527	NA	NA	NA	NA	NA	NA	NA
n-C22	NA	NA	NA	NA	5786	NA	NA	NA	12623	NA	NA	7804	NA	NA	NA	NA
n-C24	NA	NA	NA	29652	71842	NA	NA	NA	39733	NA	NA	38740	NA	NA	27000	NA
n-C26	NA	NA	NA	NA	305984	NA	NA	NA	101633	NA	NA	124872	NA	NA	78300	NA
n-C28	NA	NA	NA	103497	200423	NA	NA	NA	64233	NA	NA	103182	NA	NA	37600	NA
n-C30	NA	NA	NA	38273	135440	NA	NA	NA	39733	NA	NA	63986	NA	NA	18200	NA
n-C32	NA	NA	NA	26425	101968	NA	NA	NA	21833	NA	NA	NA	NA	NA	9410	NA
n-C36	NA	NA	NA	NA	<1E3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-C40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-C44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
squalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-octadecene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3. SRM 1649a (Trial I)											
ng/g (reported as if three figures were significant)											
PAHs											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
naphthalene	NA	121	NA	<1020	NA	NA	NA	NA	no target		Target
fluorene	NA	105	NA	<560	NA	NA	NA	NA	230	50	Reference
phenanthrene	NA	4091	NA	<4500	NA	NA	NA	NA	4140	370	Certified
anthracene	NA	364	NA	<1730	NA	NA	NA	NA	432	82	Certified
1-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	370	40	Reference
2-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	730	120	Reference
3-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	500	50	Reference
9-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
9+4-methylphenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
retene	NA	NA	NA	NA	571	NA	NA	DL	no target		Target
4H-cyclopenta(*def*)phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	320	60	Reference
fluoranthene	NA	5754	NA	10150	NA	NA	NA	5700	6450	180	Certified
pyrene	NA	4760	NA	6050	NA	NA	NA	5200	5290	250	Certified
benzo[*ghi*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	8800	880	20	Reference
cyclopenta[*cd*]pyrene	NA	NA	NA	NA	NA	NA	NA	DL	no target		Target
benz[*a*]anthracene	NA	1869	NA	2120	NA	NA	NA	2200	2210	73	Certified
chrysene	NA	2602	NA	3320	NA	NA	NA	NA	3049	60	Certified
triphenylene	NA	NA	NA	NA	NA	NA	NA	NA	1357	54	Certified
chrysene+triphenylene	NA	NA	NA	NA	NA	NA	NA	4700	no target		Target
benzo[*b*]fluoranthene	NA	5790	NA	5680	2620	NA	NA	6100	6450	640	Certified
benzo[*j*]fluoranthene	NA	NA	NA	3690	NA	NA	NA	DL	1500	400	Reference
benzo[*k*]fluoranthene	NA	1552	NA	1640	2967	NA	NA	2900	1913	31	Certified
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benzo[*b+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benzo[*b+j*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benzo[*e*]pyrene	NA	NA	NA	3260	2440	NA	NA	3900	3090	190	Certified
benzo[*a*]pyrene	NA	1961	NA	2360	NA	NA	NA	1990	2509	87	Certified
perylene	NA	NA	NA	NA	NA	NA	NA	DL	646	75	Certified
indeno[1,2,3-*cd*]pyrene	NA	2706	NA	3220	NA	NA	NA	3700	3180	720	Certified
benzo[*ghi*]perylene	NA	3205	NA	4010	1997	NA	NA	4600	4010	910	Certified
dibenz[*a,h*]anthracene	NA	NA	NA	282	NA	NA	NA	1100	288	23	Certified
dibenz[*a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	200	25	Certified
dibenz[*a,h+a,c+a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
dibenz[*a,h+a,c*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benzo[*b*]chrysene	NA	NA	NA	NA	NA	NA	NA	NA	315	13	Certified
coronene	NA	NA	NA	NA	746	NA	NA	4000	no target		Target
dibenzo[*a,e*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	630	80	Reference
Nitro-PAH ANALYSES											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
9-nitroanthracene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
1-nitropyrene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
2-nitrofluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
3-nitrofluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
7-nitrobenz[*a*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
6-nitrochrysene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
6-nitrobenzo[*a*]pyrene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
Alkanes and Alkenes											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
n-C20	NA	NA	NA	NA	NA	915	1567	NA	no target		Target
n-C22	NA	NA	NA	NA	NA	1797	4733	NA	no target		Target
n-C24	NA	NA	NA	NA	5150	16364	37000	22500	no target		Target
n-C26	NA	NA	NA	NA	9247	73257	111333	74500	no target		Target
n-C28	NA	NA	NA	NA	5250	32984	60633	40500	no target		Target
n-C30	NA	NA	NA	NA	5295	12978	35667	29000	no target		Target
n-C32	NA	NA	NA	NA	4315	5900	18733	40000	no target		Target
n-C36	NA	NA	NA	NA	NA	2537	4567	12000	no target		Target
n-C40	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
n-C44	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
squalene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
1-octadecene	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target

Table 3. Continued																
Hopanes, Cholestanes, Sterols																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
22, 29, 30-trisnorhopane	NA	NA	NA	2769	5893	NA	NA	NA	NA	NA	NA	NA	2007	NA	NA	NA
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	25974	NA	NA	NA	NA	NA	NA	12651	NA	NA	NA	NA
17a(H), 21b(H)-29-hopane	NA	NA	NA	15879	41959	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
20R-5a(H), 14a(H), 17a(H)-cholestane	NA	NA	NA	NA	9255	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ABB-20R-C28-methylcholestane	NA	NA	NA	3495	4153	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	14062	NA	NA	NA	NA	NA	NA	4507	3389	NA	NA	NA
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	11517	NA	NA	NA	NA	NA	NA	2819	2674	NA	NA	NA
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	7834	NA	NA	NA	NA	NA	NA	2097	2169	NA	NA	NA
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	6108	NA	NA	NA	NA	NA	NA	2473	2192	NA	NA	NA
pristane	NA	NA	NA	NA	NA	NA	NA	NA	406	NA	NA	NA	NA	NA	NA	NA
phytane	NA	NA	NA	NA	NA	NA	NA	NA	351	NA	NA	NA	NA	NA	NA	NA
cholesterol	NA	NA	NA	13650	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
stigmasterol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbonyls and Acids																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
benzanthrone	NA	NA	NA	NA	4474	NA	NA	NA	NA	NA	NA	2494	48	NA	NA	NA
9-fluorenone	NA	NA	NA	3006	2271	NA	NA	NA	NA	NA	NA	NA	<40	NA	NA	NA
anthroquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
benz[*a*]anthracene-7, 12-dione	NA	NA	NA	NA	4345	NA	NA	NA	NA	NA	NA	2128	NA	NA	NA	NA
G-nonanoic lactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
syringaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
isopimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
hexadecanoic acid	NA	NA	NA	NA	NA	NA	NA	222333	NA	NA	NA	NA	NA	NA	NA	NA
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
nopinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pinonaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
caronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
syringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-ethylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
isoeugenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
propionylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
butyrylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
guaiacol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-ethylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sugars																
Laboratory No.																
* received after initial data review)	1	2	3	4	5	6	6a*	7	8	9	10	11	12	13	14	15*
levoglucosan	NA	NA	NA	28800	<2E6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3. Continued											
Hopanes, Cholestanes, Sterols											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
22, 29, 30-trisnorhopane	NA	NA	NA	NA	1131	NA	3267	3900	no target		Target
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	NA	NA	13600	12500	no target		Target
17a(H), 21b(H)-29-hopane	NA	NA	NA	NA	2437	NA	19000	23500	no target		Target
20R-5a(H), 14a(H), 17b(H)-cholestane	NA	NA	NA	NA	<167	NA	3433	NA	no target		Target
ABB-20R-C28-methylcholestane	NA	NA	NA	NA	NA	NA	1900	5050	no target		Target
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	8700	6000	no target		Target
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	6700	5100	no target		Target
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	5533	3900	no target		Target
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	3833	3400	no target		Target
pristane	NA	NA	NA	NA	NA	NA	667	NA	no target		Target
phytane	NA	NA	NA	NA	NA	NA	433	NA	no target		Target
cholesterol	NA	NA	NA	NA	NA	NA	NA	DL	no target		Target
stigmasterol	NA	NA	NA	NA	NA	NA	NA	DL	no target		Target
Carbonyls and Acids											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
benzanthrone	NA	NA	NA	NA	52567	945	NA	1610	no target		Target
9-fluorenone	NA	NA	NA	NA	NA	382	NA	NA	no target		Target
anthroquinone	NA	NA	NA	NA	NA	812	NA	850	no target		Target
benz[*a*]anthracenc-7, 12-dione	NA	NA	NA	NA	14130	1467	NA	6500	no target		Target
G-nonanoic lactonc	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
syringaldehydc	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
pimaric acid	NA	NA	NA	NA	<708	NA	NA	DL	no target		Target
isopimaric acid	NA	NA	NA	NA	<2380	NA	NA	DL	no target		Target
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
pinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
hexadecanoic acid	NA	NA	NA	NA	NA	208370	NA	495000	no target		Target
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
nopinone	NA	NA	NA	NA	NA	0	NA	NA	no target		Target
pinionaldchyde	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
caronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
Phenols											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
syringol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
4-ethylsyringol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
isoeugenol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
propionylsyringol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
butyrylsyringol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
guaiacol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
4-methylguaiacol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
4-ethylguaiacol	NA	NA	<20	NA	NA	NA	NA	NA	no target		Target
Sugars											
Laboratory No.									From 1649a Certificate of Analysis		
(* received after initial data review)	16*	17*	18*	19*	20*	21*	22*	23*	conc.	95%CL	type
levoglucosan	NA	NA	NA	NA	NA	NA	NA	DL	no target		Target

Table 4. Air Particulate Extract I: z scores (25%)

Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
naphthalene	-0.2		-0.4	-1.0	1.3		0.2	-0.5	3.5	0.8		19.7	-0.4	
fluorene	-1.7		-2.9	-2.1	-1.3	-0.2	0.1	-1.1	-1.2	-2.3	2.7	1.9	-0.5	
phenanthrene	-0.4		0.0	-0.6	0.4	0.2	-0.1	-0.5	-0.7	0.0	-0.7	0.8	0.3	0.8
anthracene	-1.3		-0.2	0.7	0.5	-1.0	1.1	1.1	1.9	1.4	-0.1	2.5	-1.1	
1-methylphenanthrene	-0.2										-0.2	0.9	-0.5	
2-methylphenanthrene	-0.3										-0.6	0.9		
3-methylphenanthrene	0.1										-0.1			
fluoranthene	-0.5		-0.4	-0.8	0.5	0.1	0.0	0.1	-0.9	-0.3	-0.5	1.5	0.1	0.8
pyrene	-0.3		0.1	-0.7	0.9	0.0	0.1	-0.6	-0.8	1.7	-0.3	0.7	0.0	1.0
benzo[*ghi*]fluoranthene	-0.4				3.1	0.4								
benz[*a*]anthracene	-0.7		-0.5	-0.7		-0.1	2.8	0.8	2.0	0.2	0.9	0.5	-0.2	
chrysene	-0.3		0.0	0.9		0.3	1.9	1.5	1.3	1.6				
triphenylene	-0.5					0.5								
chrysene+triphenylene					-1.1						0.1	1.1	-0.2	
benzo[*b*]fluoranthene	-0.5	-0.6	-0.8	-0.9	-1.8	1.5	1.7			1.3			-0.4	
benzo[*j*]fluoranthene	-0.5				-2.4								0.5	
benzo[*k*]fluoranthene	-0.5	0.1	0.2	-1.5		1.3	2.5			2.2			0.4	
benzo[*e*]pyrene	-0.9				0.9	1.0		-0.8	-0.5		-0.2	0.6	-0.2	
benzo[*a*]pyrene	-1.1	-0.5	-0.9	-0.3	-0.1	0.2	1.6	-0.4	-1.0	-1.6	0.8	0.6	0.4	0.4
perylene	-0.7				0.5	0.3		-0.6	-0.9		1.3	0.7	-0.7	
indeno[1,2,3-*cd*]pyrene	-1.1	0.0	-0.9	-0.8	0.9	0.4	0.6	0.8	-2.5	-0.3	1.0	0.1	0.1	1.4
benzo[*ghi*]perylene	-0.4	-0.5	-0.5	-1.4	1.1	0.6	1.4	-0.1	-1.2	-0.2	0.3	-0.6	0.0	1.2
dibenz[*a,h*]anthracene	-0.7	-0.7	1.1	0.3		3.8	19.3	2.7	9.2	4.6			0.3	
dibenz[*a,c*]anthracene	0.1												-0.1	
benzo[*b*]chrysene	-0.4					0.4								
C20				-0.5				0.5		-3.7				
C22					-0.9			0.2		2.2	0.7			
C24				-1.3	0.6			-1.1		2.1	1.9			-0.1
C26					1.7			-1.1		1.4	-0.1			-0.5
C28				-1.2	2.3			-1.0		2.0	0.5			-0.7
C30				-2.0	2.8			-1.3		3.1	1.6			-1.0
C32				-0.9	12.6			0.6		3.7				0.3

Table 5. Air Particulate Extract I: z scores (s)

Laboratory No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
naphthalene	-0.3		-0.5	-1.4	1.9		0.3	-0.8	5.1	1.2		28.5	-0.6	
fluorene	-1.1		-1.9	-1.4	-0.8	-0.1	0.1	-0.7	-0.8	-1.5	1.8	1.2	-0.3	
phenanthrene	-0.8		0.0	-1.1	0.8	0.4	-0.3	-1.0	-1.2	0.1	-1.3	1.4	0.5	1.4
anthracene	-0.9		-0.1	0.5	0.4	-0.7	0.8	0.8	1.4	1.0	-0.1	1.8	-0.8	
1-methylphenanthrene	-0.4										-0.4	1.5	-0.7	
2-methylphenanthrene	-0.4										-0.8	1.1		
fluoranthene	-0.7		-0.6	-1.2	0.8	0.1	0.0	0.1	-1.3	-0.4	-0.7	2.2	0.1	1.1
pyrene	-0.6		0.2	-1.4	1.7	0.0	0.1	-1.1	-1.5	3.2	-0.5	1.4	0.0	1.8
benzo[*ghi*]fluoranthene	-0.7				6.2	0.7								
benz[*a*]anthracene	-1.1		-0.7	-1.1		-0.1	4.2	1.2	3.1	0.3	1.4	0.7	-0.3	
chrysene	-0.7		0.1	1.8		0.7	3.9	3.3	2.7	3.4				
chrysene+triphenylene					-1.2						0.2	1.2	-0.2	
benzo[*b*]fluoranthene	-0.5	-0.5	-0.7	-0.8	-1.6	1.4	1.5			1.2			-0.3	
benzo[*j*]fluoranthene														
benzo[*k*]fluoranthene	-0.5	0.1	0.2	-1.6		1.4	2.6			2.4			0.4	
benzo[*e*]pyrene	-1.2				1.2	1.3		-1.0	-0.7		-0.2	0.8	-0.2	
benzo[*a*]pyrene	-1.3	-0.6	-1.1	-0.3	-0.1	0.2	1.9	-0.5	-1.2	-1.9	1.0	0.7	0.5	0.5
perylene	-0.9				0.6	0.4		-0.7	-1.1		1.6	0.9	-0.8	
indeno[1,2,3-*cd*]pyrene	-1.0	0.0	-0.9	-0.8	0.8	0.4	0.6	0.7	-2.3	-0.3	0.9	0.1	0.1	1.3
benzo[*ghi*]perylene	-0.4	-0.6	-0.6	-1.5	1.2	0.7	1.6	-0.1	-1.4	-0.2	0.4	-0.6	0.0	1.4
dibenz[*a,h*]anthracene	-0.8	-0.8	1.3	0.4		4.4	22.7	3.2	10.8	5.4			0.3	
C22					-1.1			0.2		2.7	0.9			
C24				-1.0	0.5			-0.9		1.6	1.4			-0.1
C26					1.4			-0.9		1.2	0.0			-0.4
C28				-0.8	1.6			-0.7		1.4	0.4			-0.5
C30				-1.0	1.3			-0.6		1.5	0.8			-0.5
C32				-1.1	15.6			0.7		4.5				0.4

Table 6. Air Particulate I: z scores (25%)

Laboratory No.	1	2	3	4	5	6	6a	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
naphthalene	1.6		-2.7	54.2	1.7			1.0	-2.6		-1.6		43.7	1.1		42.4		-3.2						
fluorene	-0.7		-3.2	7.8	23.9	-0.9	-1.3	0.1	-1.0	-1.0	0.5	1.7	0.7	1.0		1.4		0.0						
phenanthrene	0.2		-0.8	2.8	-0.3	0.0	-0.3	0.3	-0.6	-0.4	0.3	-0.6	0.7	1.1	0.2	0.9		-0.4						
anthracene	-0.1		-0.9	5.7	1.0	-0.9	-0.7	2.7	0.5	4.5	1.7	1.1	0.0	0.6		0.0		-0.3						
1-methylphenanthrene	-0.4											0.0	0.1	0.4										
2-methylphenanthrene	-0.3											-0.2	0.5											
3-methylphenanthrene	-0.2											0.2												
retene						1.6	-1.0						-0.5								34.1			
4H-cyclopenta(def)phenanthrene																-0.8		-0.7						
fluoranthene	-0.1		-0.7	0.8	-0.1	-0.4	-0.2	0.2	0.5	-0.5	-0.1	-0.5	0.5	0.6	-0.1	0.0		0.1		2.2				-0.3
pyrene	0.0		-0.4	0.5	0.0	-0.5	0.0	0.2	-0.2	-0.5	1.4	-0.3	0.2	0.4	0.0	-0.1		0.0		0.6				-0.2
benzo[*ghi*]fluoranthene	-0.5				1.8	0.0	0.5																	29.3
cyclopenta[cd]pyrene																3.8		1.6						
benz[*a*]anthracene	-0.2		-0.9	0.9		-0.4	0.1	1.6	1.2	3.7	0.3	-0.3	0.2	0.3		-0.5		-0.1		-0.2				0.0
chrysene	-0.1		-0.5	2.3		-0.1	0.2	2.1	1.8	2.1	2.0					1.8		0.1		0.4				
triphenylene	-0.1					-0.7	0.8																	
chrysene+triphenylene					-1.0							-0.7	1.0	0.4										0.3
benzo[*b*]fluoranthene	-0.2	-0.2	-1.4	-0.1	-2.0	0.8	-0.1	1.0			0.9			0.3		0.3		0.2		-0.2	-2.0			-0.3
benzo[*j*]fluoranthene	-0.7				-3.0									0.7						7.9				
benzo[*k*]fluoranthene	0.1	-0.1	-0.3	-1.4		0.1	0.0	3.0			1.7			0.8		0.4		0.2		0.3	3.6			0.7
benzo[*a*+*j*+*k*]fluoranthene										0.0		0.1	-0.1											
benzo[*e*]pyrene	-0.6				-0.6	0.0	-0.2		-0.5	1.2		0.6	0.0	0.1		0.2				0.0	-0.7			0.4
benzo[*a*]pyrene	-0.1	-0.3	-0.9	2.8	-0.9	0.3	0.0	0.8	0.1	1.3	-1.5	1.3	0.0	1.1	-0.4	-0.5		-0.4		-0.5				-1.1
perylene	0.0				-1.0	0.1	-0.1		-0.3	1.3		0.9	-0.8	-0.2		0.1								
indeno[1,2,3-*cd*]pyrene	-0.5	0.0	-1.0	0.5	-1.1	0.0	0.7	-0.2	1.4	-1.1	0.0	-0.5	-0.6	1.2	0.1	0.2		0.3		-0.3				0.8
benzo[*ghi*]perylene	0.3	-0.5	-1.3	-0.4	-1.5	0.1	0.3	0.6	0.4	1.7	0.1	-0.8	0.6	0.8	-0.2	-0.4		-0.1		0.1	-0.3			0.5
dibenz[*a,h*]anthracene	-0.2	-0.4	0.0			2.9	0.5	4.3	3.2	20.4	5.8			0.7		2.3				-0.2				10.8
dibenz[*a,c*]anthracene	-0.1													0.1										
benzo[*b*]chrysene	-0.1					0.4	-0.3																	
coronene				-1.2								0.8	0.2								-2.0			0.2
1-nitropyrene	0.4					-0.3	0.0										-0.5							
2-nitrofluoranthene	0.4					-0.8	0.4										-0.4							
3-nitrofluoranthene	1.9					-1.9																		
7-nitrobenz[*a*]anthracene	0.3					-0.4	0.0																	
6-nitrochrysene																						-1.6	0.3	
C22					-0.3				2.1		-1.3	1.4										-2.6	-0.6	
C24				1.6	3.2				0.5		2.5	0.6			-0.5						-2.4	-2.5	0.8	-1.2
C26					8.1				0.9		3.1	2.0			-0.2						-3.0	-1.1	1.6	-0.2
C28				2.7	4.5				-0.7		1.2	1.1			0.0						-3.1	-2.5	-0.4	-1.8
C30				3.7	9.7				-0.2		2.3	2.4			-1.7						-1.9	-2.5	0.7	-0.4
C32				2.2	11.3				0.2		1.4				-2.0						-1.5	-3.0	0.1	3.9
C36											2.7											-3.1	-0.9	4.0
22, 29, 30-trisnorhopane				-0.6	1.1								-1.6										0.0	1.1
17a(H), 21b(H)-29-norhopane					0.8							-0.4											-0.2	-0.2
17a(H), 21b(H)-29-hopane				-1.0	1.8																-1.1		-0.4	0.7
ABB-20R-C28-methylcholestane				-1.1	2.9																		-0.1	-1.7
22S-17a(H), 21b(H)-30-homohopane					1.9							-1.2	-1.6										1.1	-0.1
22R-17a(H), 21b(H)-30-homohopane					2.2							-1.5	-2.2										1.2	0.3
22S-17a(H), 21b(H)-30-bishomohopane					1.6							-1.0	-2.2										1.4	0.3
22R-17a(H), 21b(H)-30-bishomohopane					0.6							-1.2	1.1										0.1	-0.7
pristane									-0.8														0.8	
phytane									-0.4														0.4	
benzanthrone					3.0							0.6									117.2	-2.9		-0.7
9-fluorenone				3.3	-0.1																	-3.2		
anthroquinone																						-1.2		1.2
benz[*a*]anthracene-7, 12-dione					0.2							-1.4									46.8	-2.9		4.1
hexadecanoic acid								-1.2														-1.8		3.0

Table 7. Air Particulate I: z scores (s)

Laboratory No.	1	2	3	4	5	6	6a	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
naphthalene	0.8		-1.3	26.0	0.8			0.5	-1.3		-0.8		20.9	0.5		20.3		-1.5						
fluorene	-0.7		-2.9	7.1	21.6	-0.8	-1.1	0.1	-0.9	-0.9	0.4	1.5	0.6	0.9		1.3		0.0						
phenanthrene	0.3		-1.4	4.8	-0.6	-0.1	-0.5	0.6	-1.0	-0.7	0.5	-1.0	1.1	1.9	0.3	1.5		-0.6						
anthracene	-0.1		-1.3	8.7	1.5	-1.4	-1.1	4.1	0.8	6.8	2.5	1.7	-0.1	0.9		0.0		-0.5						
1-methylphenanthrene	-1.3											-0.1	0.3	1.1										
2-methylphenanthrene	-0.7											-0.4	1.1											
3-methylphenanthrene	-0.7											0.7												
retene						1.1	-0.7						-0.4								24.7			
fluoranthene	-0.1		-1.6	1.8	-0.3	-0.8		0.5	1.2	-1.2	-0.3	-1.1	1.2	1.4	-0.1	0.0		0.3		4.9				-0.7
pyrene	0.1		-1.2	1.5	0.1	-1.5		0.7	-0.6	-1.4	4.2	-1.0	0.7	1.3	0.1	-0.3		0.1		1.9				-0.6
benzo[ghi]fluoranthene	-1.0				3.8	-0.1	1.0																	62.0
cyclopenta[cd]pyrene																								
benz[*a*]anthracene	-0.3		-1.5	1.5		-0.7	0.1	2.7	2.1	6.3	0.5	-0.5	0.3	0.5		-0.8		-0.2		-0.3				0.0
chrysene	-0.2		-1.6	7.3		-0.4	0.7	6.8	5.8	6.7	6.4					5.6		0.4		1.2				
triphenylene	-0.1					-1.0	1.0																	
chrysene+triphenylene					-1.2							-0.9	1.2	0.5										0.3
benzo[*b*]fluoranthene	-0.4	-0.4	-2.3	-0.2	-3.3	1.3	-0.2	1.7			1.4			0.4		0.5		0.3		-0.4	-3.3			-0.4
benzo[*j*]fluoranthene																								
benzo[*k*]fluoranthene	0.2	-0.2	-0.5	-2.1		0.1	0.0	4.6			2.7			1.2		0.5		0.4		0.4	5.6			1.1
benzo[*b*+*j*+*k*]fluoranthene										-0.2		1.1	-0.9											
benzo[*e*]pyrene	-1.1				-1.2	0.1	-0.3		-0.9	2.2		1.1	0.0	0.3		0.4				0.0	-1.3			0.8
benzo[*a*]pyrene	-0.1	-0.4	-1.2	3.8	-1.2	0.5	0.0	1.1	0.2	1.7	-2.0	1.7	-0.1	1.4	-0.5	-0.6		-0.5		-0.6				-1.4
perylene	-0.1				-1.4	0.1	-0.1		-0.5	1.9		1.3	-1.1	-0.3		0.2								
indeno[1,2,3-*cd*]pyrene	-0.6	0.0	-1.4	0.7	-1.5	0.0	0.9	-0.3	1.9	-1.5	0.0	-0.7	-0.8	1.6	0.2	0.3		0.4		-0.4				1.1
benzo[*ghi*]perylene	0.5	-0.6	-1.7	-0.5	-2.0	0.1	0.4	0.8	0.5	2.2	0.1	-1.1	0.8	1.1	-0.3	-0.5		-0.1		0.2	-0.4			0.7
dibenz[*a,h*]anthracene	-0.5	-0.9	0.1			7.2	1.2	10.5	7.9	49.6	14.1			1.7		5.6				-0.4				26.2
dibenz[a,c]anthracene																								
benzo[b]chrysene	-0.4					1.1	-0.8																	
coronene				-1.4								1.0	0.2								-2.4			0.2
C20				1.1					0.1		0.1											-1.3	0.2	
C22					-0.2				1.1		-0.7	0.8										-1.4	-0.3	
C24				0.9	1.7				0.2		1.3	0.3			-0.3						-1.3	-1.4	0.4	-0.6
C26					4.7				0.5		1.8	1.2			-0.1						-1.7	-0.7	0.9	-0.1
C28				1.1	1.8				-0.3		0.5	0.4			0.0						-1.3	-1.0	-0.2	-0.7
C30				1.7	4.5				-0.1		1.1	1.1			-0.8						-0.9	-1.2	0.3	-0.2
C32				0.9	4.6				0.1		0.6				-0.8						-0.6	-1.2	0.0	1.6
C36											0.7											-0.9	-0.2	1.1
22, 29, 30-trisnorhopane				-0.5	1.0								-1.4										0.0	1.0
17a(H), 21b(H)-29-norhopane					1.5							-0.7											-0.4	-0.3
17a(H), 21b(H)-29-hopane				-0.8	1.4																-0.9		-0.3	0.6
ABB-20R-C28-methylcholestane				-0.5	1.4																		-0.1	-0.8
22S-17a(H), 21b(H)-30-homohopane					1.3							-0.8	-1.1										0.7	-0.1
22R-17a(H), 21b(H)-30-homohopane					1.2							-0.8	-1.2										0.7	0.1
22S-17a(H), 21b(H)-30-bishomohopane					1.0							-0.6	-1.4										0.9	0.2
22R-17a(H), 21b(H)-30-bishomohopane					0.6							-1.3	1.2										0.1	-0.7
pristane																								
phytane																								
benzanthrone					3.0							0.6									117.2	-2.9		-0.7
9-fluorenone				3.3	-0.1																	-3.2		
anthroquinone																						-1.2		1.2
benz[*a*]anthracene-7, 12-dione					0.2							-1.4									46.8	-2.9		4.1
hexadecanoic acid								-1.2														-1.8		3.0

Table 8. p scores (15%) for all reported compounds in Air Particulate Extract I, Air Particulate I, and SRM 1649a

Laboratory No.	1			2			3			4			5		
	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a
PAHs															
naphthalene	0.1	0.1	0.2				0.2	0.3	0.3	1.9	0.5	0.5	0.7	0.9	4.7
fluorene	0.4	0.3	0.2				0.6	0.8	1.0	2.9	0.1	0.5	1.2	0.8	1.5
phenanthrene	0.0	0.1	0.1				0.3	0.3	0.6	0.4	0.1	1.1	1.2	1.0	0.7
anthracene	0.1	0.4	0.1				0.4	0.3	0.4		2.9	0.3	1.5	1.1	1.7
1-methylphenanthrene	0.2	0.6	0.1												
2-methylphenanthrene	0.1	0.1	0.1												
3-methylphenanthrene	0.0	0.1	0.1												
9-methylphenanthrene	0.1	0.1	0.1												
retene															
4H-cyclopenta(def)phenanthr	0.1	0.1	0.1												
fluoranthene	0.0	0.1	0.1				0.3	0.3	0.4	0.4	0.2	0.5	1.7	1.7	0.2
pyrene	0.0	0.1	0.1				0.3	0.2	0.5	0.4	0.2	0.5	1.8	1.7	0.2
benzo[ghi]fluoranthene	0.0	0.0	0.0										1.7	1.5	0.4
benz[a]anthracene	0.1	0.1	0.2				0.3	0.2	0.6		0.1	0.3			
chrysene	0.2	0.1	0.1				0.5	0.3	0.4	0.1	1.4	0.4	1.6	1.8	0.4
triphenylene	0.1	0.2	0.2												
benzo[b]fluoranthene	0.1	0.1	0.0	0.7	0.2	0.4	0.3	0.2	0.4	0.4	0.5	0.5	1.0	2.2	0.7
benzo[j]fluoranthene	0.1	0.0	0.5										0.8	2.2	0.2
benzo[k]fluoranthene	0.7	0.0	0.1	0.6	0.2	0.6	0.4	0.4	0.3	0.0	0.2	0.3			
benzo[e]pyrene	0.7	0.0	0.1										1.2	1.8	0.2
benzo[a]pyrene	0.4	0.1	0.0	0.6	0.6	0.8	0.2	0.3	0.6	0.2	0.3	1.1	1.2	1.7	0.9
perylene	0.1	0.1	0.2										1.5	2.0	0.5
indeno[1,2,3-cd]pyrene	0.0	0.1	0.1	0.2	0.5	0.4	0.2	0.2	0.3	0.4	0.1	0.6	1.3	2.1	1.9
benzo[ghi]perylene	0.0	0.1	0.0	0.6	0.2	0.4	0.3	0.2	0.4	0.1	0.3	1.0	1.4	2.2	1.3
dibenz[a,h]anthracene	0.3	0.3	0.2	0.8	0.6	1.0	0.2	0.3	0.6	0.4					
dibenz[a,c]anthracene	0.2	0.3	0.2												
benzo[b]chrysene	0.1	0.1	0.1												
coronene										0.4	0.5	1.7			
dibenzo[a,e]pyrene															
Nitro-PAH															
9-nitroanthracene	0.0	0.6	0.8												
1-nitropyrene	0.1	0.3	0.3												
2-nitrofluoranthene	0.2	0.1	0.3												
3-nitrofluoranthene		0.2	0.5												
7-nitrobenz[a]anthracene	0.2	0.3	0.2												
6-nitrochrysene															
6-nitrobenz[a]pyrene															
Alkanes and Alkenes															
n-C20										0.0					
n-C22													2.5	1.8	0.9
n-C24										0.0	2.7	1.1	2.2	1.0	0.9
n-C26													2.4	1.3	0.6
n-C28										0.1	0.2	2.9	1.8	1.5	0.6
n-C30										0.1	4.0	2.0	2.4	0.9	1.4
n-C32										0.4	4.7	0.5	1.4	1.3	0.4
n-C36															
Hopanes, Cholestanes, Sterols															
22, 29, 30-trisnorhopane										0.1	1.4	1.0	1.1	1.9	0.3
17a(H), 21b(H)-29-norhopane													1.4	2.1	0.5
17a(H), 21b(H)-29-hopane										1.4	0.5	1.1	1.5	2.2	0.4
20R-5a(H), 14a(H), 17b(H)-cholestane													1.4	1.6	0.6
ABB-20R-C28-methylcholestane										0.0	1.4	2.2	1.2	2.2	0.9
22 a(H), 21b(H)-30-homohopane													1.4	1.9	0.9
22 a(H), 21b(H)-30-homohopane													1.5	2.3	0.5
22S-17a(H), 21b(H)-30-bishomohopane													1.0	2.5	0.5
22R-17a(H), 21b(H)-30-bishomohopane													1.8	2.4	1.4
pristane															
phytane															
cholesterol												0.7			
Carbonyls and Acids															
benzanthrone													1.6	1.0	1.9
9-fluorenone										0.3	1.4		1.9	1.2	2.4
anthroquinone															
benz[a]anthracene-7, 12-dione													1.8	0.7	1.6
hexadecanoic acid															
Sugars															
levoglucosan										1.8	1.4				

Table 8. p scores (15%)

Laboratory No.		6			6a		7			8			9			10		
	Ext. 1	Part. 1	1649a	Part. 1	1649a	Ext. 1	Part. 1	1649a	Ext. 1	Part. 1	1649a	Ext. 1	Part. 1	1649a	Ext. 1	Part. 1	1649a
PAHs																	
naphthalene						0.8	0.3	0.6	0.7	0.6	0.4	1.7			0.1	5.5	
fluorene	1.3	0.3	1.0	0.5	0.3	0.4	0.3	0.3	0.7	1.4	2.0	1.3	1.4	0.3	2.1	1.7	
phenanthrene	0.1	0.3	0.5	0.2	0.6	0.5	0.2	0.2	1.3	0.3	0.2	1.3	1.4	0.2	0.1	0.3	
anthracene	1.3	0.2	0.4	0.3	0.6	0.2	0.3	0.1	1.1	0.7	0.4	1.3	1.4	0.1	0.2	0.3	
1-methylphenanthrene																	
2-methylphenanthrene																	
3-methylphenanthrene																	
9-methylphenanthrene																	
retene	0.3	0.2	0.4	0.5	0.2												
4H-cyclopenta(def)phenanthrene																	
fluoranthene	0.3	0.3	0.4	0.1	0.5	0.5	0.2	0.2	1.4	0.3	0.7	1.1	0.1	0.6	0.2	0.3	
pyrene	0.5	0.3	0.4	0.2	0.6	0.5	0.2	0.2	1.4	0.5	0.6	1.0	0.1	0.5	0.2	0.5	
benzo[ghi]fluoranthene	0.5	0.7	0.4	0.1	0.6												
benz[a]anthracene	0.3	0.3	0.4	0.6	0.5	0.1	0.1	0.1	1.4	0.3	0.8	0.9	0.3	0.4	0.2	0.2	
chrysene	0.3	0.2	0.5	0.2	0.5	0.5	0.2	0.2	1.4	0.2	0.7	0.8	0.2	0.3	1.1	0.2	
triphenylene	0.1	0.3	0.5	0.5	0.6												
benzo[b]fluoranthene	0.3	0.2	0.4	0.3	0.5	0.6	0.2	0.1	1.0	0.2	0.6	0.8	0.2	0.7	0.9	0.2	
benzo[j]fluoranthene																	
benzo[k]fluoranthene	0.3	0.8	0.6	0.3	0.5	0.6	0.2	1.3							0.1	0.2	
benzo[e]pyrene	0.3	0.3	0.4	0.2	0.4				1.2	0.2	0.6	0.8	0.1	0.5			
benzo[a]pyrene	0.3	0.3	0.4	0.2	0.5	0.6	0.4	0.4	1.3	0.1	0.8	0.8	0.1	0.5	0.2	0.3	
perylene	0.1	0.3	0.4	0.2	0.5				1.1	0.1	1.4	1.0	0.3	0.5			
indeno[1,2,3-cd]pyrene	0.3	0.3	0.4	0.3	0.5	2.8	0.3	0.1	1.1	0.2	0.4	0.4	0.2	0.6	0.1	0.5	
benzo[ghi]perylene	0.3	0.2	0.4	0.1	0.4	2.5	0.2	0.1	1.1	0.2	0.5	0.4	0.1	0.6	0.2	0.3	
dibenz[a,h]anthracene	0.3	0.5	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.3	1.0	0.7	0.5	0.4	0.7	0.8	
dibenz[a,c]anthracene																	
benzo[b]chrysene	0.1	0.6	0.2	0.5	0.6												
coronene																	
dibenzo[a,e]pyrene																	
Nitro-PAH																	
9-nitroanthracene	4.1	0.2	0.6														
1-nitropyrene	0.6	0.7	0.1														
2-nitrofluoranthene	0.5	0.3	0.6														
3-nitrofluoranthene		1.4															
7-nitrobenz[a]anthracene	0.2	0.2	0.4														
6-nitrochrysene	0.1	0.7	0.2														
6-nitrobenz[a]pyrene	0.3	0.3	0.5														
Alkanes and Alkenes																	
n-C20									0.2	0.4	0.8				39.1	6.3	
n-C22									1.3	2.1	0.5				0.6	0.7	
n-C24									0.9	1.0	0.3				0.1	0.9	
n-C26									0.1	0.6	0.6				0.3	0.4	
n-C28									0.7	1.0	1.0				0.4	0.6	
n-C30									0.6	1.4	1.0				0.3	0.7	
n-C32									0.7	1.0	1.3				0.0	0.9	
n-C36															1.1	2.3	
Hopanes, Cholestanes, Sterols																	
22, 29, 30-trisnorhopane																	
17a(H), 21b(H)-29-norhopane																	
17a(H), 21b(H)-29-hopane																	
20R-5a(H), 14a(H), 17b(H)-cholestane																	
ABB-20R-C28-methylcholestane																	
22S-17a(H), 21b(H)-30-homohopane																	
22R-17a(H), 21b(H)-30-homohopane																	
22S-17a(H), 21b(H)-30-bishomohopane																	
22R-17a(H), 21b(H)-30-bishomohopane																	
pristane									0.7	0.6	0.6						
phytane									2.5	0.4	0.1						
cholesterol																	
Carbonyls and Acids																	
benzanthrone																	
9-fluorenone																	
anthroquinone																	
benz[a]anthracene-7, 12-dione																	
hexadecanoic acid						8.7	0.4	0.4									
Sugars																	
levoglucosan																	

Table 8. p scores (15%)

Laboratory No.	11			12			13			14			15	
	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a	Ext. I	Part. I	1649a	Part. I	1649a
PAHs														
naphthalene				0.1	1.0	0.4	0.2	0.3	0.4				6.1	2.1
fluorene	1.2	0.5	0.5	0.9	3.1	0.2	0.1	0.2	0.4				1.9	2.9
phenanthrene	1.0	0.4	1.0	0.8	0.2	0.2	0.5	0.1	0.2	0.1			1.2	0.7
anthracene	0.5	0.5	0.5	0.8	0.6	0.8	0.1	0.3	0.2				0.4	0.8
1-methylphenanthrene	0.1	0.5	0.4	0.3	0.1	0.4	0.1	0.1	0.2					
2-methylphenanthrene	1.0	0.2	0.9	0.5	0.9	0.1								
3-methylphenanthrene	0.6	0.0	0.5											
9-methylphenanthrene	1.5	0.8	0.4											
retene				0.1	0.5	0.8								
4H-cyclopenta(def)phenanthrene														
fluoranthene	1.0	0.2	0.3	0.8	0.1	0.1	0.1	0.1	0.2	0.7			0.6	0.3
pyrene	1.2	0.0	0.3	0.5	0.1	0.2	0.0	0.3	0.4	0.7			0.4	0.3
benzo[ghi]fluoranthene														
benz[a]anthracene	0.4	0.2	0.6	0.1	0.3	0.4	0.2	0.1	0.4				0.3	0.2
chrysene	0.6	0.3	0.2	0.1	0.1	0.2	0.1	0.1	0.4				0.2	0.2
triphenylene				0.6	0.4	0.2								
benzo[b]fluoranthene	0.2	0.2	0.5	0.1	0.1	0.4	0.1	0.1	0.2				0.3	0.2
benzo[j]fluoranthene				0.5	0.3	0.4	0.2	0.2	0.4					
benzo[k]fluoranthene				0.5	0.1	0.4	0.1	0.1	0.4				0.4	0.1
benzo[e]pyrene	1.5	0.1	0.4	0.1	0.3	0.2	0.0	0.1	0.2				0.4	0.2
benzo[a]pyrene	0.2	0.5	0.5	0.1	0.2	0.4	0.3	0.1	0.4	0.0			0.2	0.2
perylene	0.1	0.2	0.9	1.0	1.0	0.2	0.3	0.2	0.1				0.6	0.1
indeno[1,2,3-cd]pyrene	0.3	0.1	0.5	0.3	0.1	1.0	0.1	0.1	0.2	0.7			0.4	0.2
benzo[ghi]perylene	0.4	0.3	0.3	0.1	0.3	0.2	0.1	0.2	0.2	0.1			0.3	0.4
dibenz[a,h]anthracene	1.1	0.3	0.7	0.2	0.1	1.8	0.1	0.1	0.4				0.8	0.5
dibenz[a,c]anthracene				0.3	0.3	1.8	0.3	0.1	0.1					
benzo[b]chrysene														
coronene	0.2	0.2	0.4	0.1	0.1	0.4								
dibenzo[a,e]pyrene	1.2	1.5	0.1											
Nitro-PAH														
9-nitroanthracene														
1-nitropyrene														
2-nitrofluoranthene														
3-nitrofluoranthene														
7-nitrobenz[a]anthracene														
6-nitrochrysene														
6-nitrobenz[a]pyrene														
Alkanes and Alkenes														
n-C20														
n-C22	0.6	0.4	0.4											
n-C24	0.4	0.3	1.2							0.1				
n-C26	0.4	0.5	0.2							0.1				
n-C28	0.8	0.5	0.4							0.1				
n-C30	0.4	0.2	0.7							0.1				
n-C32										0.5				
n-C36														
Hopanes, Cholestanes, Sterols														
22, 29, 30-trisnorhopane				1.1	1.6	1.3								
17a(H), 21b(H)-29-norhopane	0.4	0.1	1.5											
17a(H), 21b(H)-29-hopane														
20R-5a(H), 14a(H), 17b(H)-cholestane														
ABB-20R-C28-methylcholestane														
22S-17a(H), 21b(H)-30-homoh	1.1	0.3	1.7	0.9	2.0	2.3								
22R-17a(H), 21b(H)-30-homoh	0.8	0.2	0.7	0.7	0.3	0.1								
22S-17a(H), 21b(H)-30-bishom	0.6	0.2	0.4	1.6	2.6	1.8								
22R-17a(H), 21b(H)-30-bishom	0.2	0.4	1.2	1.7	1.1	1.8								
pristane														
phytane														
cholesterol														
Carbonyls and Acids														
benzanthrone	0.8	0.4	0.2											
9-fluorenone														
anthroquinone														
benz[a]anthracene-7, 12-dione	0.6	0.4	0.9											
hexadecanoic acid														
Sugars														
levoglucosan														

Table 8. p scores (15%)	Table 8 . p scores											
Laboratory No.	16		17		18		19		20		21	
	Part. I	1649a	Part. I	1649a	Part. I	1649a	Part. I	1649a	Part. I	1649a	Part. I	1649a
PAHs												
naphthalene			2.1	2.6								
fluorene			1.2	0.6								
phenanthrene			0.6	0.5								
anthracene			0.9	0.6								
1-methylphenanthrene												
2-methylphenanthrene												
3-methylphenanthrene												
9-methylphenanthrene												
retene									2.1	4.1		
4H-cyclopenta(def)phenanthrene												
fluoranthene			0.7	2.6								
pyrene			0.3	2.6								
benzo[ghi]fluoranthene												
benz[a]anthracene			0.3	0.6								
chrysene			0.1	0.7								
triphenylene												
benzo[b]fluoranthene			0.1	0.6					0.4	2.5		
benzo[j]fluoranthene												
benzo[k]fluoranthene			0.4	0.2					0.5	2.7		
benzo[e]pyrene									0.6	3.0		
benzo[a]pyrene			0.3	0.7								
perylene												
indeno[1,2,3-cd]pyrene			0.3	0.6								
benzo[ghi]perylene			0.3	0.6					1.1	1.4		
dibenz[a,h]anthracene												
dibenz[a,c]anthracene												
benzo[b]chrysene												
coronene									1.9	0.6		
dibenzo[a,e]pyrene												
Nitro-PAH												
9-nitroanthracene												
1-nitropyrene	0.4											
2-nitrofluoranthene	0.5											
3-nitrofluoranthene												
7-nitrobenz[a]anthracene												
6-nitrochrysene												
6-nitrobenz[a]pyrene												
Alkanes and Alkenes												
n-C20											1.2	0.4
n-C22											0.4	1.1
n-C24									4.4	2.6	1.0	1.1
n-C26									5.0	0.6	0.9	0.7
n-C28									3.6	0.6	1.2	1.2
n-C30									2.3	2.3	1.0	1.0
n-C32									2.3	2.7	1.3	1.0
n-C36											1.2	0.4
Hopanes, Cholestanes, Sterols												
22, 29, 30-trisnorhopane										1.7		
17a(H), 21b(H)-29-norhopane												
17a(H), 21b(H)-29-hopane										3.5		
20R-5a(H), 14a(H), 17b(H)-cholestane												
ABB-20R-C28-methylcholestane												
22S-17a(H), 21b(H)-30-homohopane												
22R-17a(H), 21b(H)-30-homohopane												
22S-17a(H), 21b(H)-30-bishomohopane												
22R-17a(H), 21b(H)-30-bishomohopane												
pristane												
phytane												
cholesterol												
Carbonyls and Acids												
benzanthrone									0.1	1.7	1.1	0.9
9-fluorenone											1.7	0.3
anthroquinone											1.3	0.7
benz[a]anthracene-7, 12-dione									7.8	0.6	1.8	0.1
hexadecanoic acid												
Sugars												
levoglucosan												

Table 8. p scores (15%)				
Laboratory No.	22		23	
	Part. I	1649a	Part. I	1649a
PAHs				
naphthalene				
fluorene				
phenanthrene				
anthracene				
1-methylphenanthrene				
2-methylphenanthrene				
3-methylphenanthrene				
9-methylphenanthrene				
retene				
4H-cyclopenta(def)phenanthrene				
fluoranthene			0.0	0.2
pyrene			0.2	0.2
benzo[ghi]fluoranthene			0.1	0.2
benz[a]anthracene			0.0	0.0
chrysene			0.2	0.2
triphenylene				
benzo[b]fluoranthene			0.0	0.2
benzo[j]fluoranthene				
benzo[k]fluoranthene			0.7	0.3
benzo[e]pyrene			0.3	0.2
benzo[a]pyrene			0.2	0.0
perylene				
indeno[1,2,3-cd]pyrene			1.8	1.3
benzo[ghi]perylene			0.2	0.0
dibenz[a,h]anthracene			0.3	0.2
dibenz[a,c]anthracene				
benzo[b]chrysene				
coronene			0.2	0.0
dibenzo[a,e]pyrene				
Nitro-PAH				
9-nitroanthracene				
1-nitropyrene				
2-nitrofluoranthene				
3-nitrofluoranthene				
7-nitrobenz[a]anthracene				
6-nitrochrysene				
6-nitrobenz[a]pyrene				
Alkanes and Alkenes				
n-C20	0.7	0.7		
n-C22	0.4	0.4		
n-C24	0.2	0.5	0.2	0.2
n-C26	0.3	0.4	0.5	0.1
n-C28	0.2	0.6	0.1	0.3
n-C30	0.2	0.7	0.0	0.7
n-C32	0.0	0.5	0.1	0.5
n-C36	0.6	1.3	0.4	0.0
Hopanes, Cholestanes, Sterols				
22, 29, 30-trisnorhopane	0.1	0.4	0.3	0.2
17a(H), 21b(H)-29-norhopane	0.1	0.4	0.0	1.1
17a(H), 21b(H)-29-hopane	0.1	0.4	0.0	0.2
20R-5a(H), 14a(H), 17b(H)-cho	0.3	0.3		
ABB-20R-C28-methylcholestan	0.4	0.6	0.0	7.4
22S-17a(H), 21b(H)-30-homoh	0.1	0.4	0.1	0.3
22R-17a(H), 21b(H)-30-homoh	0.1	0.5	0.3	0.4
22S-17a(H), 21b(H)-30-bishom	0.1	0.4	0.2	0.0
22R-17a(H), 21b(H)-30-bishom	0.3	0.4	0.9	0.3
pristane	0.0	1.5		
phytane	0.8	0.9		
cholesterol				
Carbonyls and Acids				
benzanthrone			0.1	0.5
9-fluorenone				
anthroquinone			0.1	0.6
benz[a]anthracene-7, 12-dione			0.1	0.1
hexadecanoic acid			0.8	1.0
Sugars				
levoglucosan				

Table 9. PM2.5 Interim RM	Laboratory means of three replicates and exercise assigned values																					Exercise Assigned		
ng/g (reported as if three figures were significant)																								
PAHs																								
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	Assigned	s	%RSD
naphthalene	774	709	41.3	145	2471	NA	494	293	NA	113	NA	NA	506	812	NA	145	NA	1473	NA	NA	NA	443	281	63.4
fluorene	138	143	<DL	81	124	121	116	62.0	NA	167	277	352	141	113	NA	NA	NA	1600	NA	NA	NA	135	55	41.1
phenanthrene	2145	2095	423	1198	2816	1712	1660	953	NA	1136	1948	2623	1886	1794	NA	1819	2407	8550	NA	NA	NA	1871	540	29
anthracene	214	195	42.3	139	815	183	207	121	NA	126	447	851	335	168	NA	133	NA	NA	NA	NA	NA	206	100	48.6
1-methylphenanthrene	269	291	NA	NA	NA	NA	NA	NA	NA	256	327	562	492	NA	NA	NA	NA	NA	NA	NA	NA	327	96	29.4
2-methylphenanthrene	513	539	NA	NA	NA	NA	NA	NA	NA	NA	NA	939	799	NA	NA	NA	NA	NA	NA	NA	NA	617	158	25.6
3-methylphenanthrene	349	391	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	580	NA	NA	NA	NA	NA	NA	NA	NA	440	123	
9-methylphenanthrene	below	below	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	412	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
9+4-methylphenanthrene	268	219	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	244	not calc	
retene	73.6	232	NA	NA	828	160	<19600	NA	NA	NA	NA	406	NA	NA	NA	NA	NA	NA	275	NA	NA	329	269	
4H-cyclopenta(*def*)phenanthrene	129	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
fluoranthene	4915	5105	1324	3870	4844	4319	5033	2863	NA	4852	4980	5720	4801	4407	NA	5072	5767	7187	NA	NA	NA	4753	735	15
pyrene	3256	3577	888	2420	3408	3095	3307	2117	NA	3499	3730	3498	3151	3056	NA	3143	4950	4960	NA	NA	NA	3174	454	14
benzo[*ghi*]fluoranthene	1140	1106	NA	NA	NA	1040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1095	51	4.7
cyclopenta[*cd*]pyrene	213	209	NA	NA	8059	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benz[*a*]anthracene	1735	1801	486	1062	1463	1637	2027	NA	NA	2585	1803	1617	1446	1478	NA	1966	NA	2750	NA	NA	NA	1798	461	26
chrysene	below	5197	1190	2745	below	3895	5720	4140	NA	5205	NA	NA	NA	4828	NA	4479	8310	8417	NA	NA	NA	4526	937	21
triphenylene	below	1153	NA	NA	NA	1181	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1167	not calc	
chrysene+triphenylene	5038	NA	NA	NA	5271	NA	NA	NA	NA	NA	5867	8685	5764	NA	NA	NA	NA	NA	NA	NA	NA	6125	1471	24
benzo[*b*]fluoranthene	5349	6058	2155	4329	3838	8604	7540	5347	NA	8996	NA	NA	6192	6340	NA	7204	NA	10497	2007	NA	NA	6345	1635	26
benzo[*j*]fluoranthene	2247	2794	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2232	NA	NA	NA	NA	4897	NA	NA	NA	2424	320	13
benzo[*k*]fluoranthene	2168	2496	1034	1755	3299	2657	4830	3960	NA	2816	NA	NA	2159	2535	NA	2374	NA	3733	3823	NA	NA	2370	335	14
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6730	20057	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benzo[*e*]pyrene	3913	4379	NA	NA	NA	3916	NA	3323	NA	4446	4678	6836	4079	4831	NA	NA	NA	9610	2687	NA	NA	4309	1095	25
benzo[*a*]pyrene	2253	2263	998	1835	1243	2008	2497	1413	NA	2480	2265	3745	2371	1783	NA	2041	NA	4223	NA	NA	NA	2085	666	32
perylene	622	626	NA	NA	NA	347	NA	699	NA	814	481	5796	487	366	NA	NA	NA	NA	NA	NA	NA	555	163	29.4
indeno[1,2,3-*cd*]pyrene	4185	4270	1777	2784	4402	4156	4117	2650	NA	3708	4108	7470	4287	3963	NA	4700	NA	6023	201	NA	NA	4173	1334	32
benzo[*ghi*]perylene	5039	5169	2392	3660	5974	4624	6177	3877	NA	4884	4683	5835	5058	4552	NA	4694	NA	7723	3047	NA	NA	4761	1279	27
dibenz[*a.h*]anthracene	520	NA	158	248	below	463	774	553	NA	558	NA	NA	497	626	NA	350	NA	1217	NA	NA	NA	410	198	48.2
dibenz[*a.c*]anthracene	261	271	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	216	NA	NA	NA	NA	NA	NA	NA	NA	249	29	11.7
dibenz[a,h+*a,c+a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	470	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
dibenz[a,h+*a,c*]anthracene	NA	NA	NA	NA	649	NA	NA	NA	NA	NA	NA	3238	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
benzo[*b*]chrysene	301	283	NA	NA	NA	113	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	292	not calc	
coronene	2075	2164	NA	NA	1643	NA	NA	NA	NA	NA	NA	4653	NA	NA	NA	NA	NA	NA	615	NA	NA	2230	1488	66.7
dibenzo[*a,e*]pyrene	301	NA	NA	NA	290	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	295	not calc	
Nitro-PAH ANALYSES																								
Laboratory No.																						Exercise Assigned		
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	Assigned	s	%RSD
9-nitroanthracene	121	NA	NA	NA	NA	133	NA	NA	NA	NA	NA	NA	NA	NA	124	NA	NA	NA	NA	NA	NA	126	6	4.9
1-nitropyrene	198	NA	NA	NA	NA	193	NA	NA	NA	NA	NA	NA	NA	NA	162	NA	NA	NA	NA	NA	NA	184	20	10.6
2-nitrofluoranthene	334	NA	NA	NA	NA	346	NA	NA	NA	NA	NA	337	NA	NA	352	NA	NA	NA	NA	NA	NA	342	8	2.4
3-nitrofluoranthene	2.56	NA	NA	NA	NA	<0.10	NA	NA	NA	NA	NA	NA	NA	NA	3.66	NA	NA	NA	NA	NA	NA	No assigned value		
7-nitrobenz[*a*]anthracene	34.6	NA	NA	NA	NA	45.0	NA	NA	NA	NA	NA	NA	NA	NA	26.9	NA	NA	NA	NA	NA	NA	35.5	9.1	25.6
6-nitrochrysene	2.14	NA	NA	NA	NA	<2.64	NA	NA	NA	NA	NA	NA	NA	NA	2.51	NA	NA	NA	NA	NA	NA	2.32	0.26	11.0
6-nitrobenzo[*a*]pyrene	312	NA	NA	NA	NA	24.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		

Note: Bolded values were not used in the calculation of the exercise assigned values.

Table 9. Continued																								
Alkanes and Alkenes																						Exercise Assigned		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	Assigned	s	%RSD
n-C20	1942	NA	NA	NA	871	NA	2447	1283	NA	40828	2593	15464	NA	NA	NA	NA	NA	NA	NA	NA	1800	1823	662	36
n-C21	3810	NA	NA	NA	NA	NA	NA	3423	NA	98962	NA	20588	NA	NA	NA	NA	NA	NA	NA	NA	3333	7789	8536	110
n-C22	4567	NA	NA	NA	NA	NA	4987	6177	NA	305912	12129	31457	NA	NA	NA	NA	NA	NA	NA	1172	4133	9232	10347	112
n-C23	10067	NA	NA	NA	NA	NA	NA	21767	NA	601014	NA	45289	NA	NA	NA	NA	NA	NA	5923	2638	9680	15894	15788	99
n-C24	7976	NA	NA	NA	NA	NA	8307	9490	NA	737948	28496	61055	NA	NA	NA	NA	NA	NA	5130	2438	8190	16385	19690	120
n-C25	13201	NA	NA	NA	NA	NA	NA	10567	NA	731869	NA	79182	NA	NA	NA	NA	NA	NA	7040	6172	15633	21966	28259	129
n-C26	9518	NA	NA	NA	NA	NA	5803	8640	NA	635504	37993	74170	NA	NA	NA	NA	NA	NA	5547	5020	11167	19732	24522	124
n-C27	20021	NA	NA	NA	NA	NA	NA	10900	NA	446829	NA	69920	NA	NA	NA	NA	NA	NA	6990	4491	18533	21809	24360	112
n-C28	9722	NA	NA	NA	8050	NA	4500	7250	NA	387921	62829	72449	NA	NA	NA	NA	NA	NA	3217	3086	9813	20102	27175	135
n-C29	26547	NA	NA	NA	NA	NA	NA	15200	NA	383083	NA	66524	NA	NA	NA	NA	NA	NA	5407	6068	27000	24458	22659	93
n-C30	9098	NA	NA	NA	37930	NA	7443	6060	NA	264500	69371	31873	NA	NA	NA	NA	NA	NA	1953	1745	7813	19254	22840	119
n-C31	26879	NA	NA	NA	NA	NA	NA	14933	NA	140367	NA	25817	NA	NA	NA	NA	NA	NA	3263	3364	23300	16259	10869	67
n-C32	9850	NA	NA	NA	15014	NA	10163	4343	NA	45962	NA	12969	NA	NA	NA	NA	NA	NA	2695	496	5420	11879	13657	115
n-C40	<2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
n-C44	<2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
squalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
1-octadecene	NA	NA	NA	NA	1602	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Hopanes, Cholestanes, Sterols																						Exercise Assigned		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	Assigned	s	%RSD
17a(H)-22, 29, 30-trisnorhopane	NA	NA	NA	NA	925	NA	NA	NA	NA	NA	NA	2172	NA	NA	NA	NA	NA	NA	673	NA	680	1112	716	64
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1639	NA	NA	NA	NA	NA	NA	NA	NA	3100	2370	not calc.	
17a(H), 21b(H)-29-hopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7849	NA	NA	NA	NA	NA	NA	2107	NA	2700	4218	3158	75
20R-5a(H), 14b(H), 17b(H)-cholestane	NA	NA	NA	NA	303	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<679	NA	513	408	not calc.	
20S,5a(H),14b(h),17b(H)-cholestane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	427	No assigned value		
20R-5a(H), 14a(H), 17a(H)-cholestane	NA	NA	NA	NA	676	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	328	NA	307	437	207	47
20R,5a(H),14b(H),17b(H)-ergostane	NA	NA	NA	NA	331	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	366	NA	237	311	67	22
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1779	NA	NA	NA	NA	NA	NA	NA	NA	2133	1956	not calc.	
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1638	NA	NA	NA	NA	NA	NA	NA	NA	1467	1553	not calc.	
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7463	NA	NA	NA	NA	NA	NA	NA	NA	1413	4438	not calc.	
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4735	NA	NA	NA	NA	NA	NA	NA	NA	710	2723	not calc.	
pristane	1148	NA	NA	NA	NA	NA	823	333	NA	NA	NA	116583	NA	NA	NA	NA	NA	NA	NA	NA	300	651	409	63
phytane	846	NA	NA	NA	NA	NA	840	378	NA	NA	NA	395516	NA	NA	NA	NA	NA	NA	NA	NA	400	616	262	43
cholesterol	NA	NA	NA	NA	3809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1679	NA	No assigned value		
stigmasterol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<DL	NA	No assigned value		
Carbonyls and Acids																						Exercise Assigned		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	Assigned	s	%RSD
benzanthrone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4577	656	NA	No assigned value		
9-fluorenone	NA	NA	NA	NA	1795	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	222	NA	No assigned value		
anthroquinone	NA	NA	NA	NA	2884	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	814	NA	No assigned value		
benz[a]anthracene-7, 12-dione	NA	NA	NA	NA	1422	NA	NA	NA	NA	NA	NA	4570	NA	NA	NA	NA	NA	NA	3173	1136	NA	2575	1606	62
G-nonanoic lactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
syringaldehyde	NA	NA	NA	NA	4232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1088	NA	NA	No assigned value		
isopimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1110	NA	NA	No assigned value		
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pinonic acid	NA	NA	NA	NA	18221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
hexadecanoic acid	NA	NA	NA	NA	118168	NA	104000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	91879	NA	104682	13158	13
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
nopinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
pinionaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
caronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		

Note: Bolded values were not used in the calculation of the exercise assigned values.

Table 9. Continued																								
Phenols																						Exercise Assigned		
Laboratory No.																						Assigned	s	%RSD
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22			
syringol	NA	NA	NA	NA	NA	NA	NA	NA	other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
4-ethylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	125	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
isoeugenol	NA	NA	NA	NA	4129	NA	NA	NA	<159	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
propionylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	366	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
butyrylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	<159	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
guaiacol	NA	NA	NA	NA	NA	NA	NA	NA	<1212	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
4-methylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
4-ethylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	<159	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No assigned value		
Sugars																						Exercise Assigned		
Laboratory No.																						Assigned	s	%RSD
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22			
levoglucosan	NA	NA	NA	NA	174847	NA	NA	NA	37640	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	56123	NA	89537	74457	83

Table 10. SRM 1649a (Trial II)	Laboratory means of three replicates and certificate values																							
ng/g (reported as if three figures were significant)																								
PAHs																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc	95%CL	type
naphthalene	1020	1045	220	233	1921	NA	803	3567	NA	835	NA	NA	813	746	NA	227	NA	6609	NA	NA	NA	no target		Target
fluorene	228	267	87	227	249	187	230	150	NA	244	327	570	210	161	NA	NA	NA	3320	NA	NA	NA	230	50	Reference
phenanthrene	4172	4667	2966	4047	4409	3529	3968	3790	NA	4242	4667	5151	4135	3680	NA	3843	4740	23667	NA	NA	NA	4140	370	Certified
anthracene	428	480	305	412	1313	386	675	569	NA	636	493	1142	500	359	NA	423	NA	2373	NA	NA	NA	432	82	Certified
1-methylphenanthrene	369	536	NA	NA	NA	NA	NA	NA	NA	438	462	562	465	NA	NA	NA	NA	NA	NA	NA	NA	370.0	40.0	Reference
2-methylphenanthrene	753	923	NA	NA	NA	NA	NA	NA	NA	NA	NA	1472	1032	NA	NA	NA	NA	NA	NA	NA	NA	730	120	Reference
3-methylphenanthrene	555	728	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	776	NA	NA	NA	NA	NA	NA	NA	NA	500	50	Reference
9-methylphenanthrene	below	below	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	475	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
9+4-methylphenanthrene	515	416	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
retene	105	174	NA	NA	166	118	<19600	NA	NA	NA	NA	352	NA	NA	NA	NA	NA	NA	<299	NA	NA	no target		Target
4H-cyclopenta(*def*)phenanthrene	358	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	320	60	Reference
fluoranthene	6755	7005	4588	6809	6204	5524	6143	6337	NA	6662	7606	7347	6057	5652	NA	6709	6080	11667	NA	NA	NA	6450	180	Certified
pyrene	5597	5695	3813	5519	5706	4782	5288	5360	NA	5706	5948	5128	5290	4628	NA	4963	9387	7943	NA	NA	NA	5290	250	Certified
benzo[*ghi*]fluoranthene	872	886	NA	NA	NA	853	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	880	20	Reference
cyclopenta[*cd*]pyrene	167	202	NA	NA	<408	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benz[*a*]anthracene	2327	2368	1645	1897	2170	2037	2208	NA	NA	2541	2240	2851	2239	1780	NA	2330	NA	2867	NA	NA	NA	2210	73	Certified
chrysene	below	3705	2058	2934	below	2645	4613	4493	NA	3393	below	below	below	3147	NA	3384	6930	7610	NA	NA	NA	3049	60	Certified
triphenylene	below	1192	NA	NA	NA	1255	NA	NA	NA	NA	below	below	below	NA	NA	NA	NA	NA	NA	NA	NA	1357	54	Certified
chrysene+triphenylene	3931	NA	NA	NA	5030	NA	NA	NA	NA	NA	4441	8734	4378	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benzo[*b*]fluoranthene	6437	5593	3765	5521	6413	7510	6848	5683	NA	8495	below	below	5877	5110	NA	6757	NA	10017	1913	NA	NA	6450	640	Certified
benzo[*j*]fluoranthene	1525	1910	NA	NA	NA	NA	NA	NA	NA	NA	below	below	1668	NA	NA	NA	NA	5650	NA	NA	NA	1500	400	Reference
benzo[*k*]fluoranthene	1916	1855	1424	1698	2847	2138	2718	3400	NA	2214	below	below	1834	1800	NA	1852	NA	3097	2970	NA	NA	1913	31	Certified
benzo[*b+j+k*]fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8430	17872	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
benzo[*e*]pyrene	2980	3199	NA	NA	NA	2995	NA	2780	NA	3646	3889	3653	3050	2992	NA	NA	NA	9253	2013	NA	NA	3090.0	190	Certified
benzo[*a*]pyrene	2627	2428	2120	2265	2086	2396	2583	2020	NA	2664	2501	2584	2321	2005	NA	2109	NA	3820	NA	NA	NA	2509	87	Certified
perylene	638	715	NA	NA	NA	524	NA	616	NA	823	658	657	611	493	NA	NA	NA	NA	NA	NA	NA	646	75	Certified
indeno[1,2,3-*cd*]pyrene	3290	3031	2311	2610	4049	3247	3583	2590	NA	2994	2933	2825	2861	3014	NA	2982	NA	4903	236	NA	NA	3180	720	Certified
benzo[*ghi*]perylene	4191	4074	2598	3686	6837	3970	4618	3863	NA	4207	4023	2755	4093	3476	NA	3400	NA	5933	2470	NA	NA	4010.0	910.00	Certified
dibenz[*a,h*]anthracene	314	NA	316	283	NA	425	562	465	NA	673	below	below	371	418	NA	714	NA	883	NA	NA	NA	288.0	23.0	Certified
dibenz[*a,c*]anthracene	217	243	NA	NA	NA	NA	NA	NA	NA	NA	below	below	206	NA	NA	NA	NA	NA	NA	NA	NA	200	25	Certified
dibenz[a,h+*a,c*+*a,j*]anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	358	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		
dibenz[a,h+*a,c*]anthracene	NA	NA	NA	NA	NA	316	NA	NA	NA	NA	NA	854	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		
benzo[*b*]chrysene	312	319	NA	NA	NA	164	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	315	13	Certified
coronene	4242	4040	NA	NA	10432	NA	NA	NA	NA	NA	NA	3484	NA	NA	NA	NA	NA	NA	1079	NA	NA	no target		Target
dibenzo[*a,e*]pyrene	598	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	630	80	Reference
Nitro-PAH ANALYSES																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc.	95%CL	type
9-nitroanthracene	35.5	NA	NA	NA	NA	45.8	NA	NA	NA	NA	NA	NA	NA	NA	21.7	NA	NA	NA	NA	NA	NA	no target		Target
1-nitropyrene	71.5	NA	NA	NA	NA	64.6	NA	NA	NA	NA	NA	NA	NA	NA	69.3	NA	NA	NA	NA	NA	NA	no target		Target
2-nitrofluoranthene	275	NA	NA	NA	NA	303	NA	NA	NA	NA	NA	277	NA	NA	405	NA	NA	NA	NA	NA	NA	no target		Target
3-nitrofluoranthene	4.64	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	28.6	NA	NA	NA	NA	NA	NA	no target		Target
7-nitrobenz[*a*]anthracene	35.7	NA	NA	NA	NA	23.0	NA	NA	NA	NA	NA	NA	NA	NA	16.0	NA	NA	NA	NA	NA	NA	no target		Target
6-nitrochrysene	4.49	NA	NA	NA	NA	<5.2	NA	NA	NA	NA	NA	NA	NA	NA	3.21	NA	NA	NA	NA	NA	NA	no target		Target
6-nitrobenzo[*a*]pyrene	<40	NA	NA	NA	NA	7.29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
Note: Bolded values were not used in the calculation of the exercise assigned values.																								

Table 10. Continued

Alkanes and Alkenes																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc.	95%CL	type
n-C20	1523	NA	NA	NA	1589	NA	1447	1363	NA	14344	2096	4213	946	NA	NA	NA	NA	NA	NA	NA	1000	no target		Target
n-C21	2944	NA	NA	NA	NA	NA	NA	3153	NA	39157	NA	5025	NA	NA	NA	NA	NA	NA	NA	NA	1933	no target		Target
n-C22	3575	NA	NA	NA	NA	NA	4178	5607	NA	116759	5046	6161	3319	NA	NA	NA	NA	NA	NA	2280	3567	no target		Target
n-C23	18445	NA	NA	NA	NA	NA	NA	27267	NA	242203	NA	12419	NA	NA	NA	NA	NA	NA	8117	8726	14467	no target		Target
n-C24	31877	NA	NA	NA	37260	NA	28250	23833	NA	291376	32277	17468	23690	NA	NA	NA	NA	NA	12093	16970	26933	no target		Target
n-C25	94820	NA	NA	NA	NA	NA	NA	47700	NA	341188	NA	42943	NA	NA	NA	NA	NA	NA	31700	63572	85500	no target		Target
n-C26	105052	NA	NA	NA	NA	NA	76125	45933	NA	315374	111415	35012	79737	NA	NA	NA	NA	NA	29767	62888	96767	no target		Target
n-C27	112336	NA	NA	NA	NA	NA	NA	44000	NA	246063	NA	27549	NA	NA	NA	NA	NA	NA	22500	57362	89067	no target		Target
n-C28	59283	NA	NA	NA	57257	NA	25025	29300	NA	186576	38096	32253	40842	NA	NA	NA	NA	NA	7950	44525	48900	no target		Target
n-C29	95353	NA	NA	NA	NA	NA	NA	48133	NA	209324	NA	42252	NA	NA	NA	NA	NA	NA	13427	36761	81967	no target		Target
n-C30	34405	NA	NA	NA	35144	NA	18225	19500	NA	102104	50647	11710	18883	NA	NA	NA	NA	NA	6200	12405	27967	no target		Target
n-C31	65744	NA	NA	NA	NA	NA	NA	43433	NA	93717	NA	14068	NA	NA	NA	NA	NA	NA	5073	16201	54767	no target		Target
n-C32	20823	NA	NA	NA	25219	NA	12875	13700	NA	29326	NA	6245	12142	NA	NA	NA	NA	NA	<836	4974	14533	no target		Target
n-C40	<2000	NA	NA	NA	4875	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
n-C44	<2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
squalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
1-octadecene	NA	NA	NA	NA	910	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target

Hopanes, Cholestanes, Sterols																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc.	95%CL	type
17a(H)-22, 29, 30-trisnorhopane	NA	NA	NA	NA	2280	NA	NA	NA	NA	NA	NA	1971	NA	NA	NA	NA	NA	NA	2723	NA	3000	no target		Target
17a(H), 21b(H)-29-norhopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1518	NA	NA	NA	NA	NA	NA	NA	NA	12533	no target		Target
17a(H), 21b(H)-29-hopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10636	NA	NA	NA	NA	NA	NA	7867	NA	18233	no target		Target
20R-5a(H), 14b(H), 17b(H)-cholestane	NA	NA	NA	NA	1797	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1930	NA	3067	no target		Target
20S,5a(H),14b(h),17b(H)-cholestane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2733	no target		Target
20R-5a(H), 14a(H), 17a(H)-cholestane	NA	NA	NA	NA	3538	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	779	NA	1700	no target		Target
20R,5a(H),14b(H),17b(H)-ergostane	NA	NA	NA	NA	1258	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1500	NA	1433	no target		Target
22S-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1761	NA	NA	NA	NA	NA	NA	NA	NA	8833	no target		Target
22R-17a(H), 21b(H)-30-homohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1471	NA	NA	NA	NA	NA	NA	NA	NA	6083	no target		Target
22S-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1172	NA	NA	NA	NA	NA	NA	NA	NA	5533	no target		Target
22R-17a(H), 21b(H)-30-bishomohopane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	790	NA	NA	NA	NA	NA	NA	NA	NA	3400	no target		Target
pristane	579	NA	NA	NA	NA	NA	326	558	NA	NA	NA	51908	NA	NA	NA	NA	NA	NA	NA	NA	267	no target		Target
phytane	764	NA	NA	NA	NA	NA	581	562	NA	NA	NA	100122	NA	NA	NA	NA	NA	NA	NA	NA	267	no target		Target
cholesterol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3428	NA	no target		Target
stigmasterol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<DL	NA	no target		Target

Carbonyls and Acids																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc.	95%CL	type
benzanthrone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7497	1613	NA	no target		Target
9-fluorenone	NA	NA	NA	NA	1479	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	413.0	NA	no target		Target
anthroquinone	NA	NA	NA	NA	1837	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1119.0	NA	no target		Target
benz[a]anthracene-7, 12-dione	NA	NA	NA	NA	2377	NA	NA	NA	NA	NA	NA	4827	NA	NA	NA	NA	NA	NA	4810	2140	NA	no target		Target
G-nonanoic lactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
G-decanolactone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
9-anthraldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
syringaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
pimaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<703	NA	NA	no target		Target
isopimeric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2340	NA	NA	no target		Target
pinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
pinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
hexadecanoic acid	NA	NA	NA	NA	327590	NA	372750	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	267957	NA	no target		Target
norpinic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
norpinonic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
nopinone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
pinionaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
ceronaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target

Note: Bolded values were not used in the calculation of the exercise assigned values.

Table 10. Continued

Phenols																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7*	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc.	95%CL	type
syringol	NA	NA	NA	NA	NA	NA	NA	NA	<128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
4-ethylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	163	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
isoeugenol	NA	NA	NA	NA	NA	NA	NA	NA	<128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
propionylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	148	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
butyrylsyringol	NA	NA	NA	NA	NA	NA	NA	NA	206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
guaiacol	NA	NA	NA	NA	NA	NA	NA	NA	<1026	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
4-methylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	<123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target
4-ethylguaiacol	NA	NA	NA	NA	NA	NA	NA	NA	<128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	no target		Target

Sugars																						From 1649a Certif.		
Laboratory No.																								
* received after initial data review	1	1a	3	3a	4	6	7	8	9	10	11	12	13	15*	16	17	18	19	20	21*	22	conc.	95%CL	type
levoglucosan	NA	NA	NA	NA	68464	NA	NA	NA	38431	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31376	NA	no target		Target

Table 11. PM2.5 Interim RM: z scores (25%)																				
Laboratory No.	1	1a	3	3a	4	6	7	8	9	10	11	12	13	16	17	18	19	20	21	22
naphthalene	3.8	3.1	-3.6	-2.5	20.9		1.0	-1.0		-2.9			1.1		-2.5		10.8			
fluorene	0.0	0.2		-1.6	-0.4	-0.5	-0.6	-2.2		0.9	4.1	6.3	0.1				42.7			
phenanthrene	0.6	0.5	-3.1	-1.4	2.0	-0.4	-0.5	-2.0		-1.6	0.2	1.6	0.0		-0.1	1.1	14.2			
anthracene	0.1	-0.3	-3.2	-1.3	11.5	-0.5	-0.1	-1.7		-1.6	4.5	12.2	2.4		-1.5					
1-methylphenanthrene	-0.7	-0.4								-0.9	0.0	2.9	2.0							
2-methylphenanthrene	-0.7	-0.5										2.1	1.2							
3-methylphenanthrene	-0.8	-0.4											1.3							
9+4-methylphenanthrene	0.4	-0.4																		
retene	-3.1	-1.2			6.1	-2.1						0.9								
fluoranthene	0.1	0.3	-2.9	-0.8	0.1	-0.4	0.2	-1.6		0.1	0.2	0.8	0.0		0.2	0.8	2.0			
pyrene	0.1	0.5	-2.9	-1.0	0.3	-0.1	0.2	-1.3		0.4	0.7	0.4	0.0		-0.1	2.2	2.2			
benzo[ghi]fluoranthene	0.2	0.0				-0.2														
benz[a]anthracene	-0.2	-0.1	-2.9	-1.7	-0.8	-0.4	0.4			1.7	0.0	-0.5	-0.8		0.3		2.0			
chrysene		0.6	-2.9	-1.6		-0.5	1.1	-0.3		0.6					0.0	3.4	3.5			
triphenylene		0.0				0.0														
chrysene+triphenylene	-0.7				-0.6						-0.2	1.7	-0.2							
benzo[b]fluoranthene	-0.6	-0.2	-2.6	-1.3	-1.6	1.4	0.8	-0.6		1.7			-0.1		0.5		2.6	-2.7		
benzo[j]fluoranthene	-0.3	0.6											-0.3				4.1			
benzo[k]fluoranthene	-0.3	0.3	-2.2	-1.0	1.6	0.5	4.2	2.8		0.8			-0.3		0.0		2.4	2.5		
benzo[e]pyrene	-0.3	0.1				-0.3		-0.9		0.2	0.4	2.4	-0.2				5.0	-1.5		
benzo[a]pyrene	0.3	0.3	-2.1	-0.5	-1.6	-0.2	0.7	-1.3		0.7	0.3	3.1	0.5		-0.1		4.0			
perylene	0.3	0.3				-1.6		0.8		1.6	-0.7	35.8	-0.7							
indeno[1,2,3-cd]pyrene	0.0	0.1	-2.3	-1.3	0.2	0.0	-0.1	-1.5		-0.5	-0.1	3.1	0.1		0.5		1.8	-3.8		
benzo[ghi]perylene	0.2	0.3	-2.0	-0.9	1.0	-0.1	1.2	-0.8		0.1	-0.1	0.9	0.2		-0.1		2.5	-1.4		
dibenz[a,h]anthracene	1.8		-2.2	-1.2		1.2	4.7	2.2		2.3			1.6		-0.1		9.7			
dibenz[a,c]anthracene	0.2	0.3											-0.5							
benzo[b]chrysene	0.1	-0.1				-2.4														
coronene	-0.3	-0.1			-1.1							4.3						-2.9		
dibenzo[a,e]pyrene	0.1				-0.1															
9-nitroanthracene	-0.2					0.2								-0.1						
1-nitropyrene	0.3					0.2								-0.5						
2-nitrofluoranthene	-0.1					0.0						-0.1		0.1						
7-nitrobenz[a]anthracene	-0.1					1.1								-1.0						
6-nitrochrysene	-0.3													0.3						
n-C20	0.3				-2.1		1.4	-1.2		85.6	1.7	29.9								0.0
n-C21	-2.0							-2.2		46.8		6.6								-2.3
n-C22	-2.0						-1.8	-1.3		128.5	1.3	9.6							-3.5	-2.2
n-C23	-1.5							1.5		147.3		7.4						-2.5	-3.3	-1.6
n-C24	-2.1						-2.0	-1.7		176.1	3.0	10.9						-2.7	-3.4	-2.0
n-C25	-1.6							-2.1		129.3		10.4						-2.7	-2.9	-1.2
n-C26	-2.1						-2.8	-2.2		124.8	3.7	11.0						-2.9	-3.0	-1.7
n-C27	-0.3							-2.0		78.0		8.8						-2.7	-3.2	-0.6
n-C28	-2.1				-2.4		-3.1	-2.6		73.2	8.5	10.4						-3.4	-3.4	-2.0
n-C29	0.3							-1.5		58.7		6.9						-3.1	-3.0	0.4
n-C30	-2.1				3.9		-2.5	-2.7		50.9	10.4	2.6						-3.6	-3.6	-2.4
n-C31	2.6							-0.3		30.5		2.4						-3.2	-3.2	1.7
n-C32	-0.7				1.1		-0.6	-2.5		11.5		0.4						-3.1	-3.8	-2.2
17a(H)-22, 29, 30-trisnorhopane					-0.7							3.8						-1.6		-1.6
17a(H), 21b(H)-29-norhopane												-1.2								1.2
17a(H), 21b(H)-29-hopane												3.4						-2.0		-1.4
20R-5a(H), 14b(H), 17b(H)-cholestane					-1.0															1.0
20R-5a(H), 14a(H), 17a(H)-cholestane					2.2													-1.0		-1.2
20R,5a(H),14b(H),17b(H)-ergostane					0.3													0.7		-1.0
22S-17a(H), 21b(H)-30-homohopane												-0.4								0.4
22R-17a(H),,21b(H)-30-homohopane												0.2								-0.2
22S-17a(H), 21b(H)-30-bishomohopane												2.7								-2.7
22R-17a(H), 21b(H)-30-bishomohopane												3.0								-3.0
pristane	3.1						1.1	-2.0				712.2								-2.2
phytane	1.5						1.5	-1.5												-1.4
benz[a]anthracene-7, 12-dione					-1.8							3.1						0.9	-2.2	
hexadecanoic acid					0.5		0.0												-0.5	
levoglucosan					3.8				-2.3										-1.5	

Table 12. PM2.5 Interim RM: z scores (s)																				
Laboratory No.	1	1a	3	3a	4	6	7	8	9	10	11	12	13	16	17	18	19	20	21	22
naphthalene	1.4	1.2	-1.4	-1.0	7.9		0.4	-0.4		-1.1			0.4		-1.0		4.1			
fluorene	0.0	0.1		-1.0	-0.2	-0.3	-0.4	-1.3		0.5	2.4	3.7	0.1				25.3			
phenanthrene	0.5	0.4	-2.6	-1.2	1.7	-0.3	-0.4	-1.6		-1.3	0.1	1.3	0.0		-0.1	0.9	11.9			
anthracene	0.0	-0.1	-1.6	-0.7	5.8	-0.3	0.0	-0.8		-0.8	2.3	6.1	1.2		-0.7					
1-methylphenanthrene	-0.6	-0.4								-0.7	0.0	2.4	1.7							
2-methylphenanthrene	-0.7	-0.5										2.0	1.2							
3-methylphenanthrene	-0.7	-0.4											1.1							
retene	-1.0	-0.4			1.9	-0.6						0.3						-0.2		
fluoranthene	0.2	0.4	-4.6	-1.2	0.1	-0.6	0.3	-2.5		0.1	0.3	1.2	0.0		0.4	1.3	3.2			
pyrene	0.2	0.8	-4.9	-1.6	0.5	-0.2	0.3	-2.3		0.7	1.2	0.7	-0.1		-0.1	3.7	3.8			
benzo[ghi]fluoranthene	0.9	0.2				-1.1														
benz[a]anthracene	-0.2	0.0	-2.8	-1.6	-0.8	-0.4	0.4			1.6	0.0	-0.4	-0.8		0.3		2.0			
chrysene		0.7	-3.3	-1.7		-0.6	1.2	-0.3		0.7					0.0	3.8	3.9			
chrysene+triphenylene	-0.7				-0.6						-0.2	1.7	-0.2							
benzo[b]fluoranthene	-0.6	-0.2	-2.4	-1.2	-1.5	1.3	0.7	-0.6		1.5			-0.1		0.5		2.4	-2.5		
benzo[j]fluoranthene	-0.6	1.2											-0.6				7.7			
benzo[k]fluoranthene	-0.5	0.4	-3.7	-1.7	2.7	0.9	7.0	4.5		1.3			-0.5		0.1		3.9	4.2		
benzo[e]pyrene	-0.3	0.1				-0.3		-0.8		0.2	0.4	2.3	-0.2				4.7	-1.4		
benzo[a]pyrene	0.2	0.2	-1.6	-0.4	-1.3	-0.1	0.6	-1.0		0.5	0.2	2.4	0.4		-0.1		3.1			
perylene	0.3	0.3				-1.5		0.8		1.5	-0.7	33.5	-0.6							
indeno[1,2,3-cd]pyrene	0.0	0.1	-1.7	-1.0	0.2	0.0	-0.1	-1.1		-0.3	-0.1	2.4	0.1		0.4		1.3	-2.9		
benzo[ghi]perylene	0.2	0.3	-1.8	-0.8	0.9	-0.1	1.1	-0.7		0.1	-0.1	0.8	0.2		-0.1		2.2	-1.3		
dibenz[a,h]anthracene	0.9		-1.1	-0.6		0.6	2.3	1.1		1.1			0.8		0.0		4.8			
dibenz[a,c]anthracene	0.4	0.7											-1.1							
coronene	-0.1	0.0			-0.4							1.6						-1.1		
9-nitroanthracene	-0.8					1.1								-0.3						
1-nitropyrene	0.7					0.4								-1.1						
2-nitrofluoranthene	-1.0					0.4						-0.6		1.2						
7-nitrobenz[a]anthracene	-0.1					1.0								-0.9						
6-nitrochrysene	-0.7													0.7						
n-C20	0.2				-1.4		0.9	-0.8		58.9	1.2	20.6								0.0
n-C21	-0.5							-0.5		10.7		1.5								-0.5
n-C22	-0.5						-0.4	-0.3		28.7	0.3	2.1							-0.8	-0.5
n-C23	-0.4							0.4		37.1		1.9						-0.6	-0.8	-0.4
n-C24	-0.4						-0.4	-0.4		36.6	0.6	2.3						-0.6	-0.7	-0.4
n-C25	-0.3							-0.4		25.1		2.0						-0.5	-0.6	-0.2
n-C26	-0.4						-0.6	-0.5		25.1	0.7	2.2						-0.6	-0.6	-0.3
n-C27	-0.1							-0.4		17.4		2.0						-0.6	-0.7	-0.1
n-C28	-0.4				-0.4		-0.6	-0.5		13.5	1.6	1.9						-0.6	-0.6	-0.4
n-C29	0.1							-0.4		15.8		1.9						-0.8	-0.8	0.1
n-C30	-0.4				0.8		-0.5	-0.6		10.7	2.2	0.6						-0.8	-0.8	-0.5
n-C31	1.0							-0.1		11.4		0.9						-1.2	-1.2	0.6
n-C32	-0.1				0.2		-0.1	-0.6		2.5		0.1						-0.7	-0.8	-0.5
17a(H)-22, 29, 30-trisnorhopane					-0.3							1.5						-0.6		-0.6
17a(H), 21b(H)-29-hopane												1.1						-0.7		-0.5
20R-5a(H), 14a(H), 17a(H)-cholestane					1.2													-0.5		-0.6
20R,5a(H),14b(H),17b(H)-ergostane					0.3													0.8		-1.1
22R-17a(H), 21b(H)-30-homohopane																				
pristane	1.2						0.4	-0.8				284								-0.9
phytane	0.9						0.9	-0.9				1505								-0.8
benz[a]anthracene-7, 12-dione					-0.7							1.2							0.4	

Table 13. p scores (15%) for all reported compounds in PM 2.5 Interim RM and SRM 1649a														
Laboratory No.	1	1	1a	1a	3	3	3a	3a	4	4	6	6	7	7
	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a
PAHs														
naphthalene	0.1	0.5	0.4	0.2	0.2	0.3	0.2	1.1	1.7	0.2			0.6	0.9
fluorene	0.0	0.3	0.2	0.4		1.0	0.4	0.8	2.2	0.2	0.0	0.4		0.2
phenanthrene	0.4	0.2	0.0	0.3	0.2	0.5	0.4	0.2	1.9	0.9	0.0	0.3	0.8	0.2
anthracene	0.4	0.1	0.1	0.4	0.4	0.8	0.4	0.9	1.0	0.3	0.0	0.4	0.7	0.4
1-methylphenanthrene	0.4	0.2	0.1	0.2										
2-methylphenanthrene	0.4	0.2	0.0	0.2										
3-methylphenanthrene	0.0	0.1	0.1	0.2										
9-methylphenanthrene	0.0	0.0	0.4	0.4										
retene	0.1	0.2	0.4	0.5					1.9	3.3	0.4	0.7		
4H-cyclopenta(*def*)phenanthrene	0.4	0.6												
fluoranthene	0.2	0.2	0.4	0.1	0.4	0.8	0.2	0.1	0.2	0.4	0.4	0.4	0.2	0.3
pyrene	0.6	0.1	0.0	0.3	0.2	0.8	0.4	0.5	0.0	0.4	0.4	0.3	0.1	0.3
benzo[*ghi*]fluoranthene	0.3	0.0	0.0	0.2							0.4	0.5		
cyclopenta[*cd*]pyrene	0.2	0.1	0.0	0.1					0.4					
benz[*a*]anthracene	0.4	0.3	0.0	0.4	0.4	0.3	0.2	0.2	1.7	0.2	0.4	0.7	0.3	0.4
chrysene			0.4	0.1	0.2	0.3	0.2	0.6	1.0	0.2	0.4	0.5	0.4	0.3
triphenylene			0.4	0.2							0.4	0.5		
benzo[*b*]fluoranthene	0.2	0.1	0.1	0.2	0.2	0.7	0.1	0.1	2.4	0.2	0.4	0.7	0.1	0.4
benzo[*j*]fluoranthene	0.4	0.1	0.4	0.2										
benzo[*k*]fluoranthene	0.1	0.1	0.0	0.3	0.4	0.1	0.1	0.3	1.9	0.6	0.4	0.7	0.4	0.4
benzo[*e*]pyrene	0.1	0.2	0.1	0.2							0.4	0.5		
benzo[*a*]pyrene	0.4	0.2	0.1	0.4	0.2	0.7	0.2	0.2	0.4	1.2	0.4	0.7	0.7	0.3
perylene	0.1	0.1	0.0	0.4							0.4	0.4		
indeno[1,2,3-*cd*]pyrene	0.1	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.0	0.2	0.4	0.5	1.2	0.7
benzo[*ghi*]perylene	0.4	0.2	0.0	0.2	0.3	0.3	0.4	0.2	1.9	1.0	0.4	0.5	0.3	0.2
dibenz[*a,h*]anthracene	0.1	0.4	0.1	0.2	0.0	0.2	0.4	0.6	1.0		0.4	1.1	1.6	2.2
dibenz[*a,c*]anthracene	0.2	0.2	0.2	0.4										
benzo[*b*]chrysene	0.4	0.2	0.3	0.3							0.4	1.1		
coronene	0.4	0.0	0.4	0.1					0.4	0.2				
dibenzo[*a,e*]pyrene	0.1	0.1							6.2					
Nitro-PAH														
9-nitroanthracene	0.4	0.1									0.1	1.1		
1-nitropyrene	0.1	0.2									0.2	0.1		
2-nitrofluoranthene	0.2	0.5									0.1	0.1		
3-nitrofluoranthene	0.0	0.5												
7-nitrobenz[*a*]anthracene	0.4	0.5									0.2	0.5		
6-nitrochrysene	0.4	0.2												
6-nitrobenzo[*a*]pyrene	0.4										0.1	0.2		
Alkanes and Alkenes														
n-C20	0.4	0.2							0.6	0.4			1.4	1.1
n-C21	0.3	0.2												
n-C22	0.4	0.1											0.5	1.0
n-C23	0.4	0.3												
n-C24	0.4	0.5								2.5			1.4	0.6
n-C25	0.4	0.3												
n-C26	0.4	0.2											1.8	0.6
n-C27	0.4	0.2												
n-C28	0.5	0.5								1.8			1.0	4.1
n-C29	0.2	0.2												
n-C30	0.5	0.5							0.5	1.5			0.6	1.1
n-C31	0.2	0.2												
n-C32	0.5	0.1							0.0	0.2			1.7	0.6
n-C40										2.3				
1-octadecene									3.3	1.3				
Hopanes, Cholestanes, Sterols														
17a(H)-22, 29, 30-trisnorhopane									1.9	0.2				
17a(H), 21b(H)-29-norhopane														
17a(H), 21b(H)-29-hopane														
20R-5a(H), 14b(H), 17b(H)-cholestane									1.9	0.2				
20S,5a(H),14b(h),17b(H)-cholestane														
20R-5a(H), 14a(H), 17a(H)-cholestane									0.6	0.2				
20R,5a(H),14b(H),17b(H)-ergostane									2.2	0.4				
22S-17a(H), 21b(H)-30-homohopane														
22R-17a(H), 21b(H)-30-homohopane														
22S-17a(H), 21b(H)-30-bishomohopane														
22R-17a(H), 21b(H)-30-bishomohopane														
pristane	0.4	0.1											1.2	0.6
phytane	0.4	0.2											0.4	0.3
cholesterol									1.9					
Carbonyls and Acids														
benzanthrone														
9-fluorenone									3.8	1.3				
anthraquinone									0.6	1.0				
benz[*a*]anthracene-7, 12-dione									0.4	0.2				
pimaric acid														
isopimaric acid														
pinonic acid									0.6					
hexadecanoic acid									2.8	0.6				0.8
Phenols														
4-ethylsyringol														
isoeugenol									3.1					
propionylsyringol														
butyrylsyringol														
Sugars														
levoglucosan									0.7	0.6				

Table 13. p scores (15%)														
Laboratory No.	8	8	9	9	10	10	11	11	12	12	13	13	16	16
Int	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a
PAHs														
naphthalene	0.6	0.4			0.9	0.7					0.3	0.2		
fluorene	1.0	0.6			0.9	0.8	1.2	0.7	1.3	3.4	0.2	0.0		
phenanthrene	0.5	0.4			0.9	0.7	0.8	0.7	0.8	0.7	0.3	0.1		
anthracene	0.4	0.1			0.2	0.8	0.9	1.1	0.9	0.7	0.3	0.1		
1-methylphenanthrene					0.9	0.7	0.9	0.4	0.9	0.4	0.5	0.1		
2-methylphenanthrene									0.9	2.9	0.3	0.5		
3-methylphenanthrene											0.3	0.0		
9-methylphenanthrene											0.3	0.1		
retene									2.7	1.8				
4H-cyclopenta(*def*)phenanthrene														
fluoranthene	0.4	0.2			0.1	0.7	0.9	0.7	0.9	0.7	0.1	0.1		
pyrene	0.5	0.1			0.9	0.3	0.8	0.8	0.9	0.7	0.1	0.2		
benzo[*ghi*]fluoranthene														
cyclopenta[*cd*]pyrene														
benz[*a*]anthracene					1.2	0.3	0.8	0.7	0.9	1.8	0.1	0.1		
chrysene	0.4	0.3			0.9	0.7	0.9	0.7	0.9	0.8	0.3	0.0		
triphenylene									0.9	0.8				
benzo[*b*]fluoranthene	0.6	0.4			0.5	0.3	0.9	0.5	0.8	1.0	0.3	0.2		
benzo[*j*]fluoranthene									0.9	1.0	0.1	0.2		
benzo[*k*]fluoranthene	0.4	0.5			0.2	0.8			0.9	1.0	0.4	0.1		
benzo[*e*]pyrene	0.5	0.4			0.9	0.7	0.8	0.5	0.9	0.4	0.3	0.2		
benzo[*a*]pyrene	0.6	0.7			0.9	0.7	0.9	0.5	0.9	0.3	0.3	0.2		
perylene	0.6	1.3			1.5	2.4	0.9	0.7	1.7	0.5	0.3	0.2		
indeno[1,2,3-*cd*]pyrene	0.5	0.5			0.1	0.8	0.9	0.7	0.9	0.5	0.3	0.2		
benzo[*ghi*]perylene	0.1	0.2			0.9	0.8	0.9	0.7	0.9	0.3	0.3	0.2		
dibenz[*a,h*]anthracene	0.4	1.3			0.9	0.3	0.9	0.7	1.3	0.8	0.3	0.1		
dibenz[*a,c*]anthracene									1.3	0.8	0.3	0.1		
benzo[*b*]chrysene														
coronene									0.9	0.7				
dibenzo]*a,e*]pyrene														
Nitro-PAH														
9-nitroanthracene													0.5	0.4
1-nitropyrene													0.2	0.1
2-nitrofluoranthene													0.2	0.1
3-nitrofluoranthene													0.8	3.6
7-nitrobenz[*a*]anthracene													1.5	0.2
6-nitrochrysene													1.1	0.5
6-nitrobenzo[*a*]pyrene														
Alkanes and Alkenes														
n-C20	0.3	0.4			0.9	1.8	0.9	1.8	0.9	2.4		0.1		
n-C21	0.7	0.3			0.6	1.7			1.0	1.0				
n-C22	0.3	0.4			0.8	1.6	1.0	1.1	0.8	1.6		0.1		
n-C23	1.2	0.4			0.9	1.8			0.9	0.9				
n-C24	0.3	0.8			1.3	1.9	0.6	0.6	0.9	1.5		0.1		
n-C25	0.3	0.4			1.0	2.1			0.8	0.4				
n-C26	0.3	0.5			0.9	2.0	1.1	0.8	0.9	0.7		0.1		
n-C27	0.3	0.4			0.9	1.8			0.9	1.0				
n-C28	0.3	0.5			0.9	1.8	0.8	1.8	0.5	1.8		0.0		
n-C29	0.3	0.7			0.9	0.7			0.9	1.2				
n-C30	0.5	0.7			0.9	0.8	0.9	0.7	0.9	0.3		0.1		
n-C31	0.3	0.8			0.9	0.7			0.9	0.5				
n-C32	0.3	0.5			0.9	0.8			1.1	2.4		0.2		
n-C40														
1-octadecene														
Hopanes, Cholestanes, Sterols														
17a(H)-22, 29, 30-trisnorhopane									1.0	1.1				
17a(H), 21b(H)-29-norhopane									0.9	1.0				
17a(H), 21b(H)-29-hopane									0.9	1.5				
20R-5a(H), 14b(H), 17b(H)-cholestane														
20S,5a(H),14b(h),17b(H)-cholestane														
20R-5a(H), 14a(H), 17a(H)-cholestane														
20R,5a(H),14b(H),17b(H)-ergostane														
22S-17a(H), 21b(H)-30-homohopane									1.7	2.4				
22R-17a(H), 21b(H)-30-homohopane									1.7	0.7				
22S-17a(H), 21b(H)-30-bishomohopane									0.9	1.8				
22R-17a(H), 21b(H)-30-bishomohopane									7.4	1.8				
pristane	1.0	0.7							0.9	1.8				
phytane	0.7	0.8							0.9	2.4				
cholesterol														
Carbonyls and Acids														
benzanthrone														
9-fluorenone														
anthraquinone									0.9	1.8				
benz[*a*]anthracene-7, 12-dione									1.0	0.7				
pimaric acid														
isopimaric acid														
pinonic acid														
hexadecanoic acid														
Phenols														
4-ethylsyringol			1.1	1.3										
isoeugenol														
propionylsyringol			1.0	0.2										
butyrylsyringol				0.6										
Sugars														
levoglucosan			0.2	0.2										

Table 13. p scores (15%)												
Laboratory No.	17	17	18	18	19	19	20	20	21	21	22	22
	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a	Int RM	1649a
PAHs												
naphthalene		0.2			1.0	0.3						
fluorene					0.1	0.6						
phenanthrene		0.1	1.1	0.2	0.6	0.4						
anthracene		0.0				0.9						
1-methylphenanthrene												
2-methylphenanthrene												
3-methylphenanthrene												
9-methylphenanthrene												
retene							0.5					
4H-cyclopenta(*def*)phenanthrene												
fluoranthene		0.0	0.4	5.7	0.7	0.6						
pyrene		0.3	5.6	0.3	0.6	0.6						
benzo[*ghi*]fluoranthene												
cyclopenta[*cd*]pyrene												
benz]*a*]anthracene		0.1			3.9	0.6						
chrysene		0.5	0.5	1.8	2.3	2.4						
triphenylene												
benzo[*b*]fluoranthene		0.4			0.1	0.3	0.5	0.6				
benzo[*j*]fluoranthene					0.6	0.2						
benzo[*k*]fluoranthene		0.2			0.1	0.4	0.1	0.6				
benzo[*e*]pyrene					0.7	1.6	0.1	0.3				
benzo[*a*]pyrene		0.2			2.9	0.6						
perylene												
indeno[1,2,3-*cd*]pyrene		0.2			2.2	0.3	0.1					
benzo[*ghi*]perylene		0.4			0.5	0.6	0.1	0.6				
dibenz]*a,h*]anthracene		1.2			3.0	0.4						
dibenz[*a,c*]anthracene												
benzo[*b*]chrysene												
coronene							0.4	0.6				
dibenzo[*a,e*]pyrene												
Nitro-PAH												
9-nitroanthracene												
1-nitropyrene												
2-nitrofluoranthene												
3-nitrofluoranthene												
7-nitrobenz]*a*]anthracene												
6-nitrochrysene												
6-nitrobenzo[*a*]pyrene												
Alkanes and Alkenes												
n-C20											0.4	0.0
n-C21									2.3	0.4	0.5	0.2
n-C22									2.3	0.6	0.3	0.9
n-C23							0.2	0.6	0.5	0.9	0.4	0.5
n-C24							0.7	0.6	0.5	0.6	0.2	0.4
n-C25							1.0	1.6	0.6	0.7	0.2	0.4
n-C26							2.3	1.6	0.5	0.2	0.5	0.3
n-C27							0.5	0.6	0.5	0.6	0.3	0.4
n-C28							1.2	1.6	0.5	0.4	0.3	0.3
n-C29							1.1	2.5	0.4	0.2	0.3	0.3
n-C30							1.1	0.2	2.3	1.6	0.5	0.2
n-C31							1.7	0.6	0.5	0.2	0.7	0.4
n-C32							2.3				0.9	0.6
n-C40												
1-octadecene												
Hopanes, Cholestanes, Sterols												
17a(H)-22, 29, 30-trisnorhopane							0.7	0.2			0.7	0.2
17a(H), 21b(H)-29-norhopane											0.8	0.3
17a(H), 21b(H)-29-hopane							1.7	0.6			0.7	0.1
20R-5a(H), 14b(H), 17b(H)-cholestane											1.0	0.3
20S,5a(H),14b(h),17b(H)-cholestane											1.8	0.4
20R-5a(H), 14a(H), 17a(H)-cholestane								0.3			1.4	0.4
20R,5a(H),14b(H),17b(H)-ergostane											0.7	0.3
22S-17a(H), 21b(H)-30-homohopane											0.7	0.2
22R-17a(H), 21b(H)-30-homohopane											0.7	0.0
22S-17a(H), 21b(H)-30-bishomohopane											0.4	0.3
22R-17a(H), 21b(H)-30-bishomohopane											0.7	0.5
pristane											0.0	1.4
phytane											0.0	1.4
cholesterol									0.5	0.6		
Carbonyls and Acids												
benzanthrone							1.1	0.2	0.5	1.2		
9-fluorenone									0.5	0.4		
anthraquinone									0.5	1.2		
benz[*a*]anthracene-7, 12-dione							0.5	0.2	0.5	0.7		
pimaric acid							2.3					
isopimaric acid								0.6				
pinonic acid												
hexadecanoic acid									0.1	0.7		
Phenols												
4-ethylsyringol												
isoeugenol												
propionylsyringol												
butyrylsyringol												
Sugars												
levoglucosan									1.6	1.0		

Table 14. Summary of percent z- and p-scores (absolute value) in ranges from <1 to >3

Laboratory		Air Particulate Extract 1				Air Particulate 1				PM2.5 Interim RM				
		z score (25%)	z score (s)	p score (15%)	# cmpds	z score (25%)	z score (s)	p score (15%)	# cmpds	z score (25%)	z score (s)	p score (15%)	# cmpds	p score (15
1	|z or p|≤1	96%	79%	100%	30	93%	91%	100%	31	70%	98%	100%	50	100%
	1<|z or p|≤2	4%	21%	0%		7%	9%	0%		11%	2%	0%		0%
	2<|z or p|≤3	0%	0%	0%		0%	0%	0%		13%	0%	0%		0%
	|z or p|>3	0%	0%	0%		0%	0%	0%		6%	0%	0%		0%
1a	|z or p|≤1									92%	91%	100%	28	
	1<|z or p|≤2									4%	9%	0%		
	2<|z or p|≤3									0%	0%	0%		
	|z or p|>3									4%	0%	0%		
2	|z or p|≤1	100%	100%	100%	6	100%	100%	100%	6					100%
	1<|z or p|≤2	0%	0%	0%		0%	0%	0%						0%
	2<|z or p|≤3	0%	0%	0%		0%	0%	0%						0%
	|z or p|>3	0%	0%	0%		0%	0%	0%						0%
3	|z or p|≤1	86%	79%	100%	14	71%	14%	100%	14	0%	0%	100%	13	100%
	1<|z or p|≤2	7%	21%	0%		14%	71%	0%		8%	46%	0%		0%
	2<|z or p|≤3	7%	0%	0%		7%	14%	0%		69%	23%	0%		0%
	|z or p|>3	0%	0%	0%		7%	0%	0%		23%	31%	0%		0%
3a	|z or p|≤1									36%	50%	100%	14	
	1<|z or p|≤2									57%	50%	0%		
	2<|z or p|≤3									7%	0%	0%		
	|z or p|>3									0%	0%	0%		
4	|z or p|≤1	68%	44%	70%	23	36%	35%	65%	23	48%	61%	29%	34	64%
	1<|z or p|≤2	26%	56%	23%		18%	30%	13%		19%	26%	29%		23%
	2<|z or p|≤3	5%	0%	9%		23%	4%	9%		19%	4%	21%		9%
	|z or p|>3	0%	0%	0%		23%	30%	13%		15%	9%	21%		5%
5	|z or p|≤1	48%	55%	12%	33	41%	35%	21%	33					70%
	1<|z or p|≤2	90%	45%	76%		28%	45%	48%						24%
	2<|z or p|≤3	14%	0%	12%		13%	0%	30%						3%
	|z or p|>3	10%	10%	0%		19%	19%	0%						3%
6	|z or p|≤1	83%	75%	54%	25	87%	68%	92%	26	78%	86%	100%	24	96%
	1<|z or p|≤2	11%	19%	12%		9%	26%	8%		13%	14%	0%		4%
	2<|z or p|≤3	0%	0%	0%		4%	0%	0%		9%	0%	0%		0%
	|z or p|>3	6%	6%	4%		0%	5%	0%		0%	0%	0%		0%
6a	|z or p|≤1					95%	82%	100%	22					100%
	1<|z or p|≤2					5%	18%	0%						0%
	2<|z or p|≤3					0%	0%	0%						0%
	|z or p|>3					0%	0%	0%						0%
7	|z or p|≤1	43%	64%	73%	15	67%	47%	87%	15	50%	83%	68%	24	93%
	1<|z or p|≤2	36%	7%	0%		7%	20%	7%		21%	9%	32%		7%
	2<|z or p|≤3	14%	7%	13%		20%	7%	7%		17%	4%	0%		0%
	|z or p|>3	7%	21%	13%		7%	27%	0%		13%	4%	0%		0%
8	|z or p|≤1	67%	80%	50%	24	77%	67%	83%	24	27%	77%	97%	30	58%
	1<|z or p|≤2	29%	10%	67%		14%	19%	13%		37%	13%	3%		25%
	2<|z or p|≤3	5%	0%	0%		9%	5%	4%		37%	7%	0%		4%
	|z or p|>3	0%	10%	0%		5%	10%	0%		0%	3%	0%		0%

Table 14. Summary of percent z- and p-scores (absolute value) in ranges from <1 to >3

9	|z or p|≤1	50%	7%	73%	15	36%	21%	79%	14	0%		67%	3	93%
	1<|z or p|≤2	29%	50%	27%		36%	36%	21%		0%		33%		0%
	2<|z or p|≤3	7%	21%	0%		7%	14%	0%		100%		0%		0%
	|z or p|>3	14%	21%	0%		21%	29%	0%		0%		0%		7%
10	|z or p|≤1	29%	30%	82%	22	38%	55%	82%	22	33%	33%	73%	30	
	1<|z or p|≤2	29%	40%	9%		38%	23%	5%		17%	23%	23%		
	2<|z or p|≤3	19%	10%	5%		14%	9%	5%		7%	3%	0%		
	|z or p|>3	19%	20%	5%		10%	14%	9%		43%	40%	3%		
11	|z or p|≤1	85%	75%	78%	32	62%	59%	97%	32	63%	63%	90%	21	88%
	1<|z or p|≤2	10%	26%	22%		34%	41%	3%		5%	26%	10%		13%
	2<|z or p|≤3	5%	0%	0%		3%	0%	0%		11%	11%	0%		0%
	|z or p|>3	0%	0%	0%		0%	0%	0%		21%	0%	0%		0%
12	|z or p|≤1	73%	40%	86%	28	74%	52%	82%	28	23%	28%	48%	46	79%
	1<|z or p|≤2	20%	47%	14%		13%	43%	11%		15%	42%	35%		18%
	2<|z or p|≤3	7%	7%	0%		9%	0%	4%		13%	14%	13%		4%
	|z or p|>3	7%	7%	0%		4%	4%	4%		49%	17%	4%		0%
13	|z or p|≤1	95%	100%	100%	19	79%	47%	100%	19	71%	76%	100%	22	100%
	1<|z or p|≤2	5%	0%	0%		21%	53%	0%		19%	24%	0%		0%
	2<|z or p|≤3	0%	0%	0%		0%	0%	0%		10%	0%	0%		0%
	|z or p|>3	0%	0%	0%		0%	0%	0%		0%	0%	0%		0%
14	|z or p|≤1	82%	55%	100%	11	82%	100%		11					
	1<|z or p|≤2	18%	45%	0%		18%	0%							
	2<|z or p|≤3	0%	0%	0%		0%	0%							
	|z or p|>3	0%	0%	0%		0%	0%							
15	|z or p|≤1					72%	69%	81%	18					88%
	1<|z or p|≤2					11%	13%	13%						0%
	2<|z or p|≤3					6%	0%	0%						13%
	|z or p|>3					11%	19%	6%						0%
16	|z or p|≤1					100%		100%	2	100%	60%	67%	6	
	1<|z or p|≤2					0%		0%		0%	40%	33%		
	2<|z or p|≤3					0%		0%		0%	0%	0%		
	|z or p|>3					0%		0%		0%	0%	0%		
17	|z or p|≤1					87%	92%	85%	15	85%	100%		13	92%
	1<|z or p|≤2					7%	8%	8%		8%	0%			0%
	2<|z or p|≤3					0%	0%	8%		8%	0%			8%
	|z or p|>3					7%	0%	0%		0%	0%			0%
18	|z or p|≤1									25%	25%	50%	4	
	1<|z or p|≤2									25%	25%	25%		
	2<|z or p|≤3									25%	0%	0%		
	|z or p|>3									25%	50%	25%		
19	|z or p|≤1					83%	73%		12	0%	0%	33%	15	
	1<|z or p|≤2					0%	18%			20%	13%	7%		
	2<|z or p|≤3					8%	0%			27%	13%	60%		
	|z or p|>3					8%	9%			53%	73%	0%		

Table 14. Summary of percent z- and p-scores (absolute value) in ranges from <1 to >3

20	|z or p|≤1					21%	29%	23%	14	14%	68%	59%	22	7%
	1<|z or p|≤2					36%	29%	15%		19%	18%	36%		13%
	2<|z or p|≤3					7%	7%	23%		38%	9%	5%		47%
	|z or p|>3					36%	36%	38%		29%	5%	0%		33%
21	|z or p|≤1					0%	23%	33%	14	7%	92%	78%	18	75%
	1<|z or p|≤2					31%	54%	67%		7%	8%	22%		25%
	2<|z or p|≤3					54%	15%	0%		29%	0%	0%		0%
	|z or p|>3					15%	8%	0%		57%	0%	0%		0%
22	|z or p|≤1					78%	100%	100%	19	28%	95%	92%	26	89%
	1<|z or p|≤2					22%	0%	0%		36%	5%	8%		11%
	2<|z or p|≤3					0%	0%	0%		36%	0%	0%		0%
	|z or p|>3					0%	0%	0%		0%	0%	0%		0%
23	|z or p|≤1					61%	68%	97%	31					90%
	1<|z or p|≤2					19%	19%	3%						6%
	2<|z or p|≤3					3%	3%	0%						0%
	|z or p|>3					16%	10%	0%						3%
total	|z or p|≤1	70%	62%	71%	313	65%	59%	81%	424	47%	65%	78%	410	84%
	1<|z or p|≤2	19%	29%	23%		18%	28%	11%		18%	19%	14%		10%
	2<|z or p|≤3	6%	3%	3%		8%	3%	5%		18%	5%	5%		4%
	|z or p|>3	5%	7%	2%		8%	10%	3%		16%	11%	3%		2%

Table 15. SRM 1649a means and standard deviations of a single measurement for the data sets from Trial I and Trial II (limited data excluded)

ng/g (reported as if three figures were significant)

	Trial I			results	Trial II			results	From 1649a Certificate of Analysis		
	average	stdev	n	not used	average	stdev	n	not used	conc.	95%CL	type
naphthalene	579	376	8	4 & 12	1068	1016	14	19	no target		Target
fluorene	208	123	14	5	248	117	12	19	230	50	Reference
phenanthrene	4182	908	15		4166	556	14	19	4140	370	Certified
anthracene	564	299	14		597	299	13	19	432	82	Certified
1-methylphenanthrene	402	15	8		472	35	8		370	40	Reference
2-methylphenanthrene	733	81	3		1045	307	3		730	120	Reference
3-methylphenanthrene	528	22	2		686	116	3		500	50	Reference
9-methylphenanthrene	342		1		475		1		no target		Target
9+4-methylphenanthrene	370		1		406	70	2		no target		Target
retene	144	32	3	20	183	99	5		no target		Target
4H-cyclopenta(*def*)phenanthrene	327		1		358		1		320	60	Reference
fluoranthene	6586	1320	15		6766	1542	15		6450	180	Certified
pyrene	5248	788	15		5742	1321	15		5290	250	Certified
benzo[*ghi*]fluoranthene	1172	531	3	23	870	17	3		880	20	Reference
cyclopenta[*cd*]pyrene			0		185	25	8		no target		Target
benz[*a*]anthracene	2393	553	15		2286	339	13		2210	73	Certified
chrysene	3670	973	13		4176	1811	13		3049	60	Certified
triphenylene	1243	270	3		1223	99	2		1357	54	Certified
chrysene+triphenylene	1243	546	5		5303	1998	5		no target		Target
benzo[*b*]fluoranthene	5631	1403	13		6218	1998	13		6450	640	Certified
benzo[*j*]fluoranthene	1724	1389	3		1701	195	3	19	1500	400	Reference
benzo[*k*]fluoranthene	1961	557	13		2305	625	13		1913	31	Certified
benzo[*b+j+k*]fluoranthene	9851	556	3		13151	6677	2		no target		Target
benzo[*b+k*]fluoranthene	9543		1				0		no target		Target
benzo[*b+j*]fluoranthene	7610		1				0		no target		Target
benzo[*e*]pyrene	3246	482	13		3134	563	8	19	3090	190	Certified
benzo[*a*]pyrene	2640	556	15		2466	446	15		2509	87	Certified
perylene	615	81	16		655	57	8		646	75	Certified
indeno[1,2,3-*cd*]pyrene	2991	553	15		4160	1106	15	20	3180	720	Certified
benzo[*ghi*]perylene	3754	339	13		4048	1151	13		4010	910	Certified
dibenz[*a,h*]anthracene	557	456	13	9 & 23	501	201	13		288	23	Certified
dibenz[*a,c*]anthracene	213	17	2		222	99	3		200	25	Certified
dibenz[*a,h+a,c+a,j*]anthracene	774		1		358		1		no target		Target
dibenz[*a,h+a,c*]anthracene	406		1		585	339	2		no target		Target
benzo[*b*]chrysene	291	21	3		265	99	3		315	13	Certified
coronene	3724	1309	5		4655	3467	5		no target		Target
dibenzo[*a,e*]pyrene	659		1		598		1		630	80	Reference

Table 15 cont.	Trial I			results	Trial II			results	Value Assignment Based on Trials I and II		
	average	stdev	n	not used	average	stdev	n	not used	conc.	95%CL	reference
9-nitroanthracene	18.3	14.2	3		34.3	12.1	3		33.4	6.1	5
1-nitropyrene	18.3	9.9	3		68.5	3.5	3		70.9	4.3	5
2-nitrofluoranthene	283	58	3		315	61	0		313	38	5
3-nitrofluoranthene	10.8		1		16.6	10.9	2				
7-nitrobenz[a]anthracene	23.1	5.6	0		24.9	10.0	0		27.8	6.7	5
6-nitrochrysene	3.49	0.56	2		3.85	0.91	2		4.01	0.52	5
6-nitrobenz[*a*]pyrene	65.1	80.7	2		7.29		1				
n-C20	1368	305	0		1772	1046	0	10			
n-C21			1		3264	1289	0	10			
n-C22	6549	4029	5		4493	1118	7	10			
n-C23			3		16143	7789	5	10			
n-C24	31998	18721	5		25965	7789	0	10			
n-C25			0		60533	27858	5	10			
n-C26	109891	86577	0		72476	31995	0	10			
n-C27			0		59090	39671	0	10			
n-C28	72034	57879	0		37656	16316	0	10			
n-C29			0		56226	32734	0	10			
n-C30	42063	39049	0		24742	13697	0	10			
n-C31			0		36617	26114	5	10			
n-C32	28573	31924	3		16858	7627	0				
n-C36	6368	4982	3				0				
n-C40			0		4875		3				
1-octadecene			0		910		3				
ABB-20R-C28-methylcholestane	3650	1329	4				0				
20R-5a(H), 14a(H), 17b(H)-cholestane	6344	4117	3				0				
17a(H)-22, 29, 30-trisnorhopane	3161	1651	0		2494	458	0				
17a(H), 21b(H)-29-norhopane	16181	6546	0		7026	7789	2				
17a(H), 21b(H)-29-hopane	20555	14312	5		12245	5367	0				
20R-5a(H), 14b(H), 17b(H)-cholestane			0		2432	306	2				
20S,5a(H),14b(h),17b(H)-cholestane			0		2733		0				
20R-5a(H), 14a(H), 17a(H)-cholestane			0		2006	1404	2				
20R,5a(H),14b(H),17b(H)-ergostane			0		1346	124	2				
22S-17a(H), 21b(H)-30-homohopane	7332	4257	5		5297	5001	2				
22R-17a(H), 21b(H)-30-homohopane	5762	3628	5		3777	3261	2				
22S-17a(H), 21b(H)-30-bishomohopane	4307	2427	5		3353	3084	2				
22R-17a(H), 21b(H)-30-bishomohopane	3601	1552	5		2095	1846	2				
pristane	536	124	2		433	458	0	10			
phytane	392	58	2		543	206	0	12			
cholesterol	13650		1				0				
benzanthrone	10356	20734	5	20	7497		1				
9-fluorenone	1886	1354	0		1479		3				
anthroquinone	831	27	2		1837		1				
benz[*a*]anthracene-7, 12-dione	5714	5104	3	20	4005	1410	3				
isopimaric acid			0		2340		1				
hexadecanoic acid	308568	161606	3		350170	31933	2				
4-ethylsyringol			0		283		1				
propionylsyringol			0		148		3				
butyrylsyringol			0		206		1				
levoglucosan	28800		1		53447	21236	2				

Table 16. Value Assignment of Selected PAHs and Nitro-PAHs in the PM 2.5 Intermin RM			
ng/g (reported as if three figures were significant)			
	Assigned Value	Uncertainty	Reference
naphthalene	520	200	5
fluorene	142	2	5
phenanthrene	2020	120	5
anthracene	258	58	5
1-methylphenanthrene	350	130	6
2-methylphenanthrene	620	170	6
3-methylphenanthrene	440	130	6
fluoranthene	4940	160	5
pyrene	3310	210	5
benzo[*ghi*]fluoranthene	1095	65	6
benz[*a*]anthracene	1690	160	5
chrysene	4780	640	6
triphenylene	1167	49	6
benzo[*b*]fluoranthene	5920	400	5
benzo[*j*]fluoranthene	2420	330	6
benzo[*k*]fluoranthene	2290	170	5
benzo[*e*]pyrene	4130	320	6
benzo[*a*]pyrene	2294	62	5
perylene	580	67	6
indeno[1,2,3-*cd*]pyrene	4268	16	5
benzo[*ghi*]perylene	5118	72	5
dibenz[*a,h*]anthracene	410	190	6
dibenz[*a,c*]anthracene	249	32	6
benzo[*b*]chrysene	292	13	6
coronene	2180	820	6
dibenzo[*a,e*]pyrene	249	42	6
9-nitroanthracene	126	8	6
1-nitropyrene	126	21	6
2-nitrofluoranthene	346	3	5
3-nitrofluoranthene	3.11	0.68	6
7-nitrobenz[a]anthracene	36	11	6
6-nitrochrysene	2.33	0.34	6

Appendix A
Description of Materials and Reporting Instructions Accompanying Samples

Intercomparison Exercise: Air Particulate Extract I and Air Particulate I Description of Materials and Instructions

Intercomparison Exercise Materials:

QA01EXT01 (Air Particulate Extract I)
QA01APT01 (Air Particulate I)

For the QA01EXT01 (Air Particulate Extract I), each of the five ampoules contains approximately 1.2 mL of Air Particulate Extract I. This extract was prepared by extracting Air Particulate I (also included in the shipment) using dichloromethane. Each 1 mL of extract represents 0.1 g of Air Particulate I. This material has not been enriched or spiked. Each 2 mL ampoule is labeled with an individual ampoule number as well as the above name.

For QA01APT01 (Air Particulate I), each bottle contains approximately 0.5 g of Air Particulate I. This material is a bulk portion of SRM 1649a that has been sieved to <63 μm. This material has also not been enriched or spiked. Each bottle is labeled with an individual jar number as well as the above name.

In addition, three concurrent analyses of SRM 1649a, Urban Dust, are recommended. One bottle containing approximately 0.5 g of this material is included in the shipment.

Instructions for Use:

Please analyze three samples of Air Particulate Extract I, Air Particulate I, and SRM 1649a, using **your** laboratory's and/or program's analytical protocols, for the concentrations (mass/mass) of the analytes listed in Table 1. If your laboratory is not analyzing some of these compounds in the PM 2.5 program, then you do not need to report values for this exercise. There is space provided at the bottom of the spreadsheet to report additional analytes of interest to your program. Please provide data for all of the compounds that your laboratory is quantifying in the PM 2.5 program. All data received will be summarized.

The concentration range for some of the most abundant PAHs of interest (phenanthrene, fluoranthene, pyrene, and benzo[*a*]pyrene) in SRM 1649a is approximately 2.5 mg/kg to 6.5 mg/kg. Note that the PAH concentrations in Air Particulate I are expected to be in a similar range.

Reporting of Results:
Please report one result, as if three figures were significant, for each of the analytes in each of the three replicates of the Air Particulate Extract I, Air Particulate I, and SRM 1649a. Report results in units of ng/g solution for the extract and ng/g as received for the air particulate samples. If your analysis of the extract is based on a mass /volume basis, please convert to mass/mass by using the density of the solution. Report the density that was used for the conversion. Report the date of measurement of each sample in the requested m/d/y format.

We recognize that the reported concentrations for some of the requested determinands will probably include concentrations of compounds reported to coelute with the determinand of interest with methods commonly in use. Please note at the bottom of your table of reported results if any coelution qualifiers are applicable to your data. Please note that any changes you make to the column or row headings **within** the tables will **not** be seen by the coordinators because only the table entries and comments at the bottom of the tables are automatically transferred to the exercise database.

We prefer that concentration values be reported for each analyte determined. If the measured concentration is below your typical reporting concentration for an analyte in a particular matrix, you can report the number and list the appropriate detection limit, quantification limit, etc. at the bottom of the data table. However, if you need to report non-numerical data please use the following conventions:

NA	"Not analyzed", "not determined"
<"value"	"Less than specified concentration", e.g., <8 ng/g
Other	"Other"; add note of explanation at end of data table, e.g., interference
DL	"Below detection limit" may be used, however, <"value" is preferable

Do not use negative numbers or parentheses to indicate "less than detection limits".

The enclosed floppy diskette (DOS format) contains an EXCEL file, APT01.xls. If you have any software/hardware conversion problems, please contact Michele Schantz. The data file templates also include places for you to list the surrogate/internal standards and type of calibration curve used, and to provide a brief description of the analyses. Please **do not** add Aspaces≅ before entering numbers in the table cells and enter them as "numbers" not as "labels". Please **do not** insert any columns or rows **within** the table in the data file. If you wish to include additional data and/or other information or comments, you may add it to the bottom of the data table in the diskette file or send it in hard copy. A printout of the data file format is shown in Table 2.

Submit your results either via diskette file or as an attached file via e-mail (preferred) to:

Michele M. Schantz
NIST
100 Bureau Drive Stop 8392
Gaithersburg, MD 20899-8392

E-mail: michele.schantz@nist.gov

The deadline for receipt of data is April 30, 2001.

Further Information:

If you need further information, please contact Michele at the address listed above or at the following phone numbers: Phone: (301)975-3106
FAX: (301)977-0685

Table 1: Analytes of Interest in NIST Intercomparison Exercise Program for Organics in PM2.5 Air Particulate Matter

Polycyclic aromatic hydrocarbons (PAHs)

naphthalene
benzo[*j*]fluoranthene
phenanthrene
anthracene
1-methylphenathrene
2-methylphenanthrene
3-methylphenanthrene
9-methylphenanthrene
retene
4H-cyclopenta(*def*)phenanthrene
fluoranthene
pyrene
benzo[*ghi*]fluoranthene
cyclopenta[*cd*]pyrene
benz[*a*]anthracene
chrysene
triphenylene
benzo[*b*]fluoranthene
benzo[*k*]fluoranthene
benzo[*e*]pyrene
benzo[*a*]pyrene
perylene
indeno[1,2,3-*cd*]pyrene
benzo[*ghi*]perylene
dibenz[*a,h*]anthracene
dibenz[*a,c*]anthracene
benzo[*b*]chrysene
coronene
dibenzo[*a,e*]pyrene

fluorene

Nitro-PAHs

9-nitroanthracene
1-nitropyrene
2-nitrofluoranthene
3-nitrofluoranthene
7-nitrobenz[*a*]anthracene
6-nitrochrysene
6-nitrobenz[*a*]pyrene

Alkanes

n-C20
n-C22
n-C24
n-C26
n-C28
n-C30
n-C32
n-C36
n-C40
n-C44

Alkenes

squalene
1-octadecene

Hopanes, Cholestanes (Diasteranes, Steranes)

22, 29, 30-trisnorhopane
17a(H), 21b(H)- 29-norhopane
17a(H), 21b(H)- 29-hopane
20R-5a(H), 14a(H), 17b(H)-cholestane
ABB-20R-C28 methylcholestane
22S-17a(H),21b(H)-30-homohopane
22R-17a(H),21b(H)-30-homohopane
22S-17a(H),21b(H)-30-bishomohopane
22R-17a(H),21b(H)-30-bishomohopane

pristane
phytane

Sterols

cholesterol
stigmasterol

Carbonyls (ketones, aldehydes)

benzanthrone
9-fluorenone
anthroquinone
benz[*a*]anthracene-7,12-dione
G-nonanoic lactone
G-decanolactone

9-anthraldehyde
syringaldehyde

Acids, Alkanoic acids, Resin Acids

pimaric acid
isopimaric acid
pinic acid
pinonic acid
hexadecanoic acid
norpinic acid
norpinonic acid
nopinone
Pinionaldehyde
caronaldehyde

Phenols and methoxyphenols

syringol

4-ethylsyringol
isoeugenol
propionylsyringol
butyrylsyringol
guaiacol
4-methylguaiacol
4-ethylguaiacol

Sugars
levoglucosan

Additional analytes quantified should be added to the bottom of the spreadsheet. These data will also be summarized.

Table 2. Diskette Data File Format (File: APT01.*)

NIST Intercomparison Exercise Program for Organics in PM2.5 Air Particulate Matter
Sample: QA01EXT01 - Air Particulate Extract I
Sample: QA01APT01 - Air Particulate I

Please fill in all blanks; Use requested units of concentration; Report results as if 3 figures were significant
DO NOT INSERT ROWS OR COLUMNS WITHIN THIS TABLE. DO NOT MOVE CELLS.

- If necessary, add additional data/information at the end of the table.
- Use one of the following if no concentration is reported for an analyte:
  NA = Not analyzed/determined; <"conc" = <detection limit conc.; Other = other, explain in a note at end of table
  (DL = "below detection limit" may be used, but <"conc", e.g., <8, is preferable.)
  Do not use parentheses or negative numbers to indicate "less than detection limit".

Reporting Date (m/d/y): _____
Laboratory: _____
Submitted by: _____

BRIEF DESCRIPTION OF PROCEDURES USED:

Approximate amount of sample extracted: AP Extract I _____ g, ; or _____ mL
Air Particulate I _____ g, as received SRM 1649a _____ g, as received

Extraction method: _____
Extraction solvent: _____
Extraction time: _____
Extraction - other: _____

Sample extract cleanup method: _____

Analytical method used (e.g., GC-FID, GC-ECD):

	Analyt. Instr.	Column Phase	Col. Length, m	Col. i.d., mm	Col. film thickness, µm
PAH					
Nitro PAH					
Alkanes and Alkenes					
Hopanes, Cholestanes, Sterols					
Carbonyls and Acids					
Phenols					
Sugars					

Method of quantitation (IS = internal standard, ES = external standard):
PAH _____
Nitro PAH _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

IF internal standard method was used, please complete the following section:
Identity of internal standards/surrogates used that were:
Added PRIOR to extraction of sample:
PAH _____
Nitro PAH _____

Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

Added after extraction/cleanup and JUST PRIOR to chromatographic analysis:

PAH _____
Nitro PAH _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

Any others? Added at what point in analyses: _____

PAH _____
Nitro PAH _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

IS/surrogate standards used for quantitation calculations were:

_____ those added prior to extraction
_____ those added after extraction/cleanup and just prior to chromatographic analysis

If the IS/surrogates added after extraction/cleanup extraction were used for quantitation, were results corrected for percent recovery? _____

Percent recovery range:

PAH _____
Nitro PAH _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

Calibration Curve

	Points	Conc. Range
PAH		
Nitro PAH		
Alkanes and Alkenes		
Hopanes, Cholestanes, Sterols		
Carbonyls and Acids		
Phenols		
Sugars		

Analytes outside of calibration curve calibration range

_____
_____
_____
_____
_____
_____
_____

Please note any differences in procedures used for SRM 1649a analyses from those for Air Particulate 1 described above:

_____
_____
_____
_____
_____

RESULTS:

PAH ANALYSES	Air Part. Extract 1 Sample 1	Air Part. Extract 1 Sample 2	Air Part. Extract 1 Sample 3	Air Particulate 1 Sample 1	Air Particulate 1 Sample 2	Air Particulate 1 Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)									

Date(s) of measurements (m/d/y)									
Sample Jar number									
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
naphthalene									
fluorene									
phenanthrene									
anthracene									
1-methylphenanthrene									
2-methylphenanthrene									
3-methylphenanthrene									
9-methylphenanthrene									
retene									
4H-cyclopenta(*def*)phenanthrene									
fluoranthene									
pyrene									
benzo[*ghi*]fluoranthene									
cyclopenta[*cd*]pyrene									
benz[*a*]anthracene									
chrysene									
triphenylene									
benzo[*b*]fluoranthene									
benzo[*j*]fluoranthene									
benzo[*k*]fluoranthene									
benzo[*e*]pyrene									
benzo[*a*]pyrene									
perylene									
indeno[1,2,3-*cd*]pyrene									
benzo[*ghi*]perylene									
dibenz[*a,h*]anthracene									
dibenz[*a,c*]anthracene									
benzo[*b*]chrysene									
coronene									
dibenzo[*a,e*]pyrene									
Nitro-PAH ANALYSES	Air Part. Extract I	Air Part. Extract I	Air Part. Extract I	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)									
Date(s) of measurements (m/d/y)									
Sample Jar number									
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
9-nitroanthracene									
1-nitropyrene									
2-nitrofluoranthene									
3-nitrofluoranthene									
7-nitrobenz[*a*]anthracene									
6-nitrochrysene									
6-nitrobenz[*a*]pyrene									
Alkanes and Alkenes	Air Part. Extract I	Air Part. Extract I	Air Part. Extract I	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)									
Date(s) of measurements (m/d/y)									

Sample Jar number									
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
n-C20									
n-C22									
n-C24									
n-C26									
n-C28									
n-C30									
n-C32									
n-C36									
n-C40									
n-C44									
squalene									
1-octadecene									
Hopanes, Cholestanes, Sterols	Air Part. Extract I	Air Part. Extract I	Air Part. Extract I	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)									
Date(s) of measurements (m/d/y)									
Sample Jar number									
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
22, 29, 30-trisnorhopane									
17a(H), 21b(H)-29-norhopane									
17a(H), 21b(H)-29-hopane									
20R-5a(H), 14a(H), 17b(H)-cholestane									
ABB-20R-C28-methylcholestane									
22S-17a(H), 21b(H)-30-homohopane									
22R-17a(H), 21b(H)-30-homohopane									
22S-17a(H), 21b(H)-30-bishomohopane									
22R-17a(H), 21b(H)-30-bishomohopane									
pristane									
phytane									
cholesterol									
stigmasterol									
Carbonyls and Acids	Air Part. Extract I	Air Part. Extract I	Air Part. Extract I	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)									
Date(s) of measurements (m/d/y)									
Sample Jar number									
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
benzanthrone									
9-fluorenone									
anthroquinone									
benz[*a*]anthracene-7, 12-dione									
G-nonanoic lactone									
G-decanolactone									
9-anthraldehyde									
syringaldehyde									

pimaric acid							
isopimaric acid							
pinic acid							
pinonic acid							
hexadecanoic acid							
norpinic acid							
norpinonic acid							
nopinone							
pinionaldehyde							
caronaldehyde							
Phenols	Air Part. Extract I	Air Part. Extract I	Air Part. Extract I	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1
Analyst (Initials)							
Date(s) of measurements (m/d/y)							
Sample Jar number							
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)
syringol							
4-ethylsyringol							
isoeugenol							
propionylsyringol							
butyrylsyringol							
guaiacol							
4-methylguaiacol							
4-ethylguaiacol							
Sugars	Air Part. Extract I	Air Part. Extract I	Air Part. Extract I	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1
Analyst (Initials)							
Date(s) of measurements (m/d/y)							
Sample Jar number							
	Air Part. Extract I Sample 1 (ng/g)	Air Part. Extract I Sample 2 (ng/g)	Air Part. Extract I Sample 3 (ng/g)	Air Particulate I Sample 1 (ng/g as received)	Air Particulate I Sample 2 (ng/g as received)	Air Particulate I Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)
levoglucosan							

Did you use a density conversion for the extract? yes _____ no _____
If yes, density value used? _____ g/mL

Any additional data/infomration should be added here.

Intercomparison Exercise: PM 2.5 Interim RM Description of Materials and Instructions

Intercomparison Exercise Materials:

PM 2.5 Interim RM

Each bottle contains approximately 100 mg of the PM 2.5 Interim Reference Material (RM). This material was collected in Baltimore City with an inlet designed to collect particles less than 1.7 μm. This material has not been enriched or spiked. Each bottle is labeled with an individual jar number as well as the above name.

In addition, one bottle of SRM 1649a containing approximately 0.5 g is included in the shipment.

Instructions for Use:

Please analyze three samples each of PM 2.5 Interim RM and SRM 1649a, using **your** laboratory's and/or program's analytical protocols, for the concentrations (mass/mass) of the analytes listed in Table 1. If your laboratory is not analyzing some of these compounds in the PM 2.5 program, then you do not need to report values for this exercise. There is space provided at the bottom of the spreadsheet to report additional analytes of interest to your program. Please provide data for all of the compounds that your laboratory is quantifying in the PM 2.5 program. All data received will be summarized.

The concentration range for some of the most abundant PAHs of interest (phenanthrene, fluoranthene, pyrene, and benzo[*a*]pyrene) in SRM 1649a is approximately 2.5 mg/kg to 6.5 mg/kg. Note that based on a preliminary analysis, the PAH concentrations in PM 2.5 Interim RM are expected to be in a similar range.

Reporting of Results:

Please report one result, as if three figures were significant, for each of the analytes in each of the three replicates of the PM 2.5 Interim RM and SRM 1649a. Report results in units of ng/g as received for the air particulate samples. Be sure to keep the bottles well sealed and bring to room temperature before weighing if stored in the refrigerator or freezer. Report the date of measurement of each sample in the requested m/d/y format.

We recognize that the reported concentrations for some of the requested analytes will probably include concentrations of compounds reported to coelute with the analyte of interest with methods commonly in use. Please note at the bottom of your table of reported results if any

coelution qualifiers are applicable to your data. Please note that any changes that you make to the column or row headings **within** the tables will **not** be seen by the coordinators because only the table entries and comments at the bottom of the tables are automatically transferred to the exercise database. Please do not add or delete lines from the spreadsheet.

We prefer that concentration values be reported for each analyte determined. If the measured concentration is below your typical reporting concentration for an analyte in a particular matrix, you can report the number and list the appropriate detection limit, quantification limit, etc. at the bottom of the data table. However, if you need to report non-numerical data please use the following conventions:

NA	"Not analyzed", "not determined"
<"value"	"Less than specified concentration", e.g., <8 ng/g
Other	"Other"; add note of explanation at end of data table, e.g., interference
DL	"Below detection limit" may be used, however, <"value" is preferable

Do not use negative numbers or parentheses to indicate "less than detection limits".

An EXCEL file, APT02.xls, has been sent as an e-mail attachment to you. If you have any software/hardware conversion problems, please contact Michele Schantz. The data file templates also include places for you to list the surrogate/internal standards and type of calibration curve used, and to provide a brief description of the analyses. Please **do not** add Aspaces≅ before entering numbers in the table cells and enter them as "numbers" not as "labels". Please **do not** insert any columns or rows **within** the table in the data file. If you wish to include additional data and/or other information or comments, you may add it to the bottom of the data table in the diskette file or send it in hard copy. A printout of the data file format is shown in Table 2.

Submit your results as an attached file via e-mail (preferred) to:

E-mail: michele.schantz@nist.gov

The deadline for receipt of data is July 31, 2002.

Further Information:

If you need further information, please contact Michele at the e-mail listed above or at the following phone numbers: Phone: (301)975-3106
FAX: (301)977-0685

Table 1: Analytes of Interest in the Intercomparison Exercise Program for Organics in PM2.5 Air Particulate Matter

Polycyclic aromatic hydrocarbons (PAHs)

naphthalene
fluorene
phenanthrene
anthracene
1-methylphenathrene
2-methylphenanthrene
3-methylphenanthrene
9-methylphenanthrene
retene
4H-cyclopenta(*def*)phenanthrene
fluoranthene
pyrene
benzo[*ghi*]fluoranthene
cyclopenta[*cd*]pyrene
benz[*a*]anthracene
chrysene
triphenylene
benzo[*b*]fluoranthene
benzo[*j*]fluoranthene
benzo[*k*]fluoranthene
benzo[*e*]pyrene
benzo[*a*]pyrene
perylene
indeno[1,2,3-*cd*]pyrene
benzo[*ghi*]perylene
dibenz[*a,h*]anthracene
dibenz[*a,c*]anthracene
benzo[*b*]chrysene
coronene
dibenzo[*a,e*]pyrene

Nitro-PAHs

9-nitroanthracene
1-nitropyrene
2-nitrofluoranthene
3-nitrofluoranthene
7-nitrobenz[*a*]anthracene
6-nitrochrysene
6-nitrobenzo[*a*]pyrene

Alkanes

n-C20
n-C21
n-C22
n-C23
n-C24
n-C25
n-C26
n-C27
n-C28
n-C29
n-C30
n-C31
n-C32
n-C40
n-C44

Alkenes
squalene
1-octadecene

Hopanes, Cholestanes (Diasteranes, Steranes)
22, 29, 30-trisnorneohopane
17a(H), 21b(H)- 29-norhopane
17a(H), 21b(H)- hopane
20R,5a(H),14b(H),17b(H)-cholestane
20S,5a(H),14b(H),17b(H)-cholestane
20R,5a(H),14a(H),17a(H)-cholestane
20R,5a(H),14b(H),17b(H)-ergostane
22S,17a(H),21b(H)-30-homohopane
22R,17a(H),21b(H)-30-homohopane
22S,17a(H),21b(H)-30-bishomohopane
22R,17a(H),21b(H)-30-bishomohopane

pristane
phytane

Sterols
cholesterol
stigmasterol

Carbonyls (ketones, aldehydes)
benzanthrone
9-fluorenone
anthroquinone
benz[*a*]anthracene-7,12-dione
G-nonanoic lactone
G-decanolactone
9-anthraldehyde
syringaldehyde

Acids, Alkanoic acids, Resin Acids
pimaric acid
isopimaric acid
pinic acid
pinonic acid
hexadecanoic acid
norpinic acid
norpinonic acid
nopinone

pinionaldehyde
caronaldehyde

Phenols and methoxyphenols

syringol
4-ethylsyringol
isoeugenol
propionylsyringol
butyrylsyringol
guaiacol
4-methylguaiacol
4-ethylguaiacol

Sugars

levoglucosan

Additional analytes quantified should be added to the bottom of the spreadsheet. These data will also be summarized.

Table 2. Diskette Data File Format (File: APT02.*)

Intercomparison Exercise Program for Organics in PM 2.5 Air Particulate Matter
Sample: PM 2.5 Interim RM

Please fill in all blanks; Use requested units of concentration; Report results as if 3 figures were significant
DO NOT INSERT ROWS OR COLUMNS WITHIN THIS TABLE. DO NOT MOVE CELLS.

- If necessary, add additional data/information at the end of the table.
- Use one of the following if no concentration is reported for an analyte:
  NA = Not analyzed/determined; <"conc" = <detection limit conc.; Other = other, explain in a note at end of table
  (DL = "below detection limit" may be used, but <"conc", e.g., <8, is preferable.)
  Do not use parentheses or negative numbers to indicate "less than detection limit".

Reporting Date (m/d/y): _____
Laboratory: _____
Submitted by: _____

BRIEF DESCRIPTION OF PROCEDURES USED:

Approximate amount of sample extracted: Interim RM _____ g, as received SRM 1649a _____ g, as received

Extraction method: _____
Extraction solvent: _____
Extraction time: _____
Extraction - other: _____

Sample extract cleanup method: _____

Analytical method used (e.g., GC-FID, GC-ECD):

	Analyt. Instr.	Column Phase	Col. Length, m	Col. i.d., mm	Col. film thickness, µm
PAH					
Nitro PAH					
Alkanes and Alkenes					
Hopanes, Cholestanes, Sterols					
Carbonyls and Acids					
Phenols					
Sugars					

Method of quantitation (IS = internal standard, ES = external standard):

PAHs _____
Nitro-PAHs _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____

Sugars _____

IF internal standard method was used, please complete the following section:

Identity of internal standards/surrogates used that were:

Added PRIOR to extraction of sample:

PAHs _____
Nitro-PAHs _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

Added after extraction/cleanup and JUST PRIOR to chromatographic analysis:

PAHs _____
Nitro-PAHs _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

Any others? Added at what point in analyses: _____

PAHs _____
Nitro-PAHs _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

IS/surrogate standards used for quantitation calculations were:

_____ those added prior to extraction
_____ those added after extraction/cleanup and just prior to chromatographic analysis

If the IS/surrogates added after extraction/cleanup extraction were used for quantitation, were results corrected for percent recovery?

Percent recovery range:

PAHs _____
Nitro-PAHs _____
Alkanes and Alkenes _____
Hopanes, Cholestanes, Sterols _____
Carbonyls and Acids _____
Phenols _____
Sugars _____

Calibration Curve

	Points	Conc. Range	Analytes outside of calibration curve calibration range
PAH			
Nitro PAH			
Alkanes and Alkenes			
Hopanes, Cholestanes, Sterols			
Carbonyls and Acids			
Phenols			
Sugars			

Please note any differences in procedures used for SRM 1649a analyses from those for the Interim RM described above:

_____
_____
_____
_____
_____

RESULTS:

PAH ANALYSES	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)						
Date(s) of measurements (m/d/y)						
Sample Jar number						
	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
naphthalene						
fluorene						
phenanthrene						
anthracene						
1-methylphenanthrene						
2-methylphenanthrene						
3-methylphenanthrene						
9-methylphenanthrene						
retene						
4H-cyclopenta(*def*)phenanthrene						
fluoranthene						
pyrene						
benzo[*ghi*]fluoranthene						
cyclopenta[*cd*]pyrene						
benz[*a*]anthracene						
chrysene						
triphenylene						
benzo[*b*]fluoranthene						
benzo[*j*]fluoranthene						
benzo[*k*]fluoranthene						
benzo[*e*]pyrene						
benzo[*a*]pyrene						
perylene						
indeno[1,2,3-*cd*]pyrene						
benzo[*ghi*]perylene						
dibenz[*a,h*]anthracene						
dibenz[*a,c*]anthracene						
benzo[*b*]chrysene						
coronene						
dibenzo[*a,e*]pyrene						

Nitro-PAH ANALYSES	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)						
Date(s) of measurements (m/d/y)						
Sample Jar number						
	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
9-nitroanthracene						
1-nitropyrene						
2-nitrofluoranthene						
3-nitrofluoranthene						
7-nitrobenz[*a*]anthracene						
6-nitrochrysene						
6-nitrobenzo[*a*]pyrene						

Alkanes and Alkenes	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)						
Date(s) of measurements (m/d/y)						
Sample Jar number						
	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
n-C20						
n-C21						
n-C22						
n-C23						
n-C24						
n-C25						
n-C26						
n-C27						
n-C28						
n-C29						
n-C30						
n-C31						
n-C32						
n-C40						
n-C44						
squalene						
1-octadecene						

Hopanes, Cholestanes, Sterols	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)						
Date(s) of measurements (m/d/y)						
Sample Jar number						

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
17a(H)-22, 29, 30-trisnorhopane						
17a(H), 21b(H)-29-norhopane						
17a(H), 21b(H)-29-hopane						
20R-5a(H), 14b(H), 17b(H)-cholestanc						
20S,5a(H),14b(h),17b(H)-cholestane						
20R-5a(H), 14a(H), 17a(H)-cholestane						
20R,5a(H),14b(H),17b(H)-ergostane						
22S-17a(H), 21b(H)-30-homohopane						
22R-17a(H), 21b(H)-30-homohopane						
22S-17a(H), 21b(H)-30-bishomohopane						
22R-17a(H), 21b(H)-30-bishomohopane						
pristane						
phytane						
cholesterol						
stigmasterol						

Carbonyls and Acids	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)						
Date(s) of measurements (m/d/y)						
Sample Jar number						

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
benzanthrone						
9-fluorenone						
anthroquinone						
benz[*a*]anthracene-7, 12-dione						
G-nonanoic lactone						
G-decanolactone						
9-anthraldehyde						
syringaldehyde						
pimaric acid						
isopimaric acid						
pinic acid						
pinonic acid						
hexadecanoic acid						
norpinic acid						
norpinonic acid						
nopinone						
pinionaldehyde						
caronaldehyde						

Phenols	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3

Analyst (Initials)	_____	_____	_____	_____	_____	_____
Date(s) of measurements (m/d/y)	_____	_____	_____	_____	_____	_____
Sample Jar number	_____	_____	_____			
	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
syringol	_____	_____	_____	_____	_____	_____
4-ethylsyringol	_____	_____	_____	_____	_____	_____
isoeugenol	_____	_____	_____	_____	_____	_____
propionylsyringol	_____	_____	_____	_____	_____	_____
butyrylsyringol	_____	_____	_____	_____	_____	_____
guaiacol	_____	_____	_____	_____	_____	_____
4-methylguaiacol	_____	_____	_____	_____	_____	_____
4-ethylguaiacol	_____	_____	_____	_____	_____	_____
Sugars	Interim RM	Interim RM	Interim RM	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)	_____	_____	_____	_____	_____	_____
Date(s) of measurements (m/d/y)	_____	_____	_____	_____	_____	_____
Sample Jar number	_____	_____	_____			
	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
levoglucosan	_____	_____	_____	_____	_____	_____

Any additional data/infomration should be added here.

Appendix A - Table 3. CAS numbers and 9CI (9th Cummulative Index) names for all of the organic compounds measured during Interl			
NARSTO Archive_CAS	CAS RN	name_9ci	IUPAC_Name (or other)
C91-20-3	91-20-3	Naphthalene	Naphthalene
C86-73-7	86-73-7	9H-Fluorene	Fluorene
C85-01-8	85-01-8	Phenanthrene	Phenanthrene
C120-12-7	120-12-7	Anthracene	Anthracene
C832-69-9	832-69-9	Phenanthrene, 1-methyl-	1-Methylphenanthrene
C2531-84-2	2531-84-2	Phenanthrene, 2-methyl-	2-Methylphenanthrene
C832-71-3	832-71-3	Phenanthrene, 3-methyl-	3-Methylphenanthrene
C883-20-5	883-20-5	Phenanthrene, 9-methyl-	9-Methylphenanthrene
C483-65-8	483-65-8	Phenanthrene, 1-methyl-7-(1-methylethyl)-	Retene
C203-64-5	203-64-5	4H-Cyclopenta[*def*]phenanthrene	4H-Cyclopenta[*def*]phenanthrene
C206-44-0	206-44-0	Fluoranthene	Fluoranthene
C129-00-0	129-00-0	Pyrene	Pyrene
C203-12-3	203-12-3		Benzo[*ghi*]fluoranthene
C27208-37-3	27208-37-3	Cyclopenta[*cd*]pyrene	Cyclopenta[*cd*]pyrene
C56-55-3	56-55-3	Benz[*a*]anthracene	Benz[*a*]anthracene
C218-01-9	218-01-9	Chrysene	Chrysene
C217-59-4	217-59-4	Triphenylene	Triphenylene
C205-99-2	205-99-2	Benz[*e*]acephenanthrylene	Benzo[*b*]fluoranthene
C205-82-3	205-82-3	Benzo[*j*]fluoranthene	Benzo[*j*]fluoranthene
C207-08-9	207-08-9	Benzo[*k*]fluoranthene	Benzo[*k*]fluoranthene
C192-97-2	192-97-2	Benzo[*e*]pyrene	Benzo[*e*]pyrene
C50-32-8	50-32-8	Benzo[*a*]pyrene	Benzo[*a*]pyrene
C198-55-0	198-55-0	Perylene	Perylene
C193-39-5	193-39-5	Indeno[1,2,3-*cd*]pyrene	Indeno[1,2,3-*cd*]pyrene
C191-24-2	191-24-2	Benzo[*ghi*]perylene	Benzo[*ghi*]perylene
C53-70-3	53-70-3	Dibenz[*a,h*]anthracene	Dibenz[*a,h*]anthracene
C215-58-7	215-58-7	Benzo[*b*]triphenylene	Dibenz[*a,c*]anthracene
C214-17-5	214-17-5		Benzo[*b*]chrysene
C191-07-1	191-07-1	Coronene	Coronene
C192-65-4	192-65-4	Naphtho[1,2,3,4-*def*]chrysene	Dibenzo[*a,e*]pyrene
C602-60-8	602-60-8	Anthracene, 9-nitro-	9-Nitroanthracene
C5522-43-0	5522-43-0	Pyrene, 1-nitro-	1-Nitropyrene
C13177-29-2	13177-29-2	Fluoranthene, 2-nitro-	2-Nitrofluoranthene
C892-21-7	892-21-7	Fluoranthene, 3-nitro-	3-Nitrofluoranthene
C20268-51-3	20268-51-3	Benz[*a*]anthracene, 7-nitro-	7-Nitrobenz[*a*]anthracene
C 7496-02-8	7496-02-8	Chrysene, 6-nitro-	6-Nitrochrysene
C63041-90-7	63041-90-7	Benzo[*a*]pyrene, 6-nitro-	6-Nitrobenz[*a*]pyrene
C389130-29-4	389130-29-4	Eicosane, branched and linear	*n*-C20
C389130-30-7	389130-30-7	Docosane, branched and linear	*n*-C22
C389130-35-2	389130-35-2	Tetracosane, branched and linear	*n*-C24
C389130-44-4	389130-44-4	Hexacosane, branched and linear	*n*-C26
C389130-54-5	389130-54-5	Octacosane, branched and linear	*n*-C28
C389130-55-6	389130-55-6	Triacontane, branched and linear	*n*-C30
C389130-57-8	389130-57-8	Dotriacontane, branched and linear	*n*-C32
C389130-58-9	389130-58-9	Tetratriacontane, branched and linear	*n*-C36
C389130-60-3	389130-60-3	Tetracontane, branched and linear	*n*-C40
C389130-63-6	389130-63-6	Tetratetracontane, branched and linear	*n*-C44
C111-02-4	111-02-4	2,6,10,14,18,22-Tetracosahexaene, 2,6,10,15,19,23-hexamethyl-, (all-E)-	Squalene
C12-88-9	112-88-9	1-Octadecene	1-Octadecene
C55199-72-9	55199-72-9	20,29,30-Trinorlupane, (17.alpha.)-	22, 29, 30-Trisnorhopane
C53584-60-4	53584-60-4	A'-Neo-30-norgammacerane, (17.alpha.)-	17a(H), 21b(H)-29-Norhopane
C13849-96-2	13849-96-2	A'-Neogammacerane, (17.alpha.)-	17a(H), 21b(H)-29-Hopane
C69483-47-2	69483-47-2	Cholestane, (5.alpha.,14.beta.,17.alpha.)-	20R,5a(H),14b(H),17b(H)-Cholestane
C69483-46-1	69483-46-1	Cholestane, (5.alpha.,14.beta.,17.alpha.,20S)-	20S,5a(H),14b(H),17b(H)-Cholestane
C40071-70-3	40071-70-3	Cholestane, (5.alpha.,14.beta.)-	20R,5a(H),14b(H),17a(H)-Cholestane
C99664-76-3	99664-76-3	Ergostane, (5.alpha.,14.beta.,17.alpha.)-	20R,5a(H),14b(H),17b(H)-Ergostane
C99664-77-4	99664-77-4	IN Ergostane, (5.alpha.,14.beta.,17.alpha.,20S)-	20S,5a(H),14b(H),17b(H)-Ergostane

Appendix A - Table 3. CAS numbers and 9CI (9th Cummulative Index) names for all of the organic compounds measured during Interl			
NARSTO Archive_CAS	CAS RN	name_9ci	IUPAC_Name (or other)
C99664-78-5	99664-78-5	Stigmastane, (5.alpha.,14.beta.,17.alpha.)-	24R,5a(H),14b(H),17b(H)-Sitostane
C387868-91-9	387868-91-9	Stigmastane, (5.alpha.,14.beta.,24S)-	24S,5a(H),14b(H),17b(H)-Sitostane
C67069-25-4	67069-25-4	A'-Neo-30-norgammacerane, 22-propyl-, (17.alpha.,22R)-	22R-17a(H), 21b(H)-30-Bishomohopane
C60305-22-8	60305-22-8	A'-Neo-30-norgammacerane, 22-ethyl-, (17.alpha.,22R)-	22R-17a(H), 21b(H)-30-Homohopane
C67069-15-2	67069-15-2	A'-Neo-30-norgammacerane, 22-propyl-, (17.alpha.,22S)-	22S-17a(H), 21b(H)-30-Bishomohopane
C60305-23-9	60305-23-9	A'-Neo-30-norgammacerane, 22-ethyl-, (17.alpha.,22S)-	22S-17a(H), 21b(H)-30-Homohopane
C99664-76-3	99664-76-3	Ergostane, (5.alpha.,14.beta.,17.alpha.)-	ABB-20R-C28-Methylcholestane
C1921-70-6	1921-70-6	Pentadecane, 2,6,10,14-tetramethyl-	Pristane
C638-36-8	638-36-8	Hexadecane, 2,6,10,14-tetramethyl-	Phytane
C57-88-5	57-88-5	Cholest-5-en-3-ol (3.beta.)-	Cholesterol
C83-48-7	83-48-7	Stigmasta-5,22-dien-3-ol, (3.beta.,22E)-	Stigmasterol
C82-05-3	82-05-3	7H-Benz[de]anthracen-7-one	Benzanthrone
C486-25-9	486-25-9	9H-Fluoren-9-one	9-Fluorenone
C84-65-1	84-65-1	9,10-Anthracenedione	Anthroquinone
C2498-66-0	2498-66-0	Benz[a]anthracene-7,12-dione	Benz[a]anthracene-7, 12-dione
C104-61-0	104-61-0	2(3H)-Furanone, dihydro-5-pentyl-	G-Nonanoic lactone
C706-14-9	706-14-9	2(3H)-Furanone, 5-hexyldihydro-	G-Decanolactone
C642-31-9	642-31-9	9-Anthracenecarboxaldehyde	9-Anthraldehyde
C134-96-3	134-96-3	Benzaldehyde, 4-hydroxy-3,5-dimethoxy-	Syringaldehyde
C127-27-5	127-27-5	1-Phenanthrenecarboxylic acid, 7-ethenyl-1,2,3,4,4a,4b,5,6,7,9,10,10a-dodecahydro-1,4a,7-trimethyl-, (1R,4aR,4bS,7S,10aR)-	Pimaric acid
C5835-26-7	5835-26-7	1-Phenanthrenecarboxylic acid, 7-ethenyl-1,2,3,4,4a,4b,5,6,7,8,10,10a-dodecahydro-1,4a,7-trimethyl-, (1R,4aR,4bS,7S,10aR)-	Isopimaric acid
C473-73-4	473-73-4	Cyclobutaneacetic acid, 3-carboxy-2,2-dimethyl-, (1R,3S)-rel-(−)-	Pinic acid
C473-72-3	473-72-3	Cyclobutaneacetic acid, 3-acetyl-2,2-dimethyl-	Pinonic acid
C57-10-3	57-10-3	Hexadecanoic acid	Hexadecanoic acid
C473-69-8	473-69-8	1,3-Cyclobutanedicarboxylic acid, 2,2-dimethyl-	Norpinic acid
C473-68-7	473-68-7	Cyclobutanecarboxylic acid, 3-acetyl-2,2-dimethyl-	Norpinonic acid
C24903-95-5	24903-95-5	Bicyclo[3.1.1]heptan-2-one, 6,6-dimethyl-	Nopinone
C2704-78-1	2704-78-1	Cyclobutaneacetaldehyde, 3-acetyl-2,2-dimethyl-	Pinonaldehyde
C73611-02-6	73611-02-6	3-Oxabicyclo[3.1.0]hexan-2-one, 4-hydroxy-6,6-dimethyl-, (1R,4R,5S)-	Caronaldehyde
C91-10-1	91-10-1	Phenol, 2,6-dimethoxy-	Syringol
C14059-92-8	14059-92-8	Phenol, 4-ethyl-2,6-dimethoxy-	4-Ethylsyringol
C97-54-1	97-54-1	Phenol, 2-methoxy-4-(1-propenyl)-	Isoeugenol
C5650-43-1	5650-43-1	1-Propanone, 1-(4-hydroxy-3,5-dimethoxyphenyl)-	Propionylsyringol
C69271-91-6	69271-91-6	1-Butanone, 1-(4-hydroxy-3,5-dimethoxyphenyl)-	Butyrylsyringol
C90-05-1	90-05-1	Phenol, 2-methoxy-	Guaiacol
C93-51-6	93-51-6	Phenol, 2-methoxy-4-methyl-	4-Methylguaiacol
C2785-89-9	2785-89-9	Phenol, 4-ethyl-2-methoxy-	4-Ethylguaiacol
C498-07-7	498-07-7	beta.-D-Glucopyranose, 1,6-anhydro-	Levoglucosan

Appendix B

Laboratory Notes Accompanying Data

Lab	Additional notes for Air Particulate Extract I and Air Particulate I										
1		Extract I Sample 1 (ng/g)	Extract 1 Sample 2 (ng/g)	Extract 1 Sample 3 (ng/g)	Part. 1 Sample 1 (ng/g as received)	Part. 1 Sample 2 (ng/g as received)	Part. 1 Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	
	2-methylnaphthalene	60.5	56.8	57.1	846	900	919	950	976	911	
	1-methylnaphthalene	29.6	29.5	29.5	417	447	431	499	501	490	
	biphenyl	18.1	18.3	18.2	467	456	399	552	567	564	
	acenaphthene	11.5	11	12.3	168	202	169	189	222	182	
	2,6-dimethylnaphthalene	26.5	26	24.8	369	355	375	448	449	480	
	acenaphthylene	9.51	9.84	10.7	138	134	130	155	152	145	
	2,3,5-trimethylnaphthalene	10.4	9.46	10.4	131	134	117	183	177	158	
3		Extract 1 Sample 1 (ng/g)	Extract 1 Sample 2 (ng/g)	Extract 1 Sample 3 (ng/g)	Part. 1 Sample 1 (ng/g as received)	Part. 1 Sample 2 (ng/g as received)	Part. 1 Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	
	acenapthene	7.40	7.26	7.05	64.6	61.5	66.8	118	103	87.6	
4		Extract 1 Sample 1 (ng/g)	Extract 1 Sample 2 (ng/g)	Extract 1 Sample 3 (ng/g)	Part. 1 Sample 1 (ng/g as received)	Part. 1 Sample 2 (ng/g as received)	Part. 1 Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	Calibration Range (ppm) to	from
	Dimethyl Phthalate					2104.2	1342.3	1674.8	1707.6	168.4	0.8	19
	Diethyl Phthalate	52.80	52.80	52.80							0.8	19
	Naphthalene	30.20	52.80	52.80	2860.3	9795.2	8713	8798.6	8585.9	9741.8	0.8	19
	2-Methylnaphthalene	60.40	67.90	60.40	1032.9	3853.6	1936.2	2248.8	2292.8	1523.4	1	23
	1-Methylnaphthalene	30.20	37.70	30.20	1787.7	1934.9	1562	1887.1	1924	1539.4	0.9	21
	2,7-Dimethylnaphthalene		60.40	67.90							0.8	18
	1,3-Dimethylnaphthalene	22.60	22.60	22.60							0.8	18
	2,6-Dimethylnaphthalene	30.20	37.70	30.20							0.8	18
	Acenaphthylene	22.60	22.60	22.60	1430.2	1934.9	1952.5	1887.1	2308.8	2309.2	1.6	38
	Acenaphthene										0.8	18
	Fluorene	15.10	7.50	7.50	516.4	572.4	577.6	558.3	569.2	569.3	0.16	3.8
	1-Methylfluorene				1350.7	1902.6		723.4	737.5		0.4	9
	Phenanthrene	249.00	279.10	279.10	8541.2	5788.5	5841.2	6400.4	6140.8	6911.5	0.08	1.9
	Anthracene	45.30	45.30	45.30	1072.6	1160.9	1171.5	754.8	769.6	1539.4	0.08	1.9
	9-Methylanthracene										0.8	19
	Octylcyclohexane										0.4	9.5
	Norpristane										0.4	9.5
	Decylcyclohexane										0.4	9.5
	Pristane				2701.4	1870.4	2277.9	314.5	320.7	705.6	0.4	9.5
	Phytane				397.3	911	2090.8	2020.8	2060.3	1290.9	0.4	9.5
	Tridecylcyclohexane										0.4	9.5
	Dibutylphthalate	105.60	105.60	83.00	6991.9	35246.7	13309.5	6447.6	18502.5	5035.3	0.8	19
	Butylbenzylphthalate	301.80	271.60	271.60	7667.2	28289.3	10584.1	5323.2	17740.9	10431.4	0.8	19
	Bis-2-Ethylhexylpthalate	2761.20	2368.90	2323.70							0.8	19
	Dioctylphthalate										0.8	19
	Fluoranthene	414.90	384.80	399.80	7508.3	8126.4	7810	7548.4	7311.2	7312.4	0.16	3.8
	Pyrene	347.00	316.90	316.90	6594.6	6377	5654.1	5842.1	5571.6	5572.5	0.08	1.9
	Chrysene	279.10	279.10	271.60	5720.6	5417.6	5076.5	5283.8	3848	5003.2	0.08	1.9
	Benzo[a]anthracene	143.30	143.30	143.30	2860.3	2708.8	2733.5	2641.9	2693.6	2694	0.08	1.9
	Benzo[k]fluoranthene	90.50	67.90	75.40	1430.2	1160.9	1171.5	1132.3	1154.4	1154.6	0.08	1.9
	Benzo[b]fluoranthene	362.10	384.80	392.30	5005.6	5030.6	6248	6038.7	5387.2	6542.7	0.16	3.8
	Benzo[a]pyrene	135.80	150.90	150.90	3217.9	3869.7	3514.5	3396.8	3078.4	3078.9	0.08	1.9
	Nonadecylcyclohexane										0.4	9.5
	Squalane										0.8	20
	Indeno[1,2,3-cd]pyrene	188.60	211.20	203.70	3932.9	3482.7	3514.5	3774.2	3078.4	3463.8	0.08	1.9
	Dibenz[a,h]anthracene	22.60	30.20	22.60							0.16	3.8
	Benzo[ghi]perylene	218.80	211.20	211.20	2860.3	3869.7	3514.5	3774.2	3463.2	3463.8	0.16	3.8
	Coronene	188.60	203.70	188.60	3217.9	5030.6	3514.5	3019.3	3463.2	3078.9	0.1	2.4
	Cholestane 1	128.30	98.10	150.90	1072.6			1509.7			0.04	0.95
	Cholestane 2	135.80	218.80	294.20	2145.2			3019.3			0.04	0.95
	Cholestane 3	369.70	181.10	218.80	1787.7						0.04	0.95
	Cholestane 4	392.30	497.90	520.60	7865.9	4256.7	3514.5	6038.7		5003.2	0.04	0.95
	ABB Methylcholestane	181.10	211.20	316.90	4648	2321.8	3514.5	1509.7	1154.4	1539.4	0.04	0.95
	ABB Ethylcholestane	354.60	490.40	550.70	3932.9	3095.8	7419.5	5283.8	4617.6	5003.2	0.04	0.95
	Trisnorhopane	173.50	226.30	324.40	2860.3	2321.8	3124	2264.5	2693.6	3463.8	0.04	0.95
	Norhopane										0.04	0.95
	17b(H),21b(H)-hopane	1214.60	1591.90	1840.80	15731.8	12770.1	19134.4	15851.5	16931.2	14624.8	0.04	0.95
	Hopane 2										0.04	0.95
	Hopane 3										0.04	0.95
	n-Decane										0.4	8
	n-Undecane										0.4	8
	n-Dodecane										0.4	8
	n-Tridecane										0.4	8
	9H-Fuorenone	*98.10*	*90.50*	*90.50*	*3575.4*	*2708.8*	*2733.5*	2641.9	3463.2	2694	0.4	8
	n-Tetradecane	37.70	30.20	30.20		395			8		0.4	8
	n-Pentadecane	67.90	113.20	67.90	5720.6	13157	23820.4	25664.4	45406.4	21937.1	0.4	8
	n-Hexadecane	30.20	52.80	67.90	2224.7	2329.9	8.1	1140.1	3471.2		0.4	8
	n-Heptadecane	52.80	67.90	45.30	3098.7	1620.4	463.7	1580.4	72.2		0.4	8
	1-Octadecene										0.8	15
	n-Octadecane	45.30	67.90	45.30	953.4	846.5	854.2	825.6	1226.6		0.4	8
	2-Methylnonadecane										0.1	2
	3-Methylnonadecane										0.1	2
	n-Eicosane	83.00	90.50	67.90	1430.2	1668.8	1293.5	1627.6	2429.1	1274.9	0.4	8
	Pyrene	*75.40*	67.90	67.90	1430.2	1160.9	1171.5	754.8	769.6	769.7	0.02	0.4
	Anthroqinone	*120.70*	*120.70*	*120.70*					6509.5		0.24	4.7
	1,8 Naphthalic Anydride	1380.60	1350.40	1342.90	25385.3	32118.7	21867.9	23399.9	21548.8	23091.7	0.4	8
	Methylfluoranthene										0.02	0.4
	Retene										0.1	2
	Cyclopenta[cd]pyrene										0.1	2
	Benzo[a]anthacene	399.80	407.40	399.80	6793.3	8513.4	7810	7548.4	6156.8	8082.1	0.4	8
	Methylchrysene										0.02	0.4
	Benzo[a]pyrene	181.10	188.60	188.60	3932.9	3482.7	5076.5	4906.4	3848	4233.5	0.2	4
	n-Tetracosane	1606.90	1591.90	1606.90	25464.8	35295.1	28197.2	26120.5	33942.6	55885.2	0.4	8
	n-Octacosane	2912.10	2776.30	2663.10	149610.7	100483.7	60397	36861.1	61055	215779.3	0.4	8

	Squalene										0.8	17
	Dibenzo[a,e]pyrene										0.04	0.04
	n-Triacontane	1161.80	1199.50	1139.20	41593.8	47525	25699.6	33519.4	36868.7	90755.3	0.8	17
	n-Dotriacontane	641.30	694.10	618.60	24749.7	28498.9	26025.1	13830.8	18718.9	48741.2	0.4	8
	Hexanoic acid	611.10	464.70	425.50		19200	12700	12500	11000	7520	0.8	19
	Succinic acid	1629.60	1705.00	1425.90	109000	132000	57600	49000	55400	38400	0.25	6.1
	Octanoic acid	569.60	529.60	461.00	9340	13000	8600	8740	7980	7130	0.8	19
	Glutaric acid	519.00	505.50	439.80	18300	25400	9720	6840	10500	6730	0.3	7.3
	Adipic acid	335.00	350.10	262.50	10400	13400	5610	5700	5990	4360	0.25	6.27
	Decanoic acid	310.10	285.20	255.00	6920	25900	21700	22400	71900	19400	0.6	15
	Pimelic acid		73.20								0.25	6.3
	Suberic acid	1539.00	1486.20	1342.90	36000	41800	25000	17900	19500	13500	0.25	6.3
	Dodecanoic acid	259.50	220.30	206.00	4500	4320	3370	4940	6490	3960	0.7	17
	Azelaic acid	83.70									0.23	22
	Pinonic acid								2000		0.9	22
	Phthalic acid (1,2)	882.70	875.10	667.70	67800	92200	47100	44800	44900	39200	0.25	6.1
	Terephthalic acid (1,4)	251.20	244.40	198.40		11000	7110		6490	7520	0.24	6.1
	Isophthalic acid (1,3)	175.80	163.00	141.80	8300	6240	4490	4560	3990	4750	0.26	6.4
	Methylphthalic acid	377.20	366.70	298.00	21800	26900	14600	14400	14500	13900	0.25	6.3
	1,2,4 Benzene tricarboxylic acid	16.60				6720	5610	4180	4490	4360	0.24	6
	1,2,4,5-Benzenetetracarboxylic acid	8.30				480					0.24	6
	Abietic acid										0.7	17
	Sebacic acid	402.10	390.80	361.40	7610	7680	5240		4990	3170	0.23	5.7
	Tetradecanoic acid	958.10	905.30	799.70	23500	27400	25100	25500	27900	26500	0.6	15
	Palmitoleic acid										0.6	16
	Hexadecanoic acid				286000	339000	277000	274000	291000	311000	0.6	15
	Linoleic acid										0.6	14
	Oleic acid	737.10	709.20	638.20	10700	13900	10900	10600	13500	10300	0.7	17
	Linolenic acid										0.7	18
	Octadecanoic acid	12599.00	11542.80	9732.20	156000	180000	156000	158000	171000	179000	0.5	12
	Eicosanoic acid	1682.40	1659.80	1433.40	24900	27800	25800	25900	27500	28500	0.5	12
	Docosanoic acid	2942.30	2934.70	2534.90	41900	44200	41100	43300	46400	49500	0.5	12
	Tetracosanoic acid	2663.10	2655.60	2278.40	39100	41300	38500	39100	47900	45500	0.6	14
	Octacosanoic acid	3236.50	3500.60	2829.10	54000	60500	59100	56200	60900	62600	0.6	14
	Triacontanoic acid	5469.60	6292.00	5296.10	68200	68600	76700	72200	80800	82800	0.6	14
	Glycerine	142.60	154.70		6920		8600	6260	1500	3800	6	60
	Levoglucosan	535.60	890.20	617.10	47700	24100	14600	11800	11500	7980	6	60
	Monopalmitin	267.80	464.70	467.70	4150	5750	5240	5150	4990	5320	1.2	12
	Monoolein								15000		1.2	12
	Monostearin	108.60			1000				46000		1.2	12
	Cholesterol					14600	12700				8	80
	Stigmasterol			325.90					5490		6.7	67

5 Coelution of chrysene and tripenylene reported as solely chrysene

7

	Extract I Sample I (ng/g)	Extract I Sample 2 (ng/g)	Extract I Sample 3 (ng/g)	Part. I Sample I (ng/g as received)	Part. I Sample 2 (ng/g as received)	Part. I Sample 3 (ng/g as received)	SRM 1649a Sample I (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
acetophenone	69.0	58.0	62.0		600				
benzoic acid	2300	2119	2164	19000	20700	21600	22600	18800	22300
1,2,4-trichlorobenzene	26.0								
naphthalene	56.0	54.0	63.0	1080	660	577	564	709	901
2-methylnaphthalene	62.0	57.0	69.0	1210	679	662	661	743	1010
1-methylenaphthalene	32.0	30.0	43.0	403	347	313	316	324	361
2,4,6-trichlorophenol	244								
2,4,5-trichlorophenol	132								
biphenyl	24.0	25.0		625	442	415	356	508	732
acenaphthylene	34.0	24.0	26.0	322	268	300	268	272	300
acenaphthene	14.0					86.2		114	
4-nitrophenol	1041	935	1063	15000	14000	15900	15300	14100	15900
diethylphthalate	64.0	52.0	77.0	3210	1620	1850	789	2190	2650
fluorene	23.0	21.0	21.0	186	195	1850	178	159	223
hexachlorobenzene	94.0	64.0	65.0						
pentachlorophenol	1018	913	905	6250	6390	6440	6560	6310	6480
phenanthrene	300	300	321	4100	4020	4240	4030	3980	4600
anthracene	47.0	50.0	49.0	693	684	736	672	675	791
carbazole	49.0								
caffeine	115			1870	1710				1930
butylbenzylphthalate	710	705	735	7090	7270	7250	6680	6730	7340
bis(2-ethylhexyl)phthalate	3778	3590	4072	45500	46000	50300	43100	42000	47400
5-Cl,2-Hy-benzaldehyde	837	860	1373						
nonanoic acid	483			11400					
1-methylisoquinoline	943	995							
tetradecanoic acid	913		943						
hexadecanoic acid	11011	9879	11538	219000	211000	237000	243000	245000	293000
1,8-naphthalic anhydride	837								
dichlorphen	41780	45173	45777	648000	625000	555000	638000	705000	794000

8

	Extract I Sample I (ng/g)	Extract I Sample 2 (ng/g)	Extract I Sample 3 (ng/g)	Part. I Sample I (ng/g as received)	Part. I Sample 2 (ng/g as received)	Part. I Sample 3 (ng/g as received)	SRM 1649a Sample I (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
n-C16	263	171	179	3240	3210	3410	2310	2230	2700
n-C17	86.4	68.7	73.8	1320	1210	1210	959	1050	1440
n-C18	64.3	51.5	43.4	849	825	972	876	737	900
n-C19	88.5	50.6	68.9	912	1040	792	938	1030	992
n-C21	177	112	115	1950	1780	2950	2630	3070	4420
n-C23	1150	854	902	36200	31800	34700	38700	34500	49300
n-C25	6070	4780	4920	84800	81100	93800	97800	92000	106000
n-C27	5850	4760	4950	80700	78900	93100	88600	93800	110000
n-C29	5770	4860	4980	79500	77800	91600	86200	84900	95400
n-C31	3730	2880	2870	52300	48400	59000	61400	59800	66000
n-C33	1610	1290	1290	22400	22900	27200	22200	23700	27100
n-C34	1610	1350	1270	20100	19500	22500	12700	18600	20500
n-C35	1630	1120	1230	21100	17500	22200	15800	14800	17100
Acenapthalene	25.8	20.1	21.4	120	125	148	130	152	137

	Dibenzothio	42.2	22.5	30.6	169	181	208	156	192	188
9	Other phenols analyzed:			No Data reported for these						
	4-propyl-guaiacol									
	Vanillin									
	4-methyl-syringol									
	4-Aceto-vanillone									
	4-ethyl-syringol									
	Allyl-Syringol									
	4-Propyl-syringol									
	Syring-aldehyde									
	4-Aceto-Syringone									
	Notes:									
	1. naphthalene was detected, but not quantified because of chromatographic disturbances in this section of the chromatograam which grossly distorted peak shape and shifted retention time for naphthalene									
	2. Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene were insufficiently resolved to integrate as separate peaks. Therefore they were integrated as a single peak and designated benzo(b)fluoranthene.									

10		Extract I Sample I (ng/g)	Extract I Sample 2 (ng/g)	Extract I Sample 3 (ng/g)	Part. I Sample I (ng/g as received)	Part. I Sample 2 (ng/g as received)	Part. I Sample 3 (ng/g as received)	SRM 1649a Sample I (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
	Acenaphthylene	18.2	17.8	18.8	236.4	225.5	292.6			
	Acenaphthalene	9.5	12.5	6.5	180.7	285.2	101.4			
	nC16	-38.1	-25.5	-26.3	-901.6	-3123.3	-323.9			
	nC21	184.4	168.2	206.7	2786.8	2776.2	3473.6			
	nC23	1949.5	1779.4	1724.1	20736.8	23844.8	21492.5			
	nC25	9287.3	9860.1	8679.5	106059.4	102823.0	106194.0			
	nC27	9610.0	10220.5	8664.2	134150.0	103232.6	102723.4			
	nC29	9464.2	8336.7	9757.8	102019.8	113484.7	111973.4			
	nC31	6343.5	6327.4	6442.9	69496.4	80705.1	72536.5			
	nC33	3505.6	3441.3	3238.4	35347.1	39727.1	31556			
	nC34	1050.3	835.2	1173	9955.8	10785.8	9239.8			
	nC35	1191.4	1174	1111.2	8979.6	12241.4	10851.1			
	nC36	992.6	810.8	712.3	7616.9	7672.5	13437			

11	
	coeluting compounds are indicated in table above by adding the names together. These included benzo (b+j+k) fluoranthene, dibenzo(ah + ac+ aj) anthracene, chrysene plus triphenylene. In addition, 9-methylphenanthrene and 4-methylphenanthrene coelute
	hopanes and steranes quantified with response of 1 hopane and 1 sterane compounds.....compounds identified using retention indices reported by Wang and Fingas (1995)
	extract concentration reported by measuring ng/ul concentration and changing to ng/g dichloromethane using 1.36 as density. Actual solvent during analysis was DCM/acetonitrile mix.
	compounds at or below the analytical detection limit were still reported above. Depending on analyte, detection limit is approx. 300 ng/g
	Additional compounds that were analyzed and not listed above include:

	Extract I Sample I (ng/g)	Extract I Sample 2 (ng/g)	Extract I Sample 3 (ng/g)	Part. I Sample I (ng/g as received)	Part. I Sample 2 (ng/g as received)	Part. I Sample 3 (ng/g as received)	SRM 1649a Sample I (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
dibenzothiopene	15.1	13.7	15.0	110	119	102	129	109	116
B-methylpyrene	6.84	15.9	22.3	301	467	207	319	467	297
A-methylpyrene	30.2	28.3	37.5	210	364	470	235	248	279
C-methylpyrene	19.2	16.5	13.4	281	274	299	260	264	215
D-methylpyrene	21.5	14.2	15.6	246	193	191	222	206	141
E-methylpyrene	11.8	9.38	10.0	187	117	175	148	121	142
A-quaterphenyl	104	112	117	1960	1890	1870	1590	1330	1430
Benzo[a]pyrene-7(8H)-one,9,10-dihydro	97.1	74.0	77.0	1270	1150	1080	1130	1050	1100
benzonaphthothiopene	61.3	53.9	69.9	438	468	465	373	445	399
B-dibenzopyrene	44.5	34.9	45.2	368	517	480	489	481	535
17a(H), 21b(H)-hopane	125	97.8	143	1980	1940	2100	1970	1850	1970
22S-17a(H), 21b(H)-30,31,32-trishomohopane	125	106	135	1850	2020	2390	2080	1830	1450
22R-17a(H), 21b(H)-30,31,32-trishomohopane	73.3	65.1	104	1320	1390	1740	1420	1180	1240
C2720S-13b(H),17a(H)-diasterane	65.1	51.8	61.8	809	894	1170	1140	1060	944
C2720R-13b(H),17a(H)-diasterane	46.7	33.7	50.8	627	661	636	644	633	598
C2720S-5a(H),14b(H), 17b(H)-cholestane	93.8	117	87.6	1640	1410	1650	1070	1360	830
C2920S-13b(H),17a(H)-diasterane + C2720R-	68.3	57.6	80.4	1350	1090	1810	1610	1340	1560
C2920R-5a(H),14b(H), 17b(H)-stigmastane	149	115	168	2080	2250	2520	2240	2470	2590
C2920R-5a(H),14a(H), 17a(H)-stigmastane	137	102	149	1710	2040	2630	2110	2100	1490

12	
	Detection Limit = 40ng/g for all data sets
	Coefution Compounds: chrysene and triphenylene; benzo(b)fluoranthene, benzo(j)fluoranthene, and benzo(j)fluoranthene; dibenz(ah)anthracene and dibenz(ac)anthracene; quantified as one peak

	Extract I Sample I (ng/g)	Extract I Sample 2 (ng/g)	Extract I Sample 3 (ng/g)	Part. I Sample I (ng/g as received)	Part. I Sample 2 (ng/g as received)	Part. I Sample 3 (ng/g as received)	SRM 1649a Sample I (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
2-methylnaphthalene	337	317	378	3510	4490	4860	5590	4840	5800
1-methylnaphthalene	158	147	180	1780	2260	2570	2920	2380	2860
Biphenyl	202	166	141	709	901	625	940	925	510
2-Methylbiphenyl	12.2	8.40	9.9	481	592	476	611	547	613
1+2ethylnaphthalene	43.8	42.7	43.0	359	466	464	453	446	485
1,3+1,6+1,7dimethylnaphth	89.3	90.1	94.9	686	768	793	783	802	829
2,6+2,7-dimethylnaphthalene	103	104	105	756	835	881	827	878	966
1,4+1,5+2,3-dimethylnaphth	281	291	282	493	596	621	590	643	694
Acenaphthylene	84.7	90.1	110	705	843	865	825	952	980
1,2-dimethylnaphthalene	61.8	61.8	68.2	525	804	777	833	759	1040
3-Methylbiphenyl	53.9	47.8	53.9	1190	1540	1590	1640	1360	2870
4-Methylbiphenyl	39.7	30.5	36.1	344	544	456	573	490	586
A-trimethylnaphthalene	43.8	46.6	50.9	384	272	342	386	201	243
Dibenzofuran	65.9	59.0	71.8	483	483	773	665	809	912
B-trimethylnaphthalene	43.8	44.8	51.4	359	362	310	277	296	157
C-trimethylnaphthalene	45.0	48.3	51.1	390	339	262	266	282	327
E-trimethylnaphthalene	33.3	31.3	38.9	371	387	310	479	446	462
F-trimethylnaphthalene	41.5	40.5	46.1	170	210	184	266	341	203
J-trimethylnaphthalene	19.1	19.6	20.9	644	712	731	808	894	812
2,3,5+1-trimethylnaphthalene	62.1	63.1	69.7	460	509	527	581	652	584
2,4,5-trimethylnaphthalene	7.89	6.36	6.11	181	210	228	225	238	222
1,4,5-trimethylnaphthalene	7.38	6.36	7.38	29	25	20	44	56	50
A-methylfluorene	17.6	15.0	14.5	73	31	40	94	33	23
1-methylfluorene	15.8	15.3	15.0	86	52	102	99	89	68
A-methylphenanthrene	92.1	85.0	111	640	525	515	579	464	580
Perinaphthenone	38.2	35.1	49.9	160	137	194	157	235	128
B-methylphenanthrene	18.6	22.9	25.2	82	67	108	61	92	104
C-methylphenanthrene	64.6	66.4	83.5	468	464	519	487	349	551
9-methylanthracene	2.04	4.07	3.31	21.0	28.8	20.0	17.2	21.7	

	3,6-dimethylphenanthrene	21.4	23.2	30.8	141	146	174	204	136	201
	A-dimethylphenanthrene	41.7	39.7	43.0	267	269	222	296	327	286
	B-dimethylphenanthrene	25.2	27.7	29.8	166	165	130	183	192	189
	C-dimethylphenanthrene	74.6	76.6	88.0	606	649	555	711	656	754
	D-dimethylphenanthrene	39.7	30.0	36.9	204	201	172	245	204	226
	E-dimethylphenanthrene	35.4	31.3	42.5	220	242	300	248	316	253
	9-Anthraaldehyde	87.8	82.2	95.2	529	364	605	334	587	622
	1-MeFl+C-MeFl/Py	21.6	24.4	24.9	411	399	362	436	423	425
	B-MePy/MeFl	126	122	144	892	823	925	913	994	957
	C-MePy/MeFl	35.6	30.8	39.9	256	252	248	260	248	303
	4-methylpyrene	48.3	48.3	54.5	388	431	458	478	479	512
	1-methylpyrene	33.1	34.6	43.5	233	260	262	264	294	282
	Benzonaphthothiophene	115	100	125	588	631	609	701	665	771
	Benzo(c)phenanthrene	61.1	58.8	71.2	348	395	416	451	439	443
	5+6-methylchrysene	32.8	34.6	41.2	229	230	212	195	188	226
	7-methylbenzo(a)pyrene	8.14	7.12	11.2	38	70	38	88	63	73
	benz[a]anthracene-7, 12-dione	294	270	365	246	251	386	615	1870	410
	C2720S-13b(H),17a(H)-diasterane	124	143	145	774	742	821	1140	797	746
	C2720R-13b(H),17a(H)-diasterane	88.0	107	122	707	520	535	776	542	672
	C2720S-13a(H),17b(H)-diasterane	32.6	56.9	66.4	441	292	220	430	320	330
	C2720R-13a(H),17b(H)-diasterane	54.7	53.2	58.0	533	467	645	617	331	564
	C2820S-13b(H),17a(H)-diasterane	70.2	92.4	91.9	485	442	671	539	771	582
	C2720S-5a(H),14a(H), 17a(H)-cholestane	118	152	190	342	115	214	166	143	126
	C2720R-5a(H),14b(H), 17b(H)-cholestane	94.9	130	210	2870	1950	1920	3070	1820	2380
	C2720S-5a(H),14b(H), 17b(H)-cholestane	93.9	205	98.5	1010	822	1020	1010	779	862
	C2920S-13b(H),17a(H)-diasterane + C2720R-	36.6	50.1	45.3	2760	1640	2300	2620	1550	2520
	C2820S-5a(H),14a(H), 17a(H)-ergostane	64.6	78.6	79.4	548	487	529	418	385	483
	C2820R-5a(H),14b(H), 17b(H)-ergostane	109	106	198	606	615	725	886	540	701
	C2820S-5a(H),14b(H), 17b(H)-ergostane + C2	65.9	57.9	93.1	397	403	699	928	428	829
	C2820R-5a(H),14aa(H), 17a(H)-ergostane	93.4	133	164	806	627	907	839	755	638
	C2920S-5a(H),14a(H), 17a(H)-stigmastane	232	308	401	1130	421	685	613	463	904
	C2920R-5a(H),14b(H), 17b(H)-stigmastane	57.3	88.3	93.6	1850	1180	1720	1440	1090	1450
	C2920S-5a(H),14b(H), 17b(H)-stigmastane	184	190	252	695	639	681	625	378	730
	C2920R-5a(H),14a(H), 17a(H)-stigmastane	264	334	347	1370	857	1270	1120	804	1120
	C27 -Tetracyclic terpanes	10.9	19.3	31.3	390	442	270	514	417	475
	C27 -Tetracyclic terpanes	328	426	506	487	380	775	468	213	348
	C28 -Tetracyclic terpanes	307	448	546	617	528	825	544	302	502
	C28 -Tetracyclic terpanes	108	128	122	577	571	669	590	369	460
	17a(H), 18a(H),21b(H)-25,28,30-trisnormopan	61.8	81.8	105	487	532	931	346	416	622
	17a(H), 21b(H)-22,29,30-trisnormopane	215	302	311	2420	1830	2160	2740	2340	2560
	17a(H), 18a(H),21b(H)-28,30-trisnormopane	49.6	80.5	116	394	290	458	273	202	458
	17a(H), 21b(H)-30-normopane	1210	1500	1660	9370	7390	11300	12400	7630	9670
	18a(H), 21b(H)-30-norneonopane	98.0	114	118	871	765	997	1130	385	752
	17a(H), 21b(H)-hopane	1330	1810	2010	10600	10000	12400	14200	8090	10600
	17b(H), 21a(H)-hopane	223	291	380	1430	1920	1450	2460	1200	2290

13		Extract 1 Sample 1 (ng/g)	Extract 1 Sample 2 (ng/g)	Extract 1 Sample 3 (ng/g)	Part. 1 Sample 1 (ng/g as received)	Part. 1 Sample 2 (ng/g as received)	Part. 1 Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
	2-methylnaphthalene	61.2	56.4	55.5	942	862	852	1001	988	973
	1-methylnaphthalene	32.9	30	29.5	475	443	439	521	525	518
	biphenyl	13.4	13.5	14.0	202	192	206	206	203	206
	2,6-dimethylnaphthalene	12.7	12.6	12.9	183	179	179	194	201	180
	acenaphthylene	5.89	6.76	6.58	70.8	78.3	72.1	78.4	76.5	81.8
	acenaphthene	12.0	12.1	12.0	168	158	175	181	187	177
	2,4,5-trimethylnaphthalene	9.53	9.31	9.48	127	128	135	134	137	137

14		Extract 1 Sample 1	Extract 1 Sample 2	Extract 1 Sample 3	Part. 1 Sample 1	Part. 1 Sample 2	Part. 1 Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
	Note units are different!	(µg/ml as received)	(µg/ml as received)	(µg/ml as received)	(µg/g as received)	(ng/g as received)	(ng/g as received)	(µg/g as received)	(ng/g as received)	(ng/g as received)
	n-C23	1.62	1.61	1.70	13.6	_____	_____	15.7	_____	_____
	n-C25	8.75	8.46	9.03	67.9	_____	_____	73.8	_____	_____
	n-C27	8.76	8.62	9.23	69.2	_____	_____	79.9	_____	_____
	n-C29	8.88	8.68	9.08	64.0	_____	_____	72.0	_____	_____
	n-C31	4.92	5.18	5.30	37.2	_____	_____	37.9	_____	_____
	n-C33	1.79	1.87	1.94	13.5	_____	_____	14.4	_____	_____

1) Only one sample each of SRM1649a and Air Particulate 1 was processed and analyzed.

2) Each 1.0 ml was removed from the ampoules: Air Part. Extract 1, Ampoules 111, 189, and 207and analyzed as received.

3) n-Alkanes were quantified from C23 to C33.

17

ND=Not Detected

BD(xxx)= Below Detection limit. Xxx is the detection limit in ng/g

XX* = There is obviously a coeluting PAH with dibenz[a,h]anthracene
because the concentrations measured are twice higher than expected

We determined the extraction efficiency based upon the ratio of our average results for sampler 1649 relative to standard reference values

To calculate the actual loading of compounds in the air particulate sample I, we corrected the average results based upon this extraction efficiency

The calculated results are presented below

	extraction efficienc	Air Particulate 1 Sample 1 (ng/g as received) normalized	Air Particulate 1 Sample 2 (ng/g as received) normalized	Air Particulate 1 Sample 3 (ng/g as received) normalized
naphthalene	not determined	not determined	not determined	not determined
fluorene	45.46	176.5	229.6	164.8
phenanthrene	98.81	3429	3784	3197
anthracene	84.15	395.5	437.4	329.2
1-methylphenanthrene	_____	_____	_____	_____
2-methylphenanthrene	_____	_____	_____	_____
3-methylphenanthrene	_____	_____	_____	_____
9-methylphenanthrene	_____	_____	_____	_____
retene	_____	_____	_____	_____
4H-cyclopenta(def)phenanthrene	_____	_____	_____	_____
fluoranthene	89.21	6019	7166	5983
pyrene	89.97	5018	5289	4868
benzo[ghi]fluoranthene	_____	_____	_____	_____

	cyclopenta[cd]pyrene				
	benz[a]anthracene	84.65	1885	2075	2411
	chrysene	85.33	3133	3060	3076
	triphenylene				
	benzo[b]fluoranthene	89.77	6398	6579	6494
	benzo[j]fluoranthene				
	benzo[k]fluoranthene	81.11	1844	1960	1761
	benzo[e]pyrene				
	benzo[a]pyrene	78.16	2190	2402	2283
	perylene				
	indeno[1,2,3-cd]pyrene	85.08	3216	3477	3280
	benzo[ghi]perylene	79.92	3722	4239	3648
	dibenz[a,h]anthracene	not determined	not determined	not determined	not determined
	dibenz[a,c]anthracene				
	benzo[b]chrysene				
	coronene				
	dibenzo[a,e]pyrene				

18	Phenols	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
		Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
	Analyst (Initials)	BR	BR	BR	BR	BR	BR
	Date(s) of measurements (m/d/y)	8/7/02	8/7/02	8/7/02	8/7/02	8/7/02	8/7/02
	Sample Jar number	#313	#313	#313			
	phenol	0.16	0.11	0.15	1.59	0.4	0.25
	o-Cresol	0.04	0.04	0.05	5.14	1.12	1.14
	m-Cresol	0.02	0.03	0.04	1.62	0.4	0.4
	p-Cresol	0.02	0.04	0.05	1.31	0.35	0.36

19		Air Particulate I	SRM 1649a
	Dibenzo[a,l]pyrene [191-30-0]	255	282
	Dibenzo[a,e]fluoranthene [5385-75-1]	<956	<1170

20 COMMENTS:

n-C23, n-C24, n-C25, n-C26, n-C27, n-C28, n-C29, n-C30, n-C31, n-C32: many of the reported values exceed the limit of the calibration (approximately 8330 ng/g).

17a(H), 21b(H)-29-hopane: one of the reported values exceeds the limit of the calibration (approximately 8330 ng/g).

Benzanthrone: all of the reported values exceed the limit of the calibration (approximately 8420 ng/g).

Benz[a]anthracene-7, 12-dione: several of the reported values exceed the limit of the calibration (approximately 8330 ng/g).

Isopimaric acid: identification based on impurity found in a standard of abietic acid; quantitation relative to abietic acid calibration curve;

RSD for abietic acid curve (average response factor) >100%; bias on all points of abietic acid curve>+/-50%;

almost all continuing calibration check standards for abietic acid >+25% deviation from known concentration.

*Possible interference: secondary ion >25% variance from primary ion.

21 Analyt. Instr. Both the GC/FID and GC/MSD were used for the analysis of n-alkanes and ketones.
The most RSD% of n-alkanes, alkan-2-one and other compounds were bigger in the GC/MSD than in the GC/FID.
Data shown in this table were the data of GC/FID.

Carbonyls (Alkan-2-ones)	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)	yc	yc	yc	yc	yc	yc
Date(s) of measurements (m/d/y)	11/10/02	11/10/02	11/10/02	11/10/02	11/10/02	11/10/02
Sample Jar number	#331	#331	#331			

	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
	(ng/g as received	ng/g as received	ng/g as received	ng/g as received	ng/g as received	ng/g as received)
2-C15	221.22	276.12	266.12	341.95	219.47	251.85
2-C16	84.9	180.34	148.34	271.10	157.17	172.28
2-C17	243.06	296.35	323.25	444.35	587.78	589.89
2-C18	217.04	241.71	254.57	130.68	117.49	104.34
2-C19	131.65	163.70	198.78	284.52	245.20	237.85
2-C20	144.81	224.33	184.59	297.46	173.08	165.17
2-C21	105.32	260.71	152.64	258.66	281.26	198.21
2-C22	13.16	0.00	14.20	135.80	115.39	72.68
2-C23	164.56	121.26	177.49	303.92	302.89	218.03
2-C24	934.70	1133.79	706.39	1797.68	1976.02	1625.30
2-C25	190.89	187.95	191.68	465.59	670.69	436.06
2-C26	164.56	181.89	220.08	129.33	180.29	184.99
2-C27	197.47	321.34	181.04	433.25	512.03	317.13
2-C28	1119.01	1376.31	894.53	1480.82	1752.46	1770.65
2-C29	895.21	666.93	653.15	1364.42	1139.46	984.43
2-C30	368.62	321.34	124.24	103.46	165.87	151.96
2-C31	638.49	794.26	511.16	1235.09	1240.42	898.54
6,10,14-trimethylpentadecano-2-one	190.89	309.21	273.33	459.12	591.36	429.45

Alkanes and Alkenes	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
Analyst (Initials)	yc	yc	yc	yc	yc	yc
Date(s) of measurements (m/d/y)	4/10/02	4/10/02	4/10/02	4/10/02	4/10/02	4/10/02
Sample Jar number	#331	#331	#331			

	Air Particulate I	Air Particulate I	Air Particulate I	SRM 1649a	SRM 1649a	SRM 1649a
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
	(ng/g as received	ng/g as received	ng/g as received	ng/g as received	ng/g as received	ng/g as received)
n-C17	432.08	554.14	421.94	492.29	471.12	459.05
n-C19	496.09	582.56	459.95	553.55	616.84	548.62
n-C21	864.15	994.62	794.21	1442.82	1271.00	1142.03
n-C23	5056.91	5768.78	4401.87	10341.12	8610.40	7266.43
n-C25	39479.07	44843.05	34937.12	69621.94	57233.18	54503.84
n-C27	43095.72	47173.30	36487.28	62159.62	54436.73	54705.38
n-C29	43287.76	49617.21	35682.95	59280.82	49197.54	50954.60
n-C31	23860.28	28147.68	20342.21	31124.97	26837.03	29334.44
n-C33	8737.57	9320.99	7121.97	10047.60	7737.20	10770.89

	n-C34	2064.37	3012.27	2047.38	2664.31	2299.05	3325.32
	n-C35	1200.22	2259.20	1740.27	3172.33	2420.64	2754.30
	n-C37	1360.24	1506.14	1286.93	1851.47	1790.61	2093.72

Carbonyls and Acids	Air Particulate I Sample 1	Air Particulate I Sample 2	Air Particulate I Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Analyst (Initials)	yc	yc	yc	yc	yc	yc
Date(s) of measurements (m/d/y)	12/11/02	12/11/02	12/11/02	12/11/02	12/11/02	12/11/02
Sample Jar number	#331	#331	#331			
	Air Particulate I Sample 1	Air Particulate I Sample 2	Air Particulate I Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
	(ng/g as received	ng/g as received	ng/g as received	ng/g as received	ng/g as received	ng/g as received)
C6 acid	10701.29	10233.53	9025.97	13299.50	13144.96	11536.32
C7 acid	2813.34	2856.73	2983.16	6817.81	6850.29	5277.32
C8 acid	4967.52	4762.71	3732.53	7143.33	7085.47	5836.61
C9 acid	6973.94	5675.95	4504.07	8664.82	7685.73	6260.91
C10 acid	4149.84	2488.50	3577.11	6624.80	5643.77	4908.16
C11 acid	2747.05	2200.22	2155.97	5334.30	4419.60	3619.10
C12 acid	5331.65	3707.43	4159.70	7696.13	8607.74	6689.97
C13 acid	8440.41	8417.77	7402.57	12452.57	14631.87	12174.73
C14 acid	11669.12	12458.12	8733.73	13004.50	17728.13	12294.78
C15 acid	5970.61	4324.81	3818.97	9878.04	11010.35	8108.78
C17 acid	17544.89	15310.80	12177.78	17769.56	21837.53	17968.83
C18 acid (stearic acid)	97938.03	93733.08	69658.70	79640.05	150639.63	93598.33
C18:1 acid	23852.99	21946.24	19855.11	19067.91	28113.35	24709.62
C20 acid	24480.80	22148.92	18239.11	20828.14	32348.21	22917.00
cis-Pinonic acid	4604.74	4031.81	3490.67	5794.31	6088.57	5069.54

22

1 For Alkanes, C20, C22 and C36 are below our limit of quantitation (LOQ) <5000ng/g
2 Prystane and Phytane, below LOQ (<5000ng/g)
3 Hopanes and steranes: LOQ = 800ng/g
4 All samples were concentrated to 0.25 ml prior to analysis
5 Slight precipitate on solvent exchange to hexane
6 Alkylcyclohexane Analysis

Calibration Curve	Points	Conc. Range
	3	0.5, 1.0

23

Values left blank inidicate the analyte was not attempted to identify or quantify
DL indicates below level of detection
The reported value for Chrysene includes Triphenylene
The following compounds were detected in the blanks at less than 10 percent of the reported values. Results are blank corrected
Tetracosane, Pentacosane, Hexacosane, Heptacosane, Fluoranthene, Pyrene, Hexadecanoic acid, Heptadecanoic acid, Oleic Acid, Octadecanoic Acid, Eicosanoic Acid, Docosanoic Acid, Tricosanoic Acid, Tetracosanoic Acid, Hexacosanoic Acid
Aliphatic and Aromatic Diacids were also measured by are not being reported due to poor spike recovery in QA/QC samples

Additional Compounds quantified
TETRADECANOIC ACID
PENTADECANOIC ACID
PALMITOLEIC ACID
HEPTADECANOIC ACID
OLEIC ACID
OCTADECANOIC ACID
NONADECANOIC ACID
EICOSANOIC ACID
HENEICOSANOIC ACID
DOCOSANOIC ACID
TRICOSANOIC ACID
TETRACOSANOIC ACID
PENTACOSANOIC ACID
HEXACOSANOIC ACID
HEPTACOSANOIC ACID
OCTACOSANOIC ACID
NONACOSANOIC ACID
TRIACONTANOIC ACID
PENTACOSANE
HEPTACOSANE
NONACOSANE
ANTEISO-TRIACONTANE
TRIACONTANE
ISO-HENTRIACONTANE
HENTRIACONTANE
ANTEISO-DOTRIACONTANE
DOTRIACONTANE
ISO-TRITRIACONTANE
TRITRIACONTANE
TETRATRIACONTANE
PENTATRIACONTANE
HEXATRIACONTANE
20R,ABB-CHOLESTANE
20S,ABB-CHOLESTANE
20R,AAA-CHOLESTANE
20S,ABB-ERGOSTANE
20R,ABB-SITOSTANE
20S,ABB-SITOSTANE
22S,AB-30,31,32-TRISHOMOHOPANE
22R,AB-30,31,32-TRISHOMOHOPANE

Lab	Additional notes for PM 2.5 Interim Reference Material							
1		Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	
	2-methylnaphthalene	732	728	773	997	1012	1028	
	1-methylnaphthalene	377	378	405	542	544	536	
	acenaphthene	104	149	144	229	217	202	
	acenaphthylene	160	138	123	177	151	173	
	2,3,5-trimethylnaphthalene	115	108	136	160	137	173	
	9+4-methylphenanthrene	273	259	272	502	521	521	
	benzo[c]phenanthrene	324	350	361	433	436	414	
	chrysene/triphenylene	4971	5144	4999	3896	3905	3991	
	benzo[a]fluoranthene	300	260	281	408	376	373	
	picene	479	495	464	428	439	463	
	pentaphene	157	134	133	142	146	138	
	1-nitronapthalene	8.21	8.34	8.14	6.83	6.51	6.44	
	2-nitronaphthalene	7.02	7.22	7.18	9.51	10.4	10.1	
	3-ntirobiphenyl	2.84	2.51	2.34	3.65	3.84	3.47	
	5-nitroacenaphthene	1.81	1.99	1.64	3.05	3.24	3.18	
	9-nitrophenanthrene	9.41	8.84	8.51	1.76	1.77	1.67	
	4-nitrophenanthrene	0.597	0.584	0.592	0.476	0.477	0.481	
	3-nitrophenanthrene	16.5	16.1	16.3	21.5	22.1	22.7	
	4-nitropyrene	7.94	8.87	8.97	5.54	5.64	5.47	
	8-nitrofluoranthene	6.01	5.45	5.64	8.56	8.99	8.47	
	2-nitropyrene	36.8	34.8	39.1	26.4	28.9	24.7	
	n-C17	2324	2513	2572	3063	3077	3215	
	n-C18	2685	2634	2731	2309	1972	2346	
	n-C19	2445	3197	2654	3888	3912	3997	
	n-C33	10649	10101	10544	22017	22543	23520	
	n-C34	5266	4519	5199	13632	12189	12222	
	n-C35	1438	1478	1501	<2000	<2000	<2000	
1a	dibeno[a,h]anthracene had a coeluting compound on the gas chromatographic column used (DB-17MS)							
	9-methylphenanthrene and 4-methylphenanthrene were coeluting on the gas chromatographic column used (DB-17MS)							
3		Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	
	Acenaphthene	<DL	<DL	<DL	125	139	123	
3a		Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	
	Acenaphthene	296	298	276	352	369	425	
4	other - chrysene coelutes with triphenylene, dibenz[a,h]anthracence coelutes with dibenz[a,c]anthracene; for the *n* -alkanes of the IRM, large background concentrations were observed in the blank samples. 20R-5a(H), 14b(H), 17b(H)-cholestane may elute with 20R-5b(H), 14a(H), 17a(H)-cholestane							
	Compound	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)	GC/MS analysis results (ng/uL) IRM blank	GC/MS analysis results (ng/uL) SRM blank
	Diethyl Phthalate	788	618	16622	496	621	499	0.06	0.12
	Naphthalene	3029	1773	2612	1696	2110	1956	0.2	
	2-Methylnaphthalene	996	907	1161	703	827	583		
	1-Methylnaphthalene	788	412	622	455	455	416		
	2,6-Dimethylnaphthalene	622	371	497	0	0	0		
	Acenaphthylene	871	536	953	827	910	874		
	Fluorene	166	82	124	165	290	291		
	1-Methylfluorene	207	371	373	0	0	0		
	Phenanthrene	3195	1897	3358	3724	4882	4620		
	Anthracene	996	577	871	1241	1324	1373		
	Dibutylphthalate							0.47	2.1
	Butylbenzylphthalate	9253	10390	7627	5958	5544	5203	0.24	0.68
	Bis-2-Ethylhexylpthalate	40331	31788	31587	92303	70957	60975	0.26	0.72
	Dioctylphthalate	4398	2680	5264	0	0	0		
	Fluoranthene	5436	4370	4726	6454	6330	5827		
	Pyrene	3734	3216	3275	5958	5792	5369		
	Chrysene & Triphenylene	6141	4906	4767	4882	5213	4995		
	Benzo[*a*]anthracene	1867	1154	1368	1945	2193	2372		
	Benzo[*k*]fluoranthene	4025	2639	3233	2689	2772	3080		
	Benzo[*b*]fluoranthene	5187	2474	3855	6330	5751	7159		
	Benzo[*a*]pyrene	1660	866	1202	2524	1945	1790		
	Indeno[1,2,3-cd]pyrene	5021	4205	3979	2937	5048	4162		
	Dibenzo[a,h]anthracene	*830*	*536*	*580*	*0*	*0*	*0*		
	Benzo[ghi]perylene	6722	6308	4891	6992	8358	5161		
	Coronene	2075	825	2031	9723	11543	10031		
	Cholestane 1	332	371	207	1614	1862	1915		
	Cholestane 2	373	371	249	1407	1738	1873		
	Cholestane 3	332	289	290	1076	1531	1457		
	Cholestane 4	664	742	622	3393	3641	3579		
	ABB Methylcholestane	456	289	249	1117	1200	1457		
	ABB Ethylcholestane	954	742	912	2317	2441	2289		
	Trisnorhopane	996	701	1078	2110	2482	2248	0.21	
	Norhopane	0	0	0	1820	2276	1956		
	Hopane 1	*2199*	*1608*	*1907*	*13157*	*16550*	*16107*		
	Hopane 2	0	0		1407	2069	1790		
	Hopane 3	0	0		579	662	499		
	n-Undecane							0.33	0.38
	n-Dodecane								
	n-Tridecane								
	9H-Fluorenone	1618	866	2902	1158	1696	1582		

	n-Tetradecane	1037	577	746	1034	1407	1124	0.13		
	n-Pentadecane	0	2144	2321						0.73
	n-Hexadecane	2282	1154	1865	910	952	1165	0.17		
	n-Heptadecane	4025	1814	3565	869	1241	1082	0.12		
	1-Octadecene	1577	825	2404	786	1034	0			
	n-Octadecane	3029	1361	2777	662	786	957	0.05		
	2-Methylnonadecane	581			0	0	0	0.11		
	3-Methylnonadecane	1909			0	0	0	0.61		
	n-Eicosane	1867	124	622	1531	1531	1706	0.52		
	Pyrene	2199	2268	1907	1324	1365	1249			
	Anthraquinone	3153	2597	2902	1903	2069	1540			
	1,8 Naphthalic Anydride	34688	16244	21389	34505	40381	35669			
	Methylfluoranthene	2780	2969	1782	0	0	1373			
	Retene	913	990	580	248	165	83			
	Cyclopenta[cd]pyrene	9294	7298	7586	0	0	0			
	Benzanthraquinone	1950	1154	1161	2110	2648	2372			
	Methylchrysene	0	0	0	0	0	0			
	Benzo[a]pyrene	1743	948	1409	2731	2607	1498			
	n-Tetracosane				28216	29996	53566	4.33		0.48
	n-Octacosane	8050			46214	50932	74626	4.72		1.35
	Squalene	0	0	0	0	0	0			
	Dibenzo[a,e]pyrene	332	0	539	0	0	0			
	n-Triacontane	67135	41848	4808	33760	27969	43702	5.29		2.01
	n-Dotriacontane	27675	15708	1658	22259	21060	32339	3.46		1.02
	n-Hexetriacontane				5834	8109	8033	0.8		0.32
	n-Tetracontane				4261	6785	3579	0.76		0.17
	Glycerine			6342	7033	6951	8160	2.48		2.11
	Levoglucosan	191321	156343	176878	61853	72115	71423	0.51		0.55
	Monopalmitin	9958			49110	46794	49209	2.51		0
	Monoolein	0	0	0	0	0	0	0		0
	Monostearin	14771			21928	7861	15455	17.46		4.77
	Cholesterol	4025	3010	4394	0	0	0	0		0
	Stigmaterol								0	0
	Eugenol	2282	1237	1907						
	Propylguaicol	0	0	0						
	Guelcyl acetone	0	0	0						
	Homovenillic acid	0	0	0						
	p-methoxyacetone	0	0	0						
	Vanillin	21452	5236	8664						
	cis-Isoeugenol	0	0	0						
	Isoeugenol	6224	2474	3689						
	3,5-Dimethoxyphenol	0	0	0						
	Acetovenillone	5767	0	0						
	Methyl vanillate	0	0	0						
	Propiovenillone	0	0	0						
	Syringealdehyde	4232	0	0						
	Methoxyeugenol	0	0	0						
	Coniferaldehyde	0	0	0						
	Acetosyringone	0	0	1244						
	Succinic acid	5767	3834	3565	42531	56062	69340			0.06
	Octanoic acid	7012	4700	3565	6371	7489	7575	0.38		0.2
	Glutaric acid	415	536	622	9474	13447	15774			
	Adipic acid	0	0	0	6454	7323	8366			
	Decanoic acid	3734	2762	2819	3930	4427	4453	0.21		0.2
	Pimelic acid	0	0	912	6578	8730	10572			
	Suberic acid	0	0	2280	18494	23832	29426			
	Dodecanoic acid	4066	3175	3316	4468	4924	4620	0		0.13
	Azelaic acid	1535	1072	2363	53330	73150	84157			
	Pinonic acid	16804	20656	17203				0		6.96
	Phthalic acid	-1577	990	2860	40297	45594	50112	2		
	1,4-Ben acid	4481	5566	9037	5834	6082	7284			
	1,3-Ben acid	6265	0	0	3144	3931	4703			
	1,2-Ben acid	0	0	0	13363	15350	16648			
	1,2,4 Ben acid	0	0	0	4551	5006	5286			
	Ben-tel acid	0	0	0	0	0	0			
	Abietic acid	0	0	0	0	0	0			
	Sebacic acid	0	0	0	6537	10881	9656			
	Tetradecanoic acid	10747	8906	6259	11419	14398	13568	0		0.24
	Palmitoleic acid	0	0	0	0	0	0			
	Hexadecanoic acid	168957	113876	71671	295196	349778	337795		2.99	1.13
	Linoleic acid	3817	2350	1534	9474	10302	10655			
	Oleic acid	12323	6885	4601	15722	18660	21352			
	Linolenic acid	0	0	0	0	0	0			
	Octadecanoic acid	32281	12822	12643	162802	186888	187502		5.75	1.8
	Eicosanoic acid	6058	3752	4726	31733	33927	35836		0.12	
	Docosanoic acid	7095	4205	8581	52254	55152	58103			
	Tetracosanoic acid	6265	3340	12187	49565	48863	55314		0.21	0.12
	Octacosanoic acid	3278	0	10363	50640	47001	59934			
	Triacontanoic acid	0	0	5762	38808	33306	52692			
	Glycerine			6342	7033	6951	8160		2.48	2.11
	Levoglucosan	191321	156343	176878	61853	72115	71423		0.51	0.55
	Monopalmitin	9958			49110	46794	49209		2.51	0
	Monoolein	0	0	0	0	0	0	0		0
	Monostearin	14771			21928	7861	15455	17.46		4.77
	Cholesterol	4025	3010	4394	0	0	0	0		0
	Stigmaterol							0.00		0
7		Interim RM	Interim RM	Interim RM	SRM 1649a	SRM 1649a	SRM 1649a	SRM 1649a		

		Sample 1 (ng/g as received)	Sample 2 (ng/g as received)	Sample 3 (ng/g as received)	Sample 1 (ng/g as received)	Sample 2 (ng/g as received)	Sample 3 (ng/g as received)	Sample 4 (ng/g as received)
	2-methylnaphthalene	411	606		812	904	830	785
	1-methylenaphthalene	160	171		397	386	376	322
	2,4,6-trichlorophenol							
	2,4,5-trichlorophenol							
	biphenyl	195	345		344	343	373	337
	nonanoic acid							
	1-methylisoquinoline							
	tetradecanoic acid	13900	13100	11300	28100	26800	30400	
	hexadecanoic acid	104000			400000	308000	378000	405000
	heptadecanoic acid	3520			15100	15800	17900	18900
	dichlorphen	<5000	<10000	<10000	142000	76900	77800	81000

8		Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
	n-C15	941	1040	661	617	617	757
	n-C16	642	548	348	527	551	576
	n-C17	481	508	385	621	593	665
	Dibenzothio	82	89	77	438	406	457
	n-C18	567	620	492	691	677	728
	n-C19	521	537	468	832	814	870
	n-C33	6100	7180	6720	19500	20200	22700
	n-C34	1890	2180	2070	5420	5260	8280
	n-C35	1770	2280	2300	6940	6430	7420

9		Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
	eugenol	297	403	352	300	321	300
	4-propylguaiacol	<126	<159	<152	other	<128	<123
	vanillin	1957	2105	2297	1022	1037	1007
	4-methylsyringol	211	other	256	222	251	226
	trans-isoeugenol	<126	<159	<152	<115	<128	<123
	acetovanillone	428	544	486	1035	888	976
	guaiacylacetone	<126	<159	<152	<115	<128	<123
	4-allylsyringol	<126	<159	<152	<115	<128	<123
	4-propylsyringol	<126	<159	<152	RT	<128	<123
	syringaldehyde	1831	2021	2111	152	159	141
	acetosyringone	617	709	712	249	276	236
	coniferylaldehyde	789	1022	911	844	892	683
	sinapylaldehyde	other	other	other	other	other	other
	* other = peak not quantifiable due to interferences						
	MDL defined as half the concentration of the lowest standard						

10	
	SRM 2260, 1494 used as external standards for quantitation
	Deuterated IS used to account for sample losses
	HP 5890 Series II GC
	HP 5972 MS

11	
	coeluting compounds are indicated in table above by adding the names together. These included benzo (b+j+k) fluoranthene, dibenzo(ah + ac+ aj) anthracene, chrysene plus triphenylene.
	In addition, 9-methylphenanthrene and 4-methylphenanthrene coelute
	compounds at or below the analytical detection limit were still reported above. Depending on analyte, detection limit is approx. 300 ng/g
	Additional compounds that were analyzed and not listed above include:

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
benzonaphthothiopene	817	773	901	1141	1033	909
dibenzothiopene	175	160	166	632	572	564
xanthone	140	190	102	214	190	223
acenaphthenequinone	30	50	70	59	99	113
4-methylphenanthrene	329	323	344	500	490	510
3,6-dimethylphenanthrene	288	273	301	257	347	337
2,6-dimethylphenanthrene	24	206	265	464	473	507
2,7-dimethylphenanthrene	279	114	225	239	396	424
1,3+2,10+3,9+3,6-dimethylphenanthrene	417	383	528	651	706	887
1,6+2,9-dimethylphenanthrene	231	170	313	338	592	552
1,7-dimethylphenanthrene	213	57	176	242	324	355
2,3-dimethylphenanthrene	57	60	145	170	288	255
Benzo[a]pyrene-7(8H)-one,9,10-dihydro	208	150	190	121	93	150

12	
	Detection limits: 4.00 E+1 for 1649a extracts and 1.40 E+2 for interim extracts.
	Coelution Compounds: chrysene and triphenylene; benzo(b)fluoranthene, benzo(j)fluoranthene, and benzo(j)fluoranthene; dibenz(ah)anthracene and dibenz(ac)anthracene; quantified as one peak
	Nitro-PAH analysis extracts were combined after extraction; the total mass for the 1649a extracts were 0.3062g and the interim extracts were 0.0901g
	Extract fraction used for nitro-PAH analysis was cleaned by SPE catridge and HPLC elution fractionation, similar to Bamford et al. method description.

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
Xanthone	647	576	381	266	240	359
Acenaphthenequinone	795	482	998	1578	819	3071
Perinaphthenone	2850	2800	3390	1448	1198	2326
9-methylanthracene	232	184	160	1134	718	1689
Anthraquinone	5170	4190	8300	3725	3008	4259
9-Anthraaldehyde	1000	942	1040	838	822	1015
1-methylpyrene	412	310	294	273	249	270
4-methylpyrene	521	480	471	360	371	362
Benzonaphthothiophene	1230	965	1230	960	1055	1074
Benzo(c)phenanthrene	839	602	831	600	530	596
Benz(a)anthracene-7,12-dione	5060	3830	4840	4854	4724	4903
C27-20S-13β(H),17α(H)-diasterane	1280	822	915	562	407	821

	C27-20R-13β(H),17a(H)-diasterane	783	479	610	407	369	561
	C27-20R-13a(H),17β(H)-diasterane	498	411	366	271	563	280
	C28-20S-13β(H),17a(H)-diasterane	3910	753	2740	329	388	420
	C27-20S-5a(H),14a(H)-cholestane	783	548	488	291	252	561
	C27-20R-5a(H),14β(H)-cholestane	1780	959	1280	1047	1242	1642
	C27-20S-5a(H),14β(H),17β(H)-cholestane	783	342	549	407	621	701
	C28-20S-5a(H),14β(H),17β(H)-ergostane	498	137	488	329	446	400
	C27-20R-5a(H),14a(H),17a(H)-cholestane&C29-20S13β(H),17a(H)-diasterane	1140	548	610	407	233	561
	C28-20R-5a(H),14a(H),17a(H)-ergostane	0	274	549	388	330	460
	C29-20S-5a(H),14a(H),17a(H)-stigmastane	1210	479	915	659	718	941
	C29-20R-5a(H),14β(H),17β(H)-stigmastane	1140	479	976	891	1086	1522
	C29-20S-5a(H),14β(H),17β(H)-stigmastane	996	479	610	484	601	821
	17a(H),18a(H),21β(H)-25,28,30-Trisnorhopane	2990	1850	2130	1492	1785	2122
	C29-20R-5a(H),14a(H),17a(H)-stigmastane	1210	616	1220	543	951	701
	17b(H),21a(H)-30-Norhopane	3770	1780	2320	271	660	681
	18a(H),21β(H)-30-Normoohopane	783	411	427	1027	776	1221
	17β(H),21a(H)-hopane	1710	548	854	1434	1785	1962
	farnesane	84400	89000	39500	30605	16006	50068
	norpristane	40100	59800	28300	17179	20797	14136
	pristane	180000	108000	61000	51304	61459	42961
	phytane	575000	308000	304000	95388	68039	136939
	n-C21	26800	18800	16200	6127	4130	4817
	n-C23	42500	54000	39400	14263	11740	11253
	n-C25	81000	87700	68900	45519	40048	43261
	n-C27	66700	72600	70500	30702	23055	28891
	n-C29	72400	56900	70200	44037	33955	48765
	n-C31	26400	21700	29300	14777	12629	14799

13 *Chrysene value includes triphenylene

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
2-methylnaphthalene	461	405	414	848	933	936
1-methylnaphthalene	205	184	190	423	463	469
biphenyl	159	115	131	148	161	152
2,6-dimethylnaphthalene	159	136	160	159	180	171
acenaphthylene	138	135	160.0	91	104	97
acenaphthene	38	29	35	161	149	155
2,4,5-trimethylnaphthalene	100	87	89	132	145	142

16

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
2-nitrofluorene		1.51	1.59	NA	NA	NA
2-nitropyrene		NA	NA	4.39	5.39	5.65

17 ND=Not Detected

We determined the extraction efficiency based upon the ratio of our average results for sampler 1649 relative to standard reference values

To calculate the actual loading of compounds in the air particulate sample 1, we corrected the average results based upon this extraction efficiency

The calculated results are presented below

	extraction efficiency %	Standard deviation %	Air Particulate 1 Sample 1 (ng/g as received) normalized
naphthalene	not determined	not determined	261
fluorene	not determined	not determined	ND
phenanthrene	92.8	14.9	1959
anthracene	97.9	8.9	136
fluoranthene	104.0	9.1	5072
pyrene	93.8	8.2	3351
benz[a]anthracene	105.5	11.8	1966
chrysene	110.9	12.3	4479
benzo[b]fluoranthene	104.8	8.2	7204
benzo[k]fluoranthene	96.8	7.9	2452
benzo[a]pyrene	84.1	4.3	2428
indeno[1,2,3-cd]pyrene	93.8	8.1	5012
benzo[ghi]perylene	84.8	6.8	5535
dibenz[a,h]anthracene	not determined	not determined	350

18 Interim RM Sample 2: for quantification we use 3 mL instead of 8 mL and in the chromatogramm we could see a double peak for fluoranthene, we could not see it in the chromatograms of the two other extractions, there was only one peak for fluoranthene.

For phenols and cresols the amount of the samples is too small, even though the detection limit is at 10 pg Fe/µL

19

	Interim RM Sample 1 (ng/g as received)	Interim RM Sample 2 (ng/g as received)	Interim RM Sample 3 (ng/g as received)	SRM 1649a Sample 1 (ng/g as received)	SRM 1649a Sample 2 (ng/g as received)	SRM 1649a Sample 3 (ng/g as received)
Dibenz[a,l]pyrene [191-30-0]	410	350	660	480	470	450
Dbenzo[a,e]fluoranthene [5385-75-1]	930	1250	1270	1250	1850	1950

20 COMMENTS:

*Possible interference: secondary ion >25% variance from primary ion.

Isopimaric acid: identification based on impurity found in a standard of abietic acid; quantitation relative to pimaric acid calibration curve.

Acids: calibration curve concentration range = approx. 833-8330 or approx. 2500-8330 ng/g.

Table 3. Additional Analytes Analyzed

Additional Analytes Analyzed	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
	(ng/g as receivec	ng/g as receivec	ng/g as receivec	ng/g as receivec	ng/g as receivec	ng/g as received)
Indeno[1,2,3-cd]fluoranthene	1880	1820	1860	1670	1370	1470
n-C33	486	<89.2	<89.2	<178	<178	<178
n-C34	<83.5	<83.5	<83.5	<835	<835	<835
20R-5a(H),14B(H),17B(H)-Sitostane	684	641	649	2710	1500	777*

	Benzo[cd]pyren-6-one	4120	4790	5660	4810	8220	7130
	cis-9-*n*-Octadecenoic acid	>8550**	>8590**	>8550**	>8570**	>8540**	>8540**
	8,15-Pimaradien-18-oic acid	<701	<704	<701	<703	<700	<700

COMMENTS:

*Possible interference: secondary ion >25% variance from primary ion.

**Value exceeds the upper limit of the calibration; contamination in method blanks and method controls has been troublesome for this analyte--quantitated values in samples are suspect.

8,15-Pimaradien-18-oic acid: identification based on impurity found in a standard of abietic acid; quantitation relative to pimaric acid calibration curve.

21

	Interim RM Sample 1	Interim RM Sample 2	Interim RM Sample 3	SRM 1649a Sample 1	SRM 1649a Sample 2	SRM 1649a Sample 3
Other Carbonyls (n-alkan-2-ones)	(ng/g as received)	(ng/g as received)	(ng/g as received)	(ng/g as received)	(ng/g as received)	(ng/g as received)
2-C15	1037	1209	1377	1259	1293	1370
2-C16	1981	2299	2521	2214	2347	2379
2-C17	943	734	1191	1422	1414	1300
2-C18	306	400	472	912	910	925
2-C19	607	705	738	829	911	841
2-C20	466	546	662	244	155	215
2-C21	202	257	275	139	217	121
2-C22	181	183	222	1132	1300	836
2-C23	232	230	262	650	835	636
2-C24	459	448	437	1094	1557	1021
2-C25	487	562	459	416	514	354
2-C26	176	168	214	993	1310	1193
2-C27	129	170	130	1368	1655	1262
2-C28	<DL	<DL	<DL	140	73.5	170
2-C29	123	182	81.7	1288	1602	1325
2-C30	37.4	19.1	<DL	888	570	399
2-C31	301	264	267	2611	2588	2555
6,10,14-trimethylpentadecan-2-one	624	810	707	906	966	878
Other Fatty Acids						
C9-F	19585	23502	19585	11723	12772	14565
C10-F	11723	12896	11723	8171	8351	8685
C11-F	6207	5570	6207	3584	4580	3117
C12-F	19329	19740	19329	13621	14487	14863
C13-F	8762	8417	8762	6292	4680	5026
C14-F	27636	27197	27636	25692	26814	28368
C15-F	12088	11955	12088	15318	14546	13217
C16-F	90914	93810	90914	235747	289954	278171
C17-F	11458	12044	11458	22905	22030	23597
C18-F	52487	51224	52487	144753	165540	161933
C20-F	14250	20529	14250	41911	37641	35538
Others						
1-octadecanol	6502	8768	11775	9484	11153	12536
1-docosanol	7208	8522	4361	9958	9826	8037
1-tetracosanol	7070	7523	4368	17189	16623	14153
1-hexacosanol	5718	7840	4077	29961	22283	24773
1-octacosanol	3504	3251	3438	22807	20465	15902
B-sitosterol	2110	1879	1585	1477	1603	1425

22

1 For Alkanes, C20, C22 and C26 are below our limit of quantitation (LOQ) <5000ng/g

2 Prystane and Phytane, below LOQ (<5000ng/g)

3 Hopanes and steranes: LOQ = 800ng/g

4 samples SRM1649 were concentrated to 0.25 ml prior to analysis; samples Interim RM were concentrated to 0.10 ml prior to analysis

5 Alkylcyclohexane Analysis

Calibration Curve	Points	Conc. Range
4	0.2, 0.5, 1.0	

Appendix C

Laboratory Methods Used

Lab #	AP Extract I	g extracted Air Part. I	g extracted SRM 1649a	Extraction Method	Extraction Solvent	Extraction Time	Extraction other
1	1.33 g	0.19 g	0.11 g	PFE	dichloromethane	15 min	100 C; 2000 psi; 3 cylces of 5 min static; flush 90%; purge 90 sec
2	dilute 1 to10 mL	0.05 g	0.05 g	sonication	10% acetonitrile in dichloromethane	60 min	
3	0.30 mL	0.05 g	0.05 g	sonication	dichloromethane	3 consecutive - 8 min each	
4	0.001mL direct injection	0.006 g	0.006 g	sonication	benzene/PA/hexanes (63/32/5 wt/wt)	50 min	filter
5		0.09 g	0.082 g	sonication	dichloromethane	3 extractions - 10 min	
6	0.075 g	0.150 g	0.170 g	Soxhlet	dichloromethane	20 h	
6a	not requested	0.035 g	0.035 g	PFE	dichloromethane	10 min	
7		0.1 g	0.1 g	PFE	dichloromethane	7 min	150 C; 1000 psi; 2 static cycles
8		0.02 g	0.02 g	sonication	dichloromethane/acetone/hexane (2:3:5)	1 h 15 min to 1 h 45 min	10 mL solvent, 2 times; 3.5 mL + 3 times 1 mL
9	0.5 mL	0.03 g	0.03 g	sonication	30 mL ethylacetate + 10 ppm hydroxytoluene+ 250 ppm phenol	1 h	
10	0.03 - 0.3 g	0.01 g		Soxhlet - micro < 20 mL	dichloromethane/hexane (50/50 v/v)	8 h	
11	0.1 g	0.1 g	0.1 g	Soxhlet	dichloromethane followed by acetone	6 h per solvent	
12	1.2 mL	0.10 g	0.10 g	microwave assisted extraction	dichloromethane followed by acetonitrile	25 min per solvent	
13	2 g	0.15 g	0.15 g	PFE	dichloromethane	3 cycles at 5 min each	100 C; 2000 psi; 3 cycles of 5 min static;
14	1 mL	0.2101 g	0.2126 g	sonication	dichloromethane	3 times for 5 min each	
15	not requested	0.10 g	0.10 g	PFE	dichloromethane	15 min	
16	2 g	0.15 g		Soxhlet	dichloromethane	20 h	
17	not requested	0.58 g	0.48 g	PFE	hexane:acetone (70:30)	20 min	
18	not requested	0.357 g	0.348 g	microwave extraction	dichloromethane	3 times for 10 min	
19	not requested	0.25 g	0.25 g	Soxtec	acetonitrile	30 min in the solvent; 60 min extraction; 30 min rinse	concentrate to 25 mL
20	not requested	0.03 g	0.03 g	sonication (ultrasonic bath)	dichloromethane (3x15mL) followed by methanol (2x15mL)	10 min per sonication; 50 min total	Concentrate using Turbovap and Reactivap
21	not requested	0.154 g	0.146 g	PFE	dichloromethane:methanol (3:1, v:v)		40 C; 1500 psi; 2 cycles of 5 min static; 60% flush; purge 60 sec
22	not requested	0.033 g	0.033 g	PFE - 2x	dichloromethane	5 min heat; 5 min static; 180 sec nitrogen purge	100 C; 2000 psi; nitrogen purge 100 psi for 240 sec
23	not requested	0.02 g	0.02 g	Soxhlet	dichloromethane and methanol	12 h with each solvent	

Lab #	Sample extract cleanup method	Method of quantitation
1	aminopropyl solid phase extraction (SPE) column; condition and elute with 20 % dichloromethane in hexane; to isolate nitroPAHs - semipreparative amino/cyano HPLC fractionation	IS
2	filter	ES
3	filter; solvent exchange to acetonitrile	ES
4	filtered and nitrogen blowdown	IS
5		ES
6	PAH: 5% deactivated silica, split extract; nitroPAH: liquid /liquid extraction with DMSO, HPLC using silica column	IS
6a	1.5 cm column containt 5 g of 5% deactivated silica topped with 1 g sodium sulphate - preclean column with 15 mL cyclohexane, add sample with 5 mL cyclohexane, fraction 1 paraffins and biomarkers (15 mL cyclohexane); fraction 2 PAH (15 mL cyclohexane:acetone, 1:1, v:v)	
7		IS
8	concentrate under nitrogen to 200 uL	ES
9	0.45 um PTFE syringe filter	IS
10	concentrate under dry filtered argon to 0.5 mL	IS
11	filter	IS
12	Supleco SPE LC-SI 12 mL, 2000 mg using hexane and hexane/benzene (1:1) to elute analytes	IS
13	aminopropyl solid phase extraction (SPE) column; condition and elute with 10 % dichloromethane in hexane	IS
14	none	IS
15	silica SPE	IS
16	HPLC Phase SEP Silica, Spherisorb 5 micron particles, 25 cm x 10 mm	IS
17	add 1 mL of iso-octane; conc to 0.75 mL; SPE (silica gel); add 1mL ACN; conc to 0.75 mL	ES
18	filter; bring up to 10 mL volume: take 2 mL through 2x23 mm alumina (1.2% H2O) in pipette	IS
19	filtration on a Millex FG Millipore cartridge	ES
20	centrifugation (20 min at 4000 rpm per sonication)	IS
21	silica gel chromatography - fraction 1 n-alkanes (25 mL of hexane); fraction 2 PAH (25 mL hexane:DCM, 6:4, v:v); fraction 3 ketones and quinones (25 mL hexane:ethyl acetate, 5:1, v:v); fraction 4 acids (30 mL ethyl acetate:methanol, 3:1, v:v)	IS + ES
22	solvent exchange to hexane; chromatographic separation using 5% (w/w) water deactivated silica column - fraction 1 n-paraffins and biomarkers (15 mL hexane); fraction 2 PAH and some polar (15 mL hexane:acetone, 1:1, v:v); fractions 3 and 4 more polar sompounds (2 x 15 mL methanol)	IS
23	none	IS

Lab #	Instrument	PAHs Phase	Dimensions	Calibration Curve # points	range
1	GC/MS	DB-XLB & DB-17MS	60m x 0.25 mm, 0.25um film	5	150 - 6500 ng/g
2	HPLC-FL	Vydac 201TP54	0.46 x 25 cm	5	4 - 80 ng/mL
3	HPLC-FL	C-18	15 cm x 4.6 mm, 5 um particle	5	10 - 250 ppb
4	GC/MS		30m x 0.25 mm, 0.25um film	5	
5	GC/MS	HP-5MS	30m x 0.25 mm	3	1.1 - 39 ng/uL
6	GC/MS	DB-XLB	30m x 0.25 mm, 0.25um film	5	0.1 - 10 ng/uL
6a	GC/MS	DB-XLB & SB Semectic	30m & 20m x 0.25 mm & 0.2 mm, 0.25um film	5	0.1 - 10 ng/uL
7	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	9	0.4 - 64 ng/uL injected
8	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	4 to 9	0 - 4000 ppb
9	GC/MS	RTx-5	30m x 0.25 mm, 0.25um film	10	0.01 - 5 ng/uL
10	GC/MS	DB-5	30m x 0.25 mm, 0.25um film	5	10 pg - 100 ng
11	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	3	0.1 - 6 ng/uL
12	GC/MS	CP-SIL 8 CB MS	30m x 0.25 mm, 0.25um film	5	0.2 - 40 ng/uL
13	GC/MS	DB-17	60m x 0.25 mm, 0.25um film	4	0.015 - 3 ug/mL
14	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	3	1 - 10 ng
15	GC/MS	DB-5	30m x 0.25 mm, 0.25um film	5	10 - 5000 pg/uL
17	HPLC-FL	Vydac 201TP52 - C18		4	0.016 - 20.130mg/ L
19	HPLC-FL	Vydac C18	2 x 25cm x 2.1 mm, 5 um particle	7	150x
20	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	4 or 5	167 - 8330 ng/g
23	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3	

Lab #	Instrument	Nitro-PAHs Phase	Dimensions	Calibration Curve # points	range
1	GC/MS NCI	DB-17 MS	30m x 0.25 mm, 0.25um film	3	1 - 400 ng/g
6	GC/HRMS NCI	DB-5	60m x 0.25 mm, 0.25um film	1	10 - 80 pg/uL
6a	GC/HRMS NCI	DB-5	30m x 0.25 mm, 0.25um film	1	10 - 80 pg/uL
16	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film		response factor used

Lab #	Instrument	Alkanes and Alkenes Phase	Dimensions	Calibration Curve # points	range
4	GC/MS		30m x 0.25 mm, 0.25um film	5	
5	GC/MS	HP-5MS	30m x 0.25 mm	3	4 - 50 ng/uL
8	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3 to 6	0 - 8000 ppb
10	GC/MS	DB-5	30m x 0.25 mm, 0.25um film	5	10 pg - 100 ng
11	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	3	0.1 - 15 ng/uL
14	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	3	1 - 10 ng
20	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	3 or 4	167 - 8330 ng/g
21	GC-FID & GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	7	1.22 - 128 ng/uL
22	GC/MS	5% phenyl	30m x 0.25 mm, 0.25um film	4	1 - 10 ng
23	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3	

Lab #	Instrument	Hopanes, Cholestanes, Sterols Phase	Dimensions	Calibration Curve # points	range
4	GC/MS		30m x 0.25 mm, 0.25um film	5	
5	GC/MS	HP-5MS	30m x 0.25 mm	3	1.3 -14 ng/uL
8	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	6	0 - 4000 ppb
11	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	3	0.1 - 10 ng/uL
12	GC/MS	CP-SIL 8 CB MS	30m x 0.25 mm, 0.25um film	3	0.1 - 1 ng/uL
20	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	5	167 - 8330 ng/g
22	GC/MS	5% phenyl	30m x 0.25 mm, 0.25um film	5	0.25 - 2.5 ng
23	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3	

Lab #	Instrument	Carbonyls and Acids Phase	Dimensions	Calibration Curve # points	range
4	GC/MS		30m x 0.25 mm, 0.25um film	5	
11					0.1 - 6 ng/uL
20	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	2 or 4	833 - 8330 ng/g
21 carbonyl	GC-FID& GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	6	0.6 - 20 ng/uL
21 acid	GC-FID	DB-FFAP	30m x 0.25 mm, 0.25um film	8	0.6 - 125 ng/uL
23	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3	

Lab #	Instrument	Phenols Phase	Dimensions	Calibration Curve # points	range
4				5	
18	GC-AED	DB-17MS	25m x 0.25 mm, 0.25um film	8	5 - 1000 pg Fe/uL
23	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3	

Lab #	Instrument	Sugars Phase	Dimensions	Calibration Curve # points	range
4	GC/MS		30m x 0.25 mm, 0.25um film	5	
23	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3	

Lab #	IS/surrogate added prior to extraction	Used?	PAHs added prior to analysis	Used?	corrected for recovery?	others?
1	deuterated naphthalene, hiphenyl, acenaphthene, phenanthrene, fluoranthene, pyrene, B[a]A, B[a]P, perylene, B[ghi]P, DB[a,h]A	x			n	
2	ES				n	
3	ES					
4	deuterated acenaphthene, chrysene, DB[a,h]A	x				
5	deutereated chrysene and DB[a,h]A	x			n	
6&6a	deutereated acenaphthene, anthracene,pyrene,B[a]A, B[a]P, DB[a,h]A, B[ghi]P		deuterated fluoranthene	x	n	
7	2-fluorophenol, 2-fluorohiphenyl, and deuterated phenol, 2-chlorophenol, 1,2-dichlorobenzene, nitrobenzene, pyrene, terphenyl		deuterated 1,4-dichlorobenzene, naphthalene, acenaphthalene, phenanthrene, chrysene, perylene	x		
8	ES					
9	deuterated analogues of all analytes		tri-isopropyl benzene	x	n	
10	deuterated naphthalene, acenaphthene, phenanthrene, chrysene, perylene	x				
11	deuterated naphthalene, phenanthrene, acenphthene, chrysene, DB[a,h]A, perylene, B[a]P	x				
12	deuterated naphthalene, hiphenyl, phenanthrene, anthracene, pyrene, B[a]A, chrysene, B[k]F, B[e]P, B[a]P, coronene	x				
13	deuterated naphthalene, biphenyl, acenaphthene, phenanthrene, fluoranthene, pyrene, B[a]A, B[a]P, perylene, B[ghi]P, DB[a,h]A	x				
14	none listed	x				
15	14 deuterated PAHs	x	C13-phenantherene; d12 perylene			d8-naphthalene (added prior to extract concentration; and d10-anthracene (added prior to clean-up)
17	ES					
19	ES					
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n	
23	deuterated chrysene and DB[a,h]A	x				

Lab #	IS/surrogate added prior to extraction	Used?	Nitro-PAHs added prior to analysis	Used?	corrected for recovery?	others?
1	deuterated 1-nitorpyrene, 3-nitrofluoranthene, 9-nitroanthracene, and 6-nitrochrysene	x			n	
6&6a	deuterated 2-nitrofluorene, 9-nitroanthracene, 3-nitrofluoranthene, 1-nitropyrene, 6-nitrochrysene, 6-nitroB[a]P, 1,3 dinitropyrene, 1,6-dinitropyrene, 1,8-dinitropyrene	x	deuterated 2-nitrodibenzodioxin, 7-nitroB[a]A			
16	deuterated 2-nitrofluoranthene and 1-nitropyrene	x				

Lab #	IS/surrogate added prior to extraction	Used?	Alkanes and Alkenes added prior to analysis	Used?	corrected for recovery?	others?
4	deuterated dodecane, hexadecane, eicosane, octacosane, hexatriacontane	x				
5	deuterated n-C24	x				
8	ES					
10	deuterated eicosane	x				
11	deuterated eicosane, hexatrioacontane, octacosane	x				
14	perdeuterated n-alkanes: C12, C16, C20, C24, C28, C32, C36	x				
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n	
21	C24-d alkane	x			n	
22	deuterotetracosane	x	1-phenyldodecane	x	y	
23	deuterated octacosane and hexatriacontane	x				

Lab #	IS/surrogate added prior to extraction	Used?	Hopanes, Cholestanes, Sterols added prior to analysis	Used?	corrected for recovery?	others?
4	aaa-20R-cholestane-d4;cholesterol-2,3,3,4,4,6-d6	x				
5	ES				n	
8	ES					
11	deuterated octacosane	x				
12	aaa-20R-cholestane-d4	x				
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n	
22	B,B-hopane	x	5a-androstane	x	y	
23	deuterated chloestane and cholesterol	x				

Lab #	IS/surrogate added prior to extraction	Used?	Carbonyls and Acids added prior to analysis	Used?	corrected for recovery?	others?
4	decanoic acid-d19;heptadecanoic acid-d33;phthalic acid-3,4,5,6-d4;benzaldehyde-d6	x				
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n	
21	C18-d alkane	x	C24-d alkane (for ketones and quinones)		n	
23	deuterated heptadecanoic acid	x				

Lab #	IS/surrogate added prior to extraction	Used?	Phenols added prior to analysis	Used?	corrected for recovery?	others?
4	4,4-dimethoxybenzophenone-d8	x				
18	4-fluoro-2-methylphenlferrocencarboxylate	x	2-methylphenylferrocencarboxylate		n	

Lab #	IS/surrogate added prior to extraction	Used?	Sugars added prior to analysis	Used?	corrected for recovery?	others?
4	levoglucosan-13C6	x				
5	ES					
23	levoglucosan-13C6	x				

Lab #	g extracted Interim RM	g extracted SRM 1649a	Extraction Method	Extraction Solvent	Extraction Time	Extraction other
1	0.03 g	0.1 g	PFE	dichloromethane for 3 samples each and methanol for an additional 3 samples	approx. 20 min	100 C; 2000 psi; 3 cylces of 5 min static; flush 90%; purge 180 sec
1a	0.03 g	0.03 g	PFE	dichloromethane		3 cycles of 5 min static extraction; 2000 psi; 100 C
3	0.01 g	0.01 g	sonication	dichloromethane	24 min	
3a	0.01 g	0.01 g	sonication	dichloromethane:acetonitrile (2:1 v/v)	24 min	
4	0.03 g	0.03 g	sonication	benzene/isopropyl alcohol/hexanes	approx. 60 min	
6	0.1 g	0.1 g	microwave	dichloromethane	10 min	
7	0.1 g	0.1 g	PFE (SW 846)	dichloromethane	7 min	150 C; 1000 psi; 2 static cycles
8	0.02 g	0.02 g	sonication	dichloromethane/acetone/hexane (2:3:5)	1 h 15 min to 1 h 45 min	10 mL solvent, 2 times; 3.5 mL + 3 times 1 mL
9	0.02 g	0.02 g	sonication	30 mL ethylacetate + 3.6 mM triethylamine	1 h	IS are added to particulate and allowed to age in sealed container before extraction
10	0.01 g	0.23 g	Soxhlet	dichloromethane	8 h	
11	0.03 g	0.3 g	Soxhlet	dichloromethane followed by acetone	min. 6 h per solvent	
12	0.03 g	0.10 g	microwave assisted extraction	dichloromethane followed by acetonitrile	25 min per solvent	
13	0.04 g	0.4 g	PFE	dichloromethane	3 cycles at 5 min each	100 C; 2000 psi; 3 cycles of 5 min static;
16	0.03 g	0.17 g	Soxhlet	dichloromethane	20 h	
17	0.11 g	0.49 g	PFE	hexane:acetone (70:30)	20 min	
18	0.09 g	0.11 g	microwave assisted extraction	cyclohexane/acetone (1:1)	2 x 4 min	
19	0.03 g	0.04 g	Soxtec	acetonitrile w/ anti-oxidizing agent, TBH (250 mg)	60 min extraction boiling mode; 60 min rinsing mode	concentrate to 10 mL
20	0.03 g	0.03 g	sonication (ultrasonic bath)	dichloromethane (3x15mL) followed by methanol (2x15mL)	10 min per sonication; 50 min total	Concentrate using Turbovap and Reactivap
21	0.108	0.121	PFE	dichloromethane:methanol (3:1)	2 - 5 min static cycles	40 C; 1500 psi; flush 60%, purge 60 sec
22	0.03 g	0.03 g	PFE - 2x	dichloromethane	5 min heat; 5 min static; 180 sec nitrogen purge	100 C; 2000 psi; nitrogen purge 100 psi for 240 sec

Lab #	Sample extract cleanup method	Method of quantitation
1	conc with solvent change to hexane for dichloromethane extracts; aminopropyl solid phase extraction (SPE) column; condition and elute with 40 mL of 20 % dichloromethane in hexane; to isolate nitroPAHs - semipreparative amino/cyano HPLC fractionation	IS
1a	aminopropyl SPE with 20 mL of 2% dichloromethane in hexane	IS
3	filtration	ES
3a	filtration	ES
4		IS
6	extract split in 2 - 1. PAH - silica column; 2. nitroPAH - DMSO vack extract with cyclohexane; HPLC with silica column, Si 60, 250 x 4.6 mm, 5 um particle size	IS
7		IS
8	concentrate under nitrogen to 200 uL	ES
9	Centrifuge; conc; 0.45 um PTFE syringe filter; methoxyphenols determined by GC/MS as acetate derivatives after treatment with acetic anhydride/pyridine (10% v/v); levoglucosan determined as tri-TMS derivative after treatment with TMSI (10% v/v)	IS
10	syringe filtered; nitrogen blowdown	IS
11	filter	IS
12	none	IS
13	aminopropyl solid phase extraction (SPE) column; condition and elute with 15 mL of 10 % dichloromethane in hexane	IS
16	HPLC Phase SEP Silica, Spherisorb 5 micron particles, 25 cm x 10 mm	IS
17	add 1 mL of iso-octane; conc to 0.75 mL; SPE (silica gel) in homemade glass cartridges; add 1mL ACN; conc to 0.75 mL	ES
18	filter; bring up to 10 mL volume: take 8 mL through 5 g alumina (1.2% H2O) with cyclohexane and cyclohexane plus dichloromethane (3:1 v/v)	IS
19	filtration on a Millex FG Millipore cartridge	ES
20	centrifugation (20 min at 4000 rpm per sonication); filtration through 0.45 um PTFE membrane filter	IS
21	silica gel chromatography - fraction 1 alkanes, 25 mL hexane; fraction 2 PAH 25 mL hexane:dichloromethane (6:4); fraction 3 ketones and quinones 25 mL hexane:ethylacetate (5:1); acids and sugars 30 mL ethylacetate:methanol (3:1)	IS and ES
22	solvent exchange to hexane; chromatographic separation using 5% (w/w) water deactivated silica column - fraction 1 n-paraffins and biomarkers (15 mL hexane); fraction 2 PAH and some polar (15 mL hexane:acetone, 1:1, v:v); fractions 3 and 4 more polar sompounds (2 x 15 mL methanol)	IS

Lab #	Instrument	PAHs Phase	Dimensions	Calibration Curve # points	range
1	GC/MS	DB-17MS	60m x 0.25 mm, 0.25um film	5	7 - 700 ng/g
1a	GC/MS	DB-17 MS	60m x 0.25 mm, 0.25um film	5	40 - 2000 ng
3 & 3a	HPLC-FL	LC-18	15 cm x 4.6 mm, 5 um particle	5	10 - 500 ppb
4	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3-5	see notes for APT01
6	GC/MS	DB-XLB	30m x 0.25 mm, 0.25um film	5	0.05 - 10 ng/uL
7	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	9	0.4 - 64 ng/uL injected
8	GC/MS	HP-5MS	60m x 0.25 mm, 0.25um film	5	1 - 500 ppb
10	GC/MS	DB-5	30m x 0.32 mm	5	10 - 1500 ng
11	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	5	0.1 - 15 ng/uL
12	GC/MS	CP-SIL 8 CB MS	30m x 0.25 mm, 0.25um film	6	0.2 - 40 ng/uL
13	GC/MS	DB-17	60m x 0.25 mm, 0.25um film	5	0.04 - 4 ug/mL
17	HPLC-FL	Vydac 201TP52 - C18		4	0.016 - 20.13 mg/ L
18	GC/ion trap MS	Phenomenex ZB-50	30m x 0.25 mm, 0.25um film	4	0.1 - 20 ng
19	HPLC-FL	Vydac C18	2 x 25cm x 2.1 mm, 5 um particle	7	150x
20[a]	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	6	83.3 - 8330 ng/g

Lab #	Instrument	Nitro-PAHs Phase	Dimensions	Calibration Curve # points	range
1	GC/MS NCI	DB-17 MS	30m x 0.25 mm, 0.25um film	7	1 - 2000 ng/g
6	GC/HRMS	DB-5	60m x 0.25 mm, 0.25um film	1	8 - 85 pg/uL
12	GC/MS	CP-SIL 24 CB-MS	30m x 0.25 mm, 0.25um film	7	0.1 - 2 ng/uL
16	GC/MS NCI	DB-17	50m x 0.25 mm, 0.25um film		response factor used

Lab #	Instrument	Alkanes and Alkenes Phase	Dimensions	Calibration Curve # points	range
1	GC/MS	DB-17 MS	60m x 0.25 mm, 0.25um film	4	1 - 10 ug/g
4	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3-5	see notes for APT01
8	GC/MS	HP-5MS	60m x 0.25 mm, 0.25um film	5	1 - 500 ppb
10	GC/MS	DB-5	30m x 0.32 mm	5	60 - 10000 ng
11	GC/MS	DB-5MS	30m x 0.25 mm, 0.25um film	5	0.1 - 15 ng/uL
12	GC/MS	CP-SIL 8 CB-MS	30m x 0.25 mm, 0.25um film	4	1 - 12 ng/uL
13	GC/MS	DB-17	60m x 0.25 mm, 0.25um film	5	0.03 - 66 ug/mL
20[a]	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	6	83 - 8330 ng/g
21	GC-FID	DB-5MS	30m x 0.25 mm, 0.25um film	6	1.3 - 90 ng/uL
22	GC/MS	5% phenyl	30m x 0.25 mm, 0.25um film	5	1 - 10 ng

Lab #	Instrument	Hopanes, Cholestanes, Sterols Phase	Dimensions	Calibration Curve # points	range
1	GC/MS	DB-17 MS	60m x 0.25 mm, 0.25um film	4	1 - 10 ug/g
4	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3-5	see notes for APT01
8	GC/MS	HP-5MS	60m x 0.25 mm, 0.25um film	5	1 - 500 ppb
12	GC/MS	CP-SIL 8 CB MS	30m x 0.25 mm, 0.25um film	4	0.1 - 4 ng/uL
20[a]	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	5 or 6	83.3 - 8330 ng/g
21	GC-FID	DB-5MS	30m x 0.25 mm, 0.25um film	6	0.5-20 ng/uL
22	GC/MS	5% phenyl	30m x 0.25 mm, 0.25um film	7	0.125 - 5.0 ng

Lab #	Instrument	Carbonyls and Acids Phase	Dimensions	Calibration Curve # points	range
4	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3-5	see notes for APT01
20[a]	GC/MS	DB-1701	30m x 0.32 mm, 0.25um film	3-6	83.3 - 8330 ng/g
21	GC-FID	DB-5MS/DB-FFAP	30m x 0.25 mm, 0.25um film	9	0.6-120 ng/uL

Lab #	Instrument	Phenols Phase	Dimensions	Calibration Curve # points	range
4	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3-5	see notes for APT01
9	GC/MS	RTX-5 (amine)	30m x 0.25 mm, 0.5um film	10	0.01 - 2.0 ug/mL
18	GC-AED	Phenomenex ZB-50	30m x 0.25 mm, 0.25um film	4	1 - 1000 pg Fe/uL

Lab #	Instrument	Sugars Phase	Dimensions	Calibration Curve # points	range
4	GC/MS	HP-5MS	30m x 0.25 mm, 0.25um film	3-5	see notes for APT01
9	GC/MS	RTX-5 (amine)	30m x 0.25 mm, 0.5um film	10	0.025 - 25 ug/mL
21	GC-FID	DB-5MS	30m x 0.25 mm, 0.25um film	8	0.5-100 ng/uL

[a]SRM 1649a samples were analyzed using two different calibration curves. The QC check standards associated with the SRM 1649a samples analyzed using the first curve passed for the PAHs and retene only). A second analysis using a different calibration curve was performed for quantition of all of the other analytes (the PAHs and retene failed QC check standards on the second analysis). Therefore, the PAHs and retene were reported from the first analysis and all of the other analytes were reported from the second analysis. The first calibration curve is the same as the one used for quantitation of the Interim RM samples. The second calibration curve used 4 or 5 points for the carbonyls (concentration range of approximately 833-8330 ng/g or 167-8330 ng/g), 4, 5, or 6 points for the alkanes (concentration range of approximately 833-, 167-, or 83.3-8330 ng/g), and 5 or 6 points for the hopanes and cholestanes (concentration range of approximately 167-8330 ng/g or 83.3-8330 ng/g). Additionally, some samples required a diluted re-analysis for some analytes due to those analytes exceeding the upper limit of the calibration curve in the original analysis. These samples were analyzed using a third calibration curve.

Lab #	IS/surrogate added prior to extraction	Used?	PAHs added prior to analysis	Used?	corrected for recovery?
1	deuterated naphthalene, biphenyl, acenaphthene, phenanthrene, fluoranthene, pyrene, B[a]A, B[a]P, perylene, B[ghi]P, DB[a,h]A	x			n
1a	deuterated naphthalene, biphenyl, acenaphthene, phenanthrene, fluoranthene, pyrene, B[a]A, B[a]P, perylene, B[ghi]P, DB[a,h]A	x			n
3	ES				
3a	ES				
4	deuterated acenaphthene, chrysene, DB[a,h]A	x			
6	deutereated acenaphthene, anthracene,pyrene,B[a]A, B[a]P, DB[a,h]A, B[ghi]P		deuterated fluoranthene	x	n
7	2-fluorophenol and deuterated phenol, 2-chlorophenol, 1,2-dichlorobenzene, nitrobenzene, pyrene, terphenyl		deuterated 1,4-dichlorobenzene, naphthalene, acenaphthylene, phenanthrene, chrysene, perylene	x	
8	ES				
10	deuterated naphthalene, acenaphthene, phenanthrene, chrysene, perylene	x			
11	deuterated naphthalene, phenanthrene, acenphthene, chrysene, DB[a,h]A, perylene, B[a]P	x			
12	deuterated naphthalene, biphenyl, phenanthrene, anthracene, pyrene, B[a]A, chrysene, B[k]F, B[e]P, B[a]P, coronene	x			
13	deuterated naphthalene, biphenyl, acenaphthene, phenanthrene, fluoranthene, pyrene, B[a]A, B[a]P, perylene, B[ghi]P, DB[a,h]A	x			
17	ES				
18	3-fluorophenanthrene, 1,3-difluorochrysene	x			
19	ES				
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n

C-19

Lab #	IS/surrogate added prior to extraction	Used?	Nitro-PAHs added prior to analysis	Used?	corrected for recovery?
1	deuterated 1-nitorpyrene, 3-nitrofluoranthene, 9-nitroanthracene, and 6-nitrochrysene	x			n
6	deuterated 2-nitrofluorene, 9-nitroanthracene, 3-nitrofluoranthene, 1-nitropyrene, 6-nitrochrysene, 6-nitroB[a]P, 1,3-dinitropyrene, 1,6-dinitropyrene, 1,8-dinitropyrene	x	deuterated 2-nitrodibenzodioxin, 7-nitroB[a]A		y
12	deuterated 1-nitorpyrene	x			
16	deuterated 2-nitrofluoranthene and 1-nitropyrene	x			

Lab #	IS/surrogate added prior to extraction	Used?	Alkanes and Alkenes added prior to analysis	Used?	corrected for recovery?
1	deuterated n-dodecane, n-eicosane, n-triacontane	x			n
4	deuterated dodecane, hexadecane, eicosane, octacosane, hexatriacontane	x			
8	ES				
10	deuterated C19, C20, and C24	x			
11	deuterated eicosane, hexatrioacontane, octacosane	x			
12	deuterated dodecane, eicosnae, and octacosnae	x			
13	deuterated n-dodecane, n-eicosane, n-triacontane	x			
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n
21	C24-d alkane	x			
22	deuterotetracosane	x	1-phenyldodecane	x	y

Lab #	IS/surrogate added prior to extraction	Used?	Hopanes, Cholestanes, Sterols added prior to analysis	Used?	corrected for recovery?	others?
1	deuterated n-dodecane, n-eicosane, n-triacontane	x			n	
4	aaa-20R-cholestane-d4;cholesterol-2,3,3,4,4,6-d6	x				
8	BS					
11	deuterated octacosane	x				
12	aaa-20R-cholestane-d4	x				
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n	
21	C-18-d acid	x				
22	B,B-hopane	x	5a-androstane	x	y	

Lab #	IS/surrogate added prior to extraction	Used?	Carbonyls and Acids added prior to analysis	Used?	corrected for recovery?	others?
4	decanoic acid-d19;heptadecanoic acid-d33;phthalic acid-3,4,5,6-d4;benzaldehyde-d6	x				
20	n-perdeuterotetracosane, pentachloronitrobenzene, and benzo[e]pyrene-d12		9,10-dichloroanthracene, fluorene-d10, and perylene-d12	x	n	
21	C18-d alkane and C-8 d acid	x	C24-d alkane (for ketones and quinones)	x	y	

Lab #	IS/surrogate added prior to extraction	Used?	Phenols added prior to analysis	Used?	corrected for recovery?	others?
4	4,4-dimethoxybenzophenone-d8	x				
9	deuterium labeled analogues of most of the methoxyphenols		2,3-dimethyoxyphenol, 2-chloro-4-methoxyphenol, sinapylaldehydepropionate	x	n	
18			2-methylphenylferrocenecarboxylate	x		

Lab #	IS/surrogate added prior to extraction	Used?	Sugars added prior to analysis	Used?	corrected for recovery?	others?
4	levoglucosan-13C6	x				
9	anhydroheptulose (sedoheptulosan)		tri-isopropylbenzene	x	n	
21	C-18-d acid	x				

Appendix D

Charts of Air Particulate Extract I (QA01EXT01) and SRM 1649a Results by Analyte

See Tables 1 and 3 for results reported as <*number*, detection limit, etc.
Charts for analytes with only one reported numerical result are not included in this appendix.

For Air Particulate Extract I plots:

Solid line: exercise assigned value

Dotted line: z = ± 1, i. e., 25 % from assigned value

Dotted/dashed line: z = ± 2, i. e., 50 % from assigned value

Dashed line: z = ± 3, i. e., 75 % from assigned value

For SRM 1649a plots:

Solid line: material certified concentration or target value (see caption of each plot)

Dotted line: 95 % confidence interval (CI)

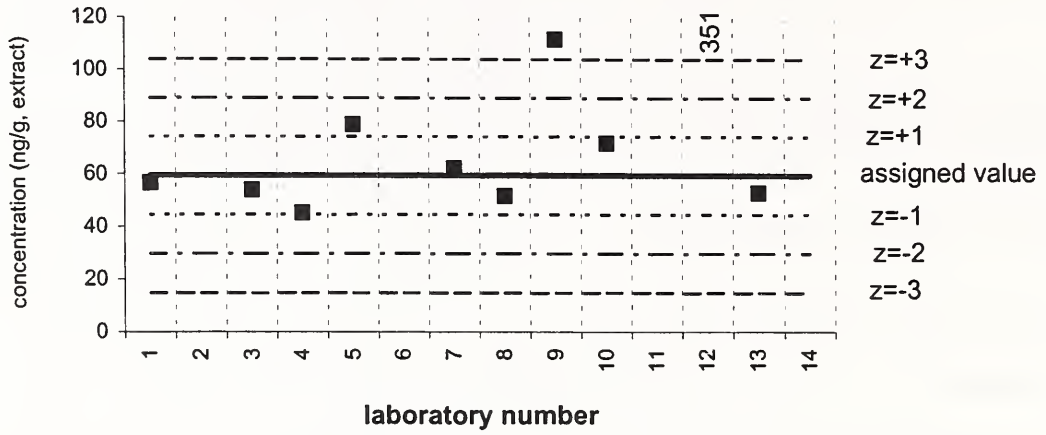
Dashed line: 30 % from 95 % confidence interval (CI)

naphthalene

Air Particulate Extract I (QA01EXT01)

Assigned value = 59.4 ng/g s = 10.3 ng/g 95% CL = 10.8 ng/g (extract)

Reported Results: 10 Quantitative Results: 10

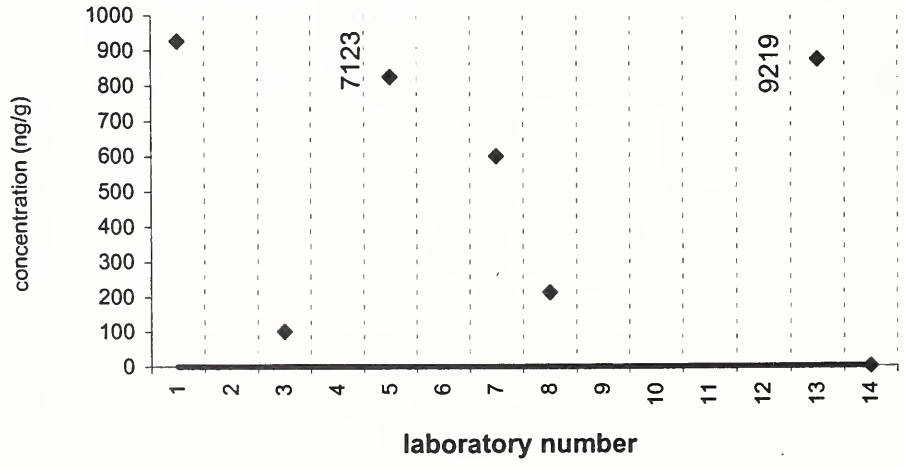


naphthalene

SRM 1649a

Target Value = no target ng/g

Reported Results: 9 Quantitative Results: 8

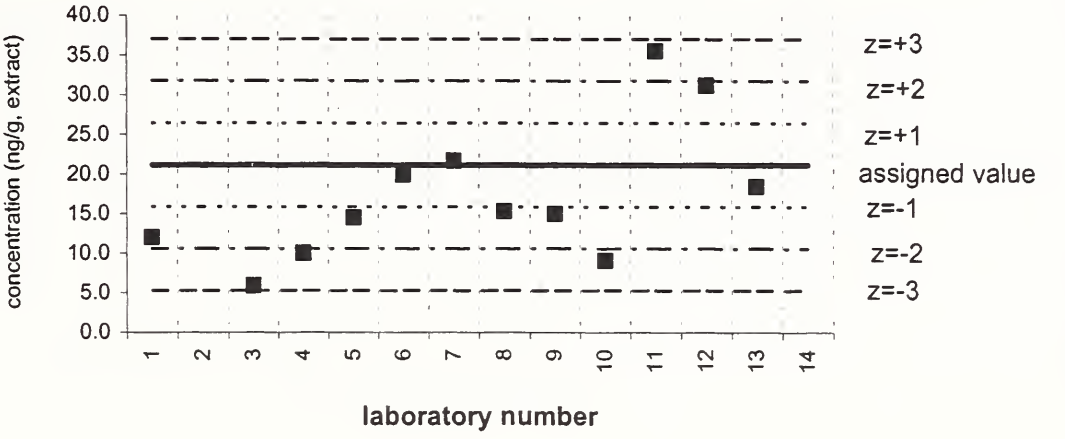


fluorene

Air Particulate Extract I (QA01EXT01)

Assigned value = 21.2 ng/g s = 8.2 ng/g 95% CL = 6.9 ng/g (extract)

Reported Results: 12 Quantitative Results: 12

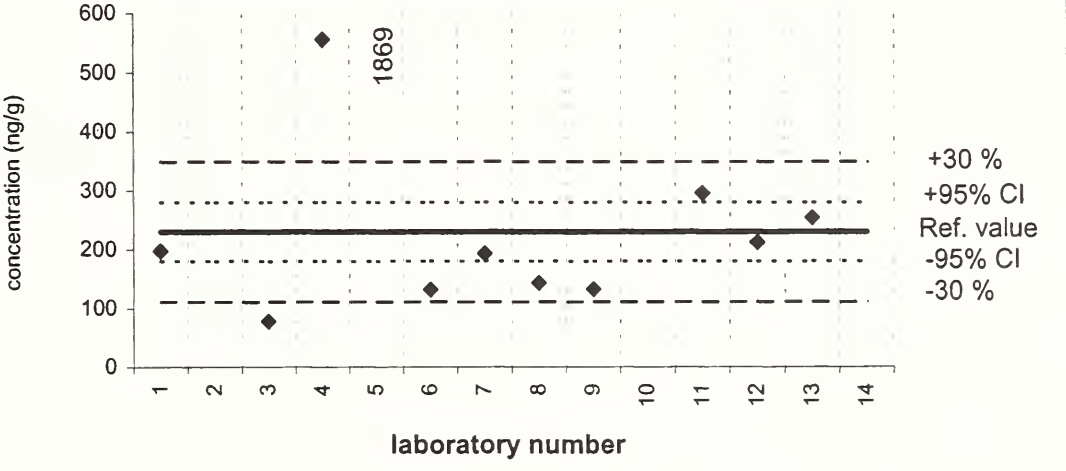


fluorene

SRM 1649a

Reference Value = 230 ± 50 ng/g

Reported Results: 11 Quantitative Results: 11

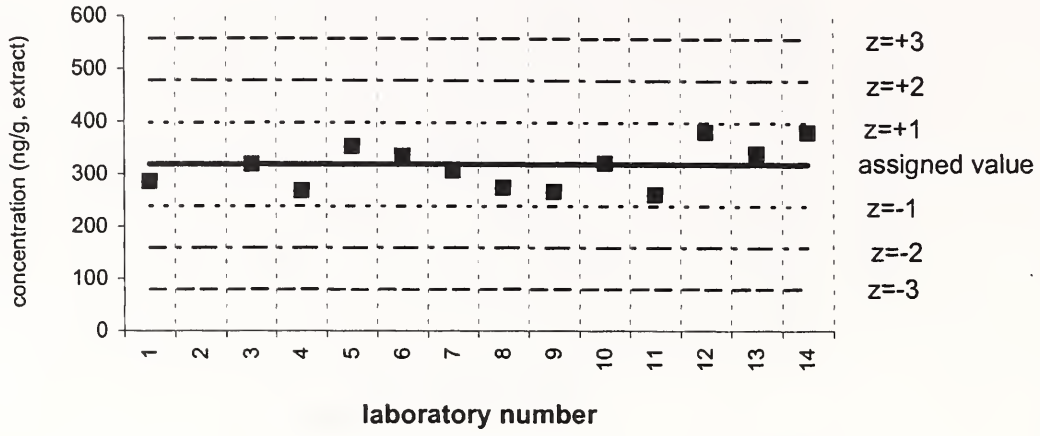


phenanthrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 319 ng/g s = 43 ng/g 95% CL = 29 ng/g (extract)

Reported Results: 13 Quantitative Results: 13

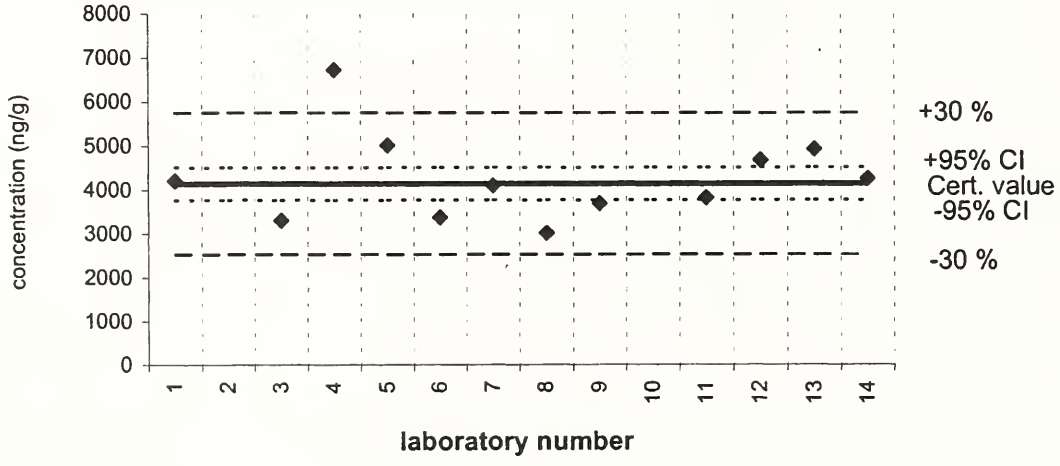


phenanthrene

SRM 1649a

Certified Value = 4140 ± 370 ng/g

Reported Results: 12 Quantitative Results: 12

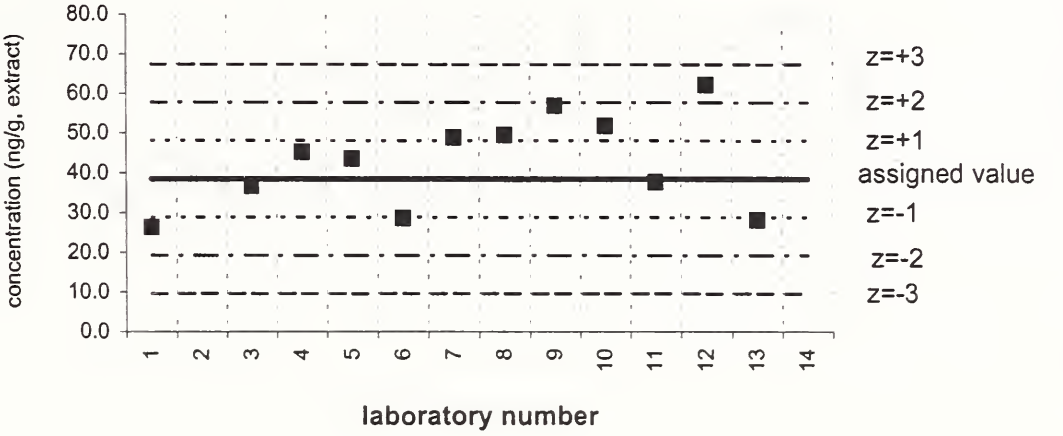


anthracene

Air Particulate Extract I (QA01EXT01)

Assigned value = 38.5 ng/g s = 13.1 ng/g 95% CL = 12.1 ng/g (extract)

Reported Results: 12 Quantitative Results: 12

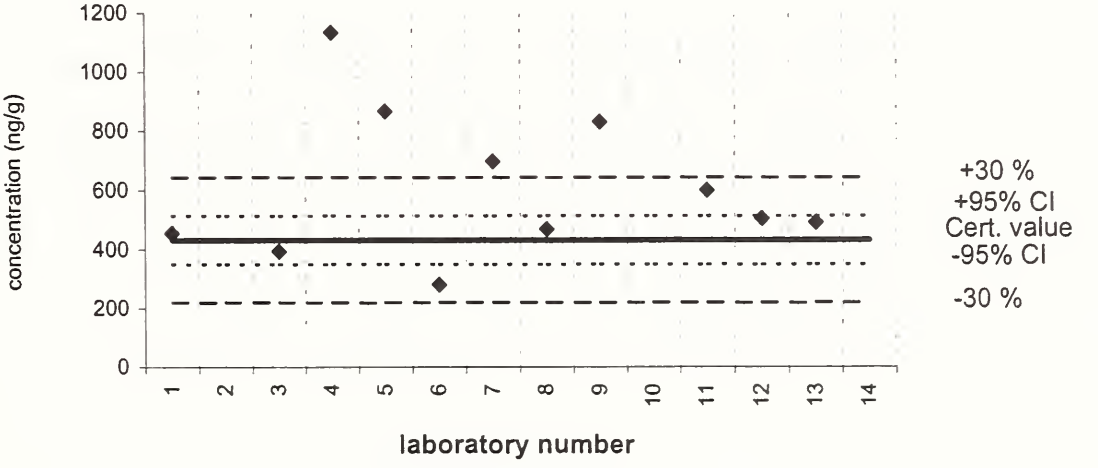


anthracene

SRM 1649a

Certified Value = 432 ± 82 ng/g

Reported Results: 11 Quantitative Results: 11

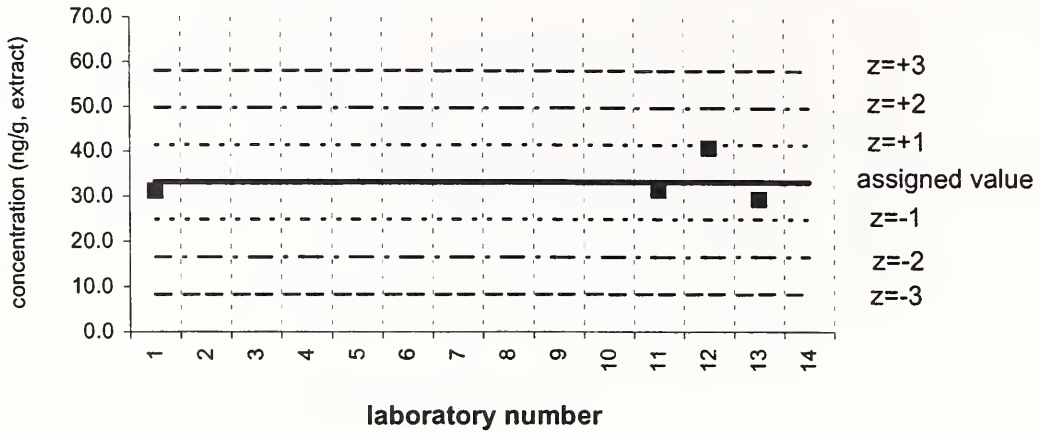


1-methylphenanthrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 33.2 ng/g s = 5.2 ng/g 95% CL = 8.2 ng/g (extract)

Reported Results: 4 Quantitative Results: 4

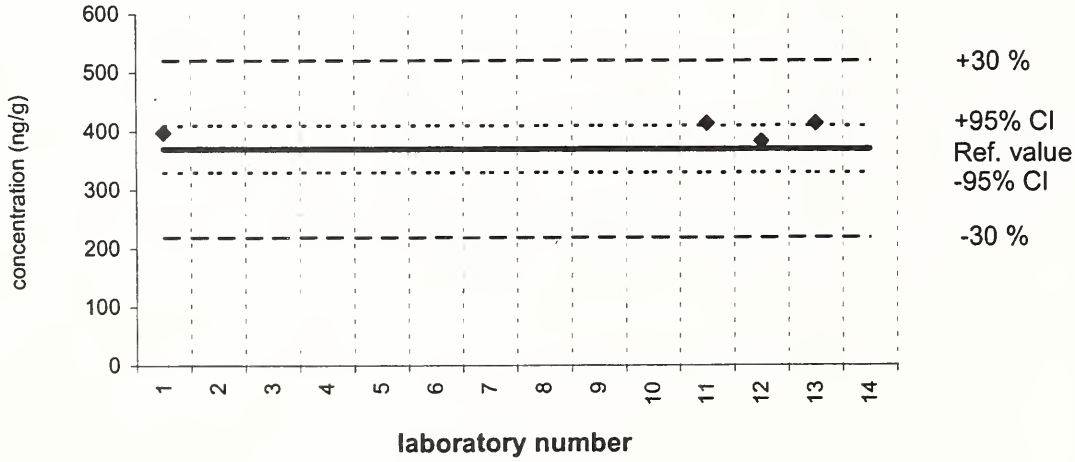


1-methylphenanthrene

SRM 1649a

Reference Value = 370 ± 40 ng/g

Reported Results: 4 Quantitative Results: 4

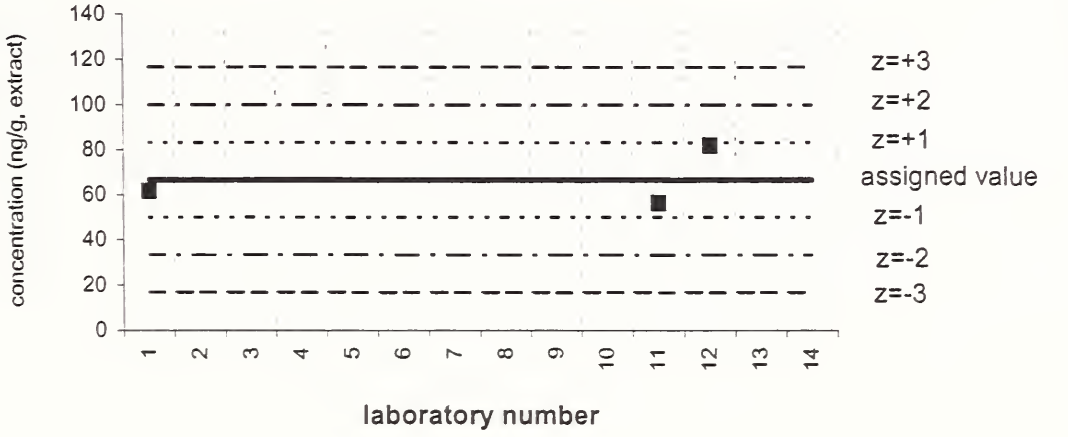


2-methylphenanthrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 66.7 ng/g s = 13.5 ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 3

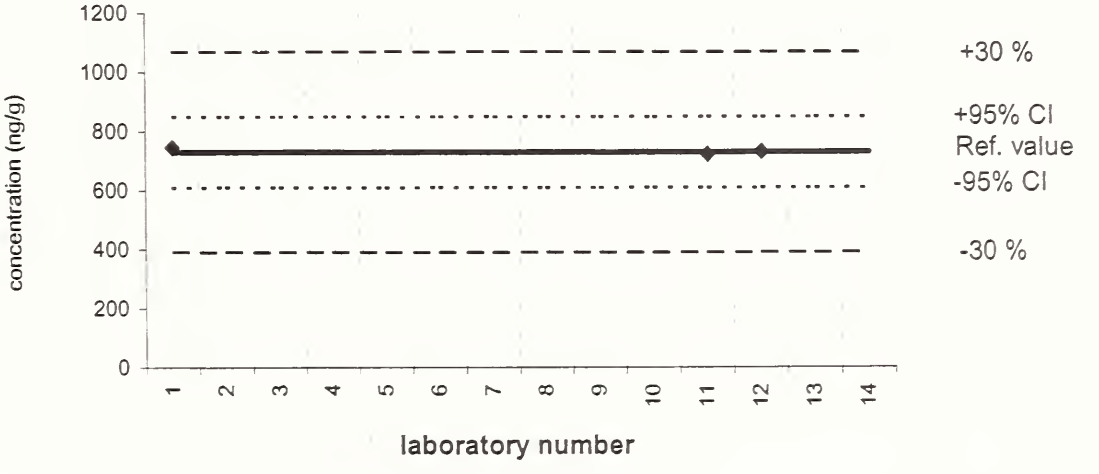


2-methylphenanthrene

SRM 1649a

Reference Value = 730 ± 120 ng/g

Reported Results: 3 Quantitative Results: 3

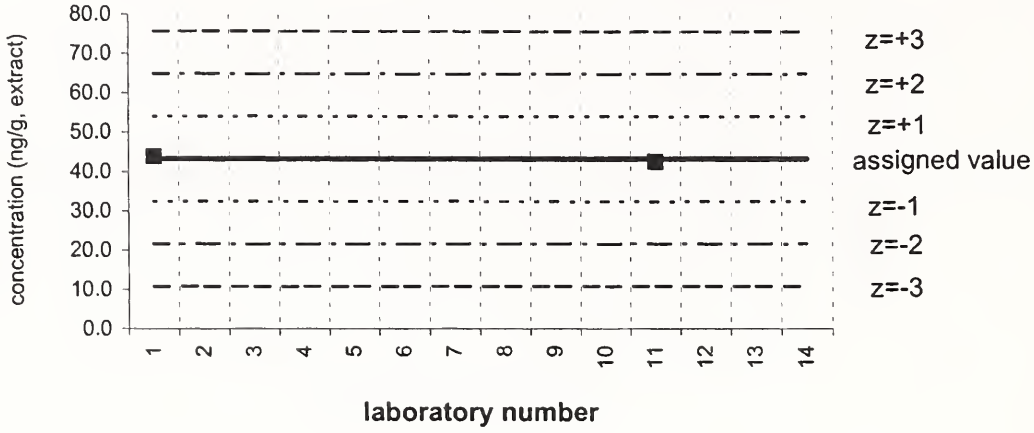


3-methylphenanthrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 43.3 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

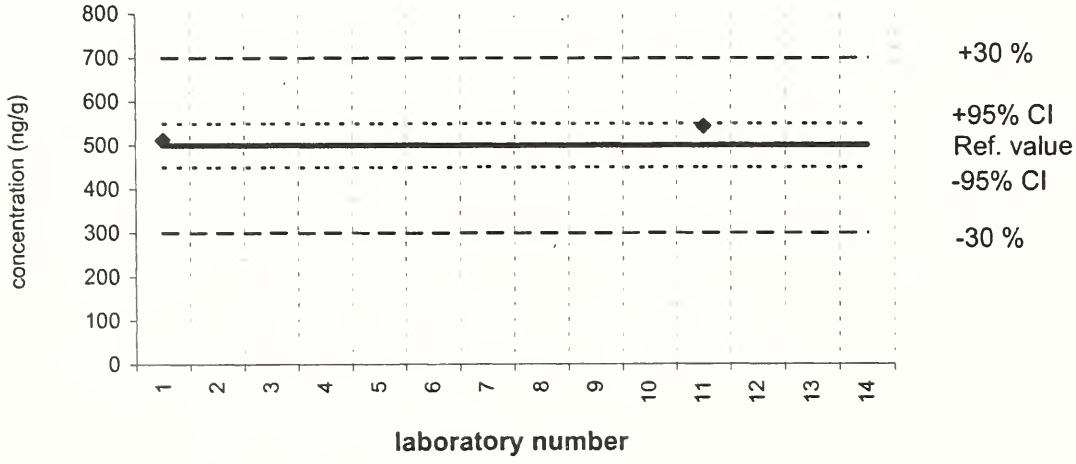


3-methylphenanthrene

SRM 1649a

Reference Value = 500 ± 50 ng/g

Reported Results: 2 Quantitative Results: 2

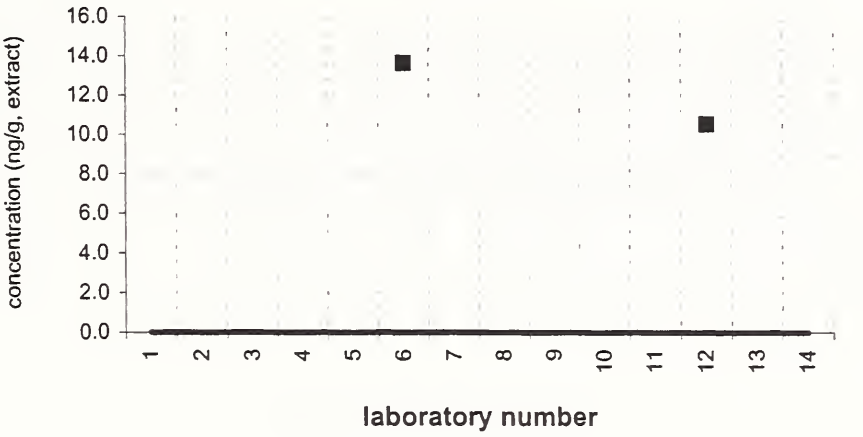


retene

Air Particulate Extract I (QA01EXT01)

Assigned value = No assigned value ng/g (extract)

Reported Results: 2 Quantitative Results: 2

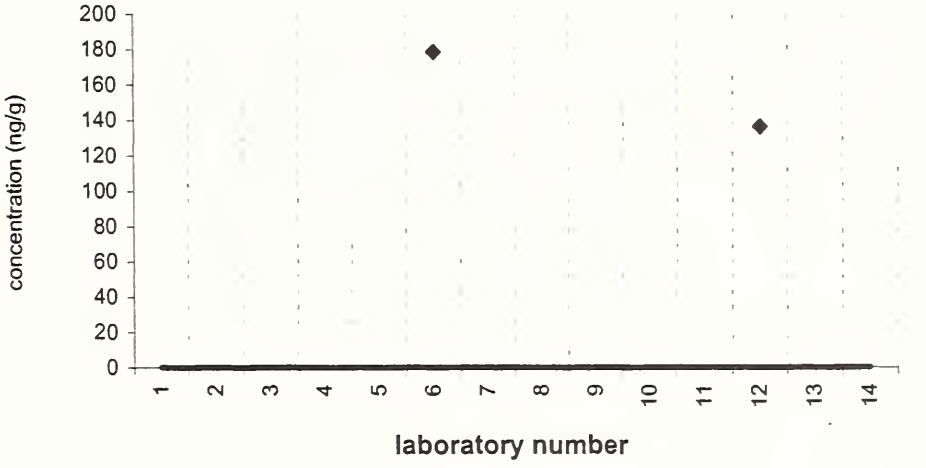


retene

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

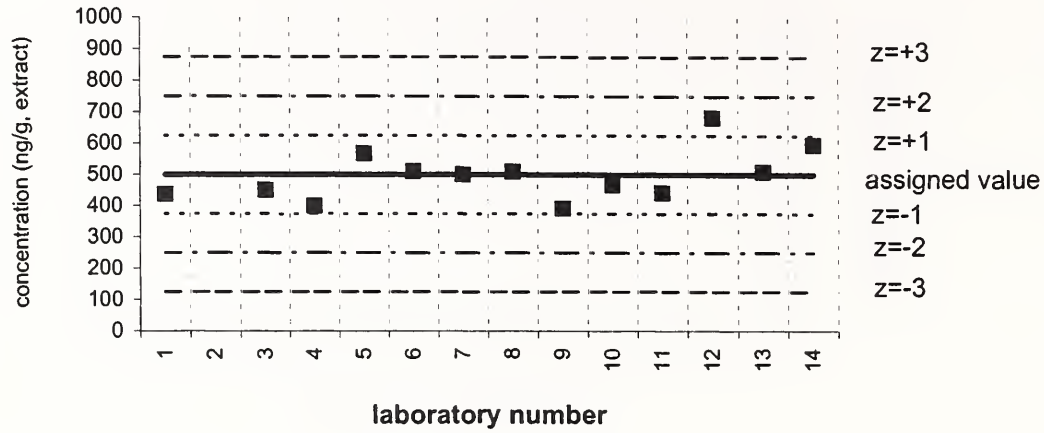


fluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = 500 ng/g s = 85 ng/g 95% CL = 54 ng/g (extract)

Reported Results: 13 Quantitative Results: 13

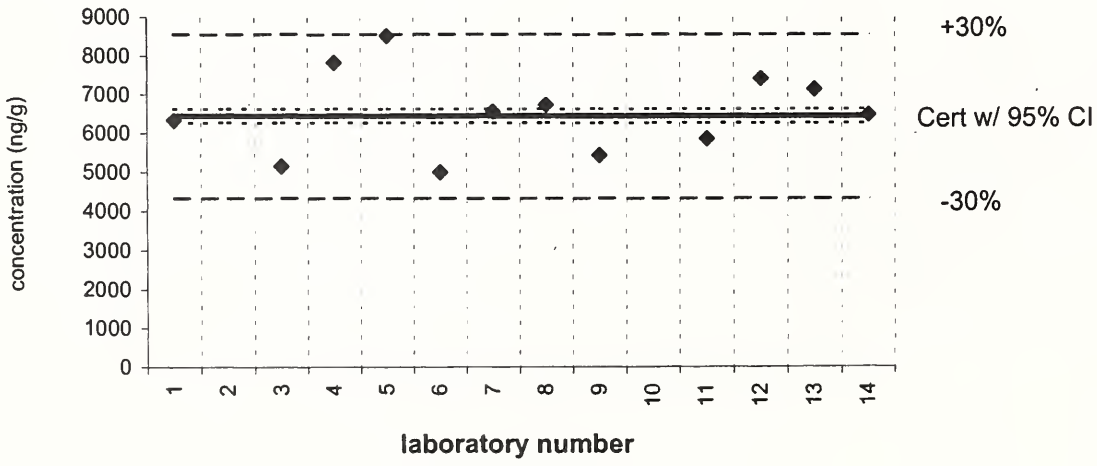


fluoranthene

SRM 1649a

Certified Value = 6450 ± 180 ng/g

Reported Results: 12 Quantitative Results: 12

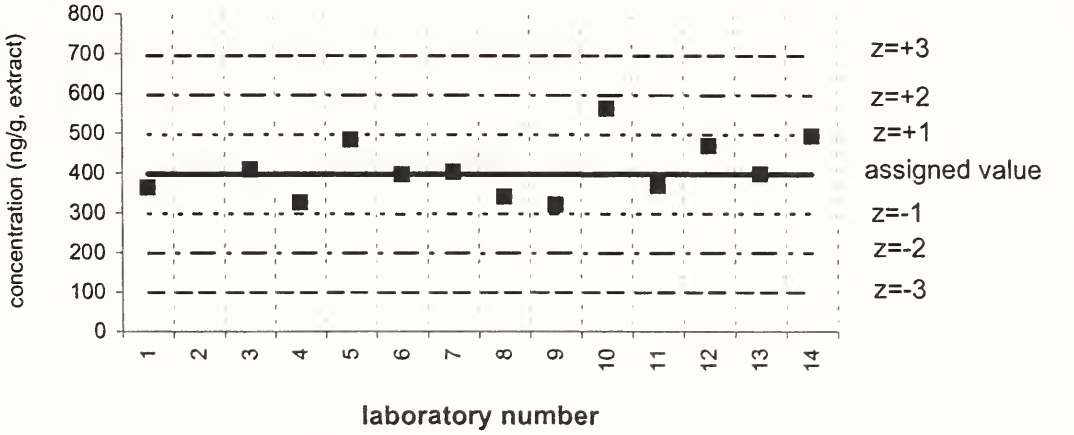


pyrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 398 ng/g s = 52 ng/g 95% CL = 33 ng/g (extract)

Reported Results: 13 Quantitative Results: 13

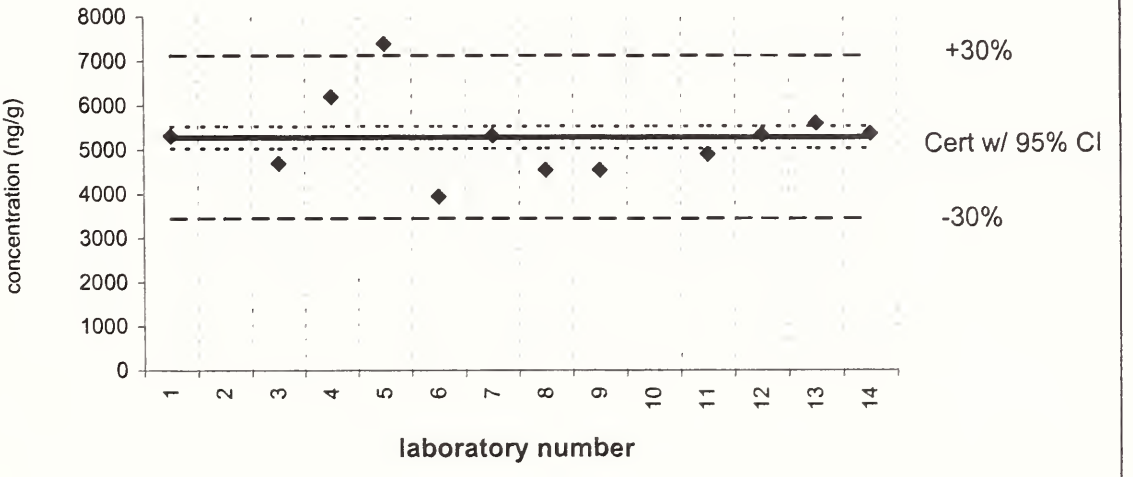


pyrene

SRM 1649a

Certified Value = 5290 ± 250 ng/g

Reported Results: 12 Quantitative Results: 12

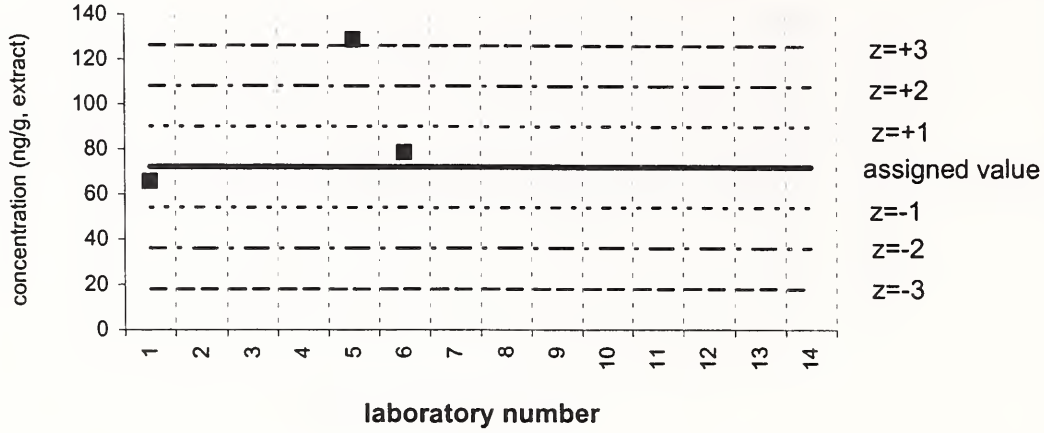


benzo[ghi]fluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = 72.2 ng/g s = 9.2 ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 3

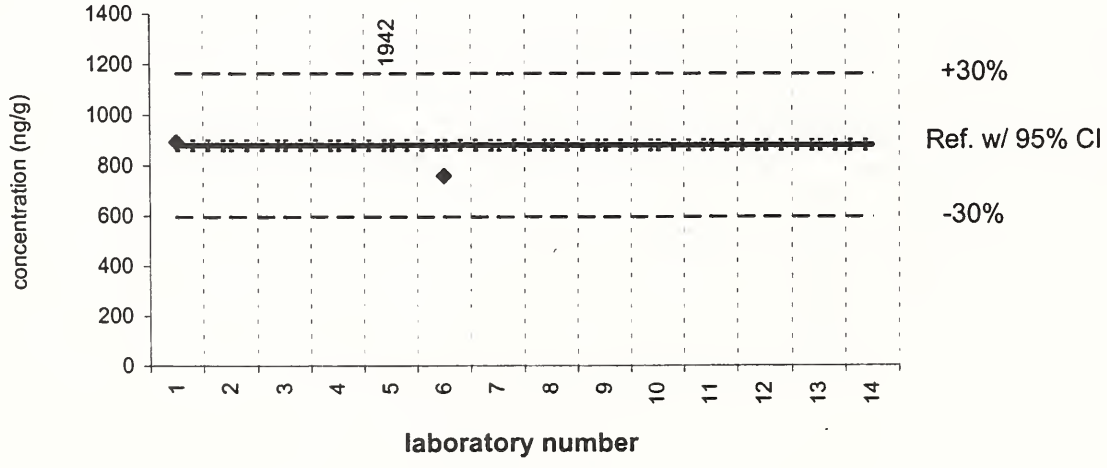


benzo[ghi]fluoranthene

SRM 1649a

Reference Value = 880 ± 20 ng/g

Reported Results: 3 Quantitative Results: 3

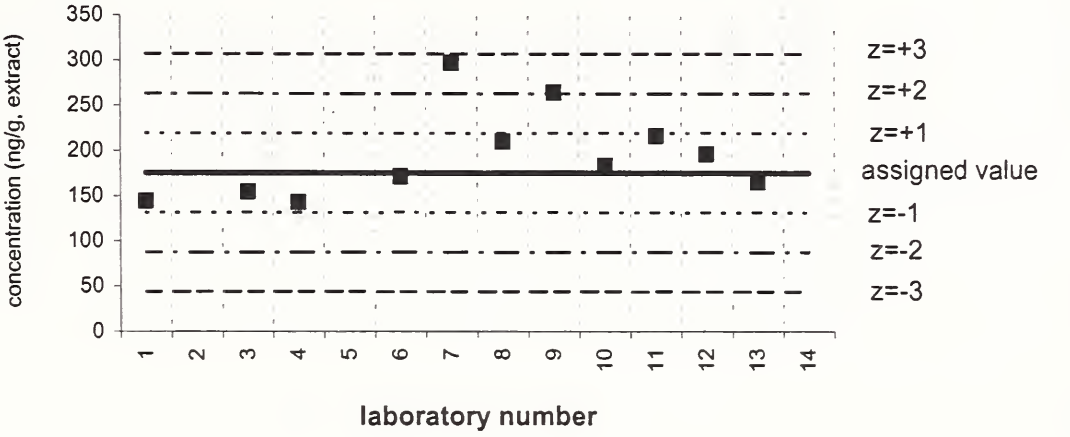


benz[a]anthracene

Air Particulate Extract I (QA01EXT01)

Assigned value = 176 ng/g s = 29 ng/g 95% CL = 24 ng/g (extract)

Reported Results: 11 Quantitative Results: 11

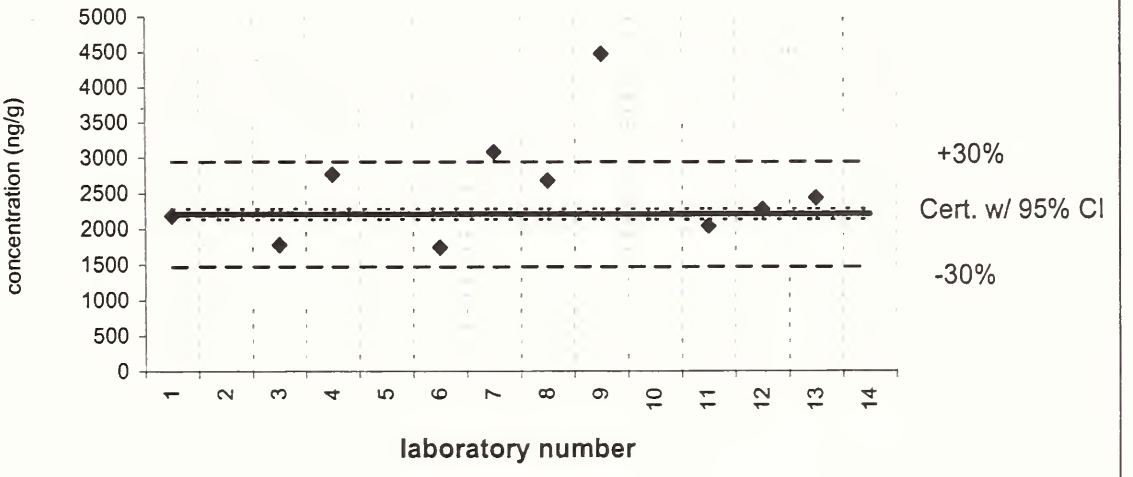


benz[a]anthracene

SRM 1649a

Certified Value = 2210 ± 73 ng/g

Reported Results: 10 Quantitative Results: 10

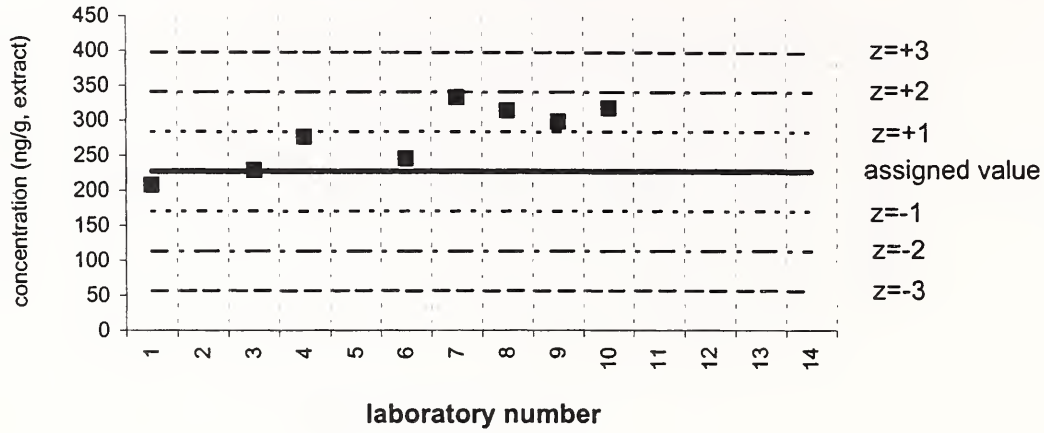


chrysene

Air Particulate Extract I (QA01EXT01)

Assigned value = 227 ng/g s = 27 ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 8 Quantitative Results: 8

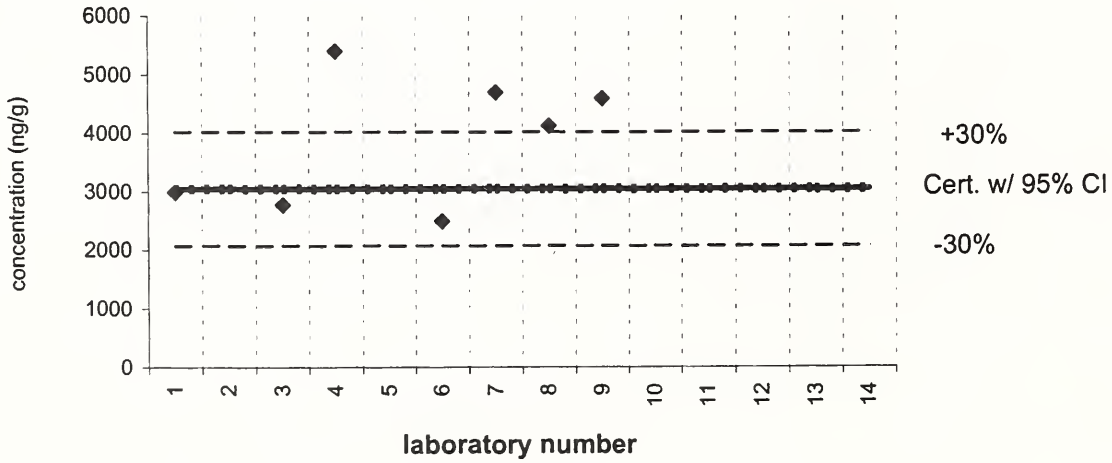


chrysene

SRM 1649a

Certified Value = 3049 ± 60 ng/g

Reported Results: 7 Quantitative Results: 7

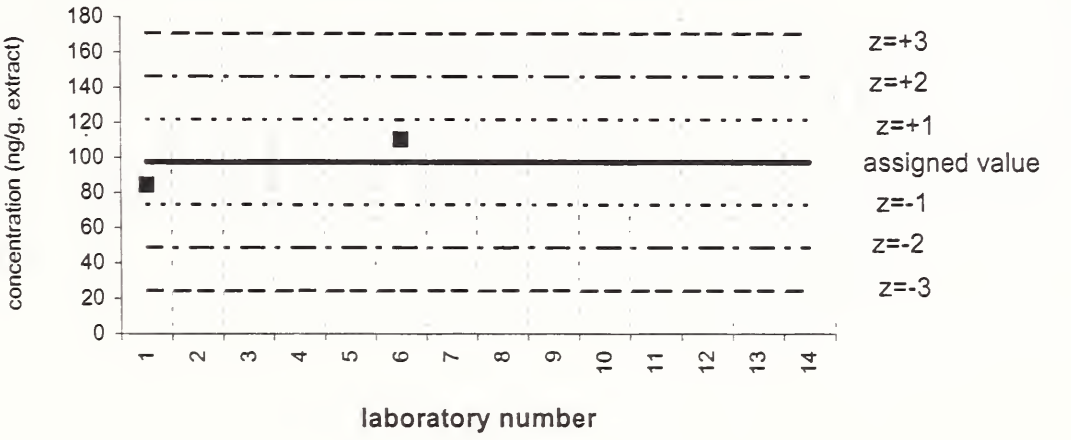


triphenylene

Air Particulate Extract I (QA01EXT01)

Assigned value = 97.7 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

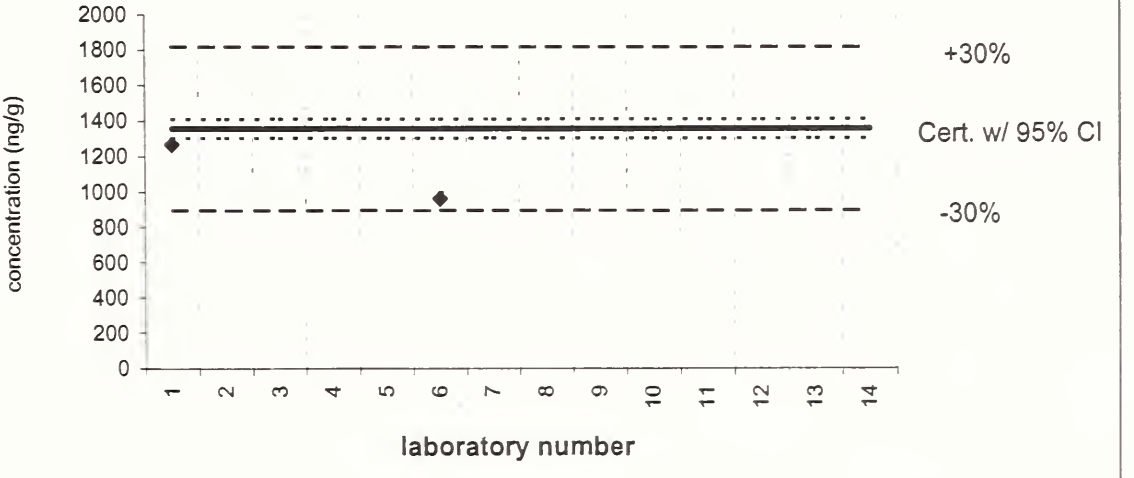


triphenylene

SRM 1649a

Certified Value = 1357 ± 54 ng/g

Reported Results: 2 Quantitative Results: 2

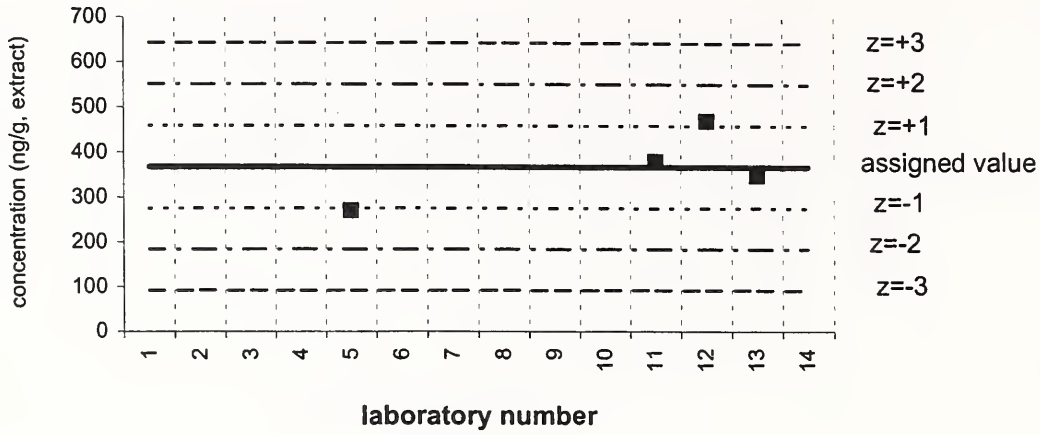


chrysene+triphenylene

Air Particulate Extract I (QA01EXT01)

Assigned value = 367 ng/g s = 82 ng/g 95% CL = 131 ng/g (extract)

Reported Results: 4 Quantitative Results: 4

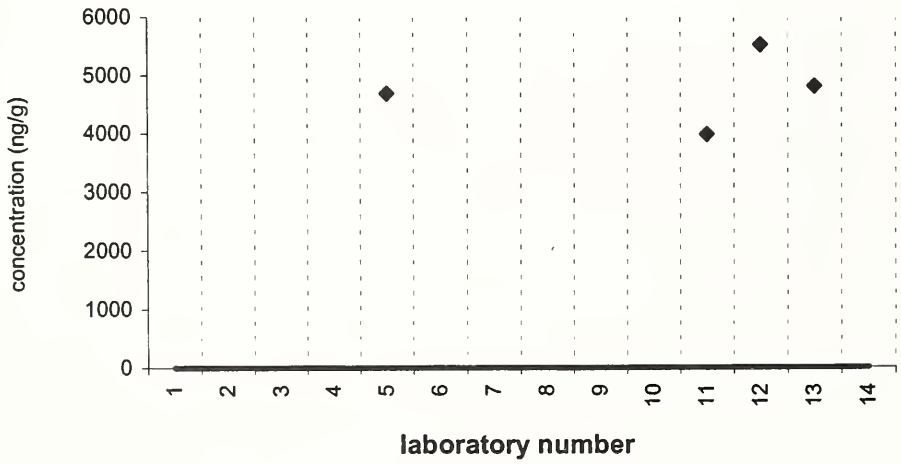


chrysene+triphenylene

SRM 1649a

Target Value = no target ng/g

Reported Results: 4 Quantitative Results: 4

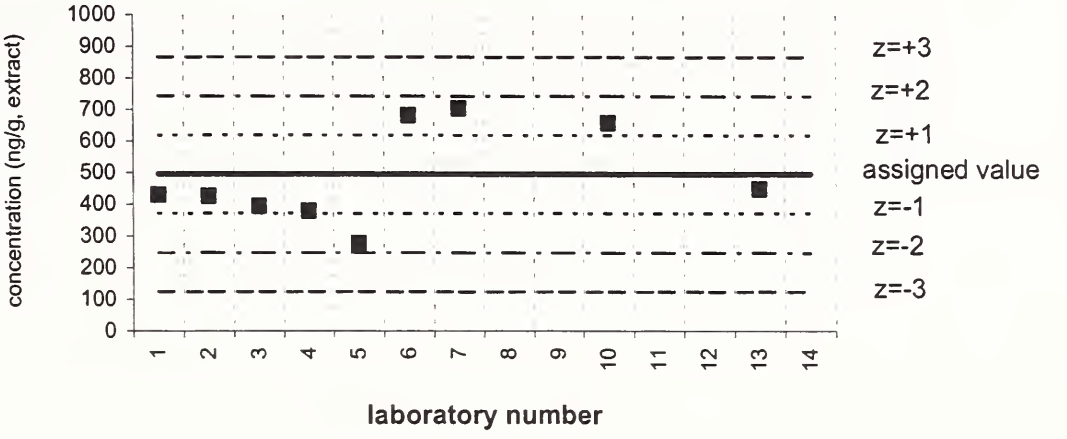


benzo[b]fluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = 496 ng/g s = 138 ng/g 95% CL = 127 ng/g (extract)

Reported Results: 9 Quantitative Results: 9

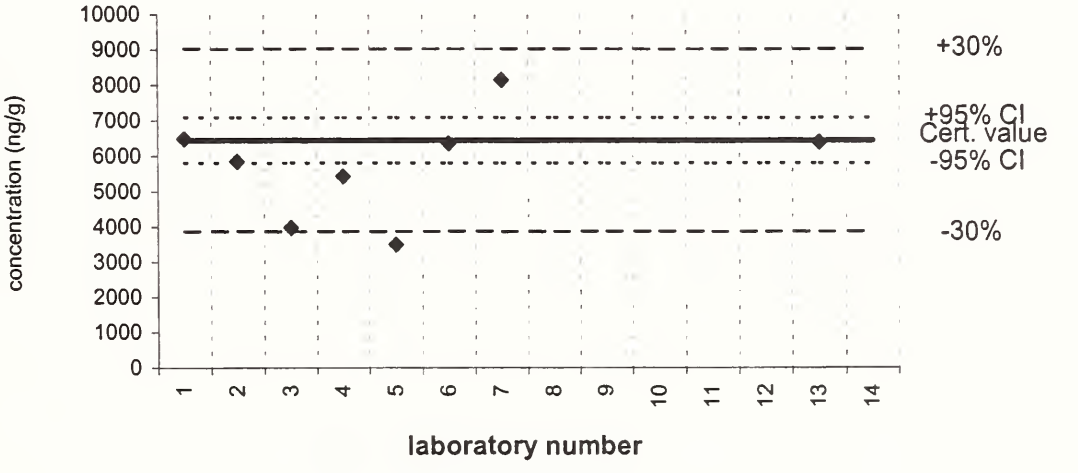


benzo[b]fluoranthene

SRM 1649a

Certified Value = 6450 ± 640 ng/g

Reported Results: 8 Quantitative Results: 8

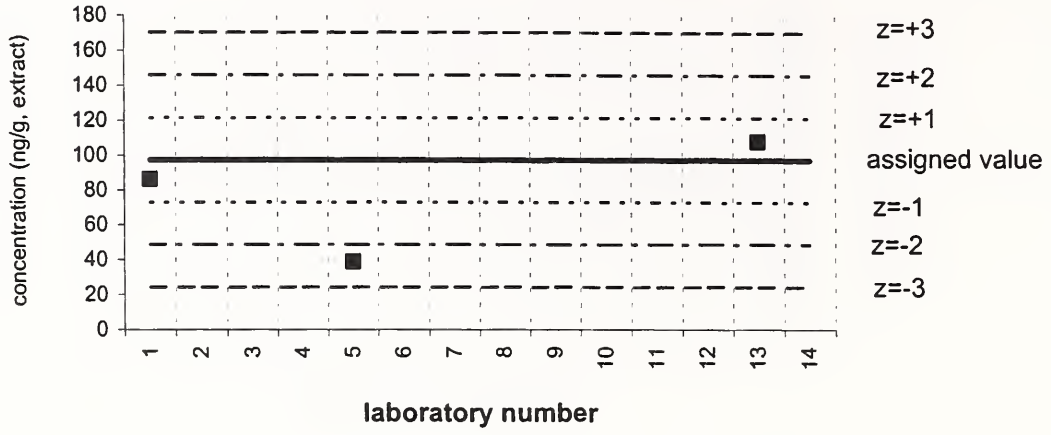


benzo[j]fluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = 97.4 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 3

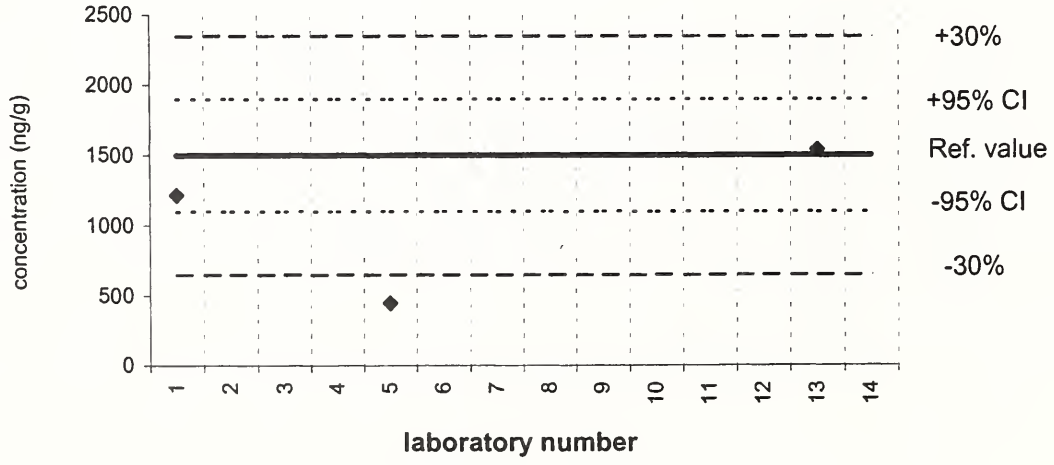


benzo[j]fluoranthene

SRM 1649a

Reference Value = 1500 ± 400 ng/g

Reported Results: 3 Quantitative Results: 3

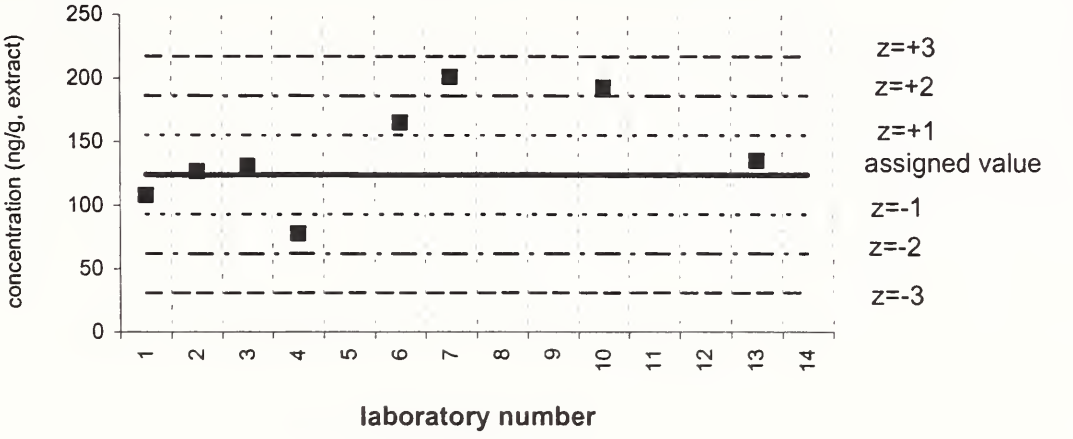


benzo[k]fluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = 124 ng/g s = 29 ng/g 95% CL = 31 ng/g (extract)

Reported Results: 8 Quantitative Results: 8

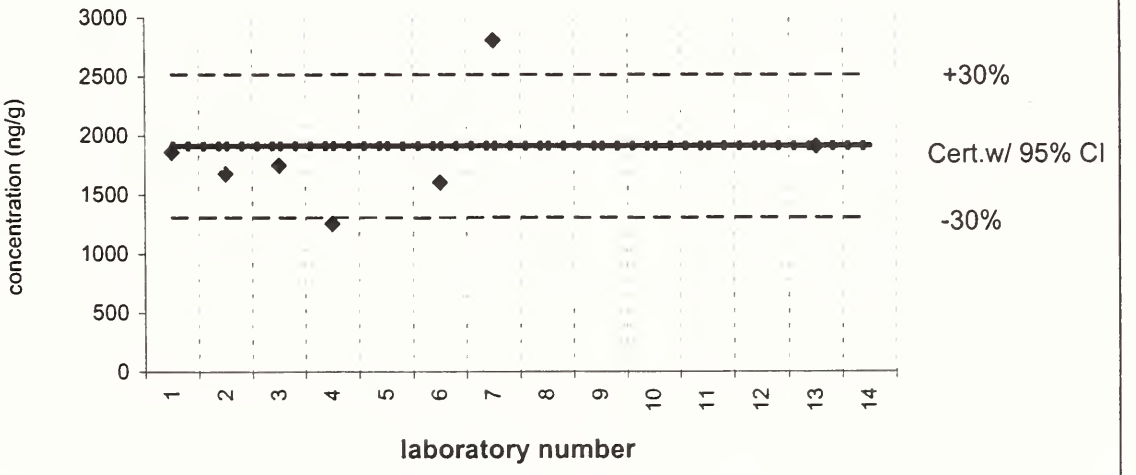


benzo[k]fluoranthene

SRM 1649a

Certified Value = 1913 ± 31 ng/g

Reported Results: 7 Quantitative Results: 7

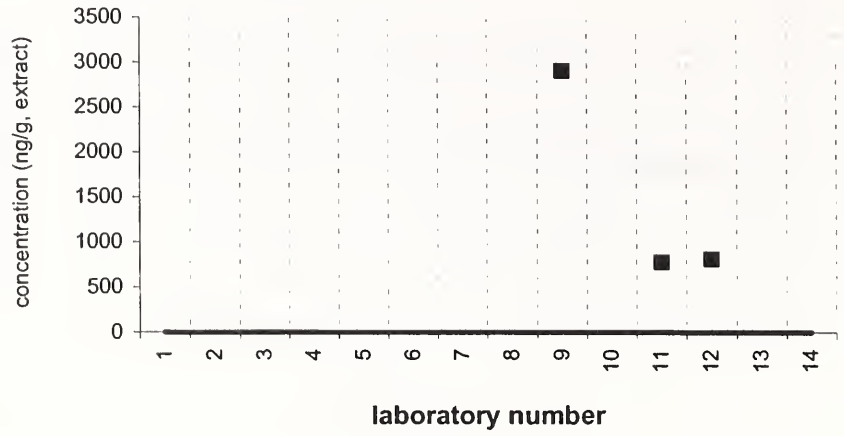


benzo[b+j+k]fluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = No assigned value ng/g (extract)

Reported Results: 3 Quantitative Results: 3

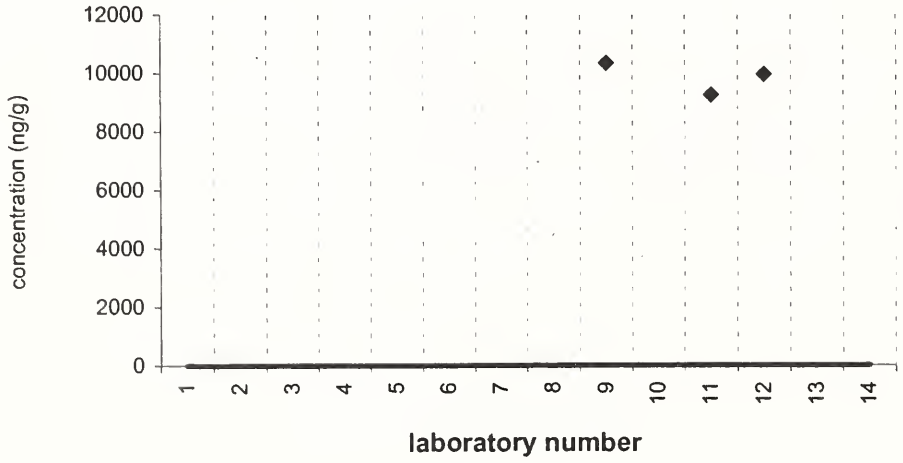


benzo[b+j+k]fluoranthene

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

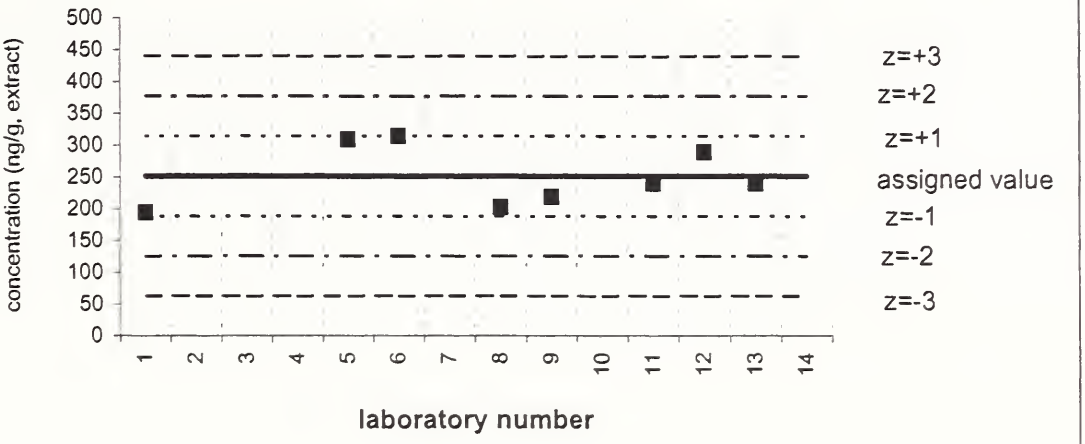


benzo[e]pyrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 252 ng/g s = 47 ng/g 95% CL = 40 ng/g (extract)

Reported Results: 8 Quantitative Results: 8

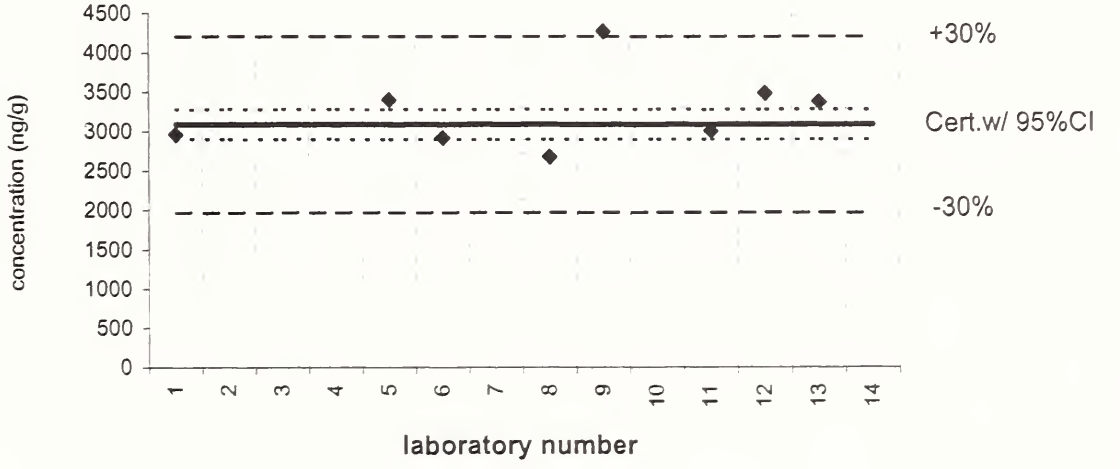


benzo[e]pyrene

SRM 1649a

Certified Value = 3090 ± 190 ng/g

Reported Results: 8 Quantitative Results: 8

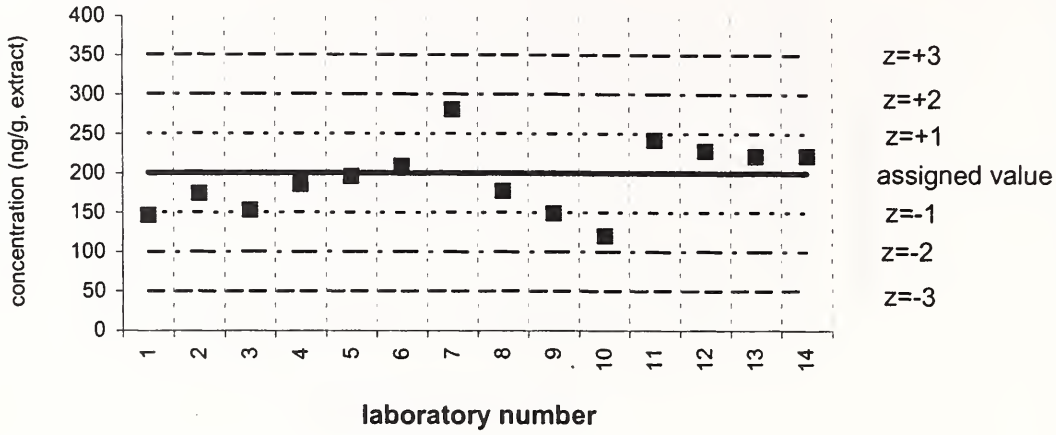


benzo[a]pyrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 201 ng/g s = 42 ng/g 95% CL = 26 ng/g (extract)

Reported Results: 14 Quantitative Results: 14

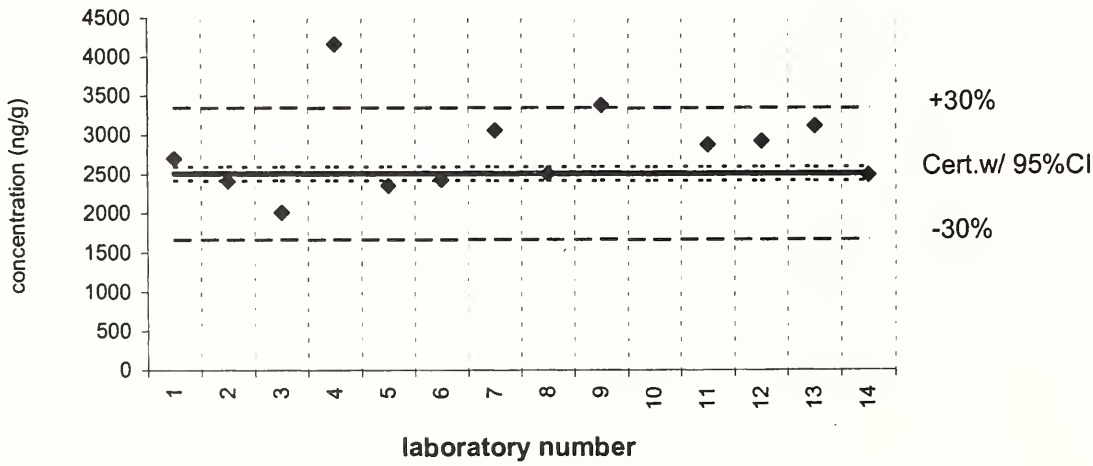


benzo[a]pyrene

SRM 1649a

Certified Value = 2509 ± 87 ng/g

Reported Results: 13 Quantitative Results: 13

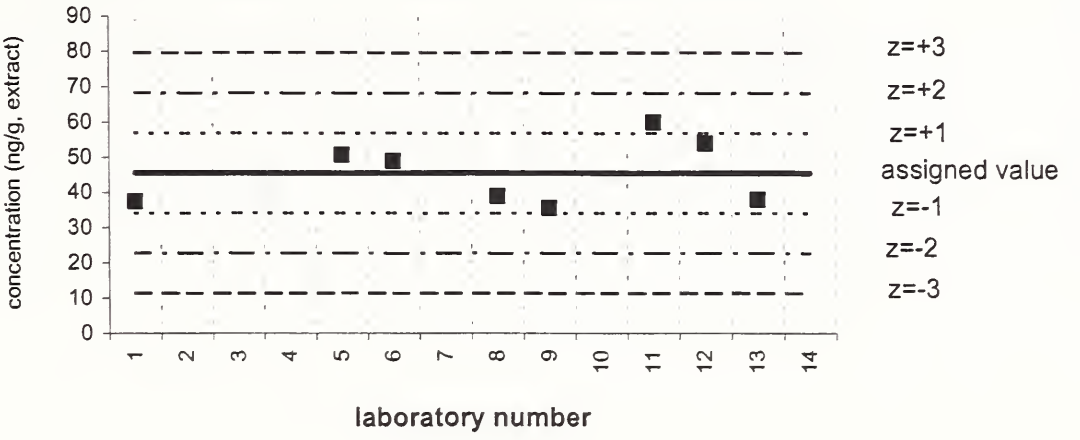


perylene

Air Particulate Extract I (QA01EXT01)

Assigned value = 45.5 ng/g s = 9.1 ng/g 95% CL = 7.6 ng/g (extract)

Reported Results: 8 Quantitative Results: 8

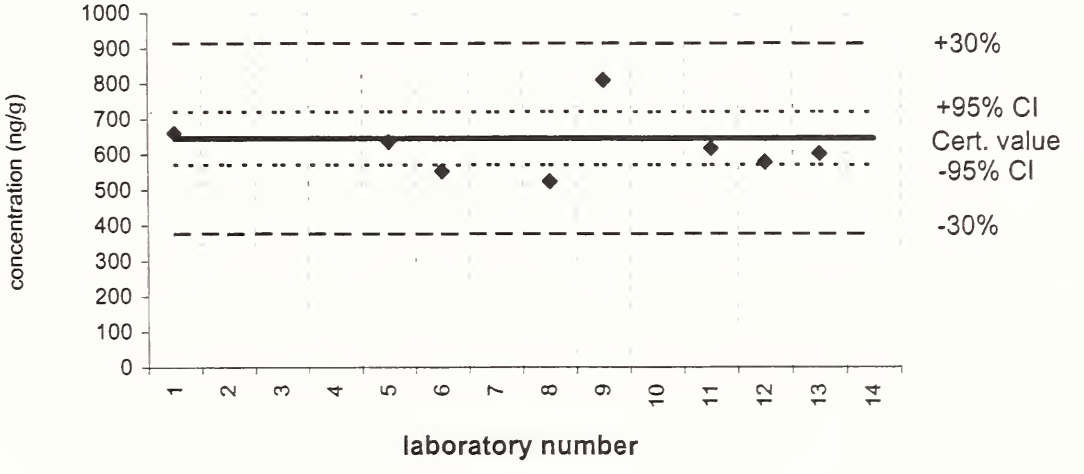


perylene

SRM 1649a

Certified Value = 646 ± 75 ng/g

Reported Results: 8 Quantitative Results: 8

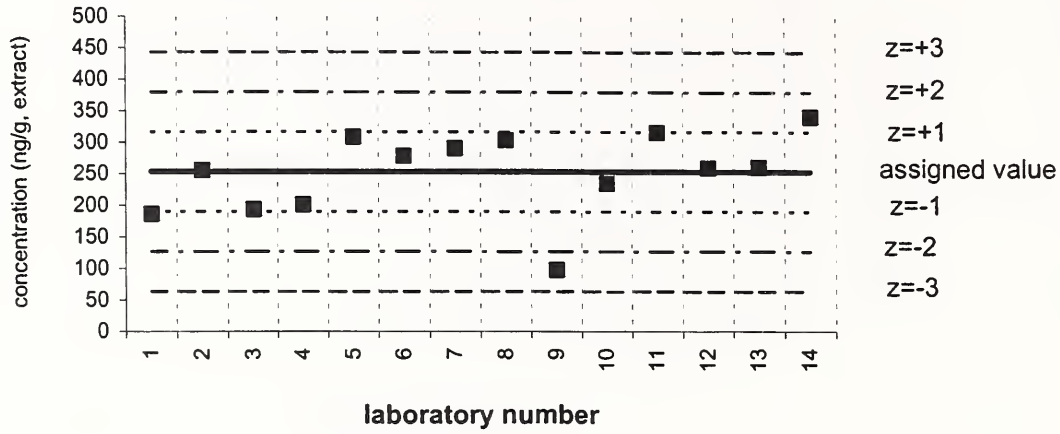


indeno[1,2,3-cd]pyrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 253 ng/g s = 67 ng/g 95% CL = 41 ng/g (extract)

Reported Results: 14 Quantitative Results: 14

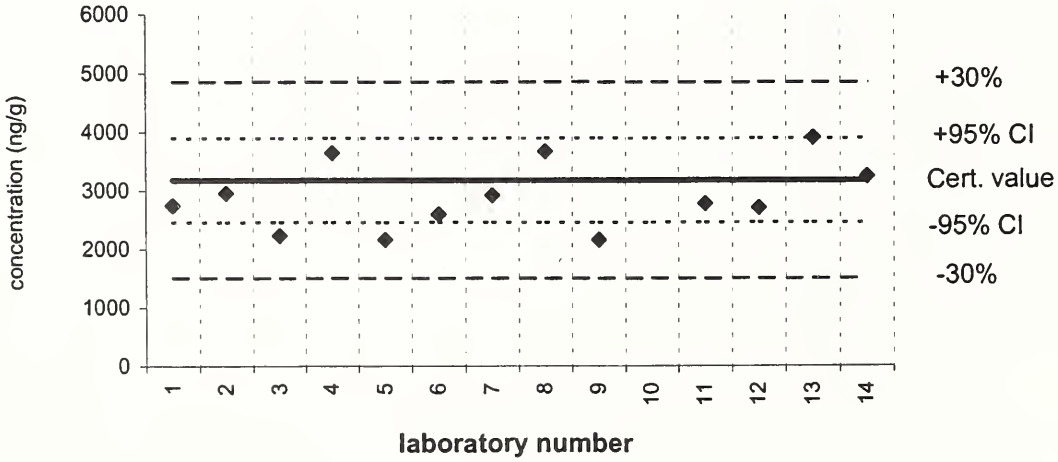


indeno[1,2,3-cd]pyrene

SRM 1649a

Certified Value = 3180 ± 720 ng/g

Reported Results: 13 Quantitative Results: 13

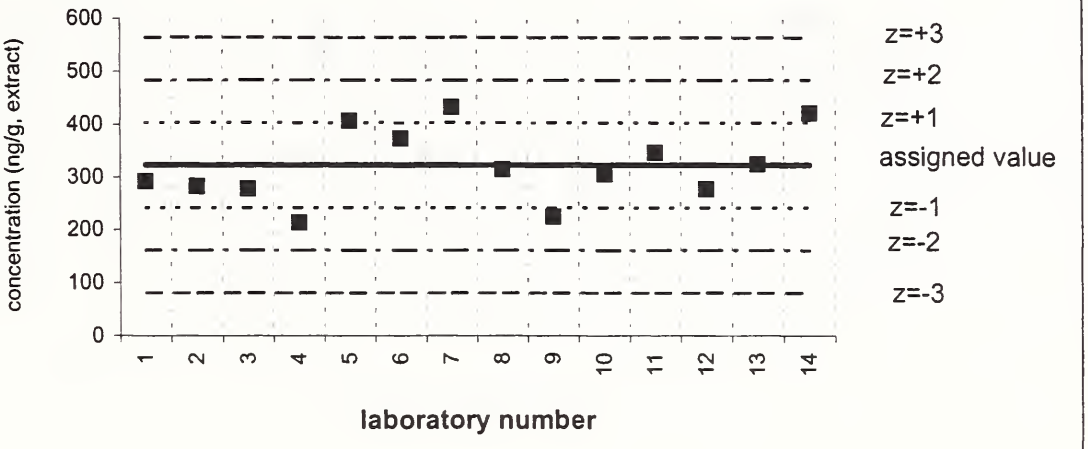


benzo[ghi]perylene

Air Particulate Extract I (QA01EXT01)

Assigned value = 323 ng/g s = 71 ng/g 95% CL = 43 ng/g (extract)

Reported Results: 14 Quantitative Results: 14

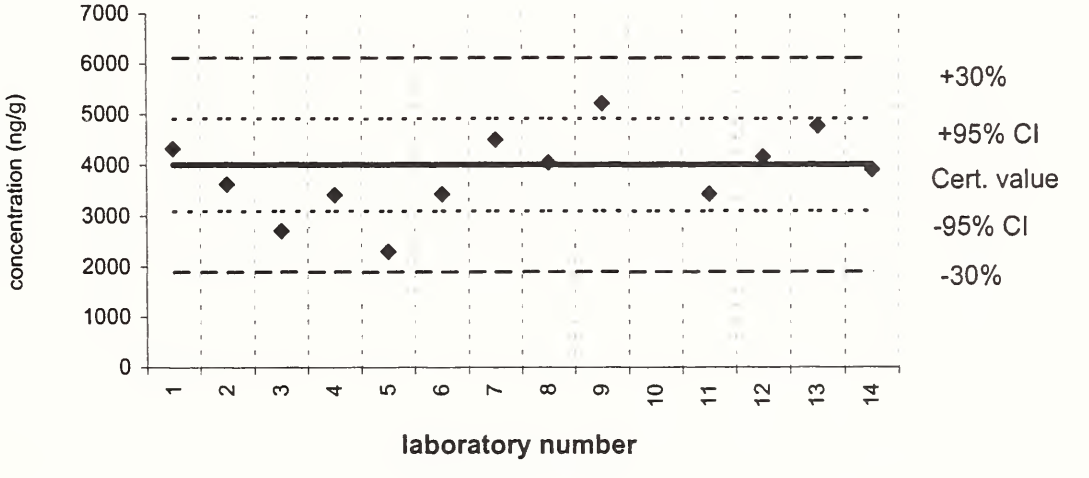


benzo[ghi]perylene

SRM 1649a

Certified Value = 4010 ± 910 ng/g

Reported Results: 13 Quantitative Results: 13

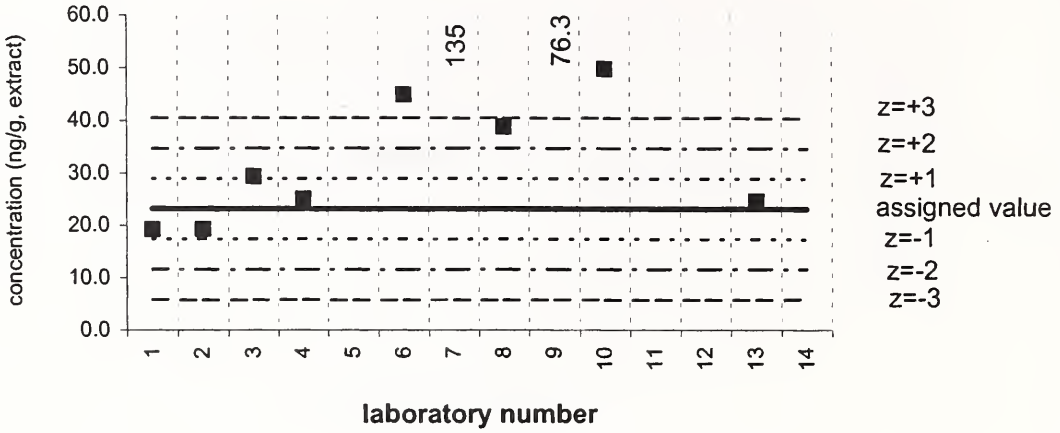


dibenz[a,h]anthracene

Air Particulate Extract I (QA01EXT01)

Assigned value = 23.2 ng/g s = 4.9 ng/g 95% CL = 7.8 ng/g (extract)

Reported Results: 10 Quantitative Results: 10

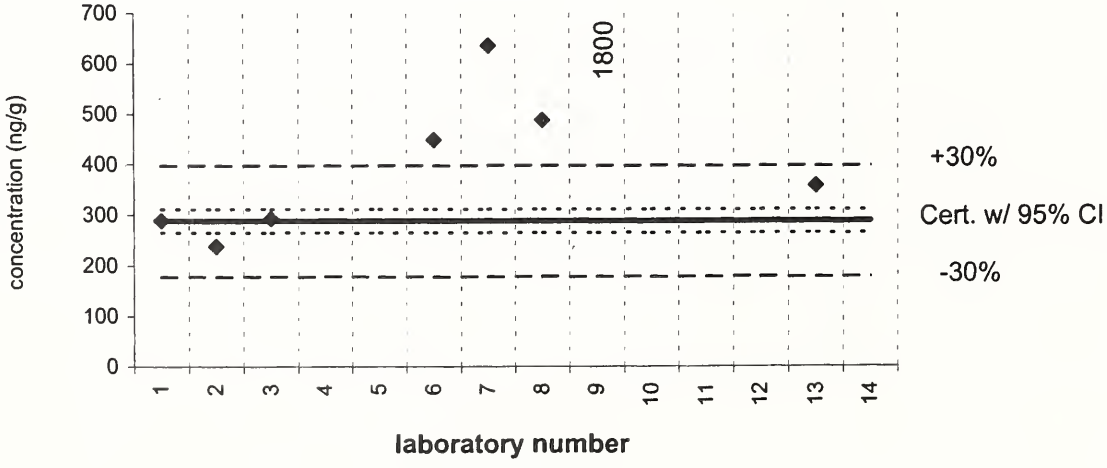


dibenz[a,h]anthracene

SRM 1649a

Certified Value = 288 ± 23 ng/g

Reported Results: 9 Quantitative Results: 8

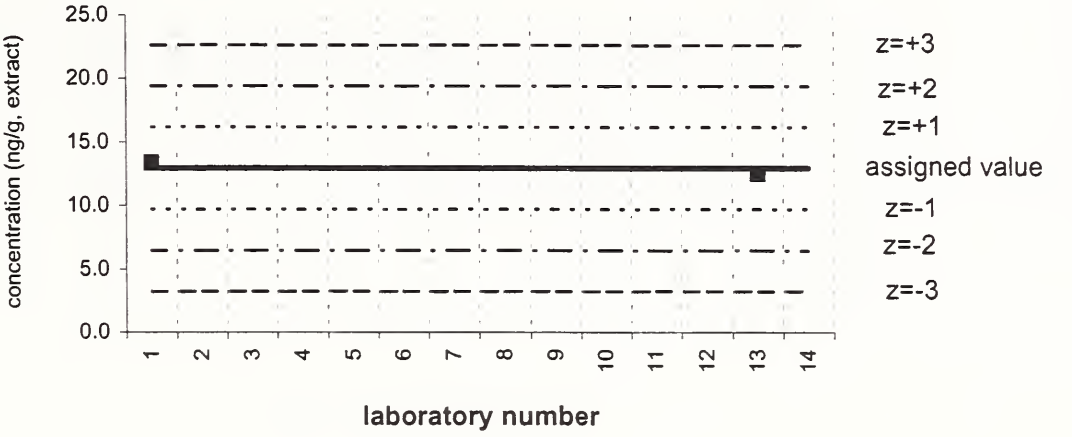


dibenz[a,c]anthracene

Air Particulate Extract I (QA01EXT01)

Assigned value = 12.9 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

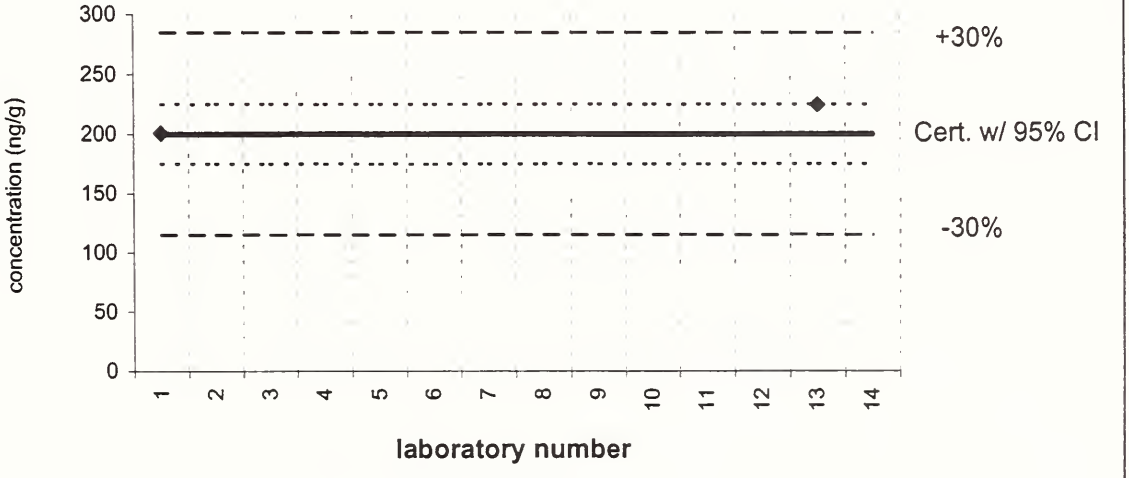


dibenz[a,c]anthracene

SRM 1649a

Certified Value = 200 ± 25 ng/g

Reported Results: 2 Quantitative Results: 2

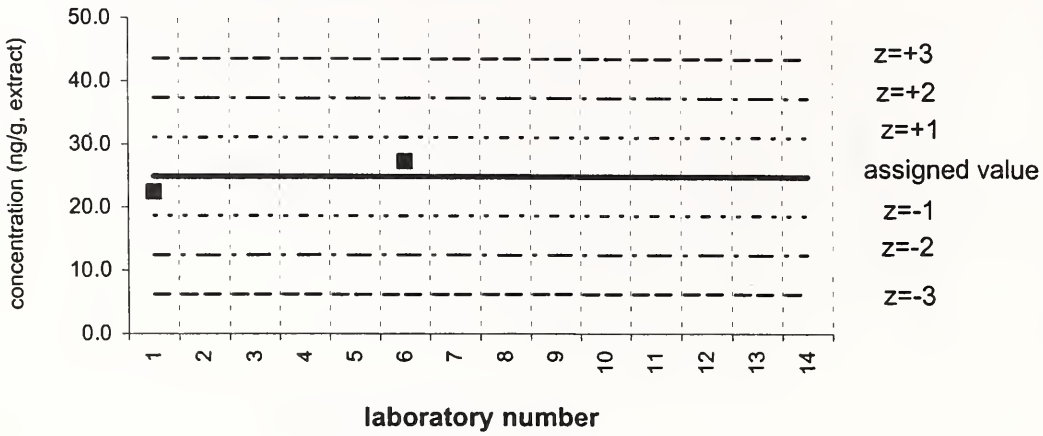


benzo[b]chrysene

Air Particulate Extract I (QA01EXT01)

Assigned value = 24.9 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

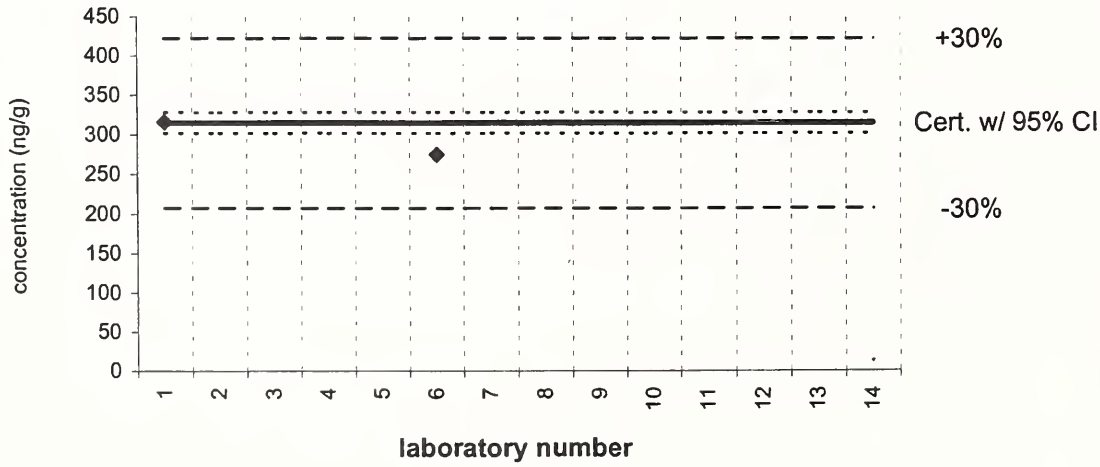


benzo[b]chrysene

SRM 1649a

Certified Value = 315 ± 13 ng/g

Reported Results: 2 Quantitative Results: 2

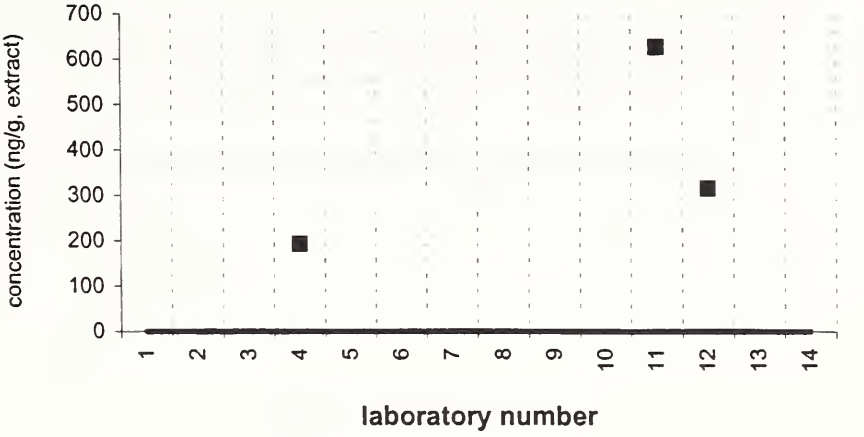


coronene

Air Particulate Extract I (QA01EXT01)

Assigned value = No assigned value ng/g (extract)

Reported Results: 3 Quantitative Results: 3

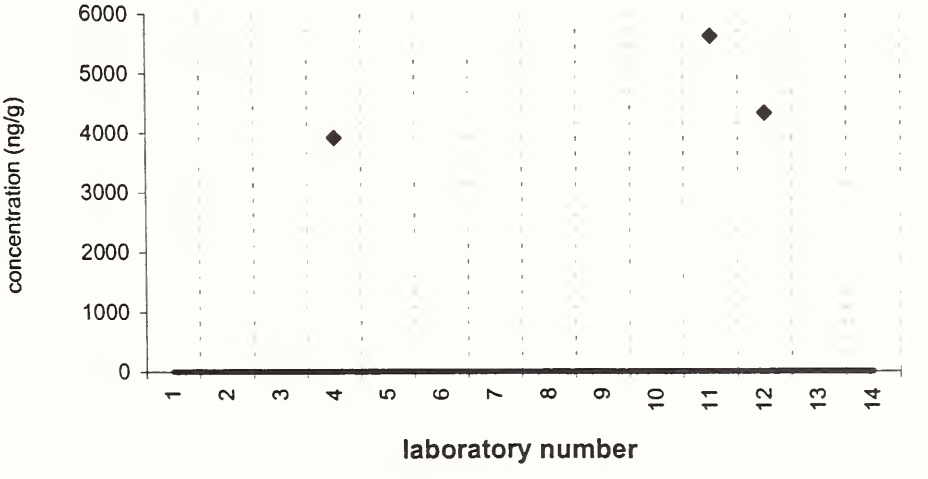


coronene

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

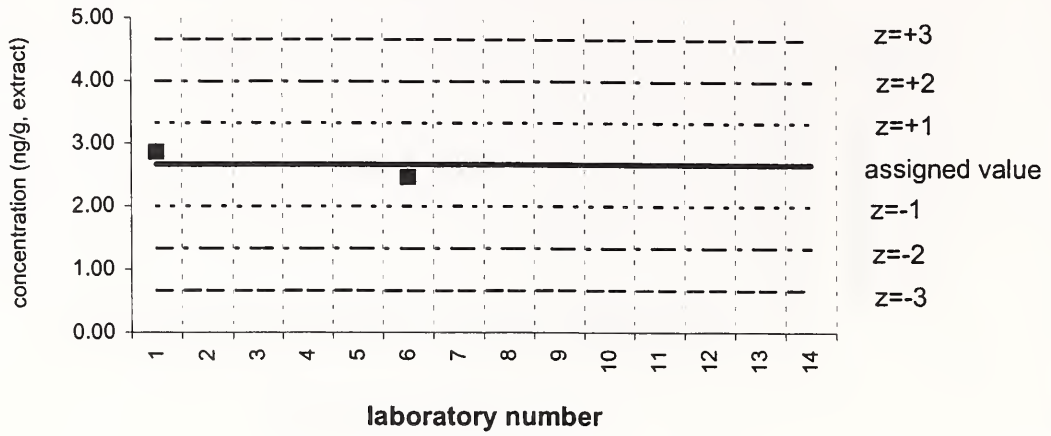


9-nitroanthracene

Air Particulate Extract I (QA01EXT01)

Assigned value = 2.66 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

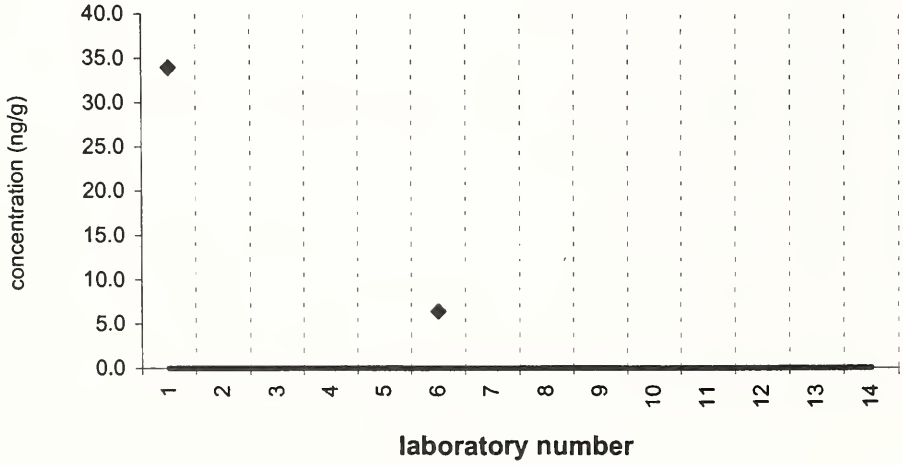


9-nitroanthracene

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

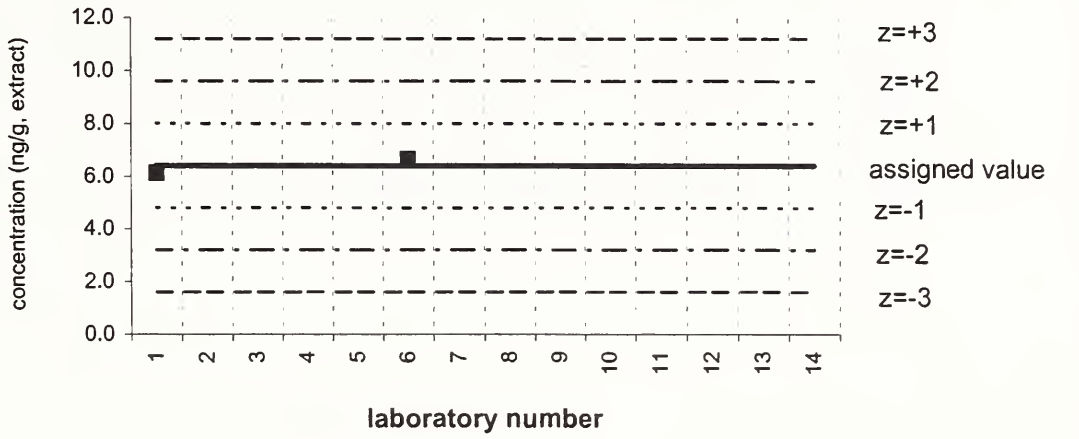


1-nitropyrene

Air Particulate Extract I (QA01EXT01)

Assigned value = 6.41 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

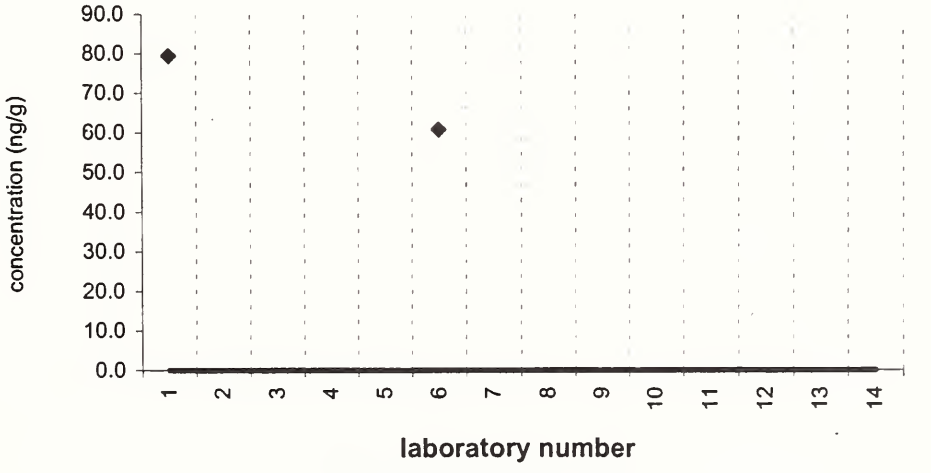


1-nitropyrene

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

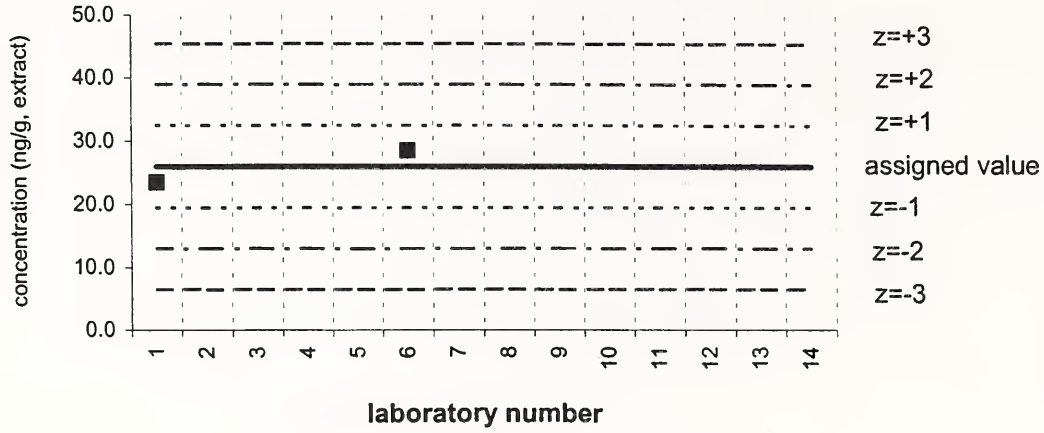


2-nitrofluoranthene

Air Particulate Extract I (QA01EXT01)

Assigned value = 26.0 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

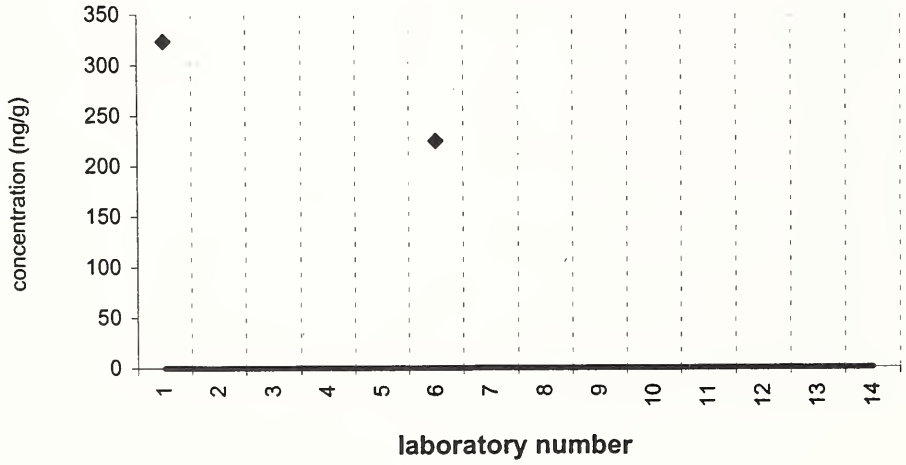


2-nitrofluoranthene

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

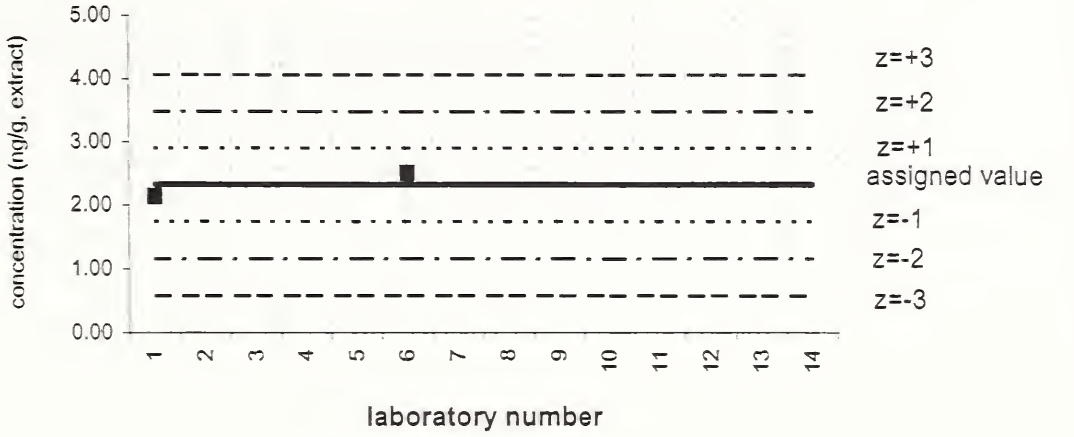


7-nitrobenz[a]anthracene

Air Particulate Extract I (QA01EXT01)

Assigned value = 2.32 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

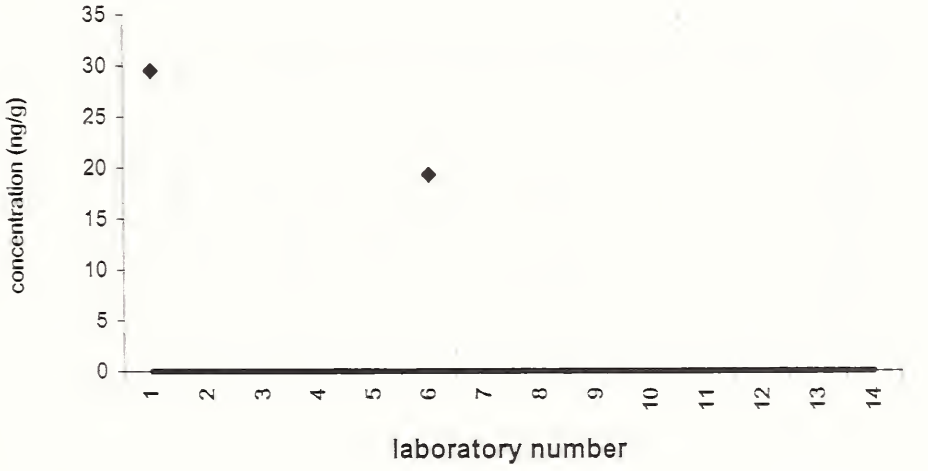


7-nitrobenz[a]anthracene

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

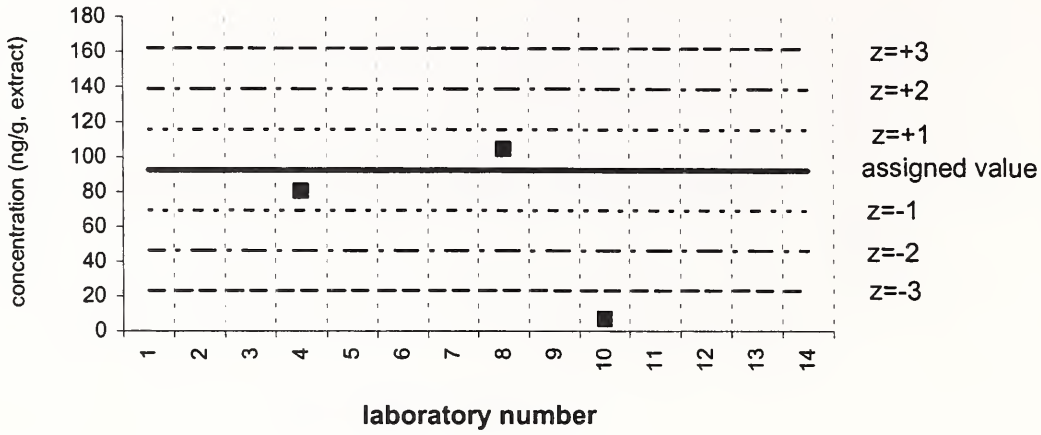


n-C20

Air Particulate Extract I (QA01EXT01)

Assigned value = 92.6 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 4 Quantitative Results: 3

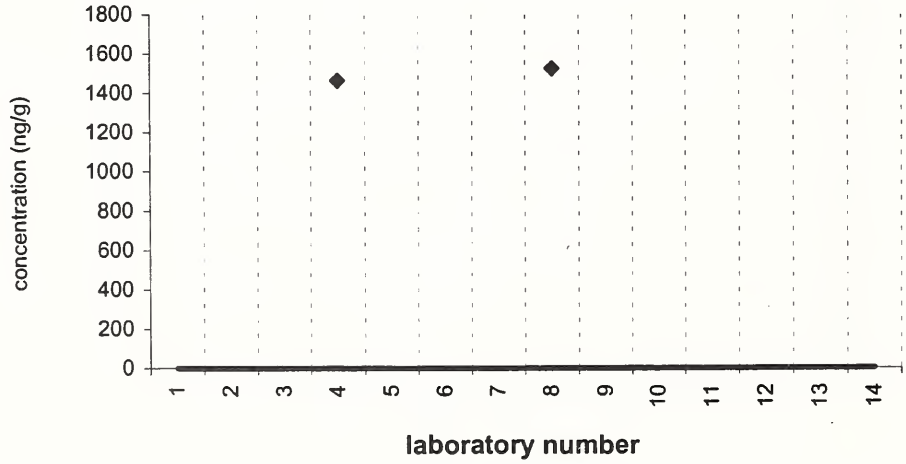


n-C20

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 2

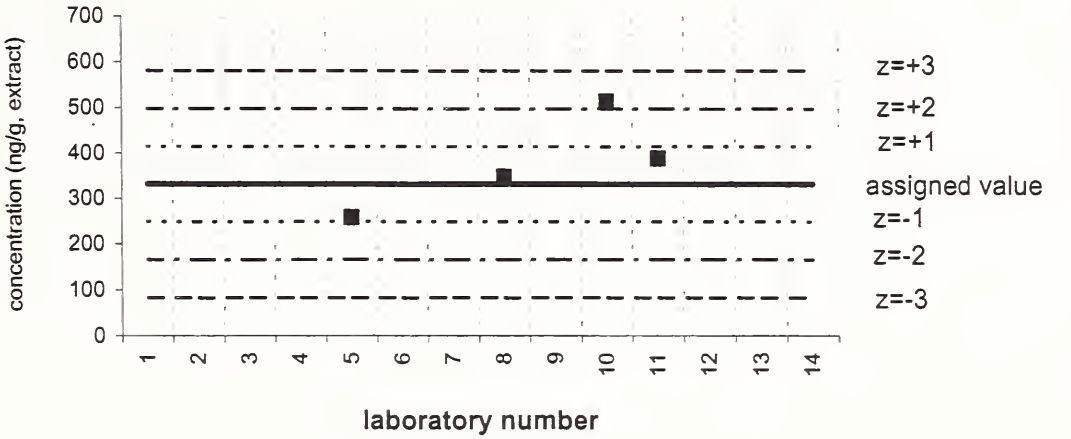


n-C22

Air Particulate Extract I (QA01EXT01)

Assigned value = 332 ng/g s = 67 ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 4 Quantitative Results: 4

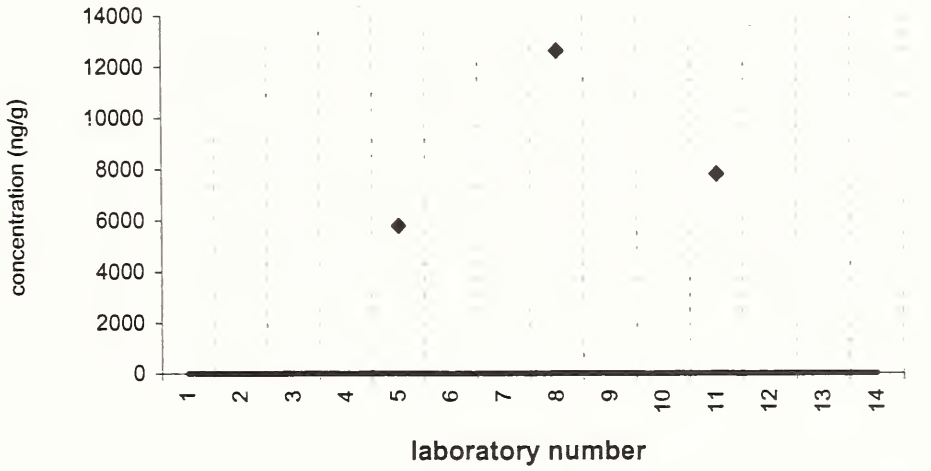


n-C22

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

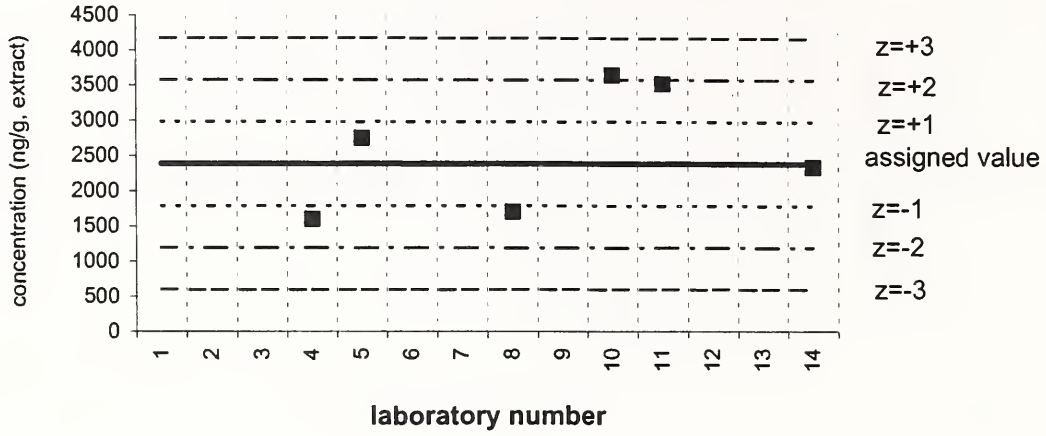


n-C24

Air Particulate Extract I (QA01EXT01)

Assigned value = 2385 ng/g s = 791 ng/g 95% CL = 982 ng/g (extract)

Reported Results: 6 Quantitative Results: 6

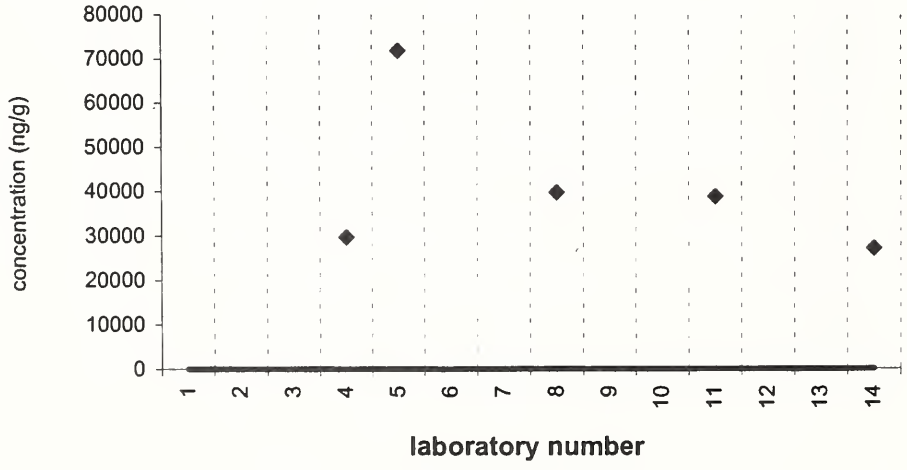


n-C24

SRM 1649a

Target Value = no target ng/g

Reported Results: 5 Quantitative Results: 5

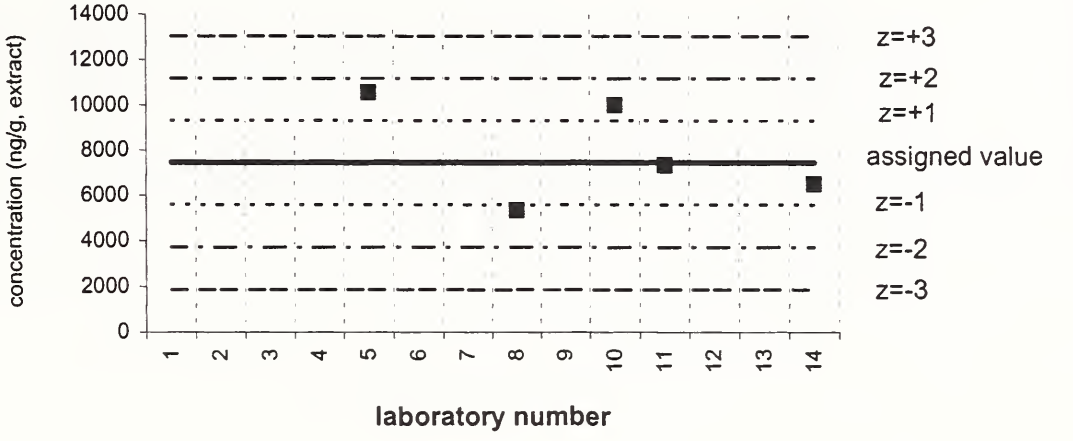


n-C26

Air Particulate Extract I (QA01EXT01)

Assigned value = 7457 ng/g s = 2245 ng/g 95% CL = 3572 ng/g (extract)

Reported Results: 5 Quantitative Results: 5

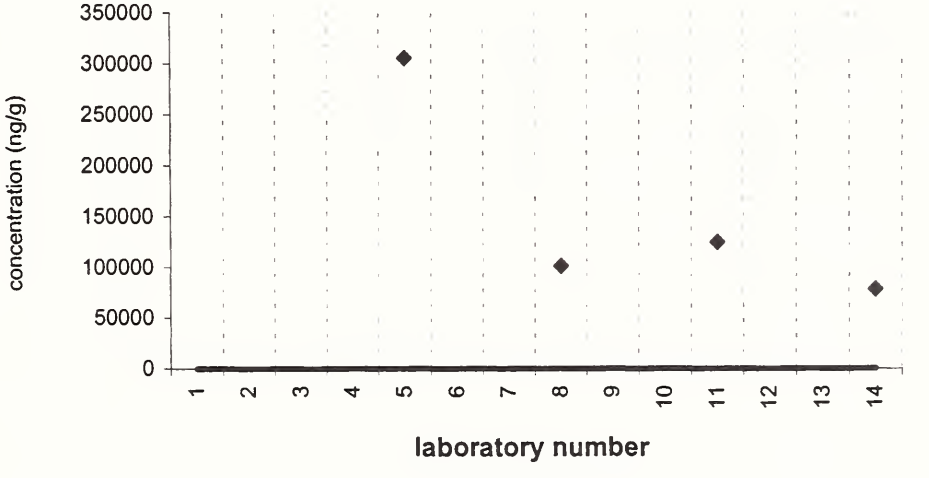


n-C26

SRM 1649a

Target Value = no target ng/g

Reported Results: 4 Quantitative Results: 4

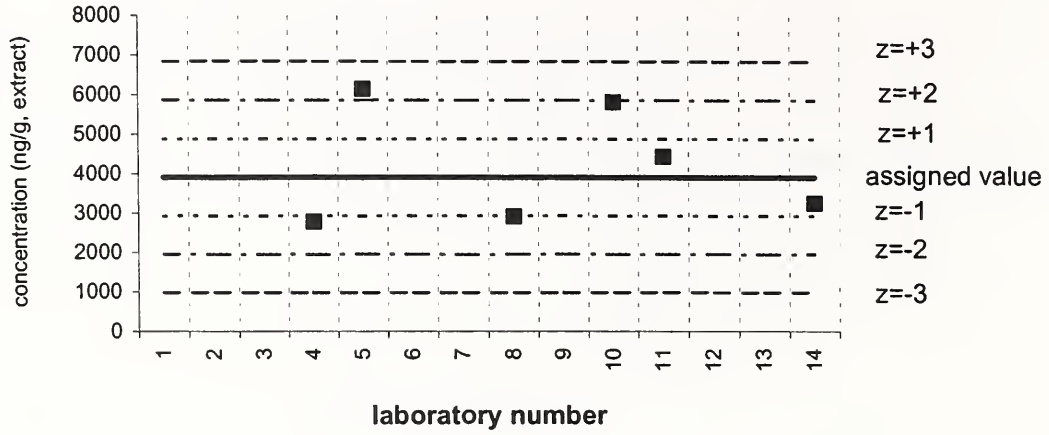


n-C28

Air Particulate Extract I (QA01EXT01)

Assigned value = 3908 ng/g s = 1408 ng/g 95% CL = 1749 ng/g (extract)

Reported Results: 6 Quantitative Results: 6

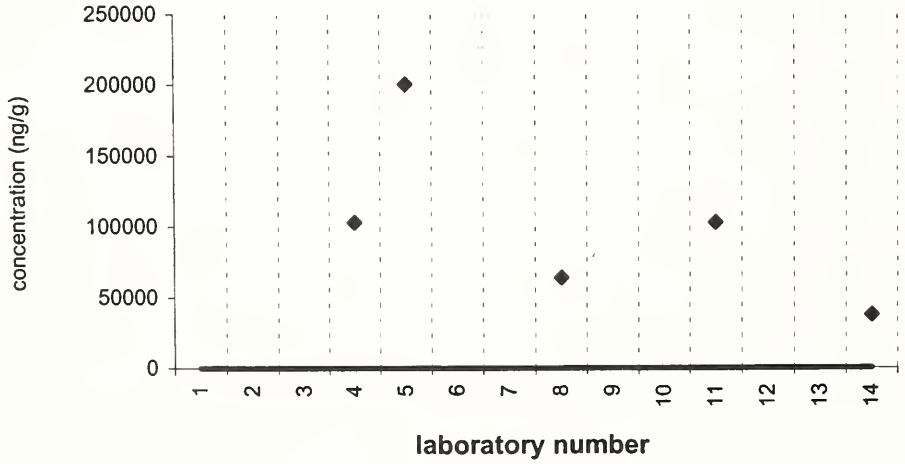


n-C28

SRM 1649a

Target Value = no target ng/g

Reported Results: 5 Quantitative Results: 5

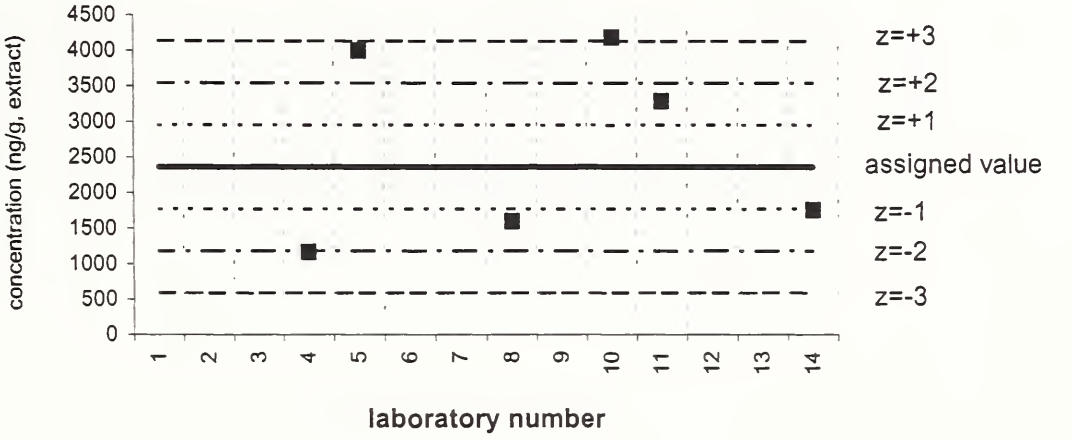


n-C30

Air Particulate Extract I (QA01EXT01)

Assigned value = 2364 ng/g s = 1218 ng/g 95% CL = 1512 ng/g (extract)

Reported Results: 6 Quantitative Results: 6

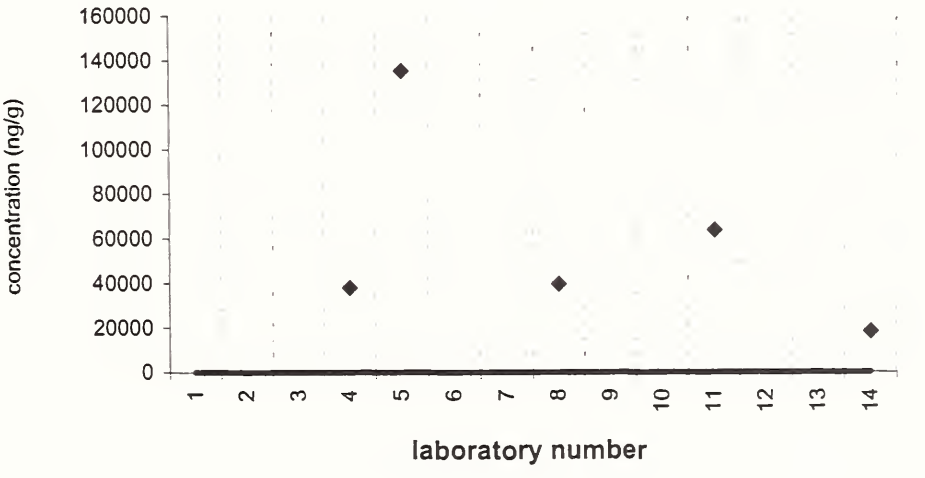


n-C30

SRM 1649a

Target Value = no target ng/g

Reported Results: 5 Quantitative Results: 5

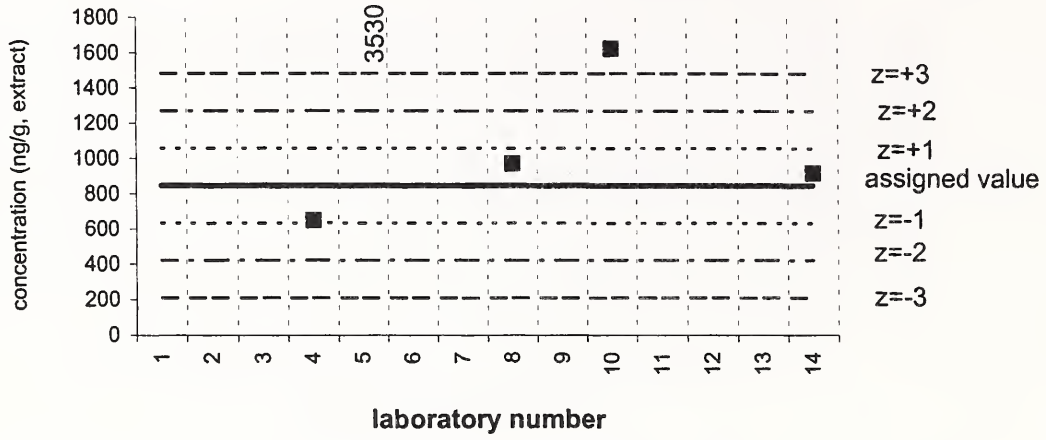


n-C32

Air Particulate Extract I (QA01EXT01)

Assigned value = 848 ng/g s = 172 ng/g 95% CL = 428 ng/g (extract)

Reported Results: 5 Quantitative Results: 5

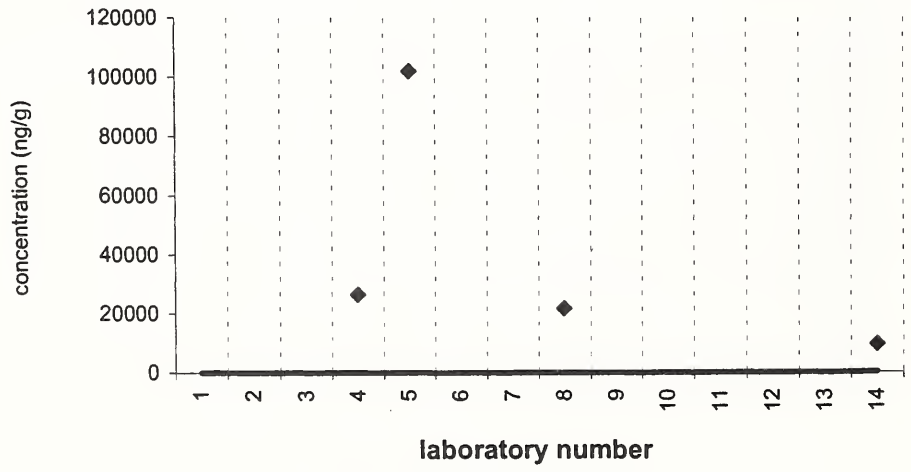


n-C32

SRM 1649a

Target Value = no target ng/g

Reported Results: 1 Quantitative Results: 1

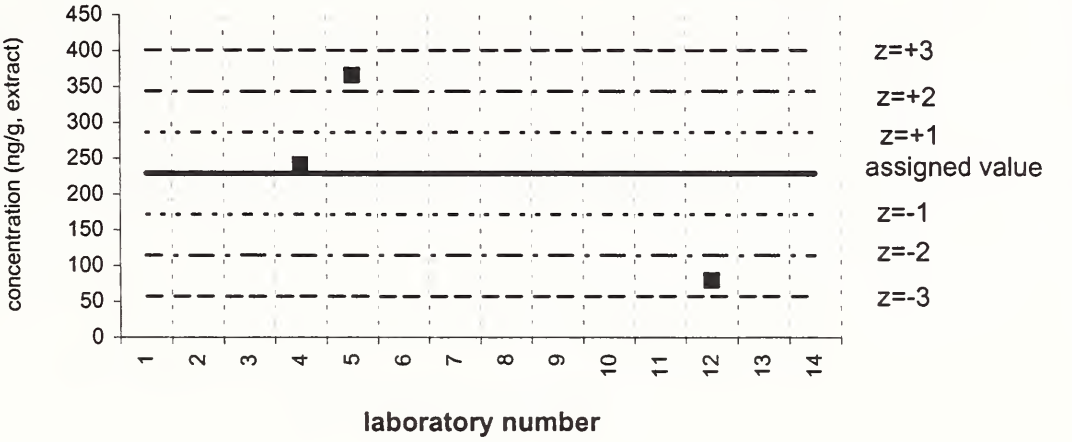


22, 29, 30-trisnorhopane

Air Particulate Extract I (QA01EXT01)

Assigned value = 229 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 3

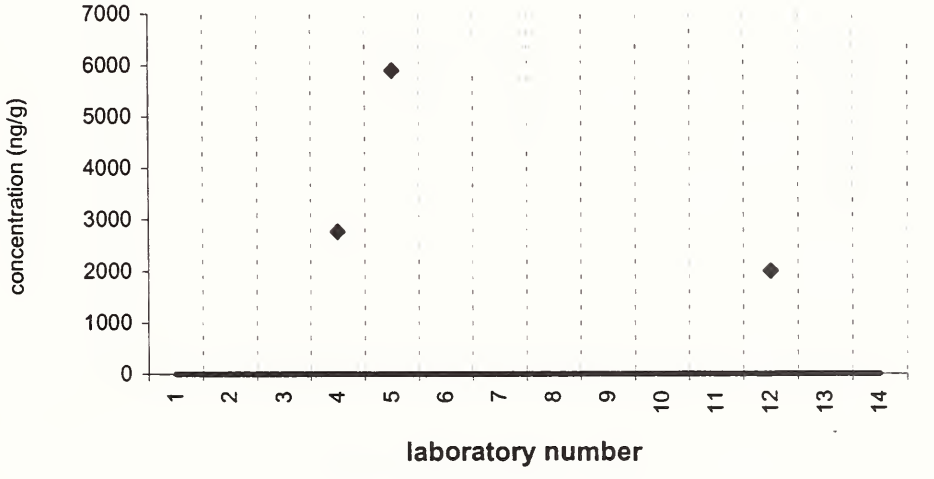


22, 29, 30-trisnorhopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

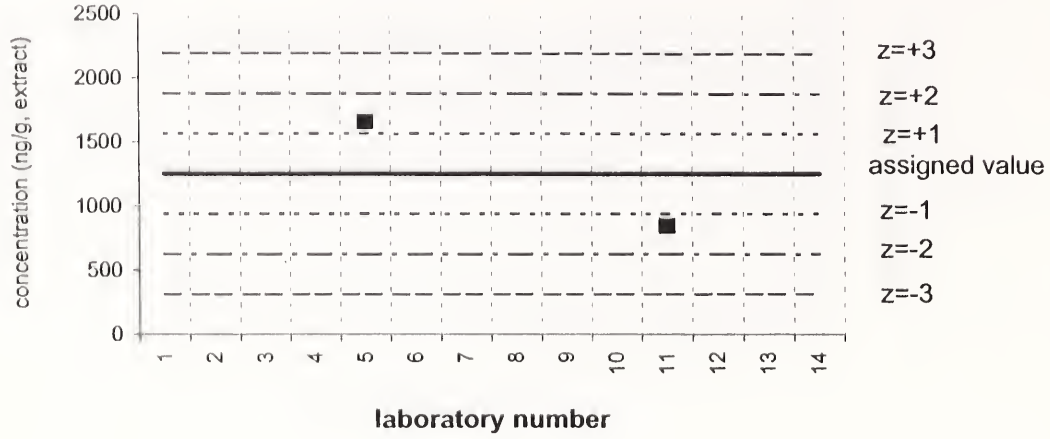


17a(H), 21b(H)-29-norhopane

Air Particulate Extract I (QA01EXT01)

Assigned value = 1255 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

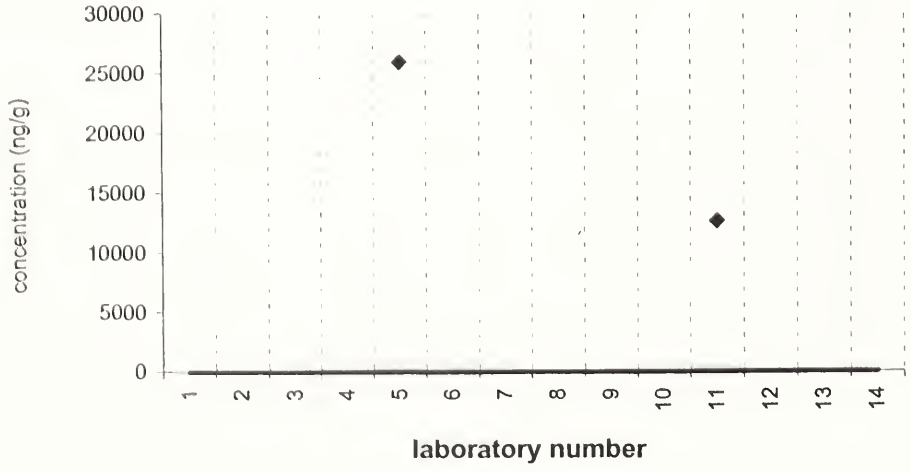


17a(H), 21b(H)-29-norhopane

SRM 1649a

Target Value = no target ng/g

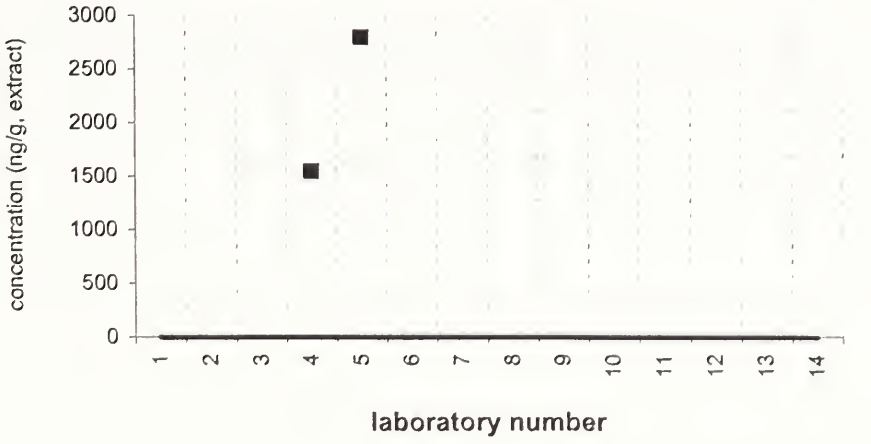
Reported Results: 2 Quantitative Results: 2



17a(H), 21b(H)-29-hopane **Air Particulate Extract I (QA01EXT01)**

Assigned value = No assigned value ng/g (extract)

Reported Results: 2 Quantitative Results: 2



17a(H), 21b(H)-29-hopane **SRM 1649a**

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

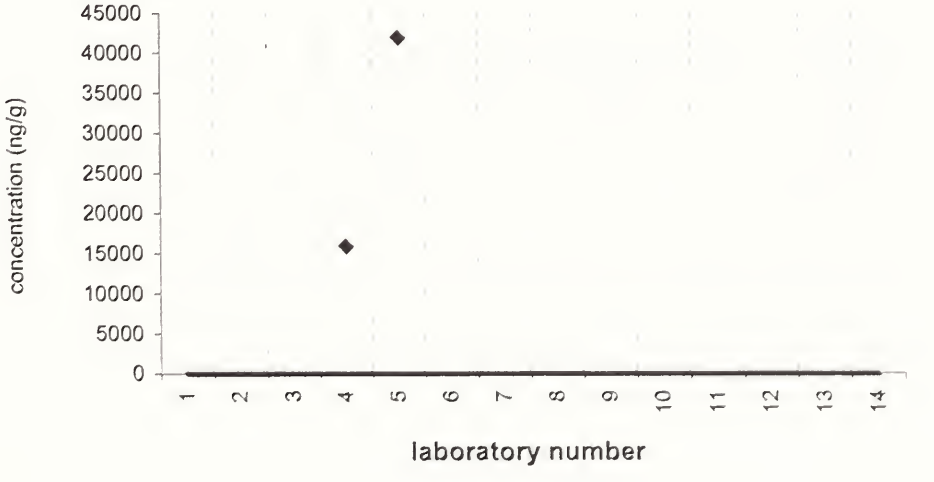


ABB-20R-C28-methylcholestane **Air Particulate Extract I (QA01EXT01)**

Assigned value = 239 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 2 Quantitative Results: 2

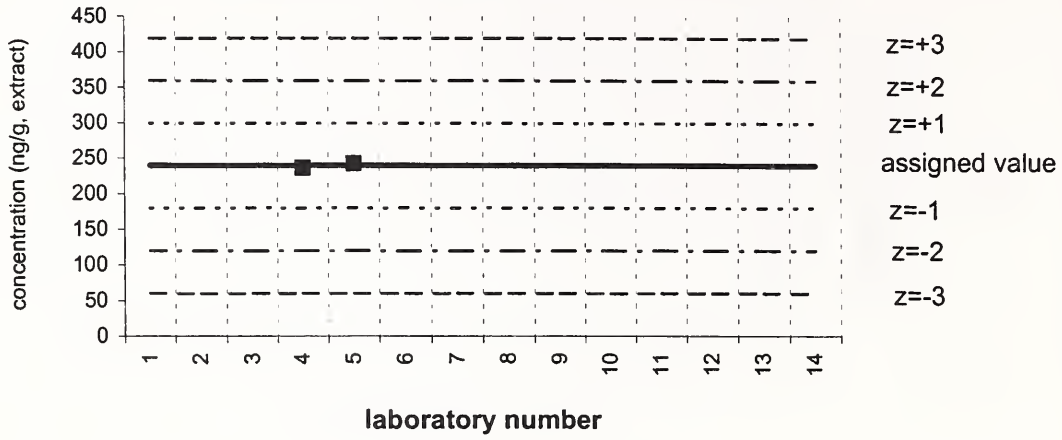
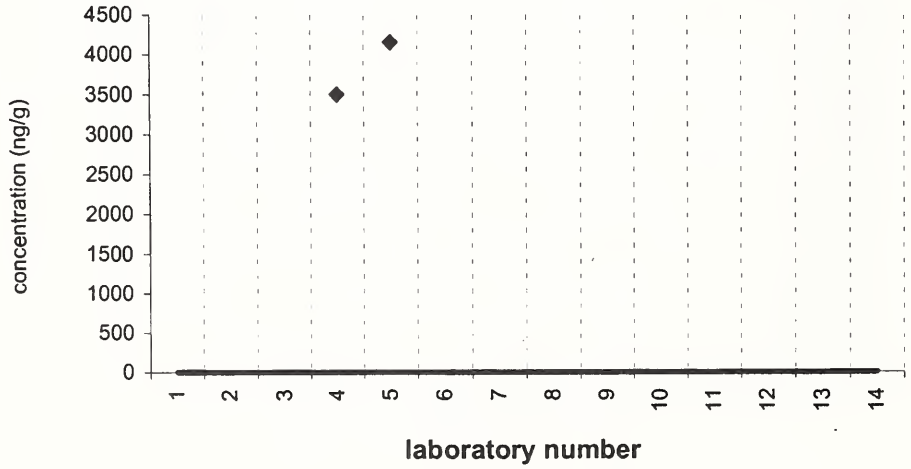


ABB-20R-C28-methylcholestane **SRM 1649a**

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

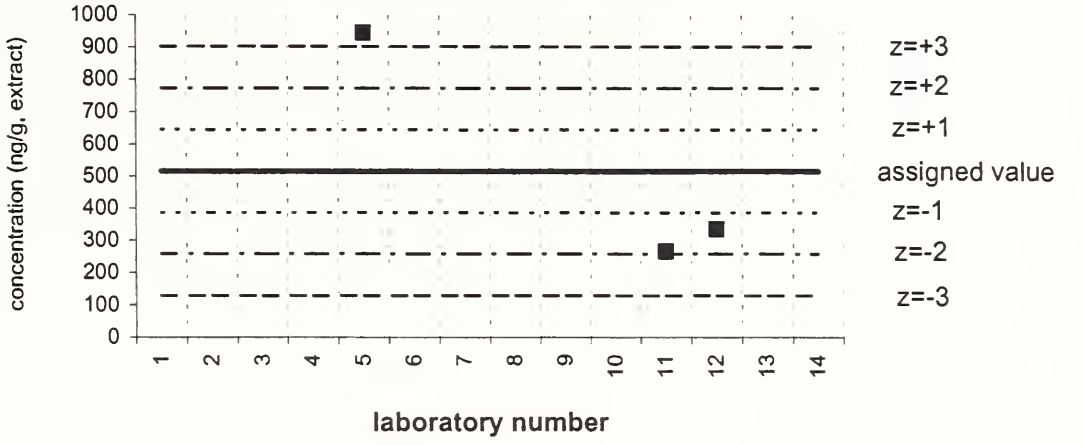


22S-17a(H), 21b(H)-30-homohopane

Air Particulate Extract I (QA01EXT01)

Assigned value = 516 ng/g s = 374 ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 3

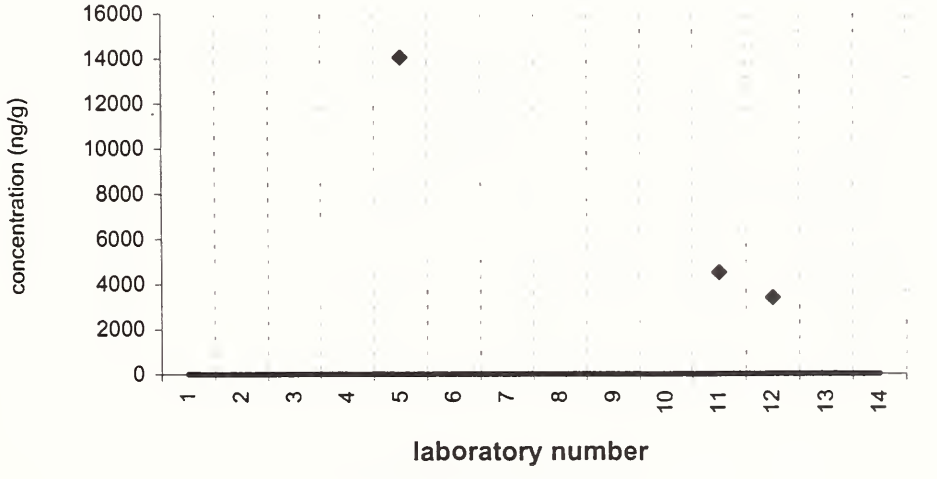


22S-17a(H), 21b(H)-30-homohopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

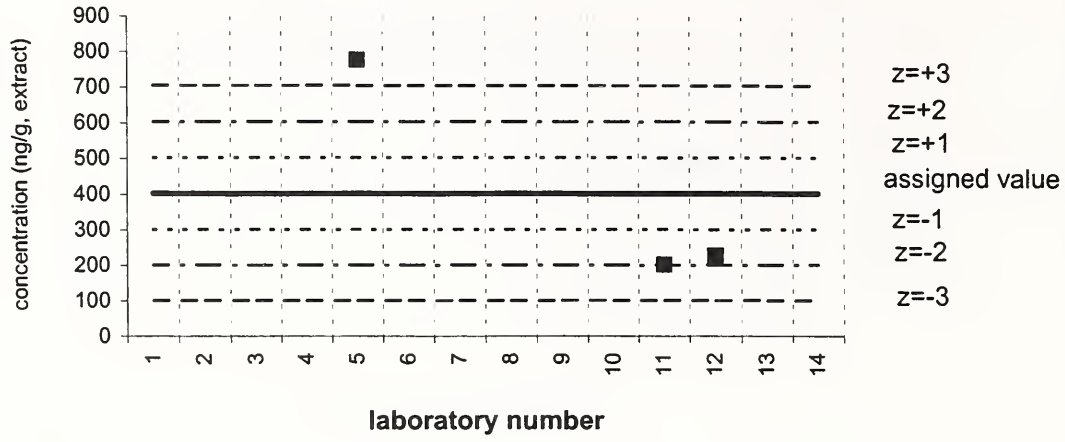


22R-17a(H), 21b(H)-30-homohopane

Air Particulate Extract I (QA01EXT01)

Assigned value = 403 ng/g s = 324 ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 3

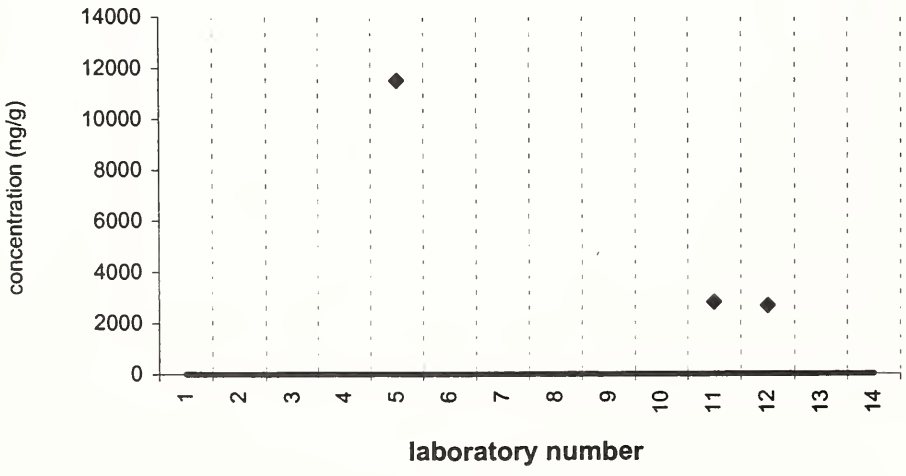


22R-17a(H), 21b(H)-30-homohopane

SRM 1649a

Target Value = no target ng/g

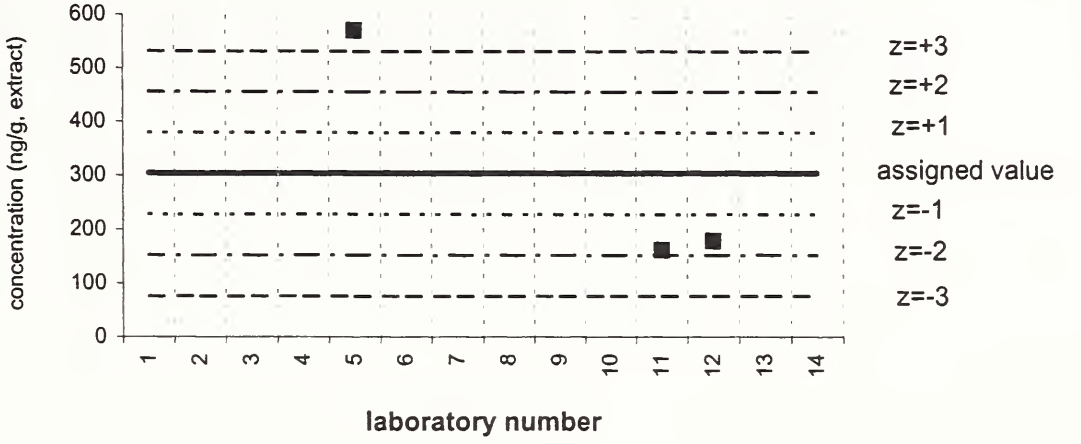
Reported Results: 3 Quantitative Results: 3



22S-17a(H), 21b(H)-30-bishomohopane Air Particulate Extract I (QA01EXT01)

Assigned value = 304 ng/g s = 232 ng/g 95% CL = not calc. ng/g (extract)

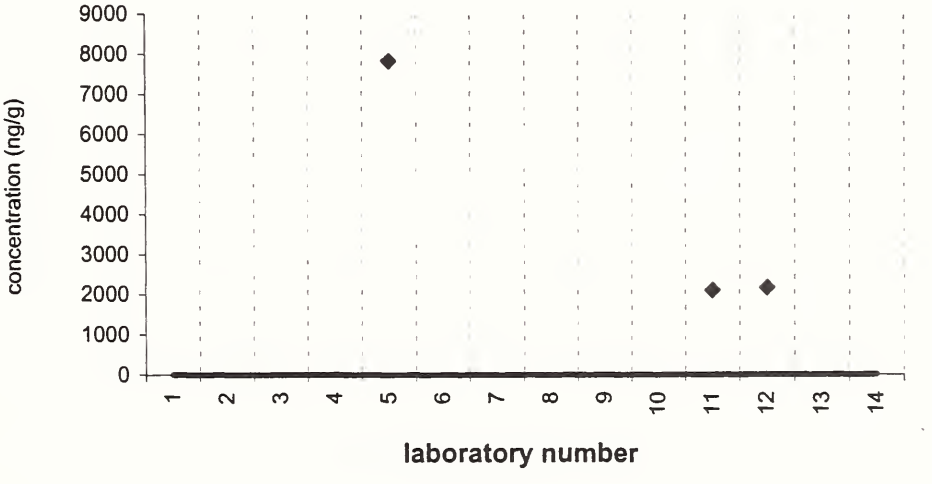
Reported Results: 3 Quantitative Results: 3



22S-17a(H), 21b(H)-30-bishomohopane SRM 1649a

Target Value = no target ng/g

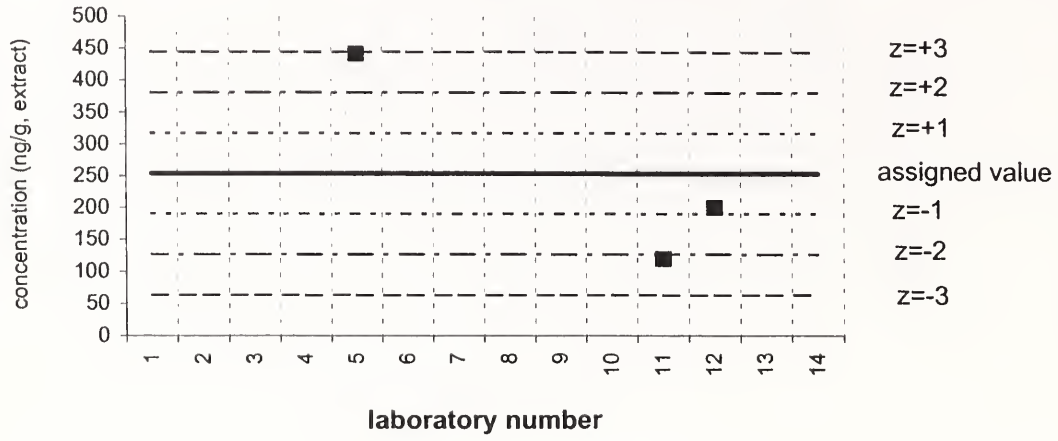
Reported Results: 3 Quantitative Results: 3



22R-17a(H), 21b(H)-30-bishomohopane Air Particulate Extract I (QA01EXT01)

Assigned value = 254 ng/g s = 167 ng/g 95% CL = not calc. ng/g (extract)

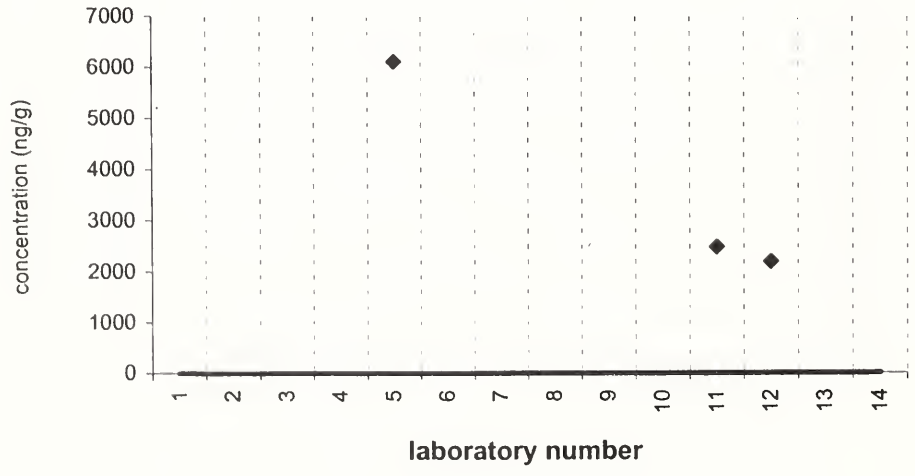
Reported Results: 3 Quantitative Results: 3



22R-17a(H), 21b(H)-30-bishomohopane SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

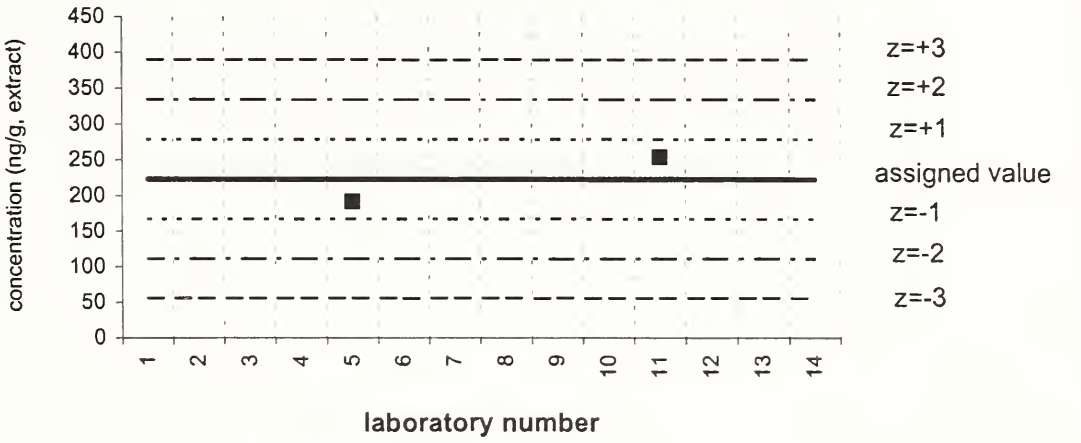


benzanthrone

Air Particulate Extract I (QA01EXT01)

Assigned value = 223 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

Reported Results: 3 Quantitative Results: 2

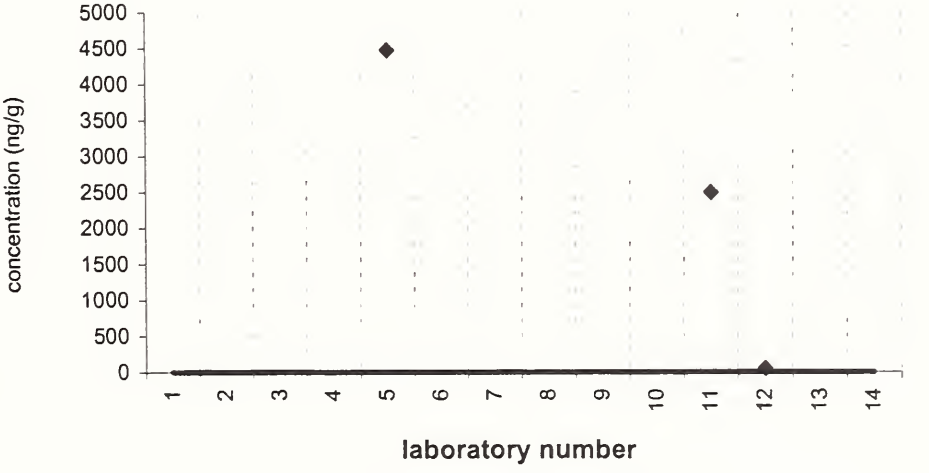


benzanthrone

SRM 1649a

Target Value = no target ng/g

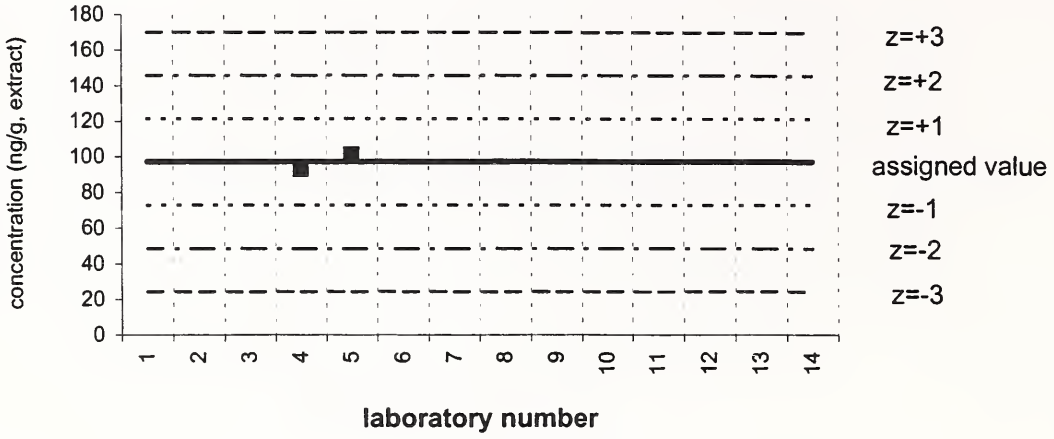
Reported Results: 3 Quantitative Results: 3



9-fluorenone **Air Particulate Extract I (QA01EXT01)**

Assigned value = 97 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

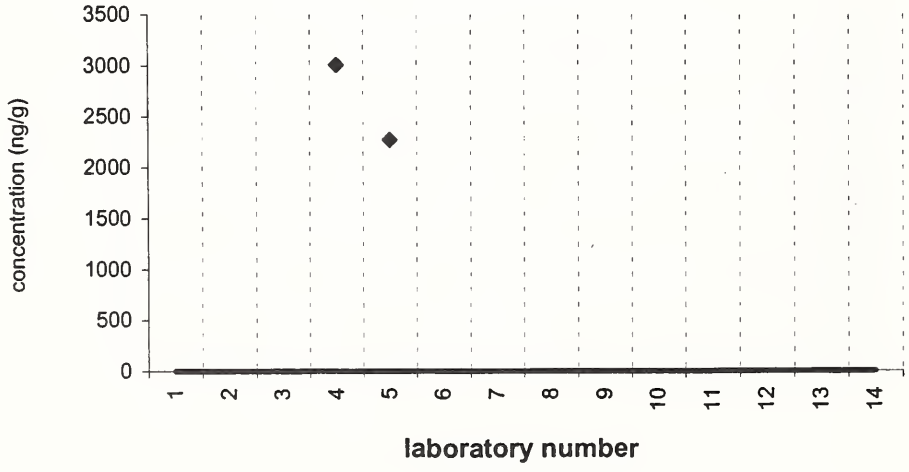
Reported Results: 3 Quantitative Results: 2



9-fluorenone **SRM 1649a**

Target Value = no target ng/g

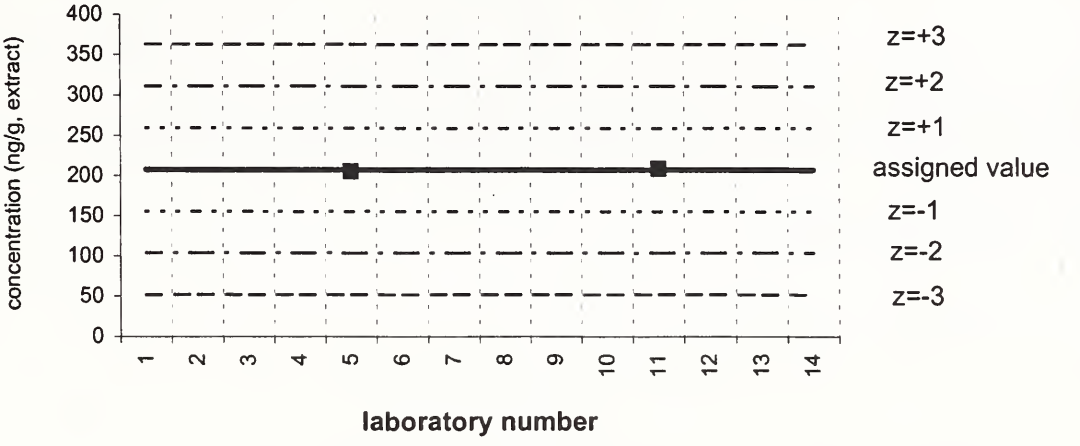
Reported Results: 3 Quantitative Results: 2



benz[a]anthracene-7, 12-dione **Air Particulate Extract I (QA01EXT01)**

Assigned value = 208 ng/g s = not calc. ng/g 95% CL = not calc. ng/g (extract)

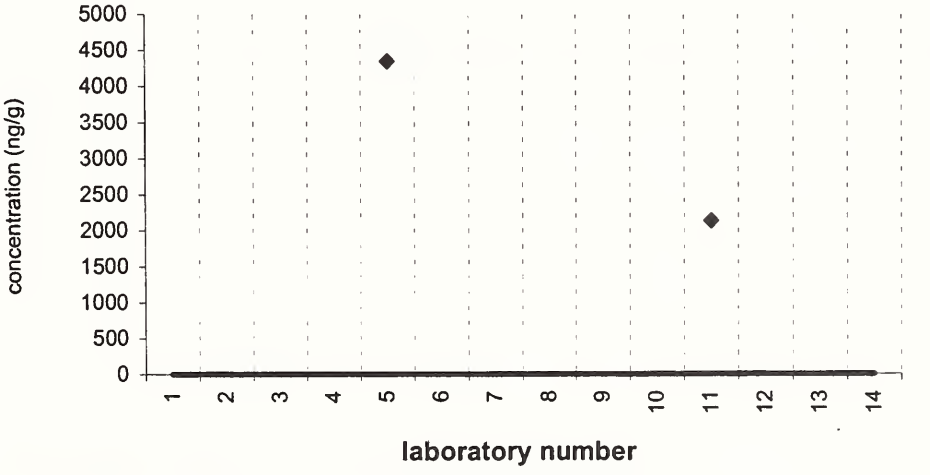
Reported Results: 2 Quantitative Results: 2



benz[a]anthracene-7, 12-dione **SRM 1649a**

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2



Appendix E

Charts of Air Particulate I (QA01APT01) and SRM 1649a Results by Analyte

See Tables 2 and 3 for results reported as *<number*, detection limit, etc.
Charts for analytes with only one reported numerical result are not included in this appendix.

For Air Particulate I plots:

Solid line: exercise assigned value

Dotted line: $z = \pm 1$, i. e., 25 % from assigned value

Dotted/dashed line: $z = \pm 2$, i. e., 50 % from assigned value

Dashed line: $z = \pm 3$, i. e., 75 % from assigned value

For SRM 1649a plots:

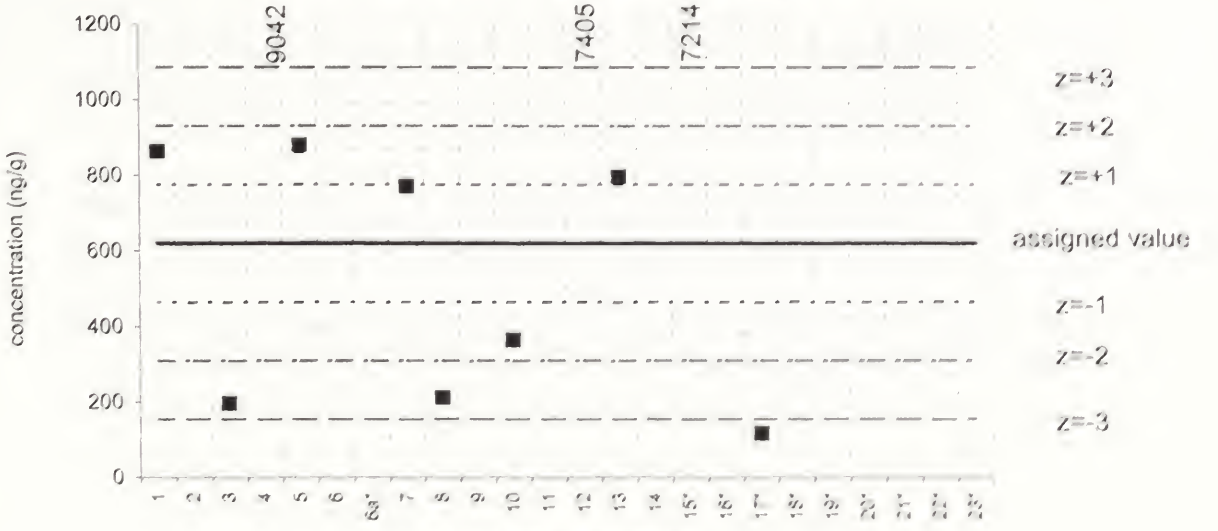
Solid line: material certified concentration or target value (see caption of each plot)

Dotted line: 95 % confidence interval (CI)

Dashed line: 30 % from 95 % confidence interval (CI)

naphthalene **Air Particulate I (QA01APT01)**

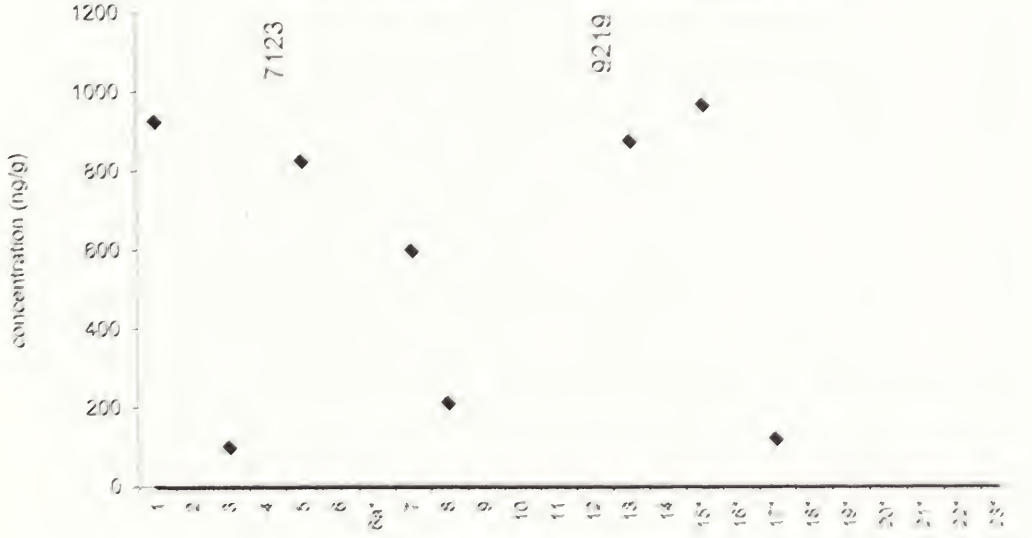
Assigned value = 622 ng/g s = 324 ng/g 95% CL = 340 ng/g
Reported Results: 13 Quantitative Results: 11



laboratory number
(*data received after initial discussion)

naphthalene **SRM 1649a**

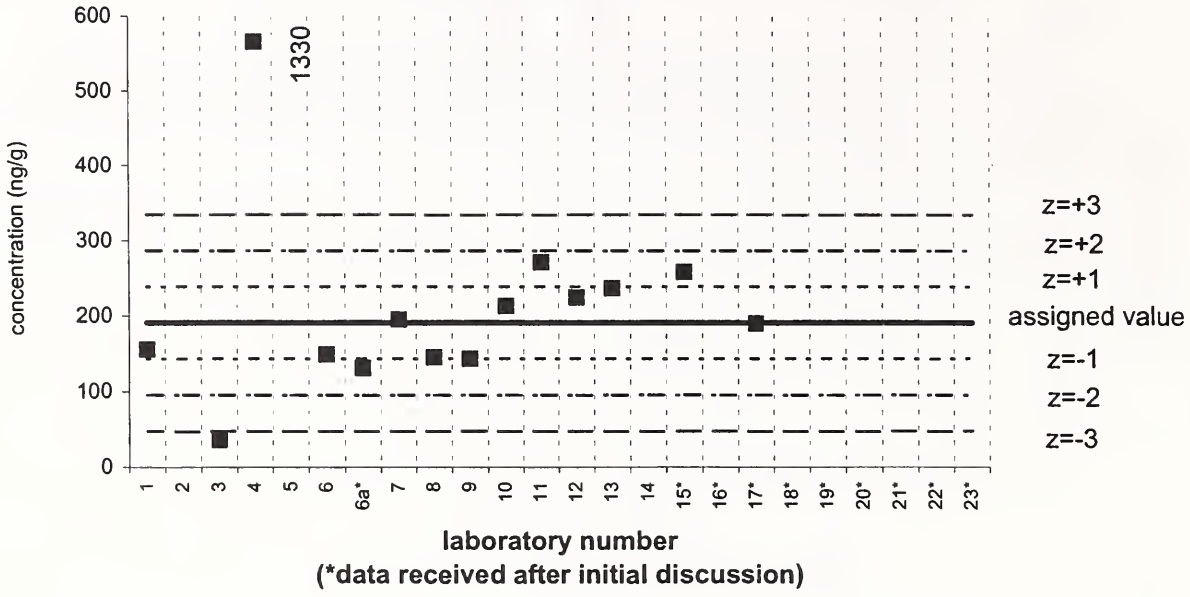
Target Value = no target ng/g
Reported Results: 12 Quantitative Results: 10



laboratory number
(*data received after initial discussion)

fluorene **Air Particulate I (QA01APT01)**

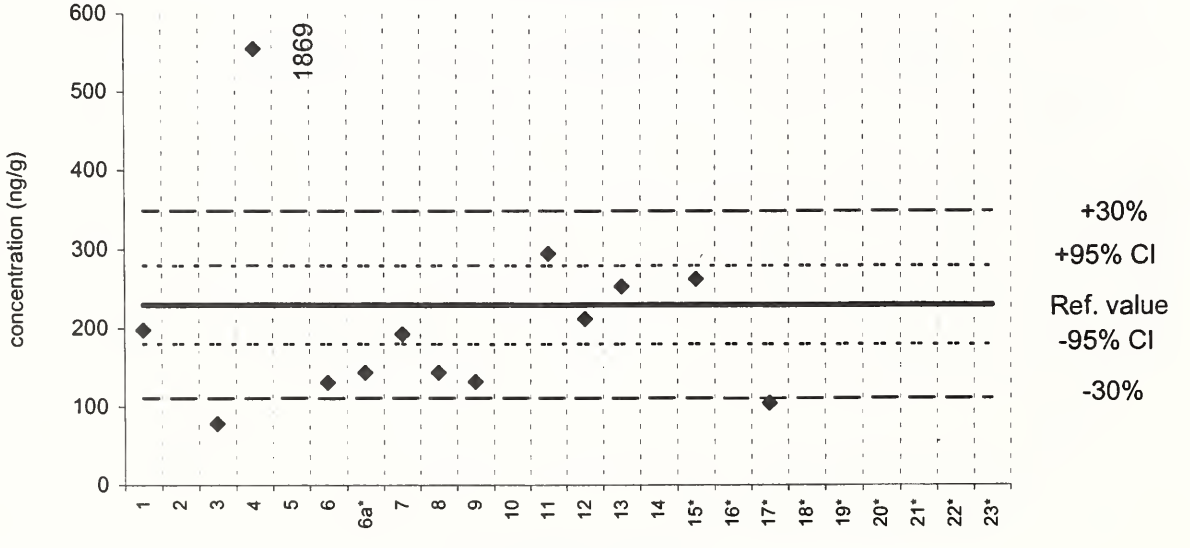
Assigned value = 191 ng/g s = 53 ng/g 95% CL = 38 ng/g
Reported Results: 16 Quantitative Results: 15



laboratory number
(*data received after initial discussion)

fluorene **SRM 1649a**

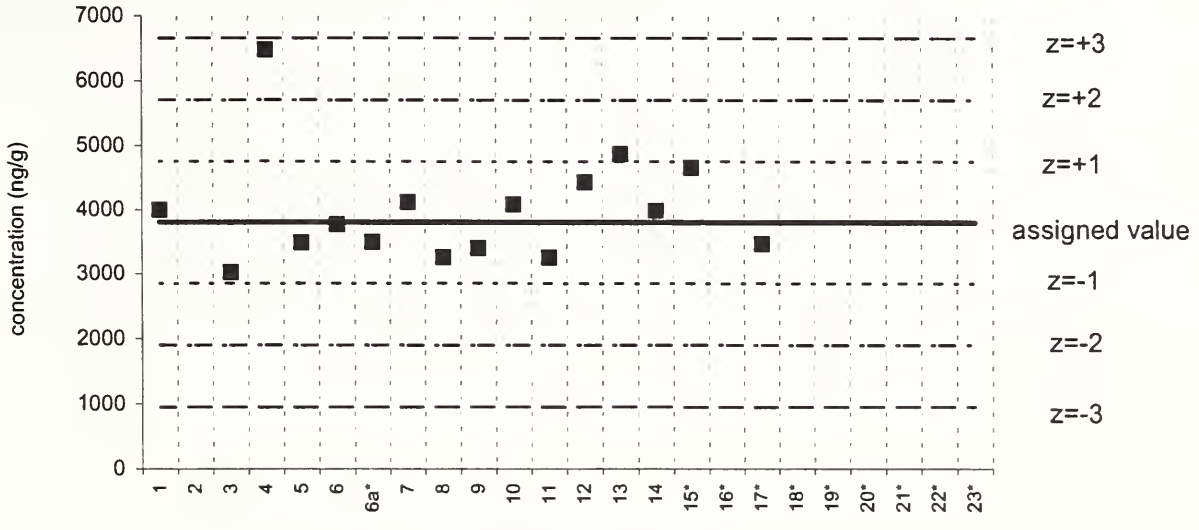
Reference Value = 230 ± 50 ng/g
Reported Results: 15 Quantitative Results: 14



laboratory number
(*data received after initial discussion)

phenanthrene **Air Particulate I (QA01APT01)**

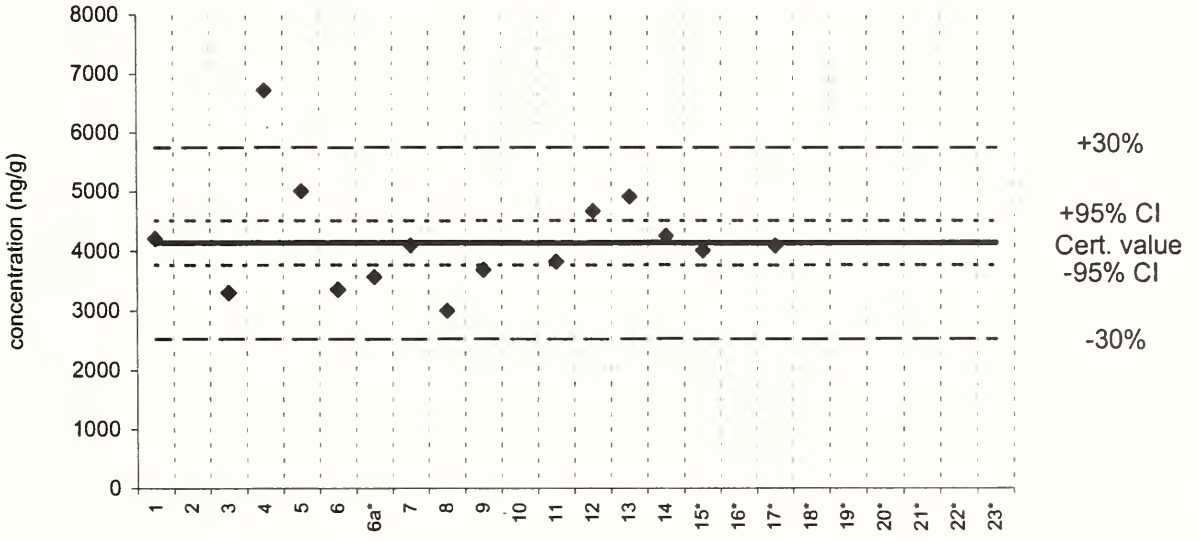
Assigned value = 3806 ng/g s = 563 ng/g 95% CL = 325 ng/g
Reported Results: 17 Quantitative Results: 16



laboratory number
(*data received after initial discussion)

phenanthrene **SRM 1649a**

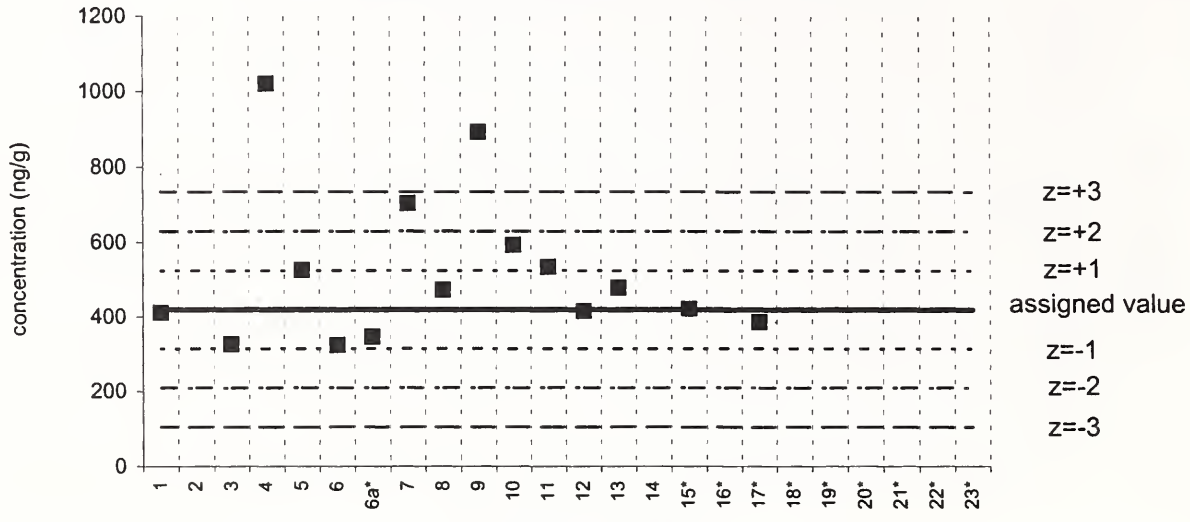
Certified Value = 4140 ± 370 ng/g
Reported Results: 16 Quantitative Results: 15



laboratory number
(*data received after initial discussion)

anthracene **Air Particulate I (QA01APT01)**

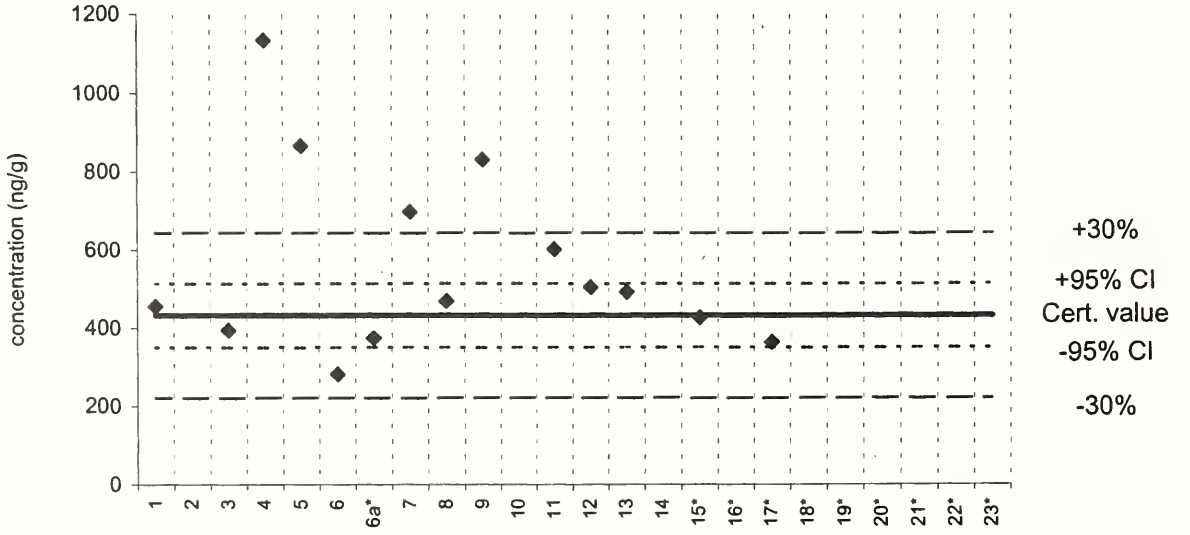
Assigned value = 420 ng/g s = 69 ng/g 95% CL = 50 ng/g
Reported Results: 16 Quantitative Results: 15



laboratory number
(*data received after initial discussion)

anthracene **SRM 1649a**

Certified Value = 432 ± 82 ng/g
Reported Results: 15 Quantitative Results: 14

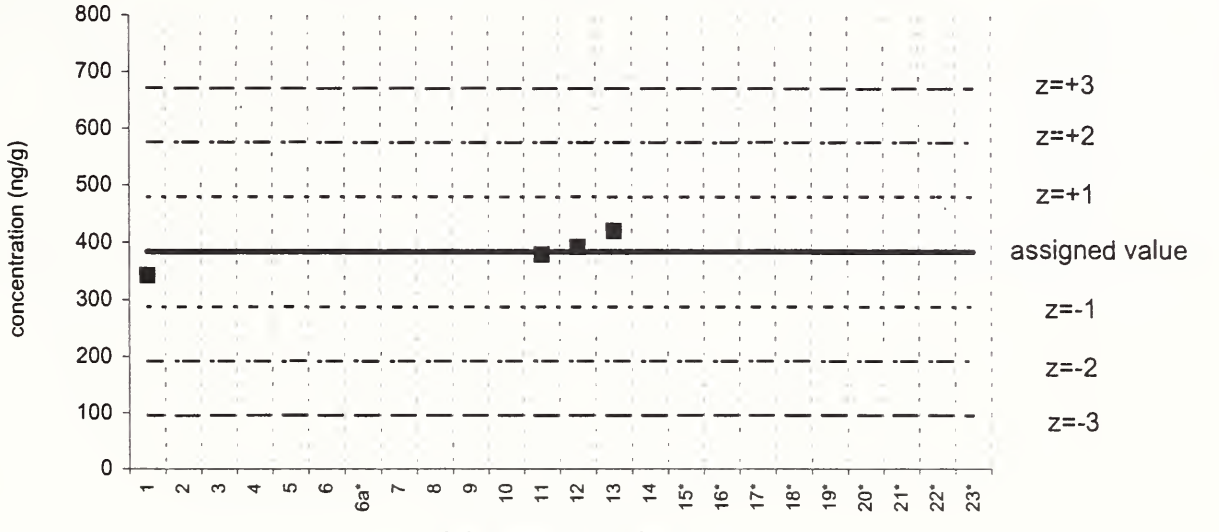


laboratory number
(*data received after initial discussion)

1-methylphenanthrene

Air Particulate I (QA01APT01)

Assigned value = 383 ng/g s = 32 ng/g 95% CL = 51 ng/g
Reported Results: 4 Quantitative Results: 4

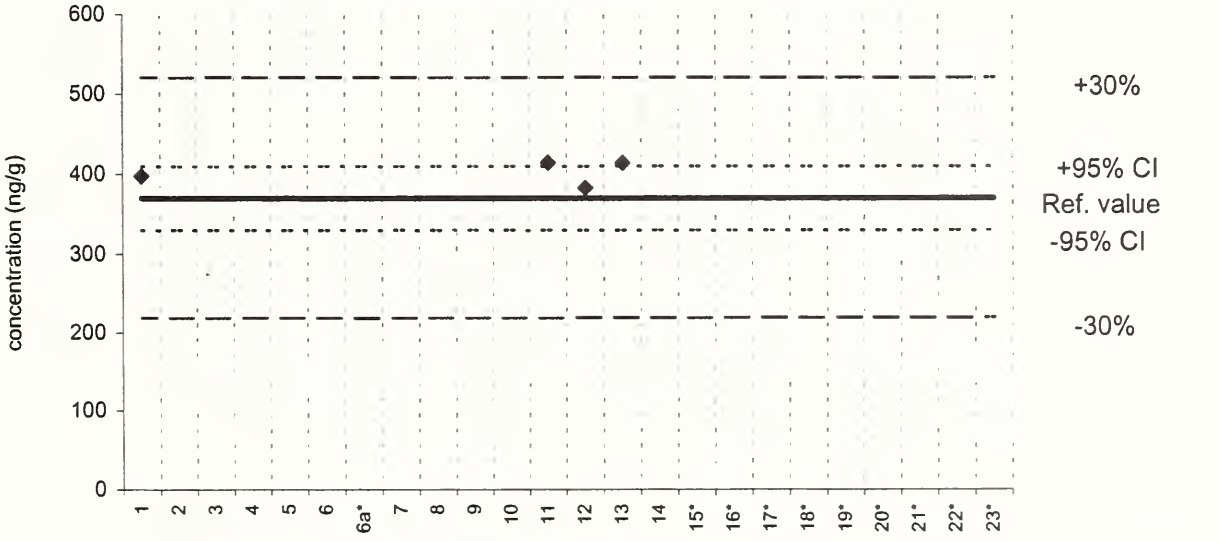


laboratory number
(*data received after initial discussion)

1-methylphenanthrene

SRM 1649a

Reference Value = 370 ± 40 ng/g
Reported Results: 4 Quantitative Results: 4

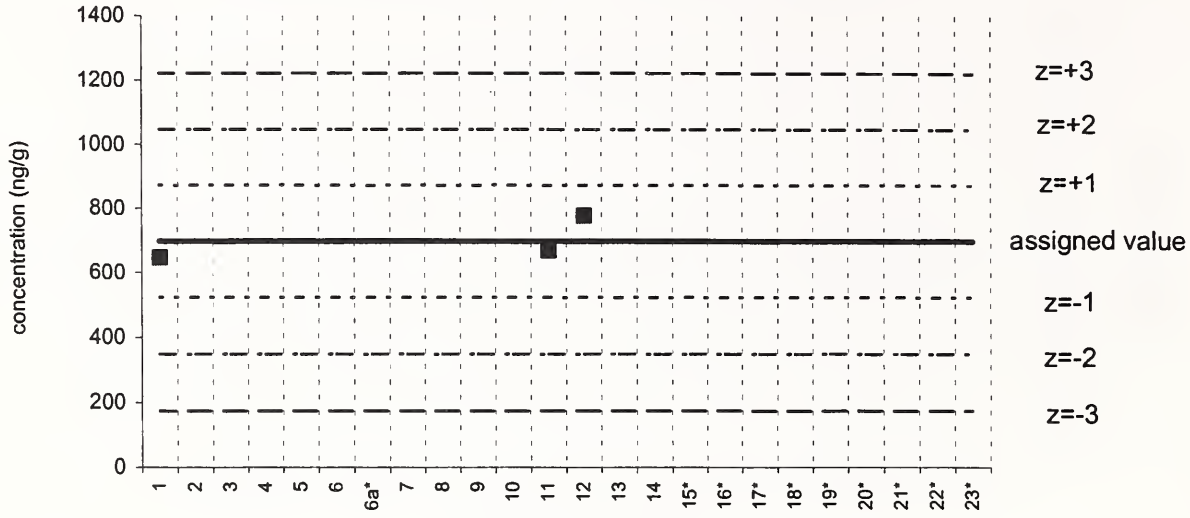


laboratory number
(*data received after initial discussion)

2-methylphenanthrene

Air Particulate I (QA01APT01)

Assigned value = 698 ng/g s = 70 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3

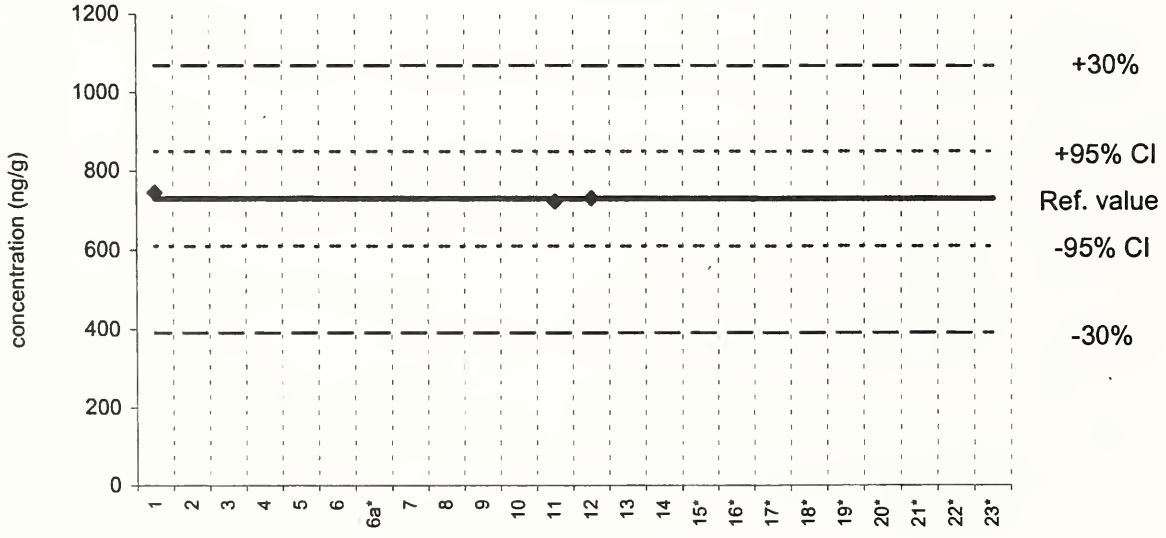


laboratory number
(*data received after initial discussion)

2-methylphenanthrene

SRM 1649a

Reference Value = 730 ± 120 ng/g
Reported Results: 3 Quantitative Results: 3

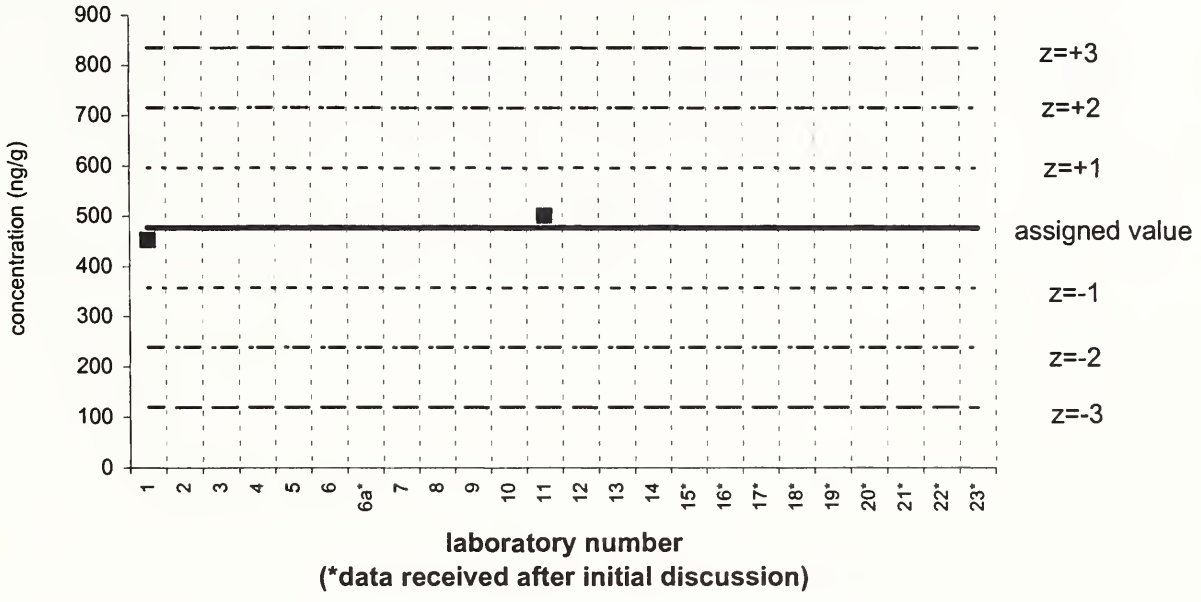


laboratory number
(*data received after initial discussion)

3-methylphenanthrene

Air Particulate I (QA01APT01)

Assigned value = 477 ng/g s = 34 ng/g 95% CL = not calc. ng/g
Reported Results: 2 Quantitative Results: 2

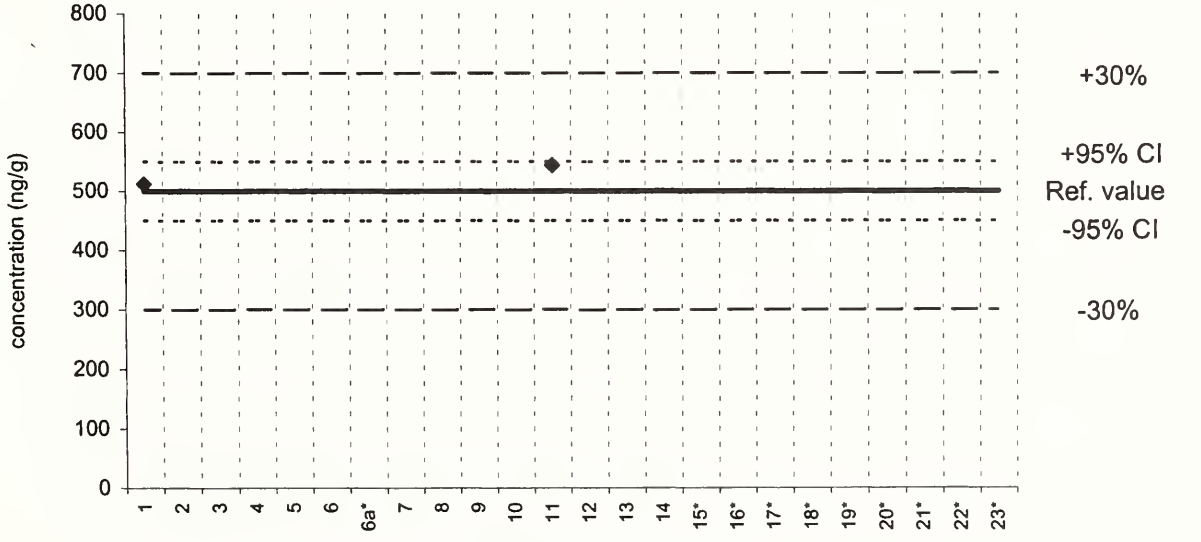


laboratory number
(*data received after initial discussion)

3-methylphenanthrene

SRM 1649a

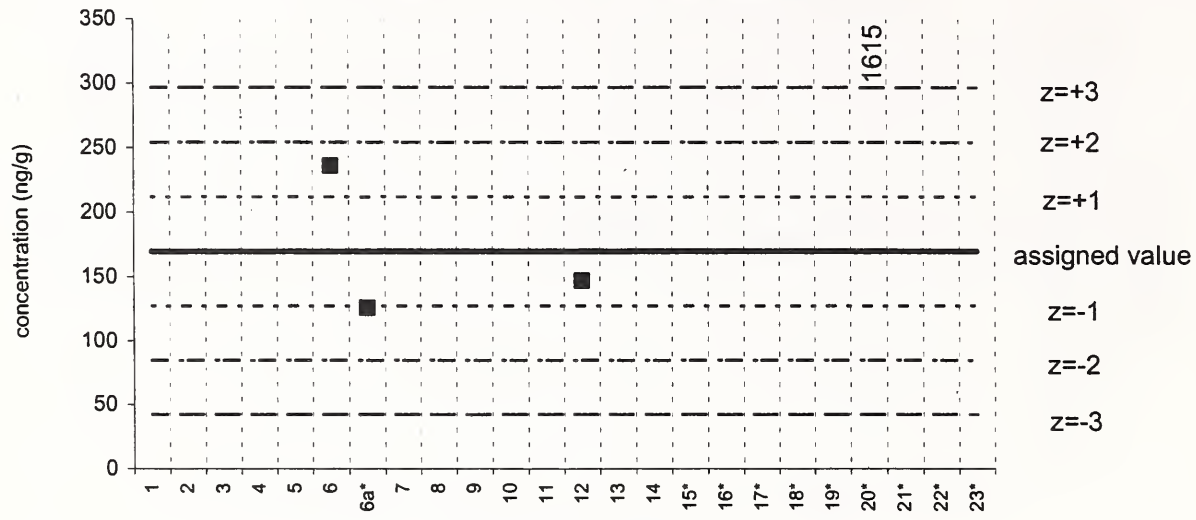
Reference Value = 500 ± 50 ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

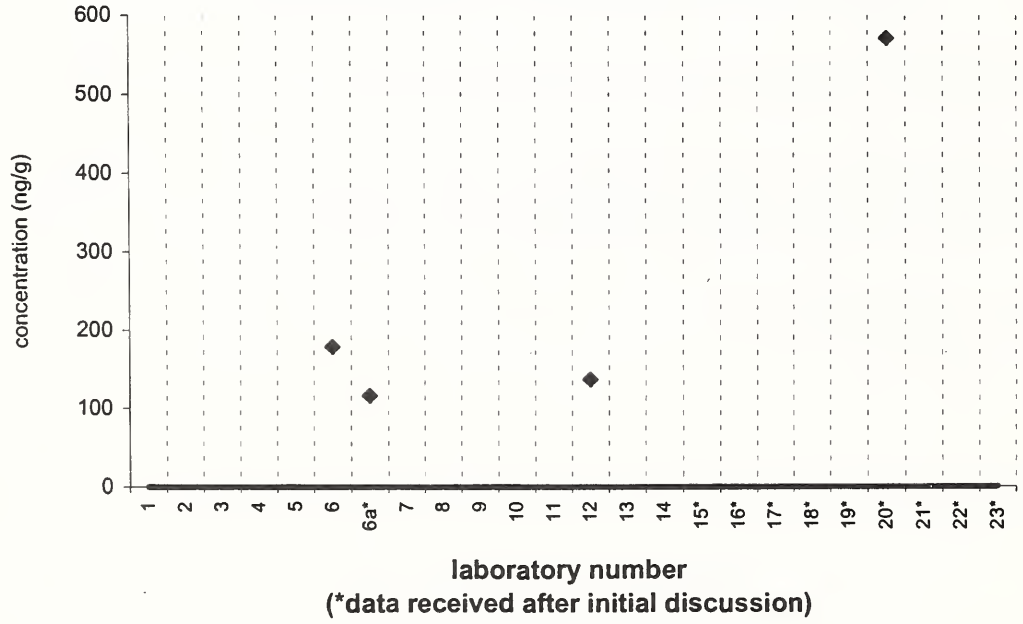
retene **Air Particulate I (QA01APT01)**

Assigned value = 169 ng/g s = 59 ng/g 95% CL = not calc. ng/g
Reported Results: 5 Quantitative Results: 3



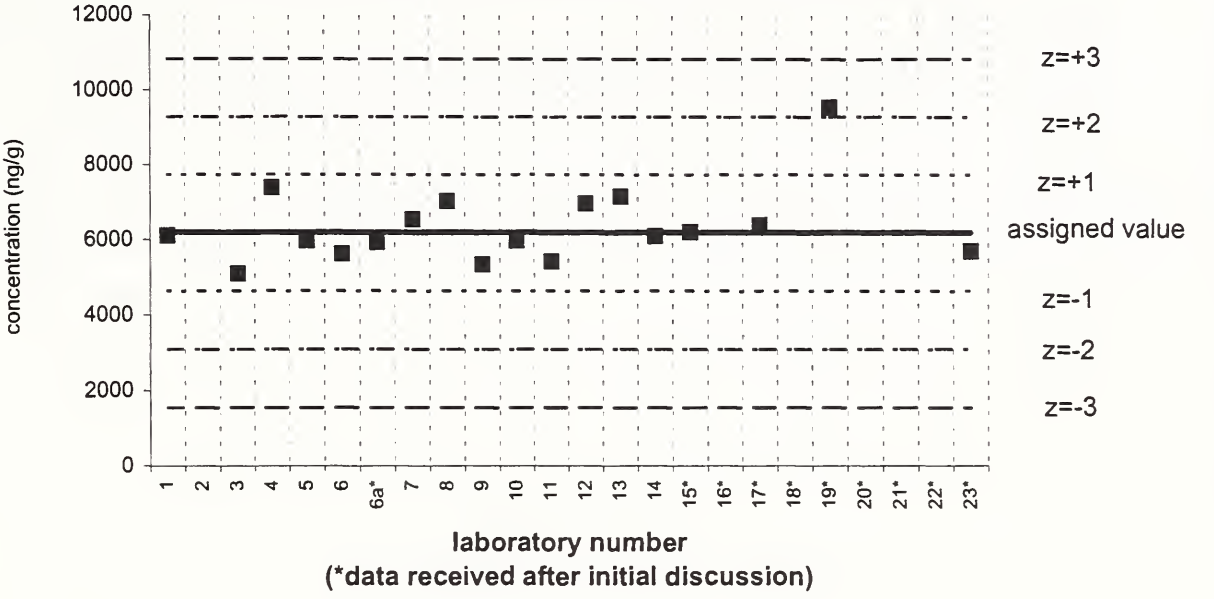
retene **SRM 1649a**

Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 4



fluoranthene **Air Particulate I (QA01APT01)**

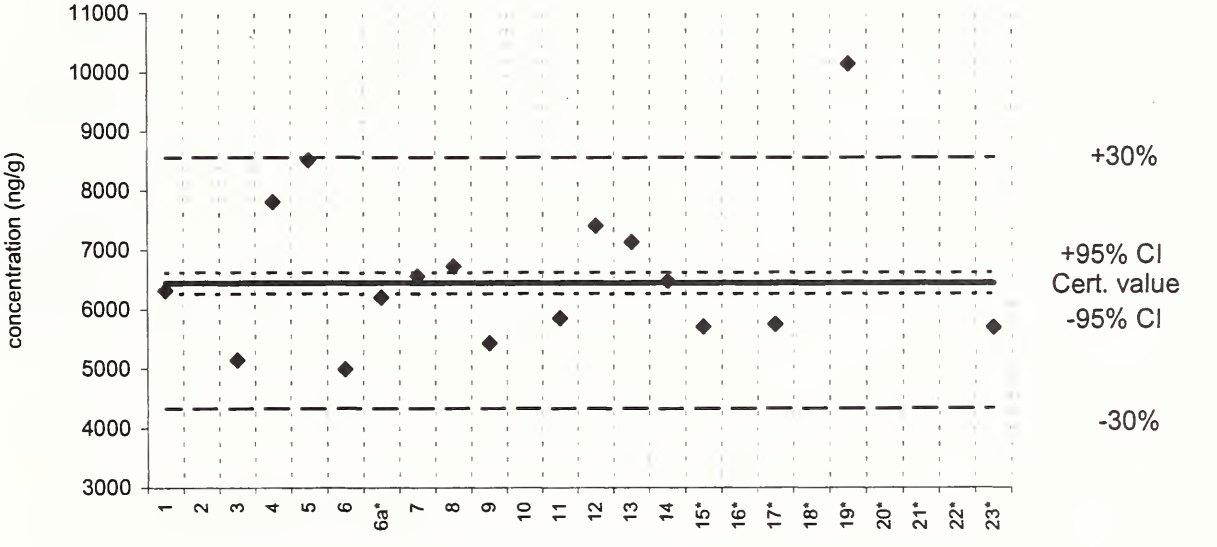
Assigned value = 6190 ng/g s = 681 ng/g 95% CL = 363 ng/g
Reported Results: 18 Quantitative Results: 18



laboratory number
(*data received after initial discussion)

fluoranthene **SRM 1649a**

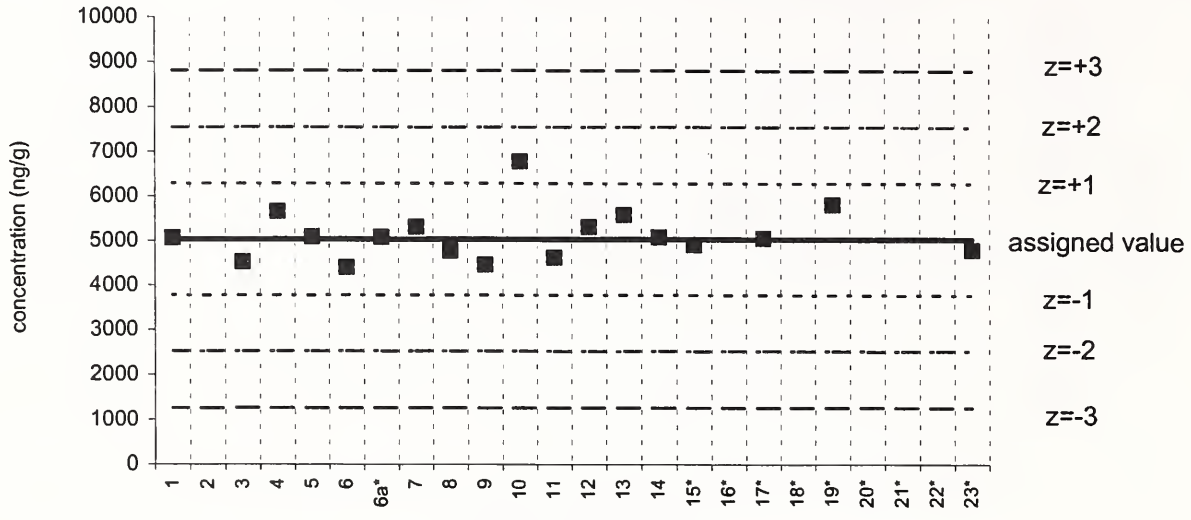
Certified Value = 6450 ± 180 ng/g
Reported Results: 17 Quantitative Results: 17



laboratory number
(*data received after initial discussion)

pyrene **Air Particulate I (QA01APT01)**

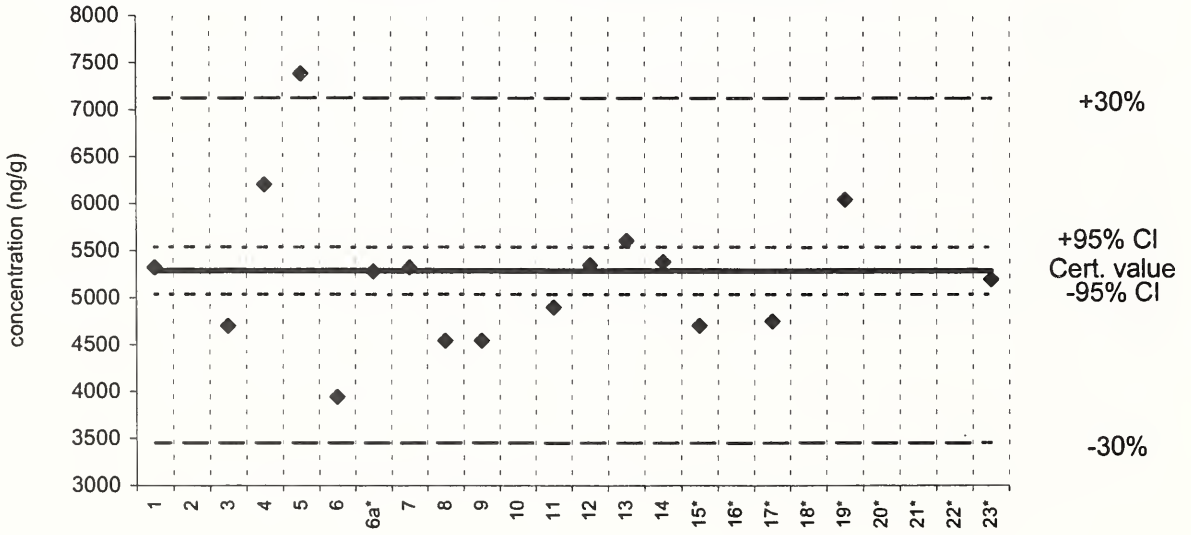
Assigned value = 5032 ng/g s = 415 ng/g 95% CL = 213 ng/g
Reported Results: 18 Quantitative Results: 18



laboratory number
(*data received after initial discussion)

pyrene **SRM 1649a**

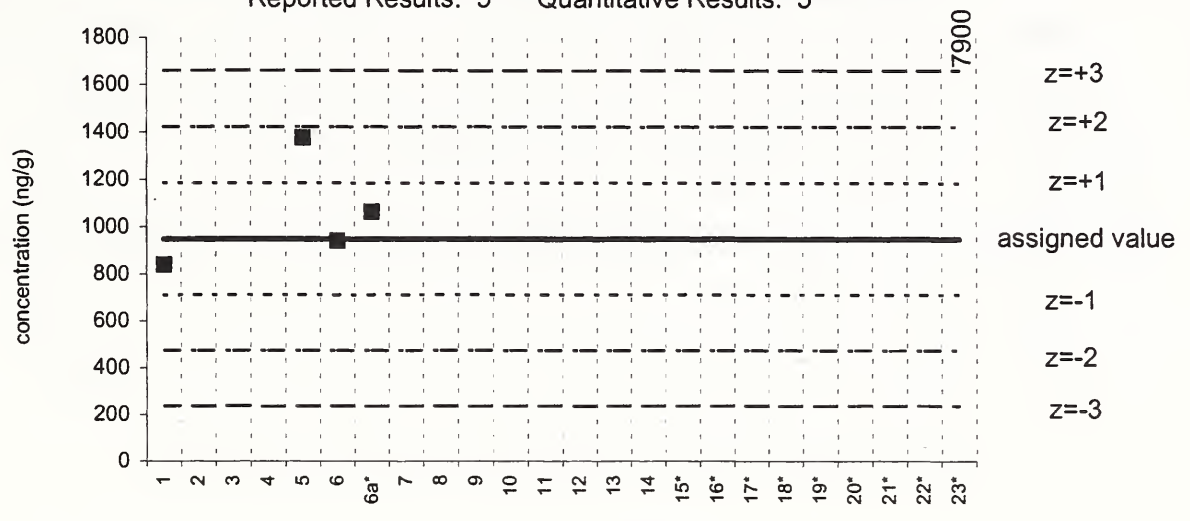
Certified Value = 5290 ± 250 ng/g
Reported Results: 17 Quantitative Results: 17



laboratory number
(*data received after initial discussion)

benzo[ghi]fluoranthene **Air Particulate I (QA01APT01)**

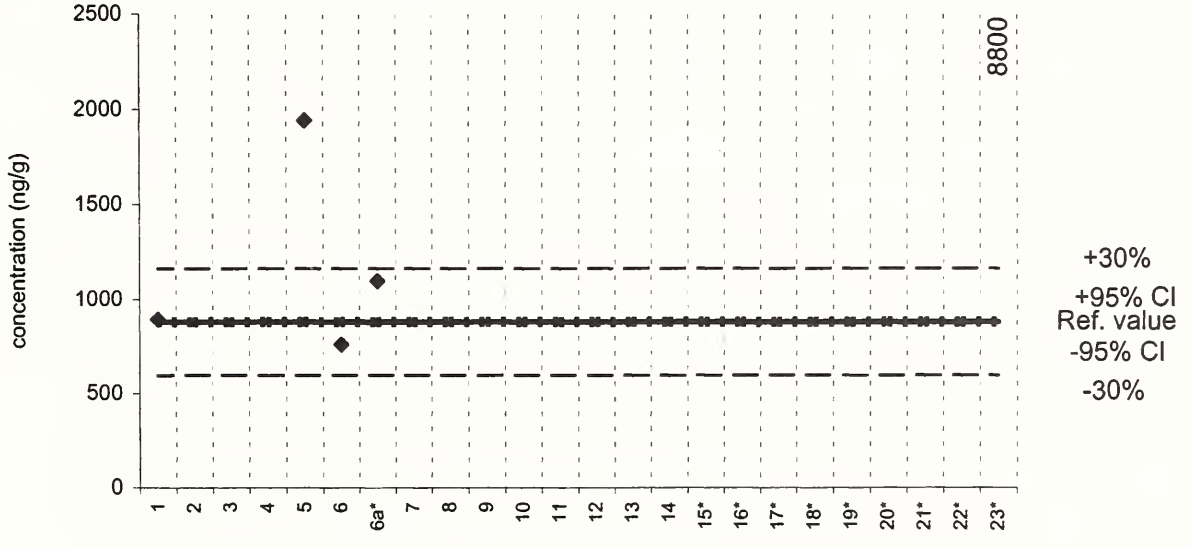
Assigned value = 949 ng/g s = 112 ng/g 95% CL = not calc. ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

benzo[ghi]fluoranthene **SRM 1649a**

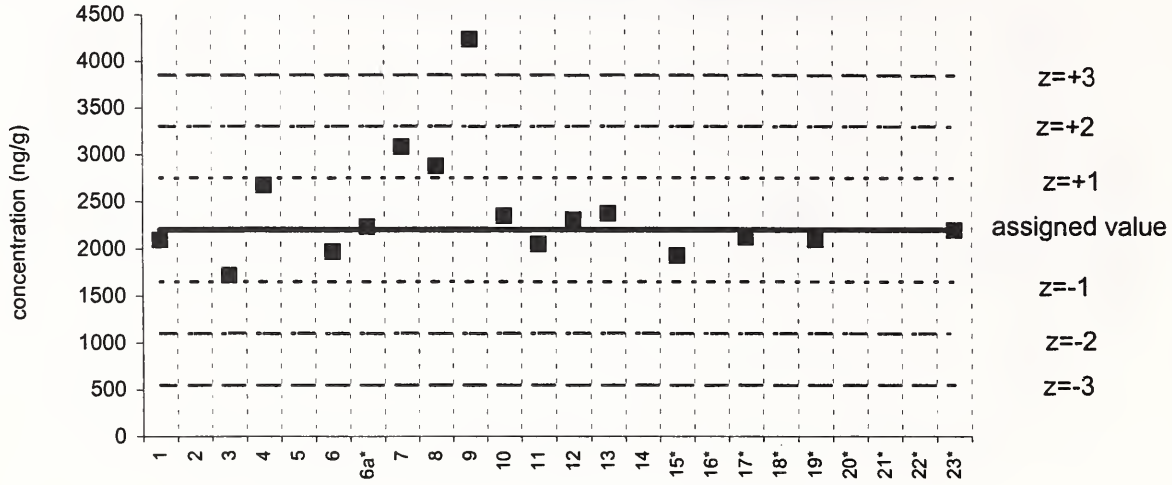
Reference Value = 880 ± 20 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

benz[a]anthracene **Air Particulate I (QA01APT01)**

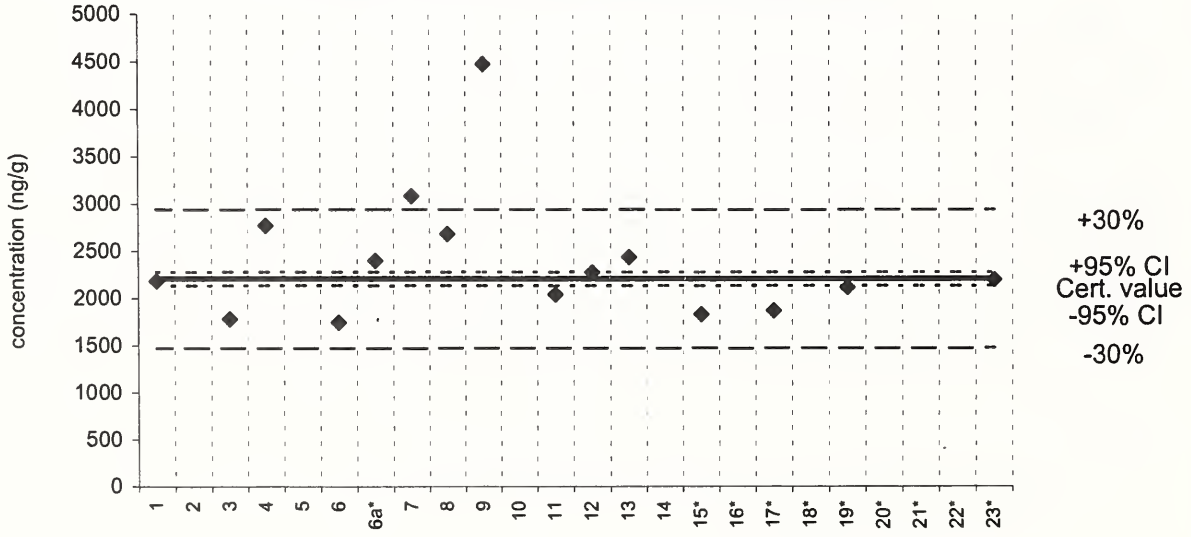
Assigned value = 2203 ng/g s = 321 ng/g 95% CL = 194 ng/g
Reported Results: 16 Quantitative Results: 16



laboratory number
(*data received after initial discussion)

benz[a]anthracene **SRM 1649a**

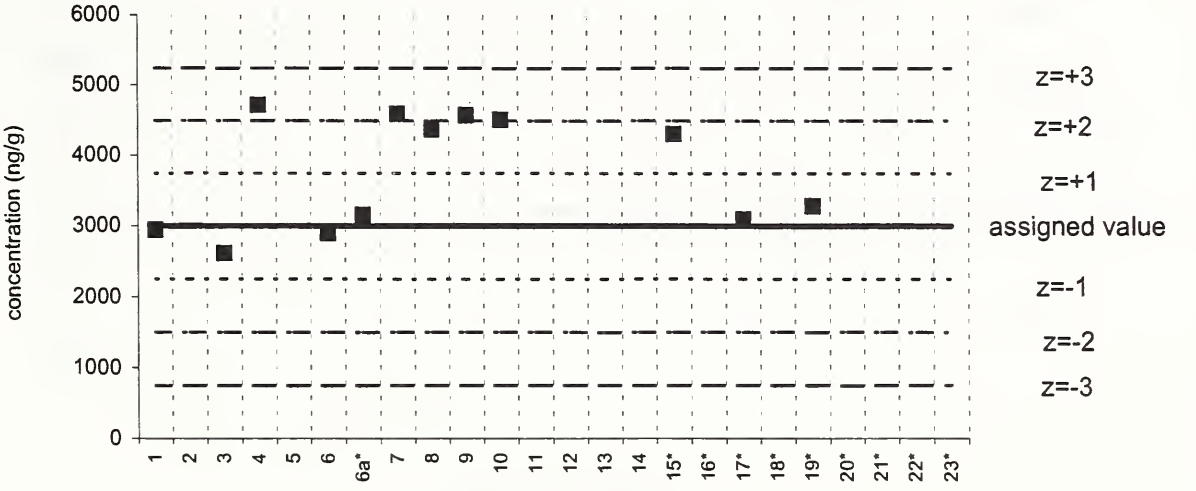
Certified Value = 2210 ± 73 ng/g
Reported Results: 15 Quantitative Results: 15



laboratory number
(*data received after initial discussion)

chrysene **Air Particulate I (QA01APT01)**

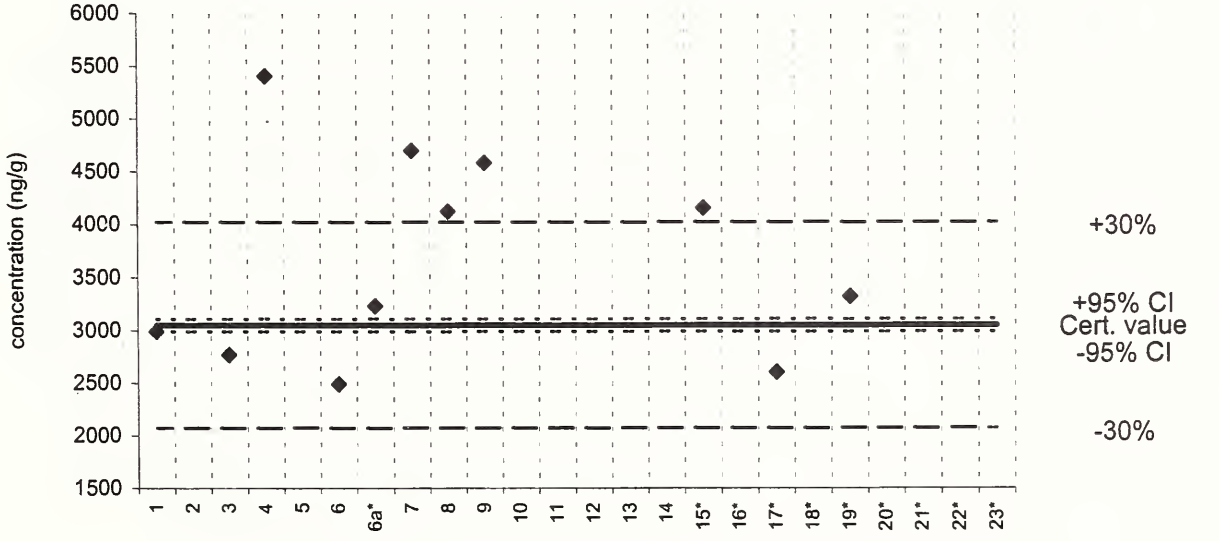
Assigned value = 2996 ng/g s = 236 ng/g 95% CL = 247 ng/g
Reported Results: 12 Quantitative Results: 12



laboratory number
(*data received after initial discussion)

chrysene **SRM 1649a**

Certified Value = 3049 ± 60 ng/g
Reported Results: 11 Quantitative Results: 11

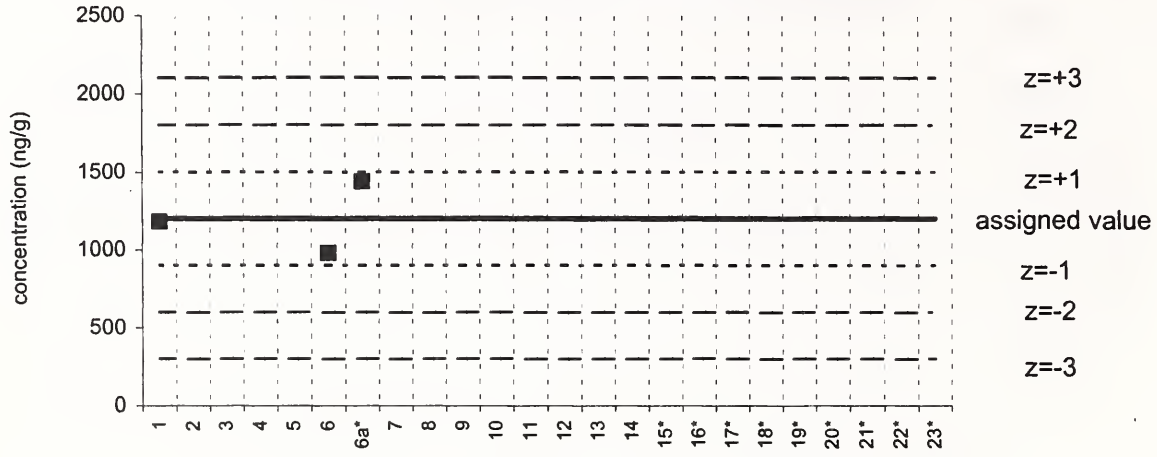


laboratory number
(*data received after initial discussion)

triphenylene **Air Particulate I (QA01APT01)**

Assigned value = 1202 ng/g s = 231 ng/g 95% CL = not calc. ng/g

Reported Results: 3 Quantitative Results: 3

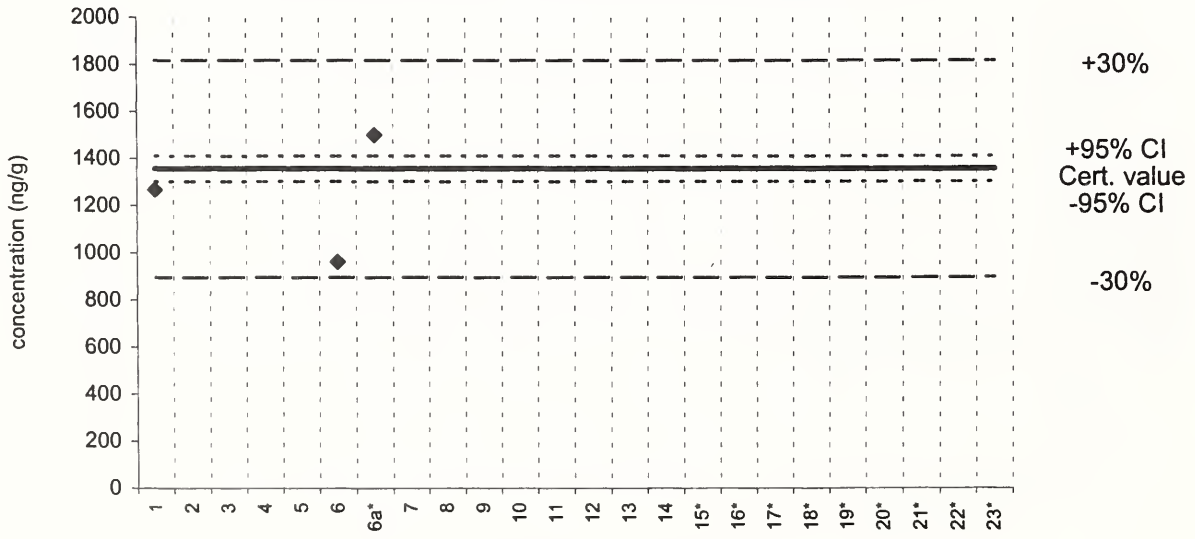


laboratory number
(*data received after initial discussion)

triphenylene **SRM 1649a**

Certified Value = 1357 ± 54 ng/g

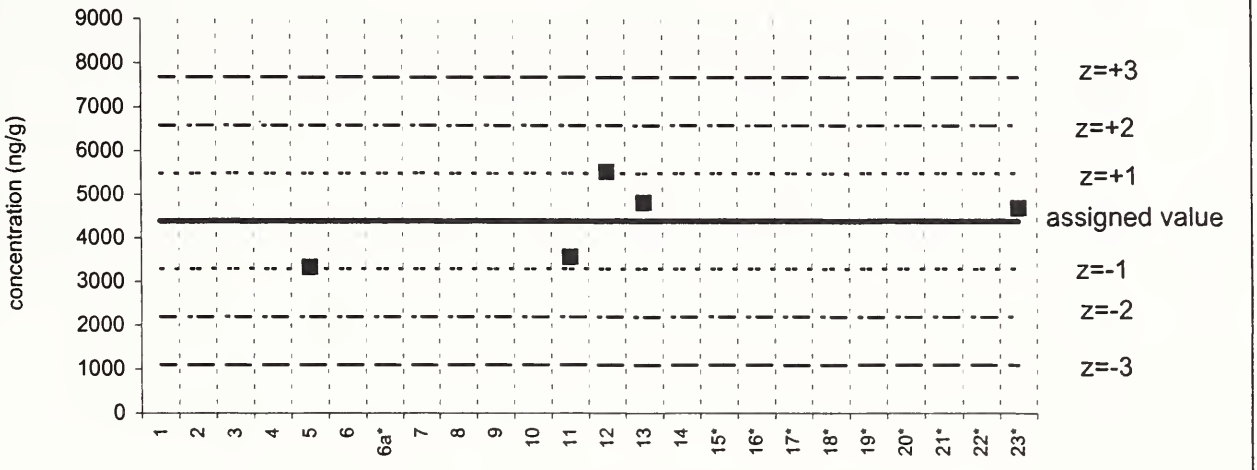
Reported Results: 3 Quantitative Results: 3



laboratory number
(*data received after initial discussion)

chrysene+triphenylene **Air Particulate I (QA01APT01)**

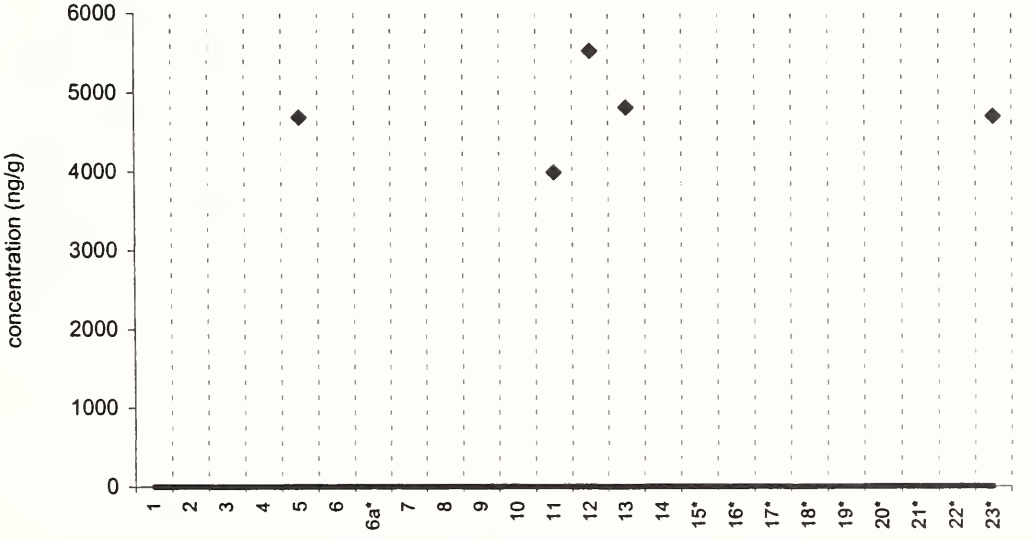
Assigned value = 4391 ng/g s = 915 ng/g 95% CL = 1137 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

chrysene+triphenylene **SRM 1649a**

Value = no target ng/g
Reported Results: 5 Quantitative Results: 5

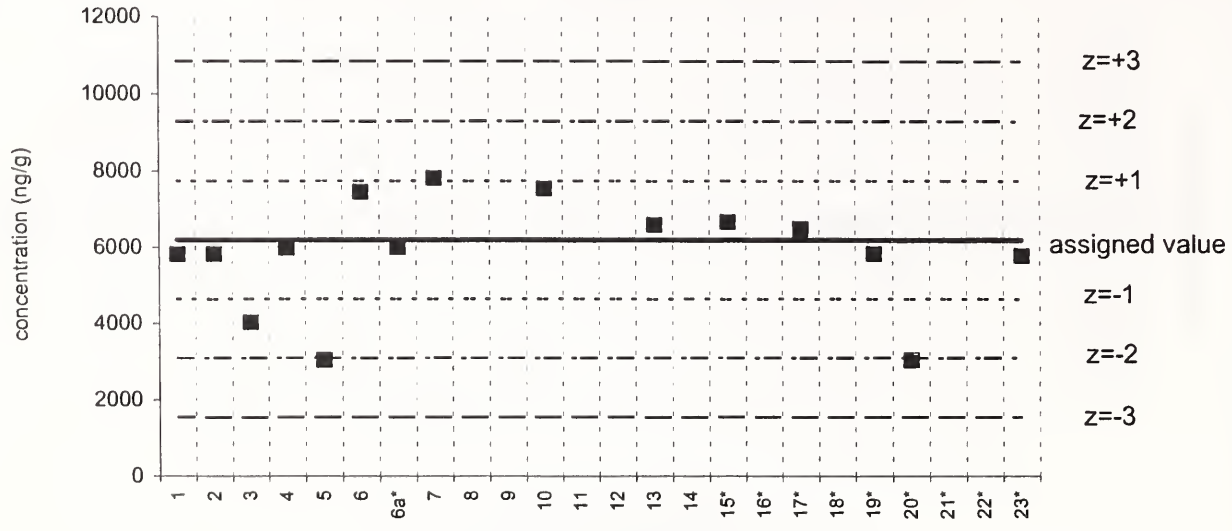


laboratory number
(*data received after initial discussion)

benzo[b]fluoranthene

Air Particulate I (QA01APT01)

Assigned value = 6199 ng/g s = 955 ng/g 95% CL = 607 ng/g
Reported Results: 15 Quantitative Results: 15

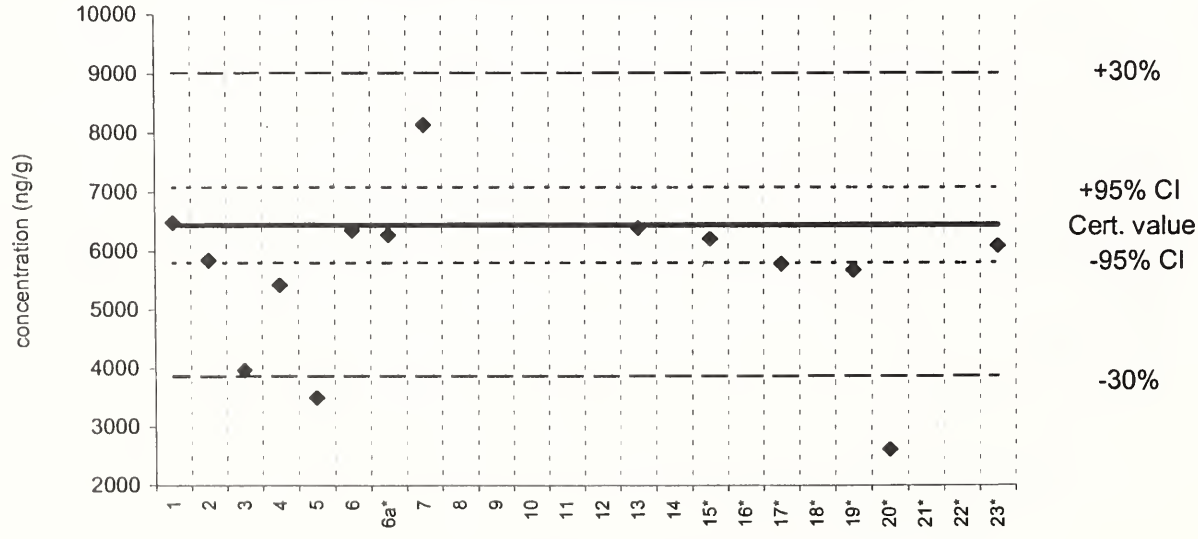


laboratory number
(*data received after initial discussion)

benzo[b]fluoranthene

SRM 1649a

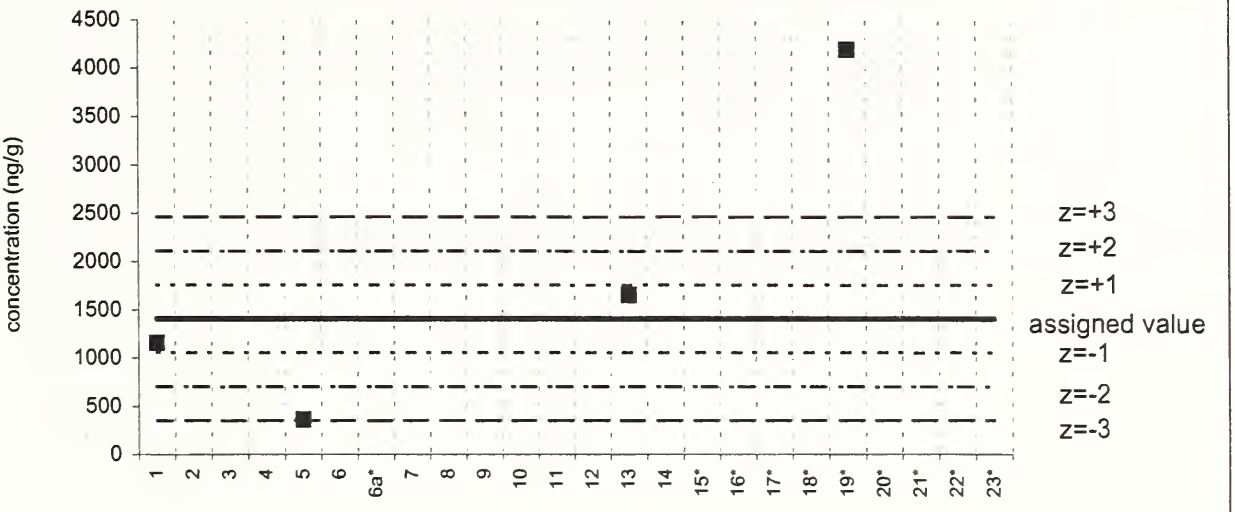
Certified Value = 6450 ± 640 ng/g
Reported Results: 14 Quantitative Results: 14



laboratory number
(*data received after initial discussion)

benzo[j]fluoranthene **Air Particulate I (QA01APT01)**

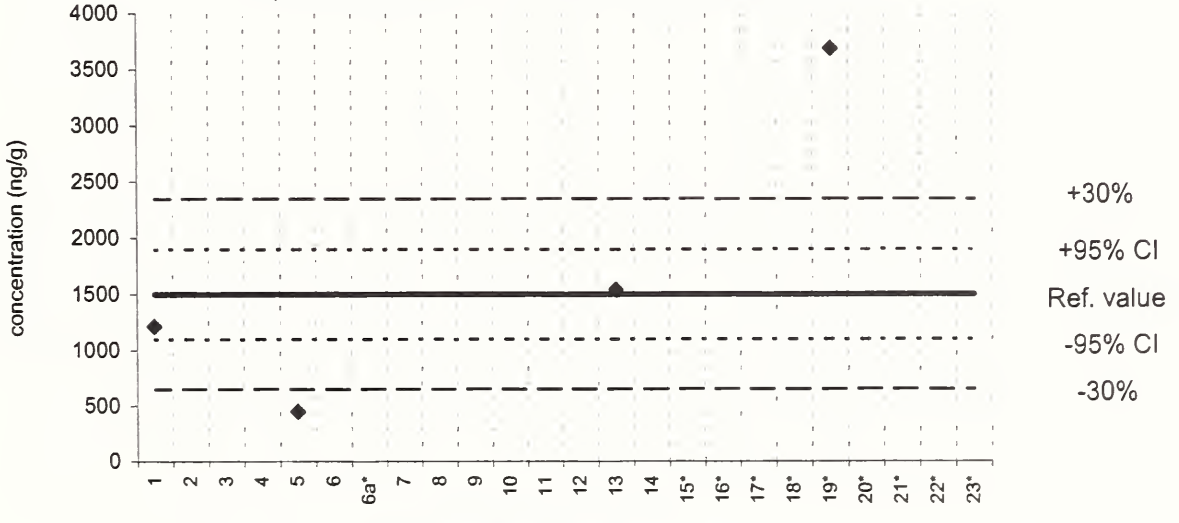
Assigned value = 1408 ng/g s = not calc. ng/g 95% CL = not calc. ng/g
Reported Results: 5 Quantitative Results: 4



laboratory number
(*data received after initial discussion)

benzo[j]fluoranthene **SRM 1649a**

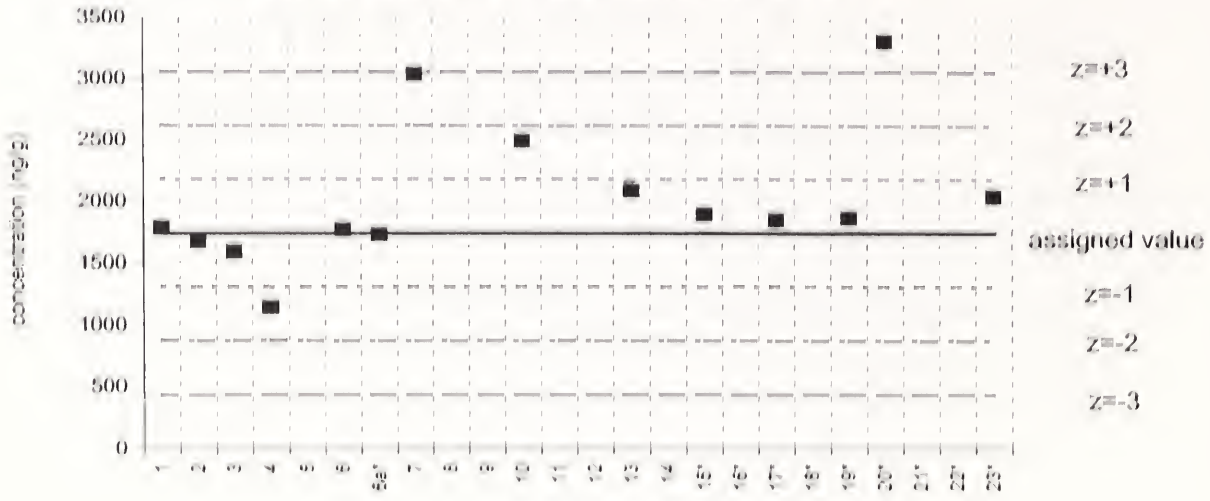
Reference Value = 1500 ± 400 ng/g
Reported Results: 5 Quantitative Results: 4



laboratory number
(*data received after initial discussion)

benzo[k]fluoranthene **Air Particulate I (QA01APT01)**

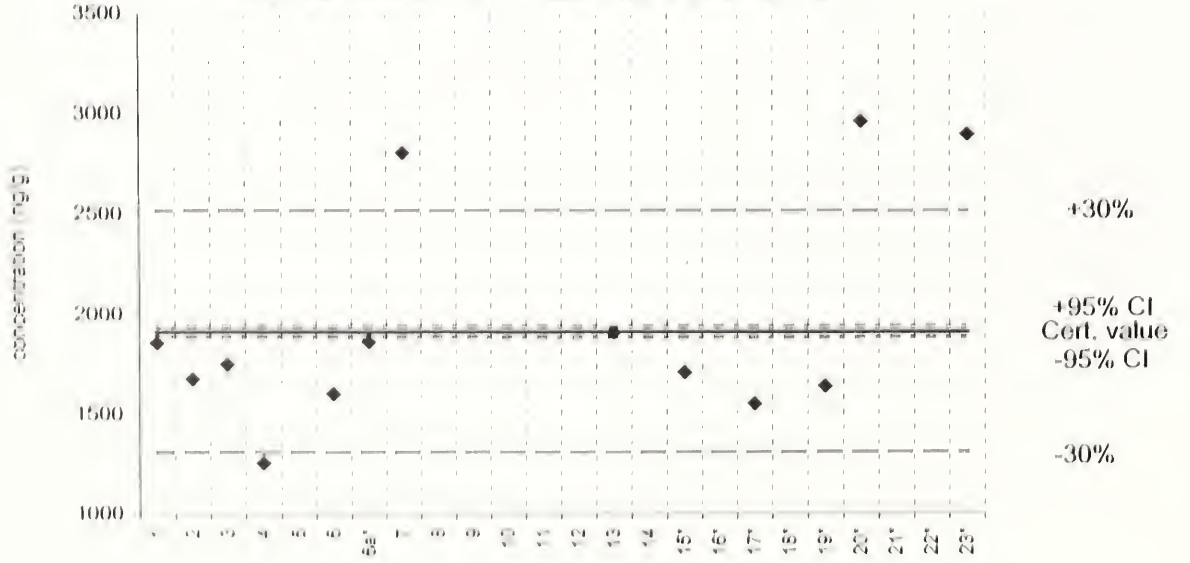
Assigned value = 1746 ng/g s = 282 ng/g 95% CL = 202 ng/g
Reported Results: 14 Quantitative Results: 14



laboratory number
(*data received after initial discussion)

benzo[k]fluoranthene **SRM 1649a**

Certified Value = 1913 ± 31 ng/g
Reported Results: 13 Quantitative Results: 13

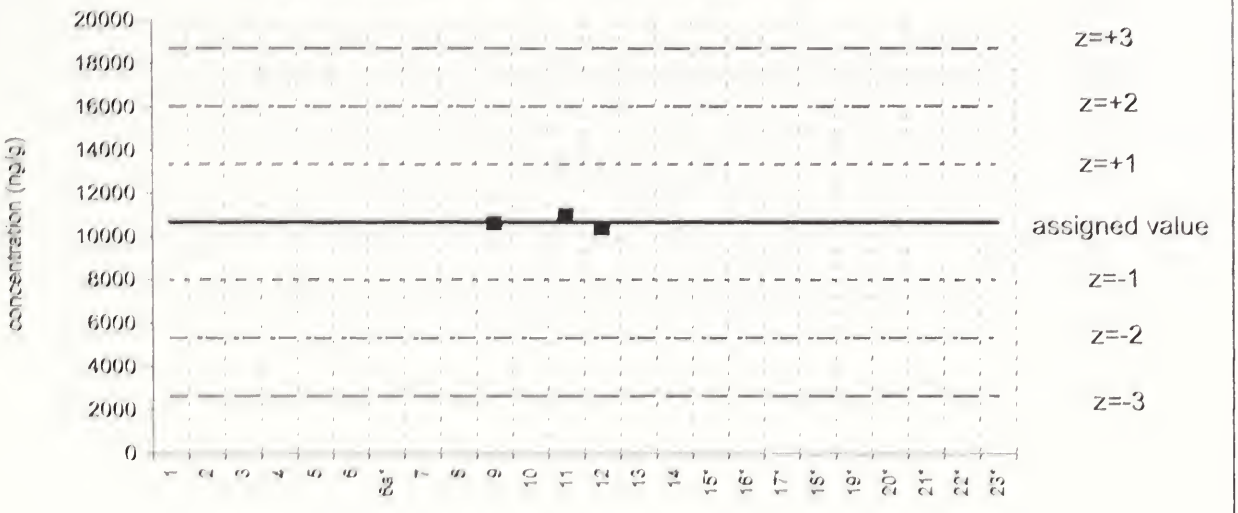


laboratory number
(*data received after initial discussion)

benzo[b+j+k]fluoranthene **Air Particulate I (QA01APT01)**

Assigned value = 10720 ng/g s = 305 ng/g 95% CL = not calc. ng/g

Reported Results: 3 Quantitative Results: 3

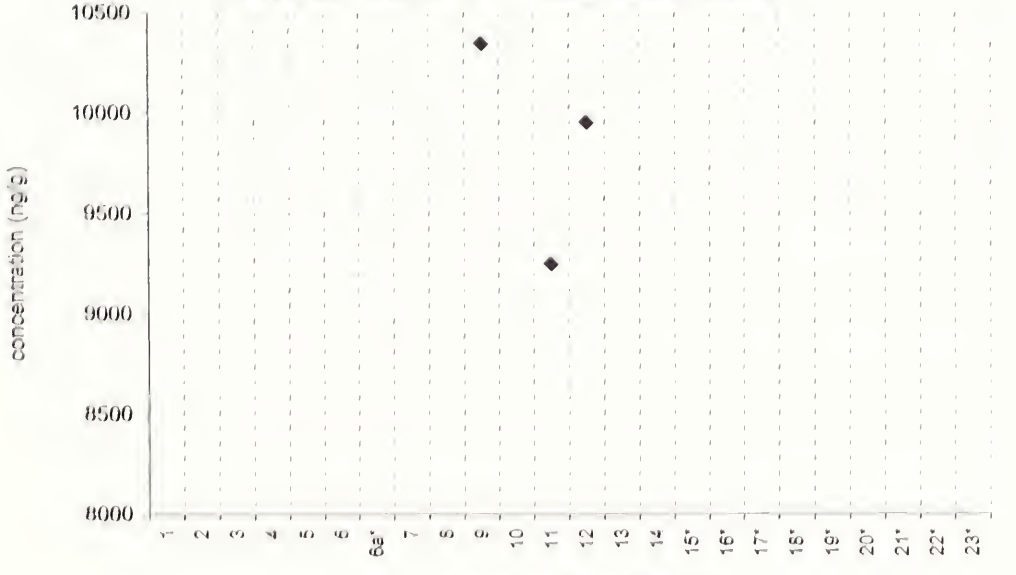


laboratory number
(*data received after initial discussion)

benzo[b+j+k]fluoranthene **SRM 1649a**

Value = no target ng/g

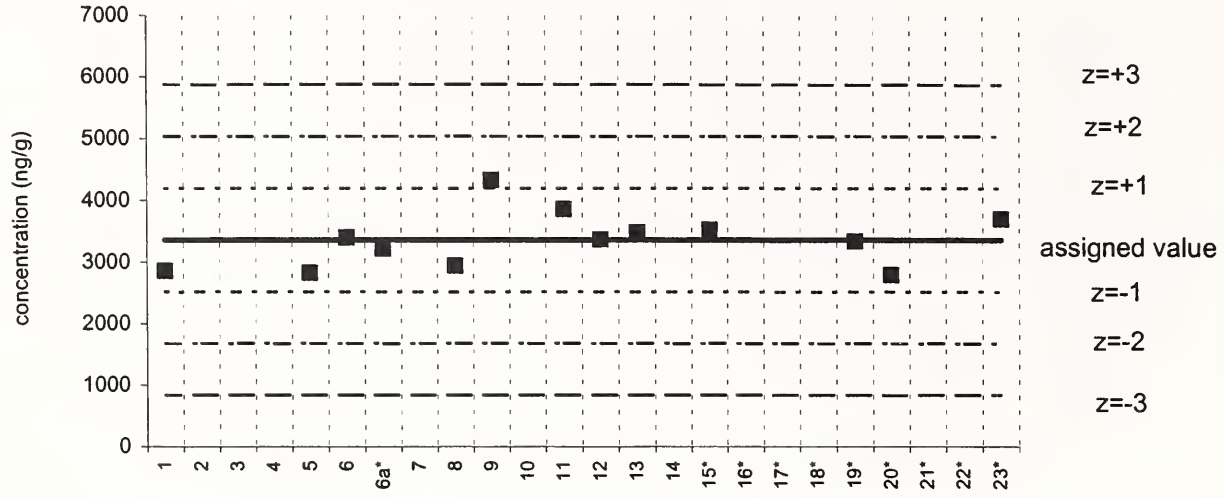
Reported Results: 3 Quantitative Results: 3



laboratory number
(*data received after initial discussion)

benzo[e]pyrene **Air Particulate I (QA01APT01)**

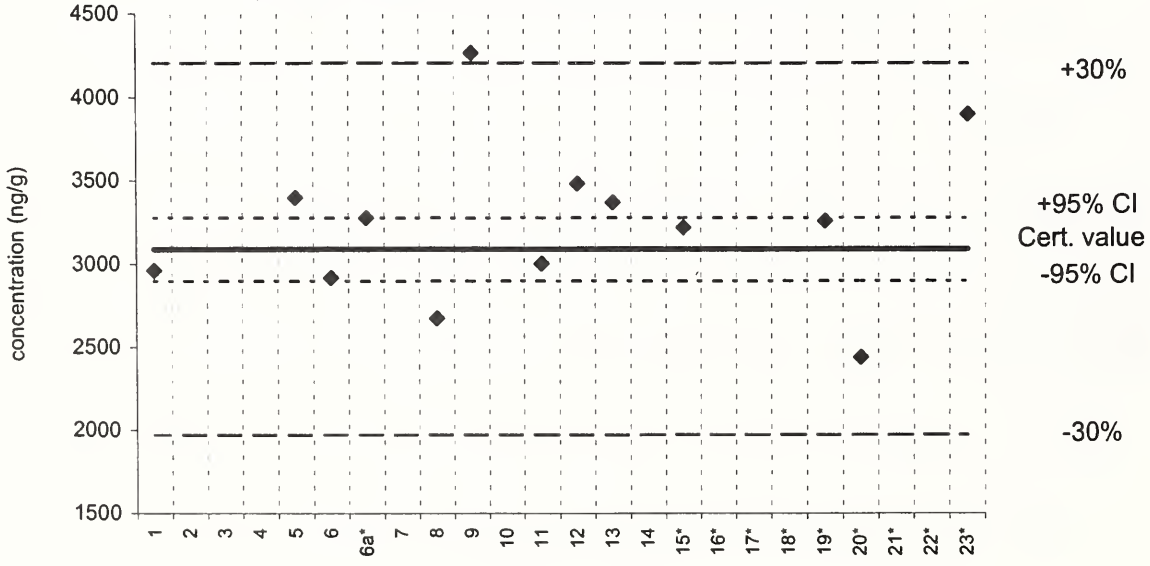
Assigned value = 3358 ng/g s = 447 ng/g 95% CL = 270 ng/g
Reported Results: 13 Quantitative Results: 13



laboratory number
(*data received after initial discussion)

benzo[e]pyrene **SRM 1649a**

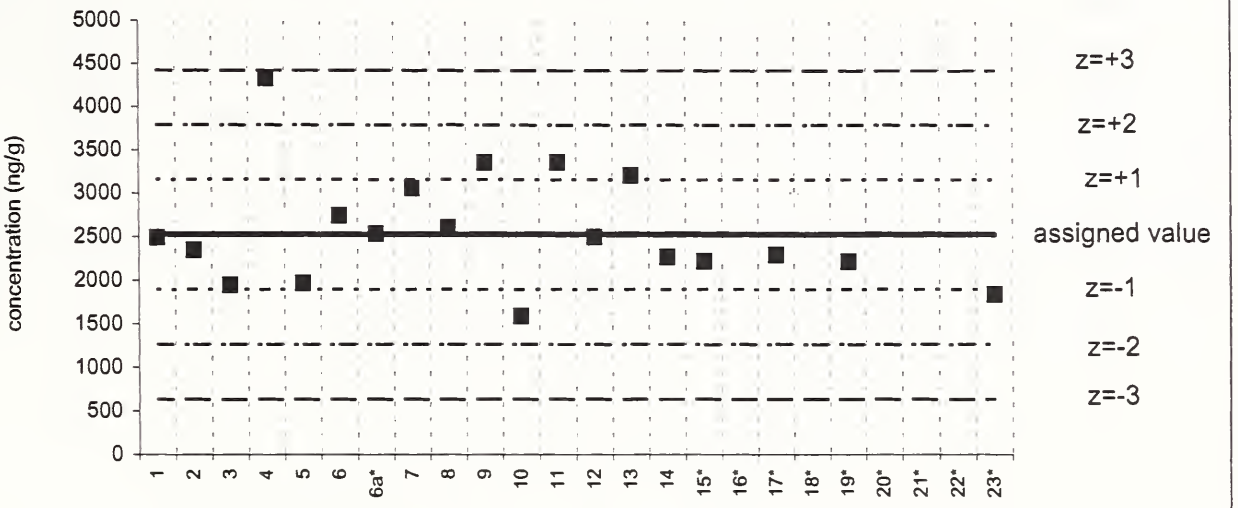
Certified Value = 3090 ± 190 ng/g
Reported Results: 13 Quantitative Results: 13



laboratory number
(*data received after initial discussion)

benzo[a]pyrene **Air Particulate I (QA01APT01)**

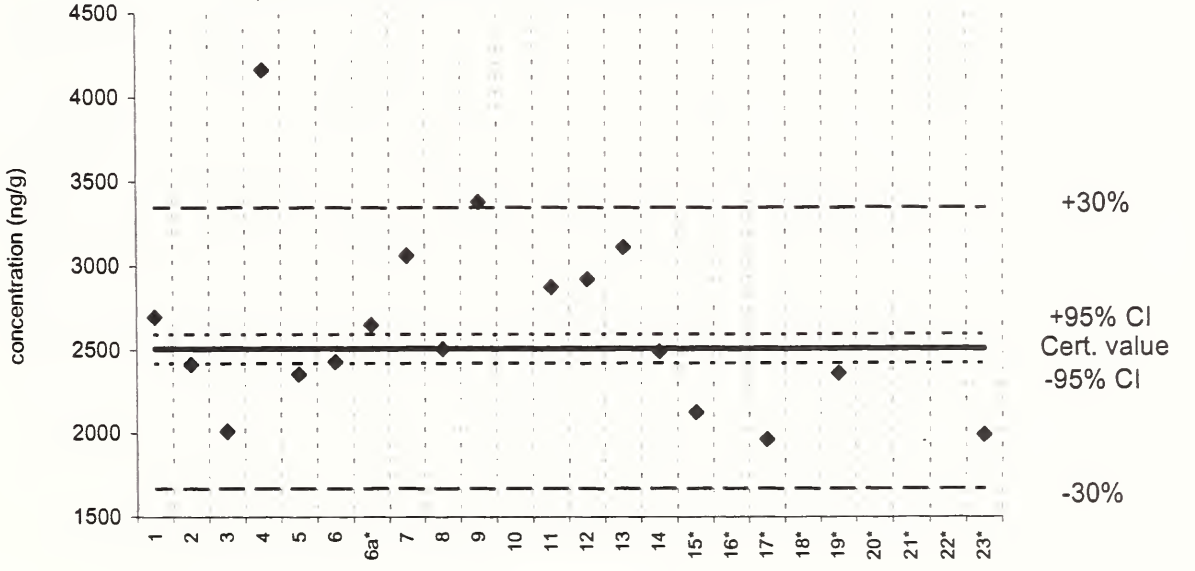
Assigned value = 2528 ng/g s = 478 ng/g 95% CL = 246 ng/g
Reported Results: 19 Quantitative Results: 19



laboratory number
(*data received after initial discussion)

benzo[a]pyrene **SRM 1649a**

Certified Value = 2509 ± 87 ng/g
Reported Results: 18 Quantitative Results: 18

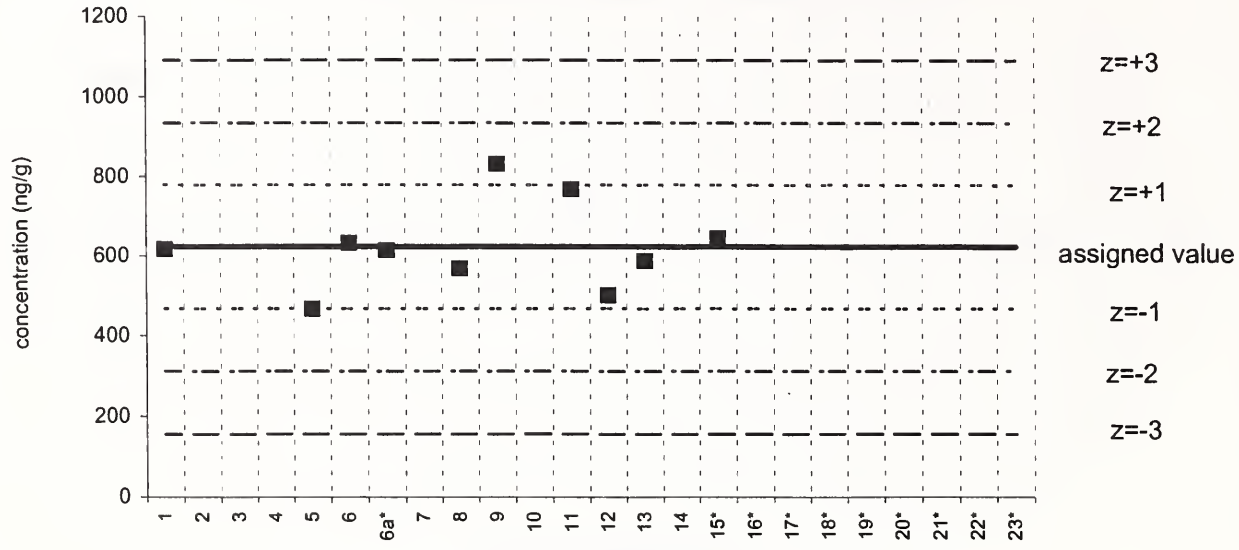


laboratory number
(*data received after initial discussion)

perylene

Air Particulate I (QA01APT01)

Assigned value = 624 ng/g s = 110 ng/g 95% CL = 79 ng/g
Reported Results: 11 Quantitative Results: 10

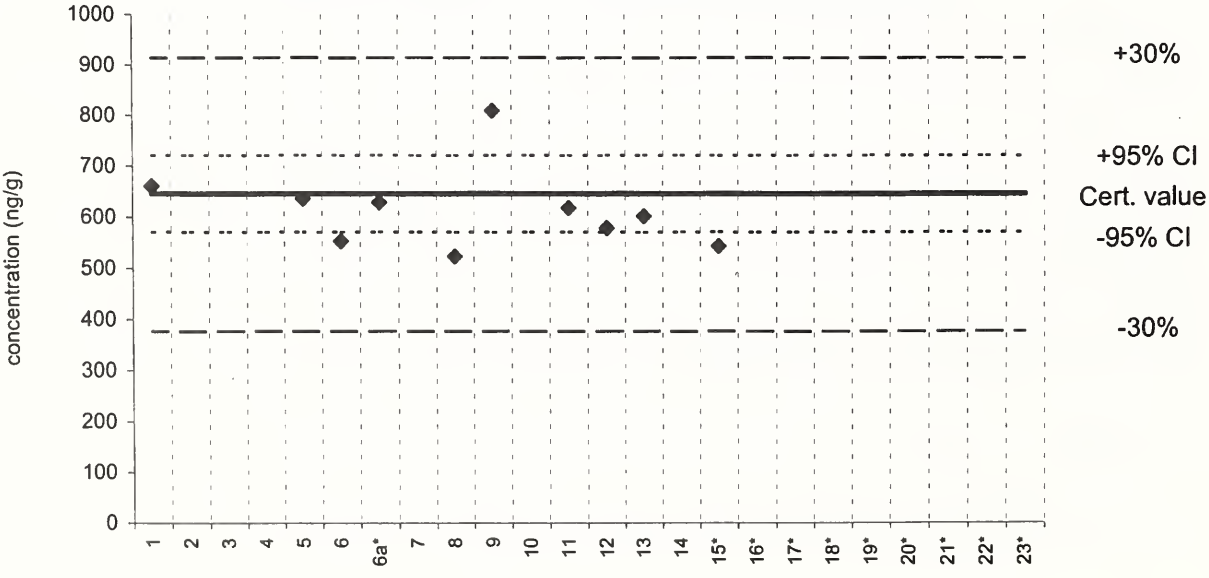


laboratory number
(*data received after initial discussion)

perylene

SRM 1649a

Certified Value = 646 ± 75 ng/g
Reported Results: 11 Quantitative Results: 10

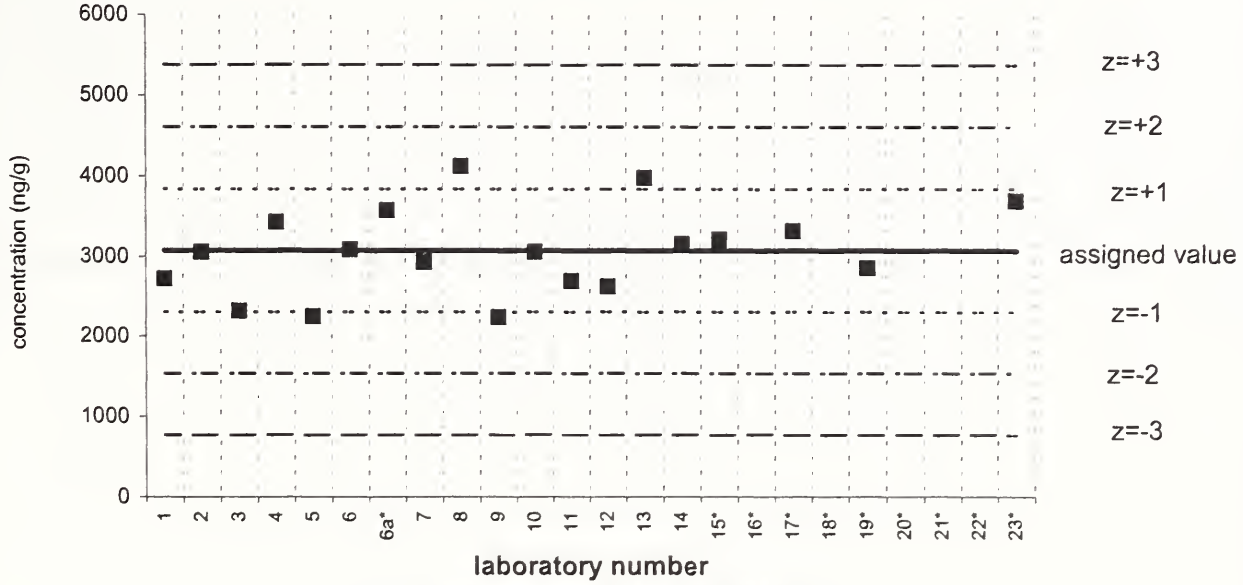


laboratory number
(*data received after initial discussion)

indeno[1,2,3-cd]pyrene

Air Particulate I (QA01APT01)

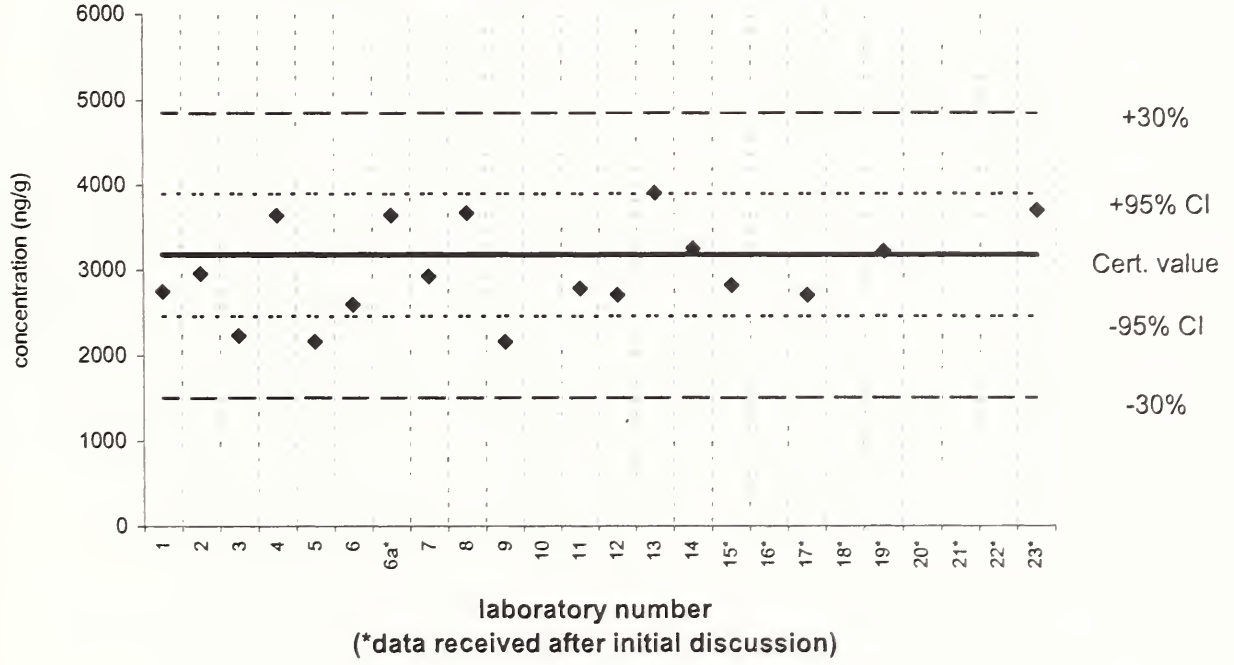
Assigned value = 3074 ng/g s = 557 ng/g 95% CL = 277 ng/g
Reported Results: 19 Quantitative Results: 19



indeno[1,2,3-cd]pyrene

SRM 1649a

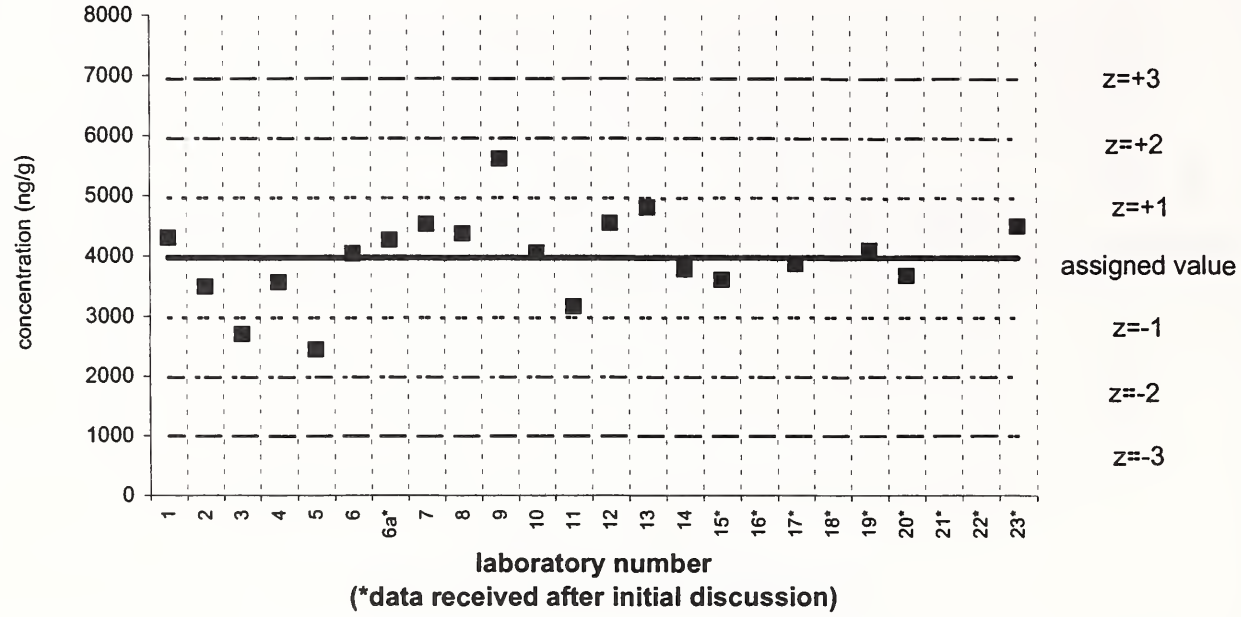
Certified Value = 3180 ± 720 ng/g
Reported Results: 18 Quantitative Results: 18



benzo[ghi]perylene

Air Particulate I (QA01APT01)

Assigned value = 3968 ng/g s = 742 ng/g 95% CL = 358 ng/g
Reported Results: 20 Quantitative Results: 20

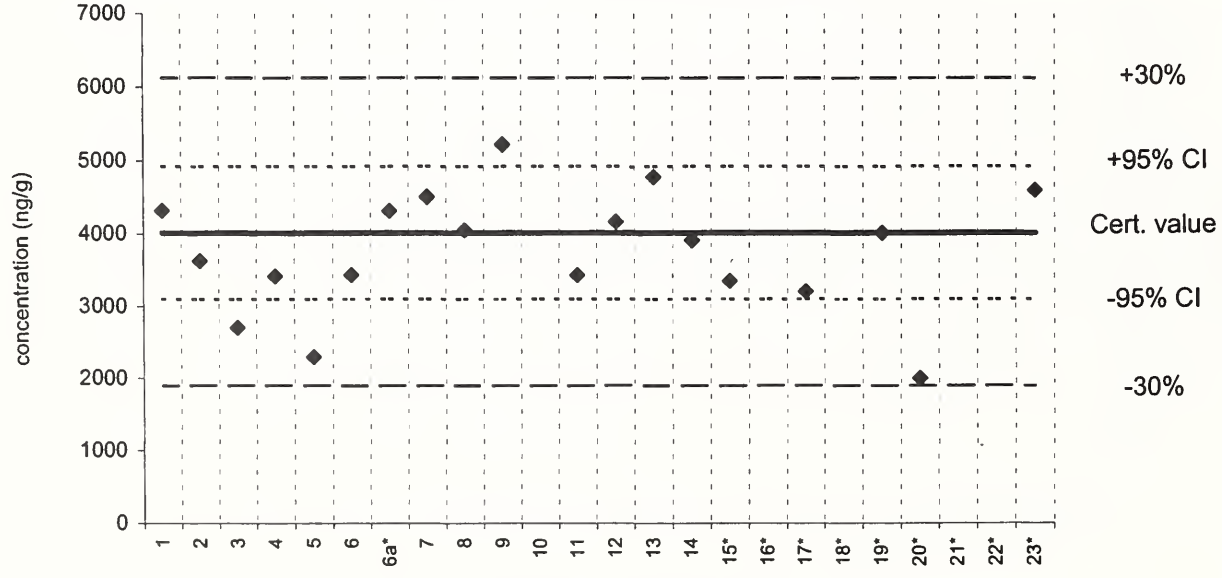


(*data received after initial discussion)

benzo[ghi]perylene

SRM 1649a

Certified Value = 4010 ± 910 ng/g
Reported Results: 19 Quantitative Results: 19

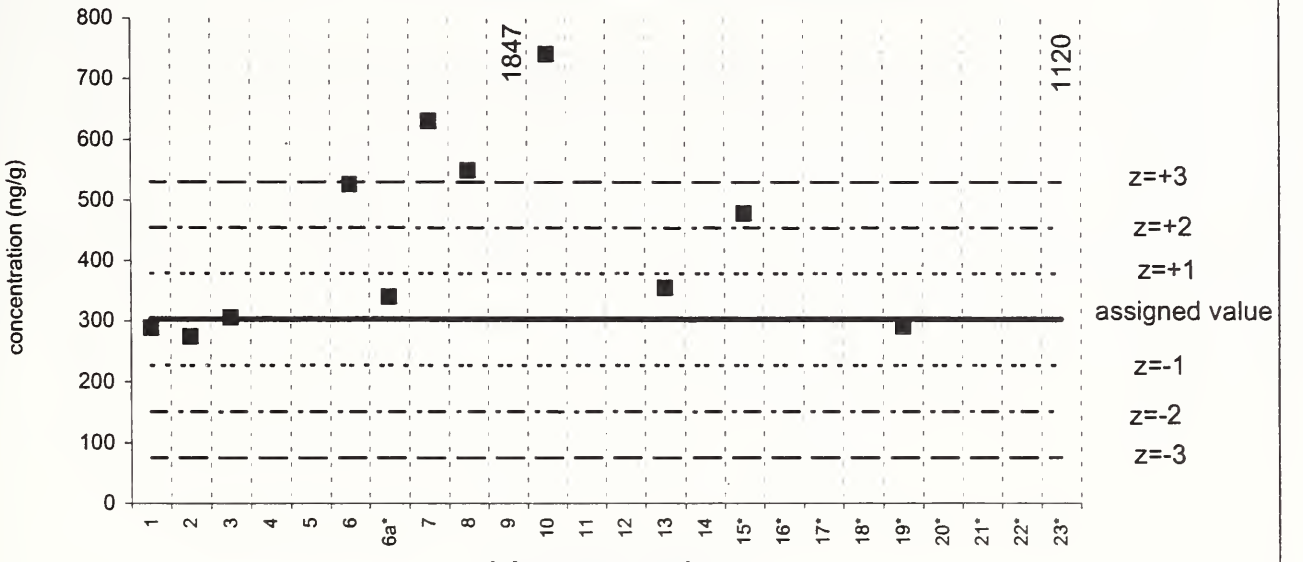


(*data received after initial discussion)

dibenz[a,h]anthracene

Air Particulate I (QA01APT01)

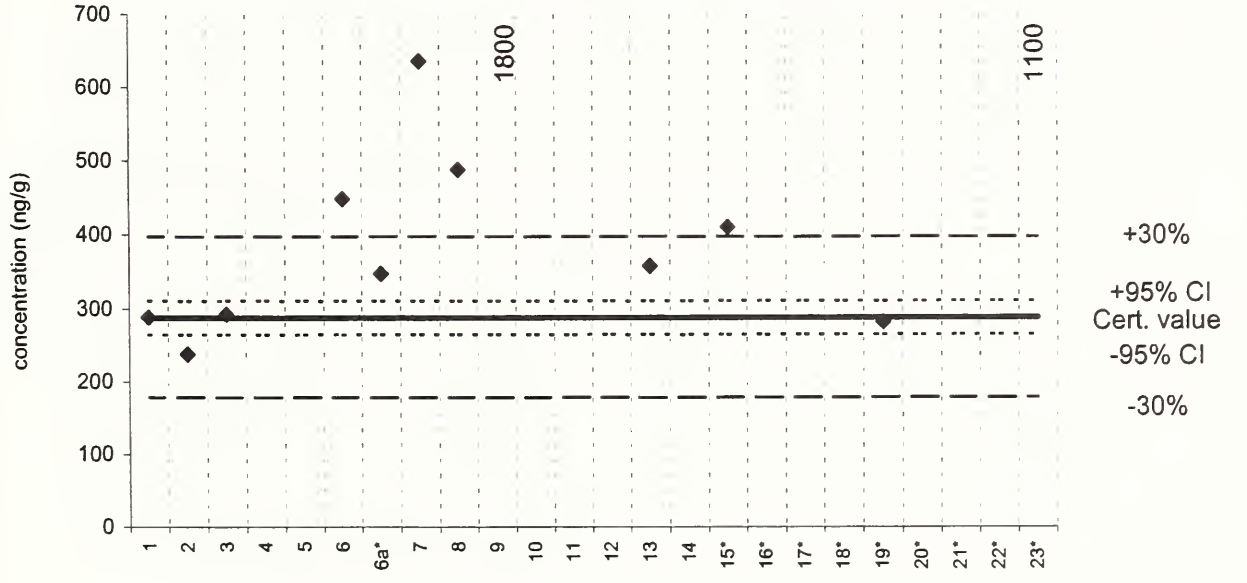
Assigned value = 303 ng/g s = 31 ng/g 95% CL = 33 ng/g
Reported Results: 13 Quantitative Results: 13



dibenz[a,h]anthracene

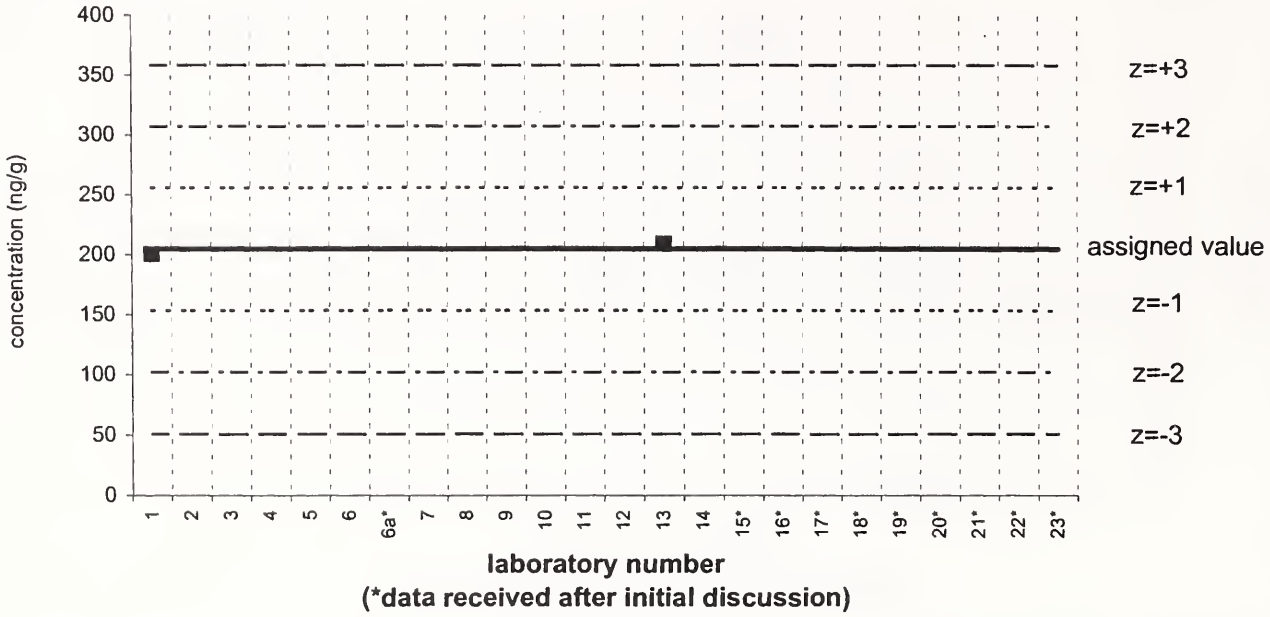
SRM 1649a

Certified Value = 288 ± 23 ng/g
Reported Results: 12 Quantitative Results: 12



dibenz[a,c]anthracene **Air Particulate I (QA01APT01)**

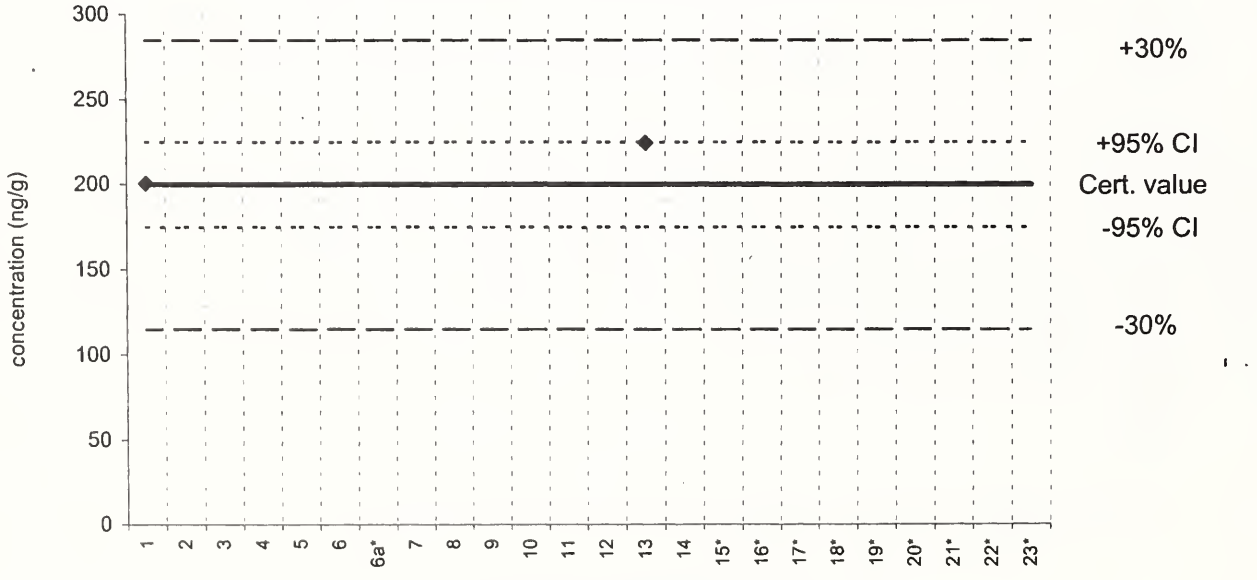
Assigned value = 205 ng/g s = not calc. ng/g 95% CL = 0 ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

dibenz[a,c]anthracene **SRM 1649a**

Certified Value = 200 ± 25 ng/g
Reported Results: 2 Quantitative Results: 2

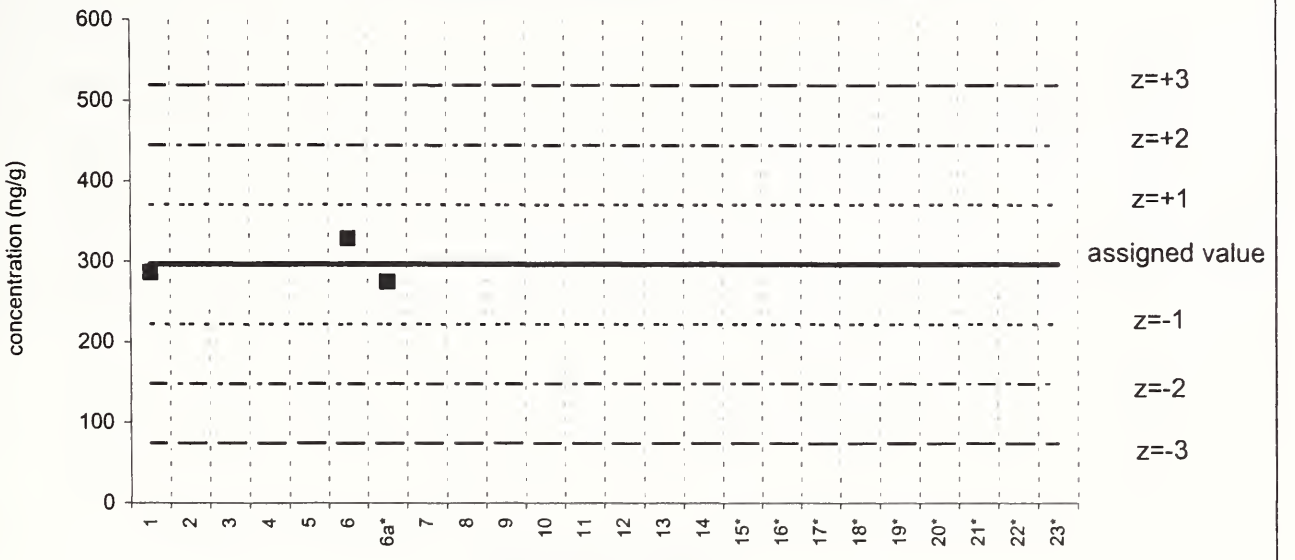


laboratory number
(*data received after initial discussion)

benzo[b]chrysene

Air Particulate I (QA01APT01)

Assigned value = 297 ng/g s = 28 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3

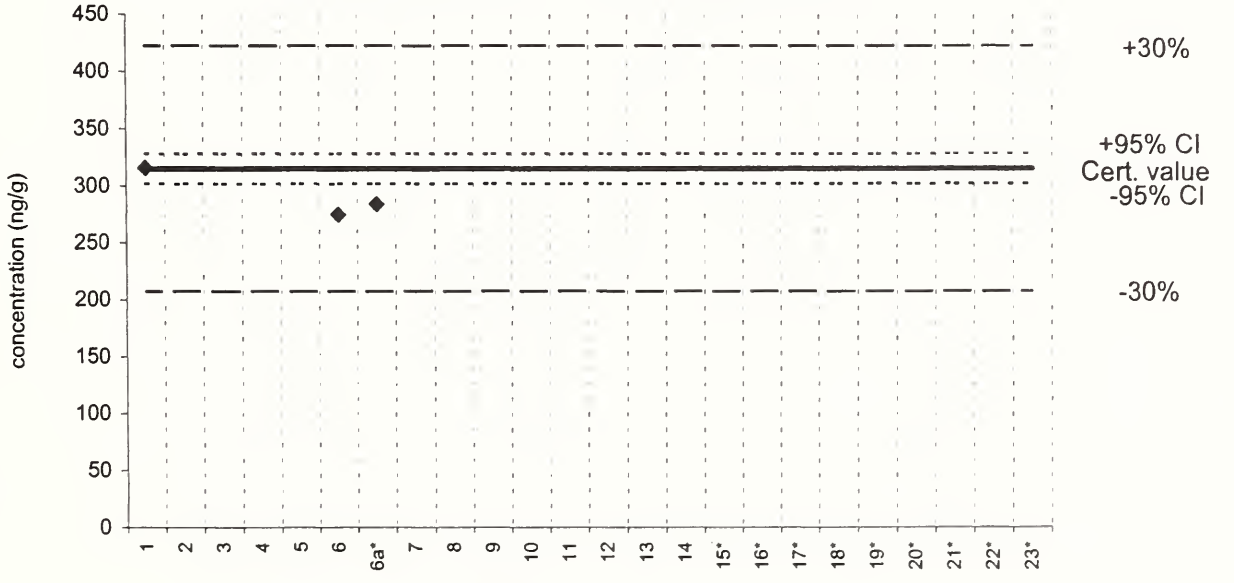


laboratory number
(*data received after initial discussion)

benzo[b]chrysene

SRM 1649a

Certified Value = 315 ± 13 ng/g
Reported Results: 3 Quantitative Results: 3

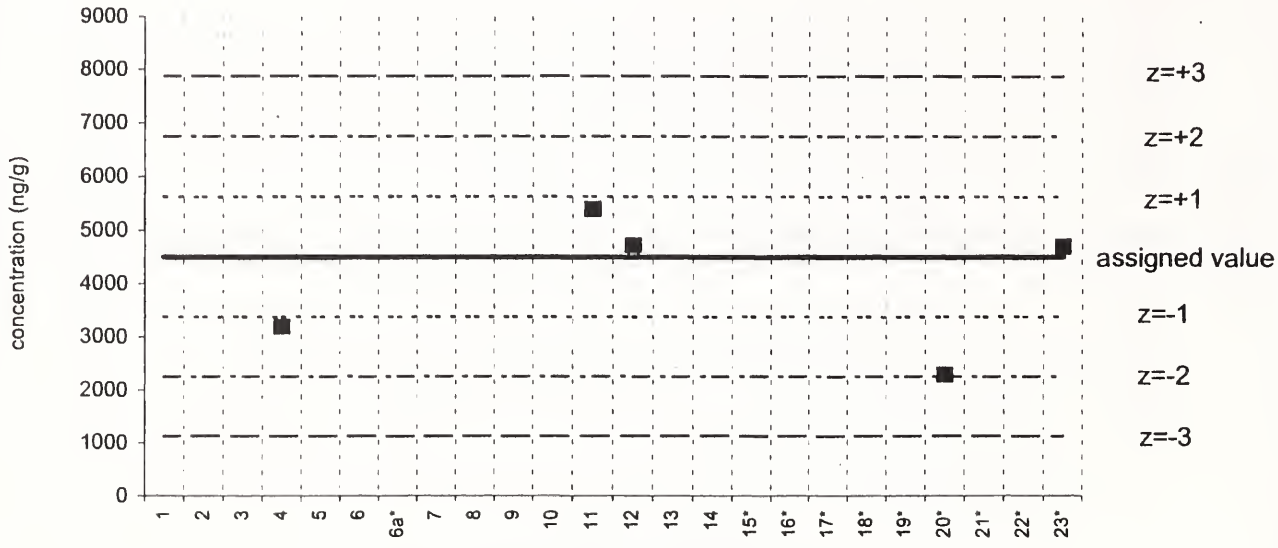


laboratory number
(*data received after initial discussion)

coronene

Air Particulate I (QA01APT01)

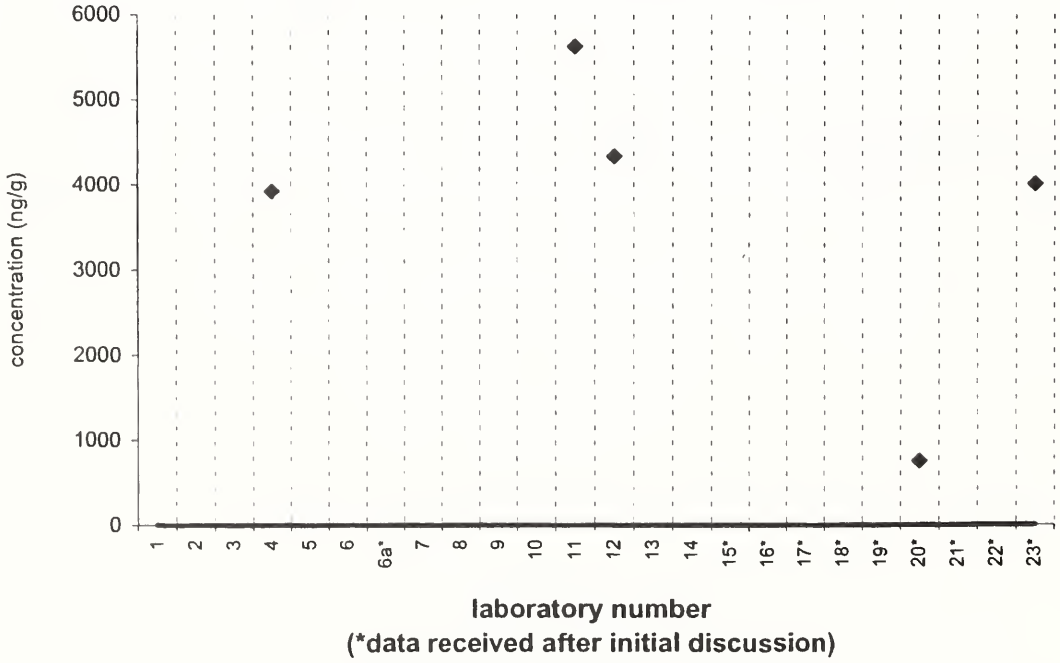
Assigned value = 4499 ng/g s = 932 ng/g 95% CL = 1483 ng/g
Reported Results: 5 Quantitative Results: 5



coronene

SRM 1649a

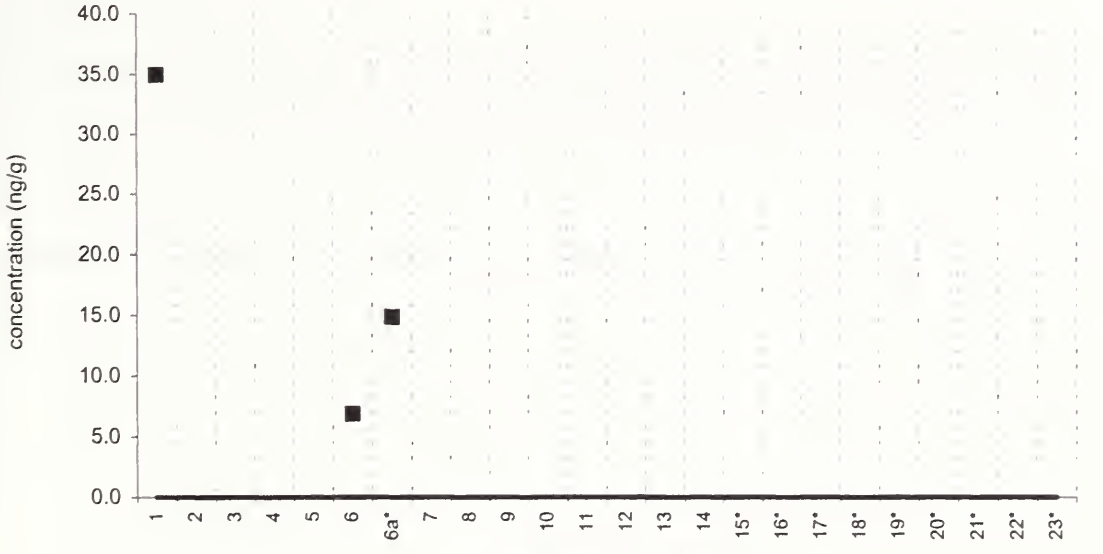
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



9-nitroanthracene

Air Particulate I (QA01APT01)

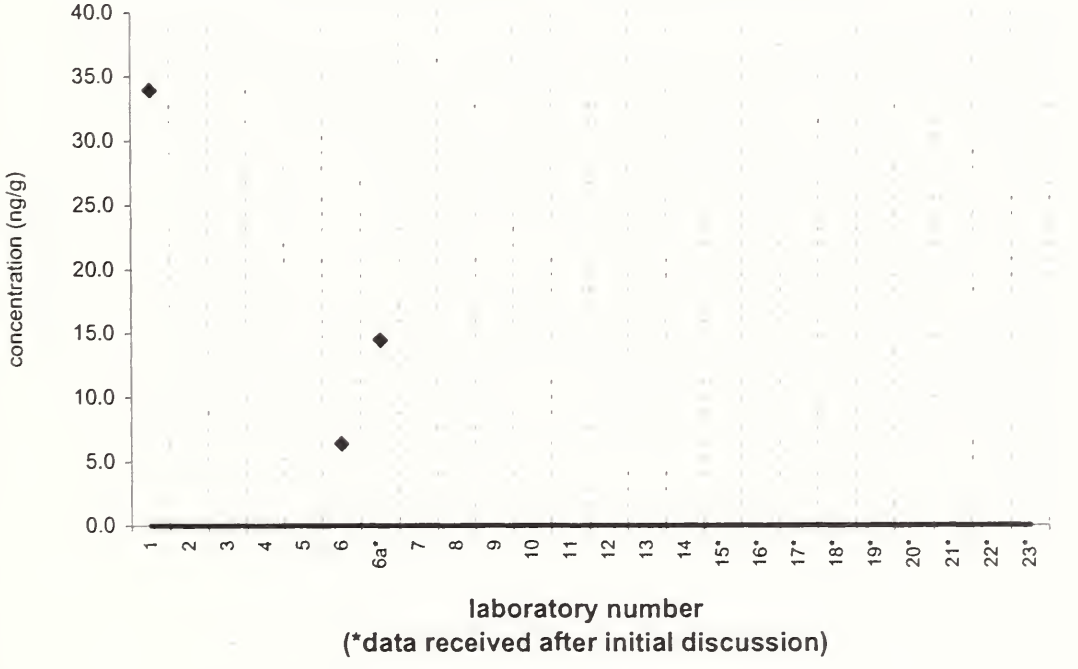
Assigned value = No assigned value ng/g
Reported Results: 3 Quantitative Results: 3



9-nitroanthracene

SRM 1649a

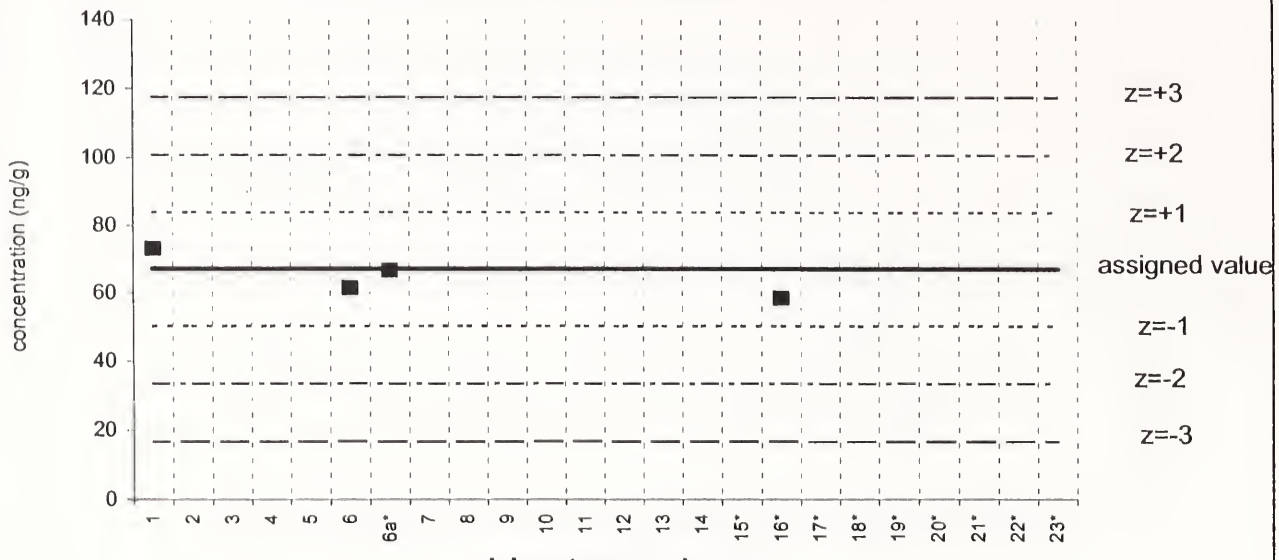
Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3



1-nitropyrene

Air Particulate I (QA01APT01)

Assigned value = 67.2 ng/g s = 6.4 ng/g 95% CL = not calc. ng/g
Reported Results: 4 Quantitative Results: 4

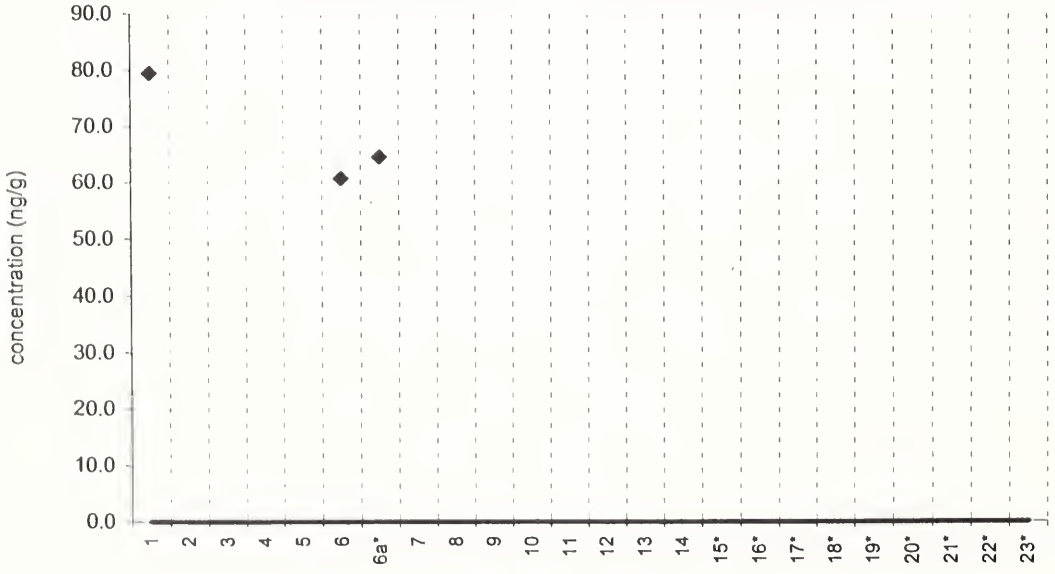


laboratory number
(*data received after initial discussion)

1-nitropyrene

SRM 1649a

Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3

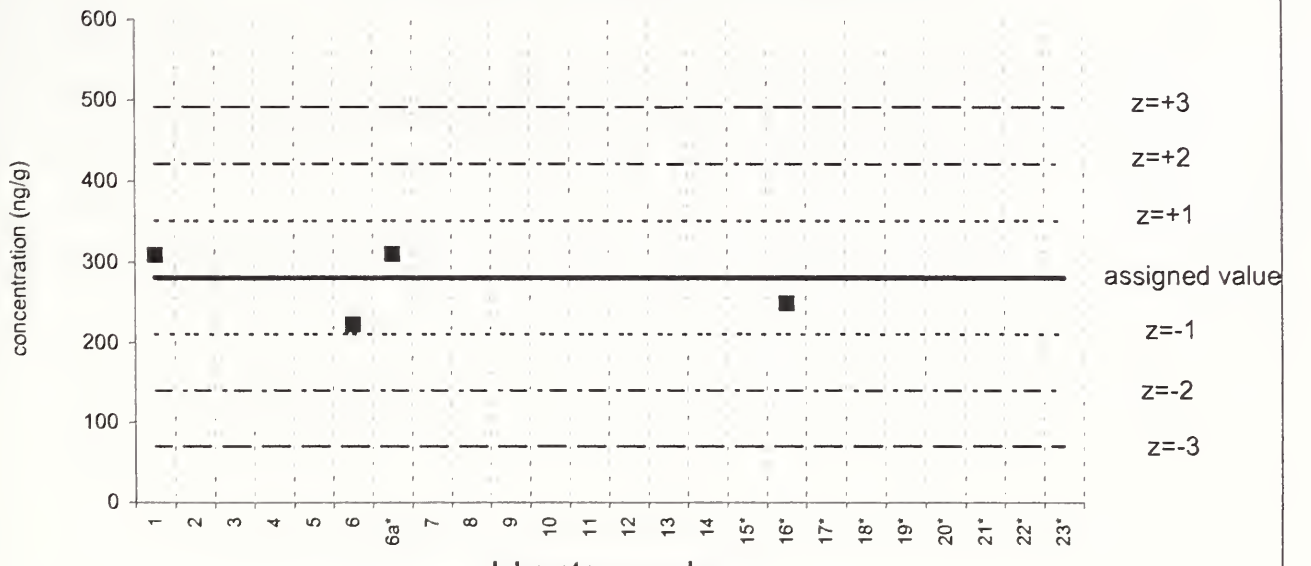


laboratory number
(*data received after initial discussion)

2-nitrofluoranthene

Air Particulate I (QA01APT01)

Assigned value = 281 ng/g s = 44 ng/g 95% CL = not calc. ng/g
Reported Results: 4 Quantitative Results: 4

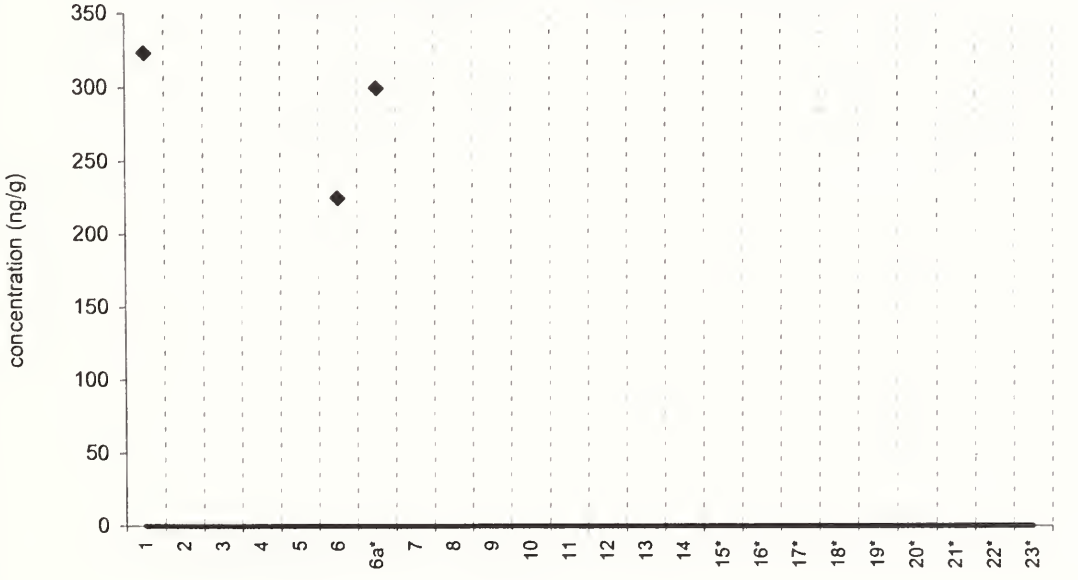


laboratory number
(*data received after initial discussion)

2-nitrofluoranthene

SRM 1649a

Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3

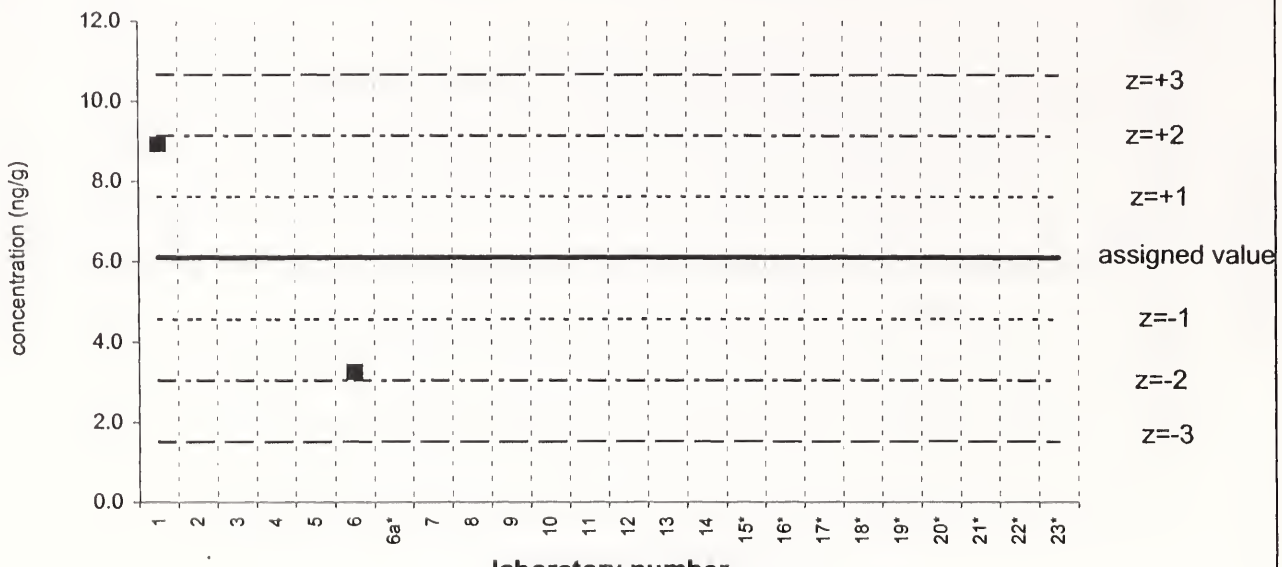


laboratory number
(*data received after initial discussion)

3-nitrofluoranthene

Air Particulate I (QA01APT01)

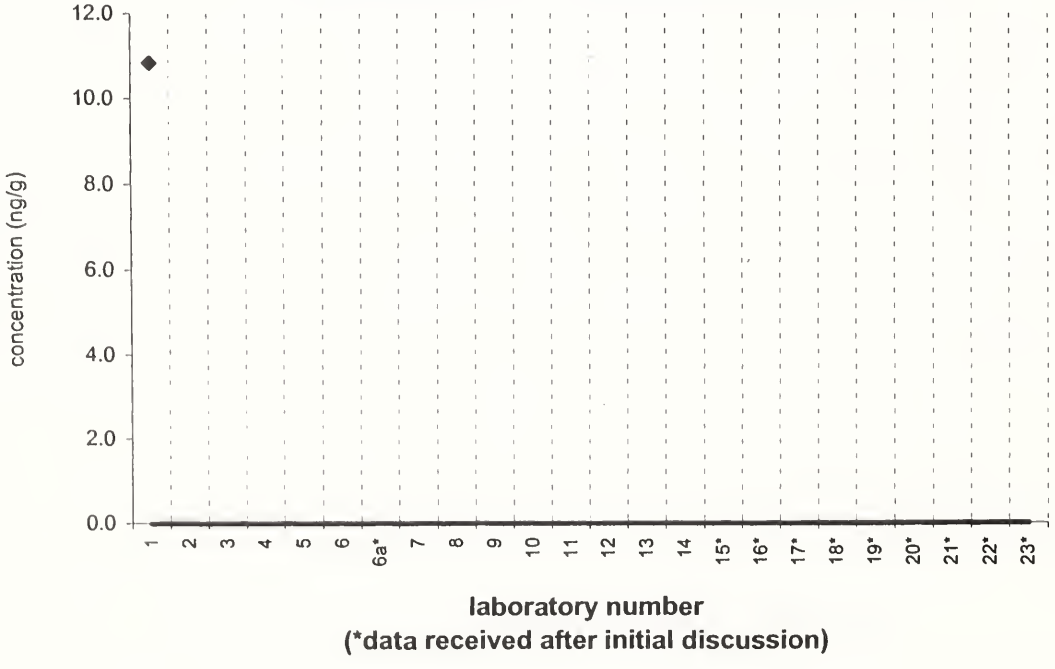
Assigned value = 6.09 ng/g s = not calc. ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 2



3-nitrofluoranthene

SRM 1649a

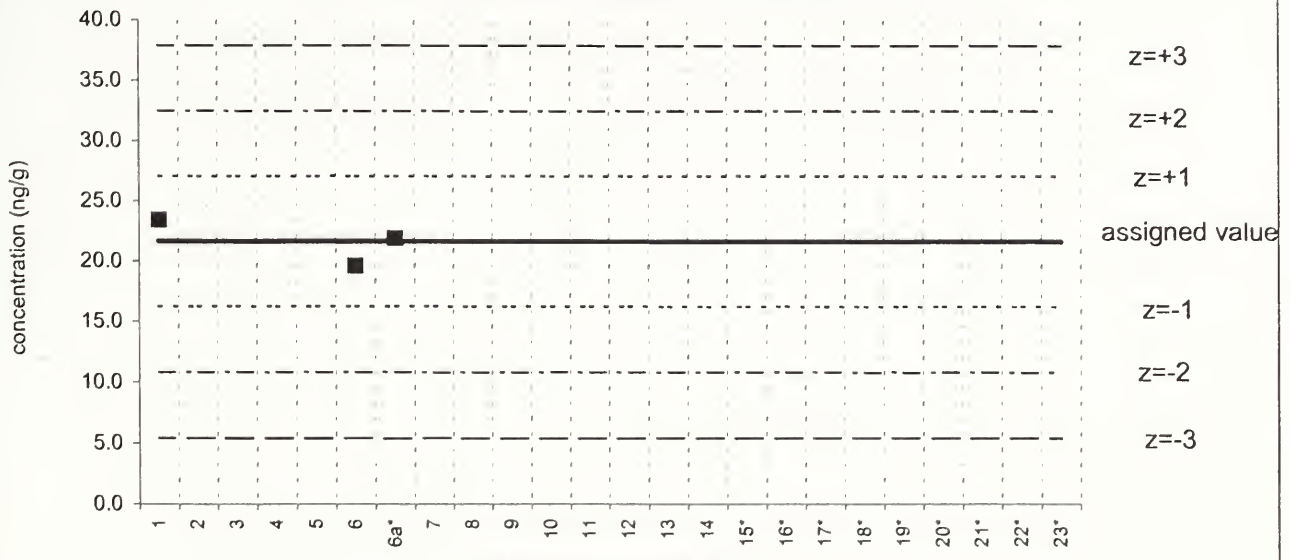
Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 1



7-nitrobenz[a]anthracene

Air Particulate I (QA01APT01)

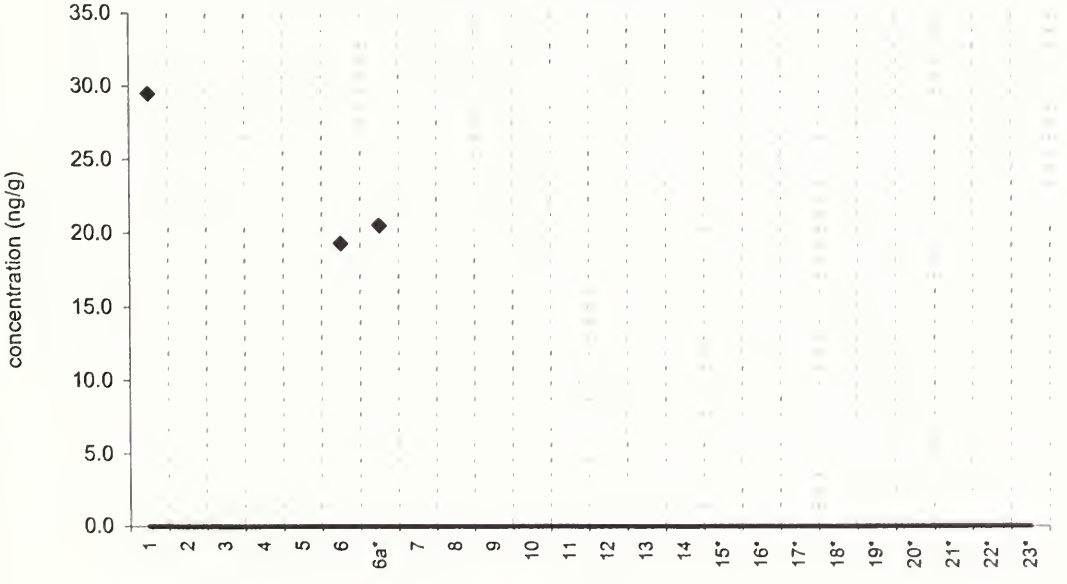
Assigned value = 21.7 ng/g s = 1.9 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



7-nitrobenz[a]anthracene

SRM 1649a

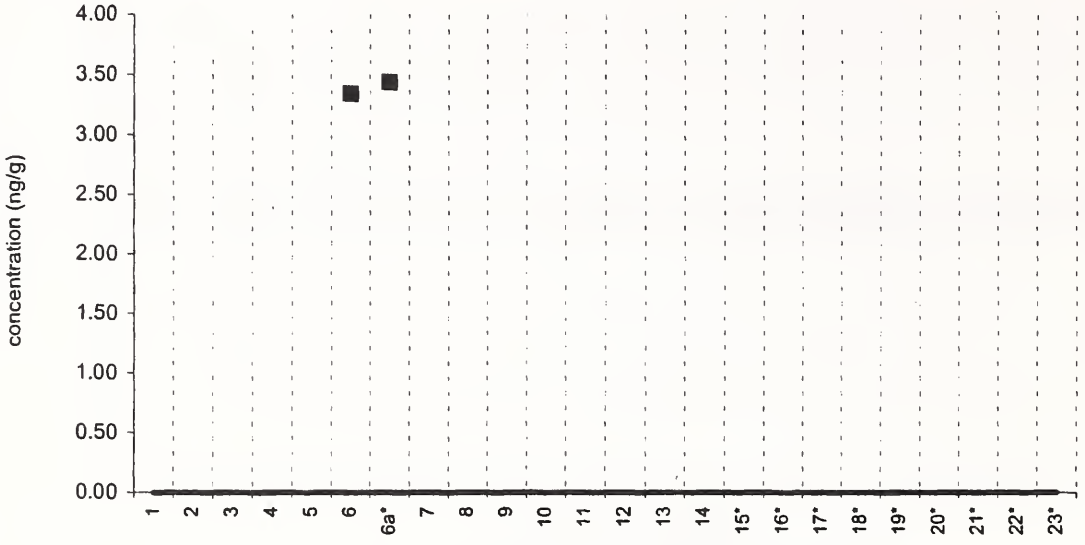
Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3



6-nitrochrysene

Air Particulate I (QA01APT01)

Assigned value = No assigned value ng/g
Reported Results: 3 Quantitative Results: 2

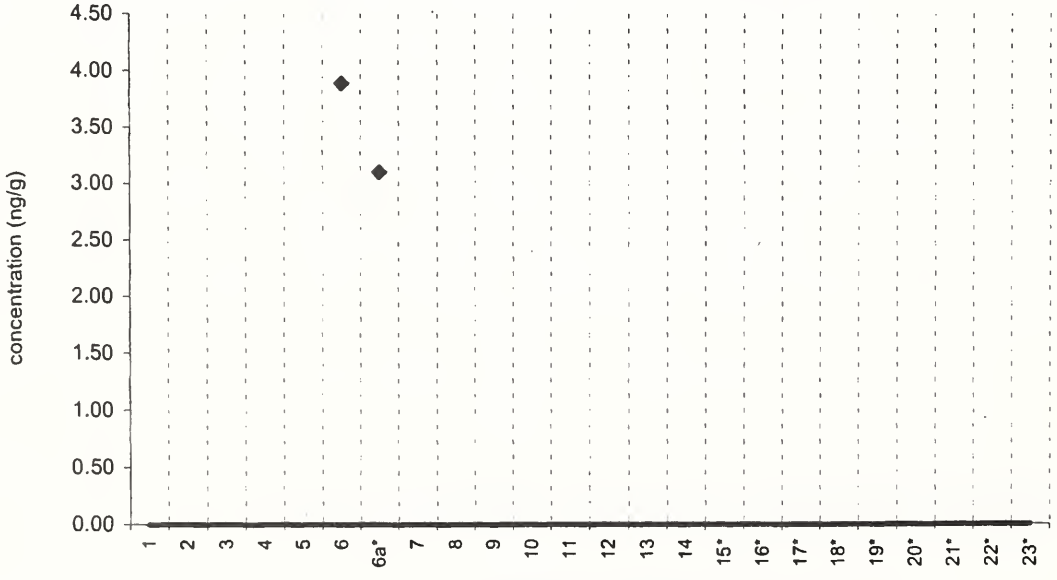


laboratory number
(*data received after initial discussion)

6-nitrochrysene

SRM 1649a

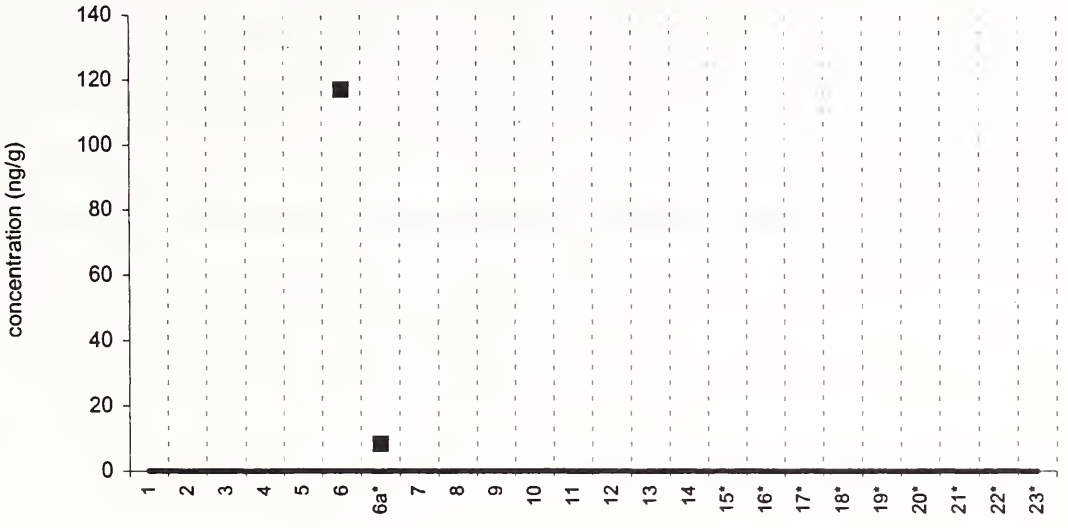
Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

6-nitrobenzo[a]pyrene **Air Particulate I (QA01APT01)**

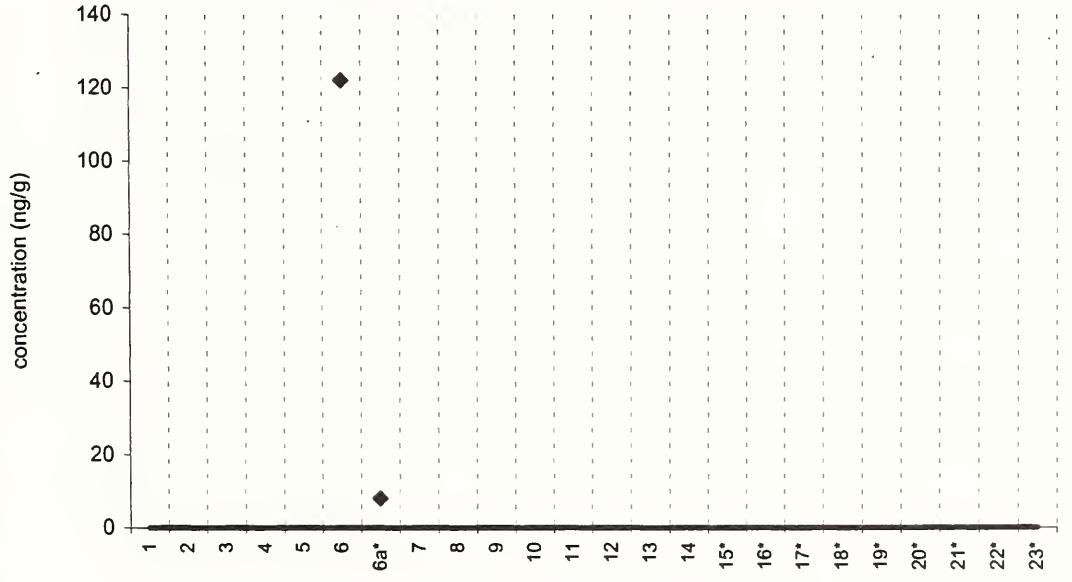
Assigned value = No assigned value ng/g
Reported Results: 3 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

6-nitrobenzo[a]pyrene **SRM 1649a**

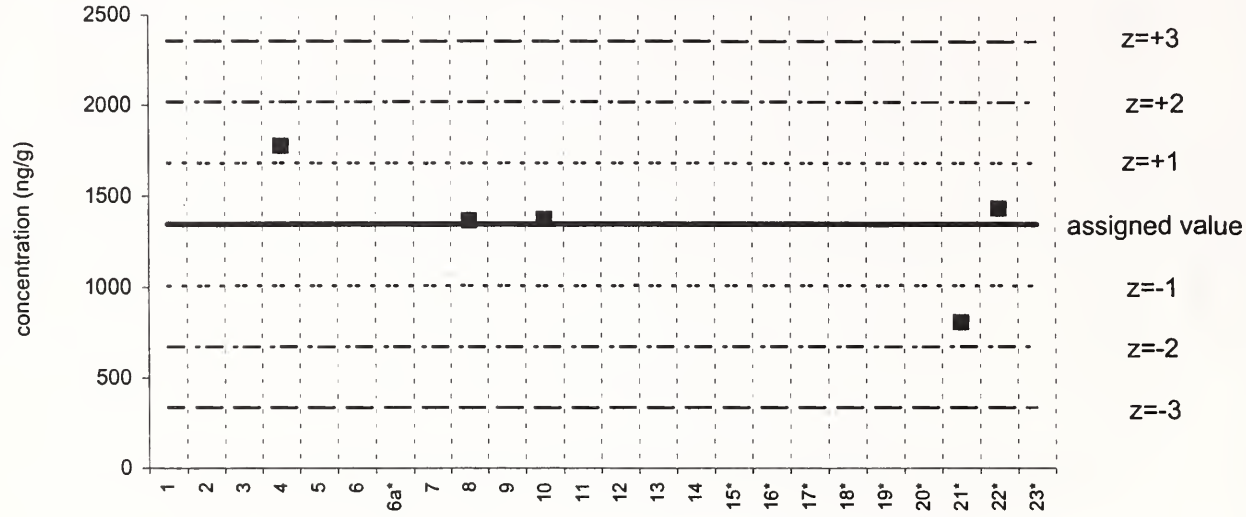
Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

n-C20 **Air Particulate I (QA01APT01)**

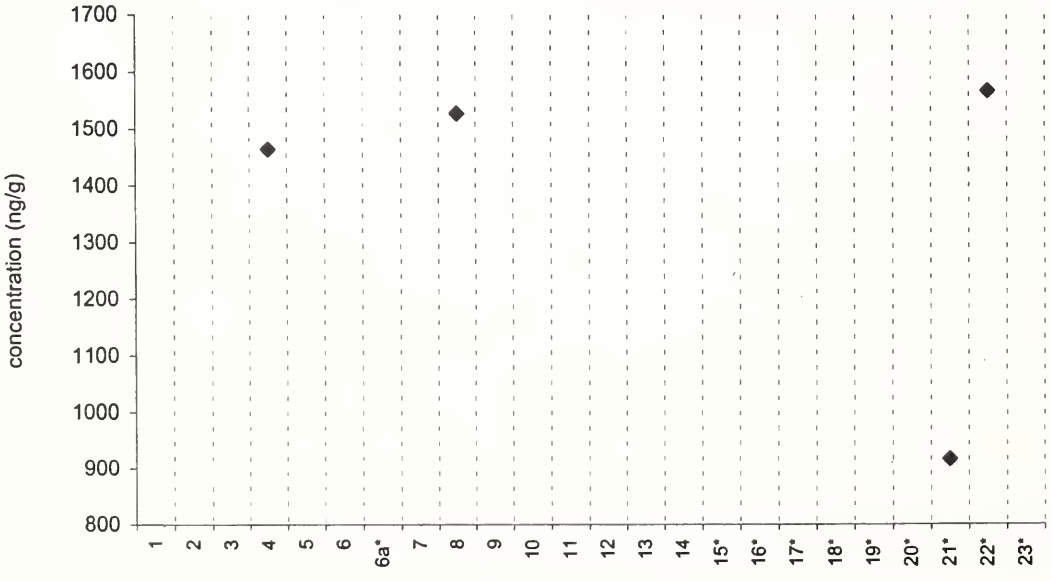
Assigned value = 1346 ng/g s = 402 ng/g 95% CL = 640 ng/g
Reported Results: 6 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

n-C20 **SRM 1649a**

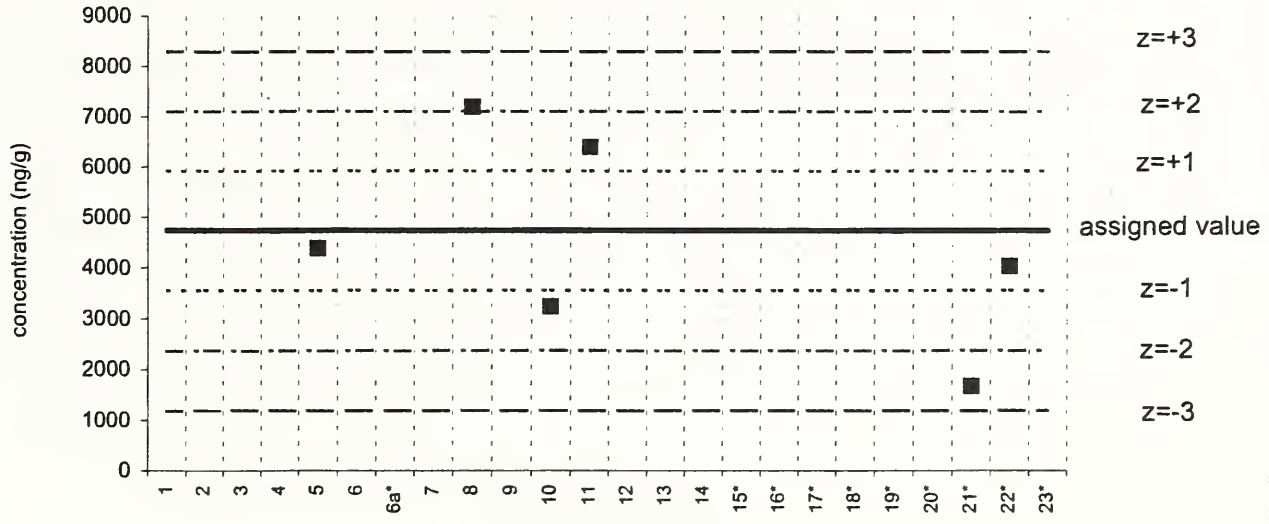
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 4



laboratory number
(*data received after initial discussion)

n-C22 **Air Particulate I (QA01APT01)**

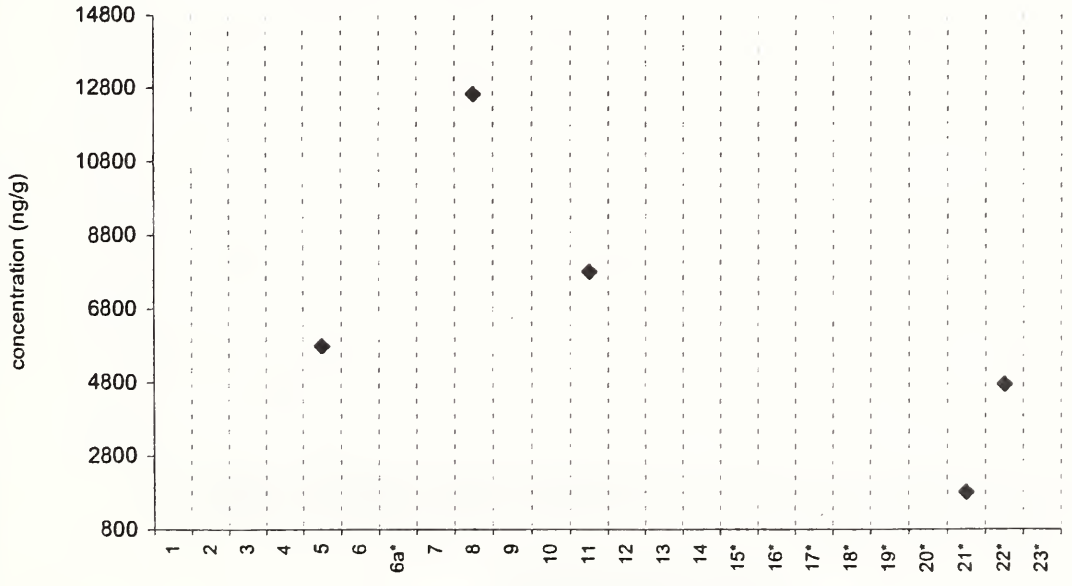
Assigned value = 4738 ng/g s = 2165 ng/g 95% CL = 2689 ng/g
Reported Results: 6 Quantitative Results: 6



laboratory number
(*data received after initial discussion)

n-C22 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5

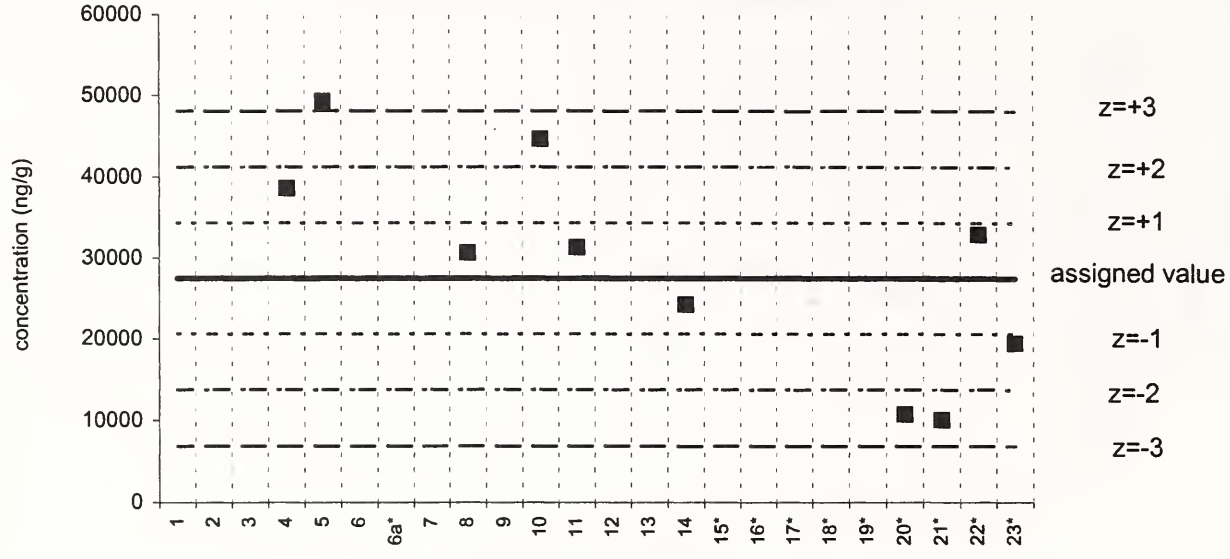


laboratory number
(*data received after initial discussion)

n-C24 **Air Particulate I (QA01APT01)**

Assigned value = 27501 ng/g s = 12803 ng/g 95% CL = 9842 ng/g

Reported Results: 10 Quantitative Results: 10

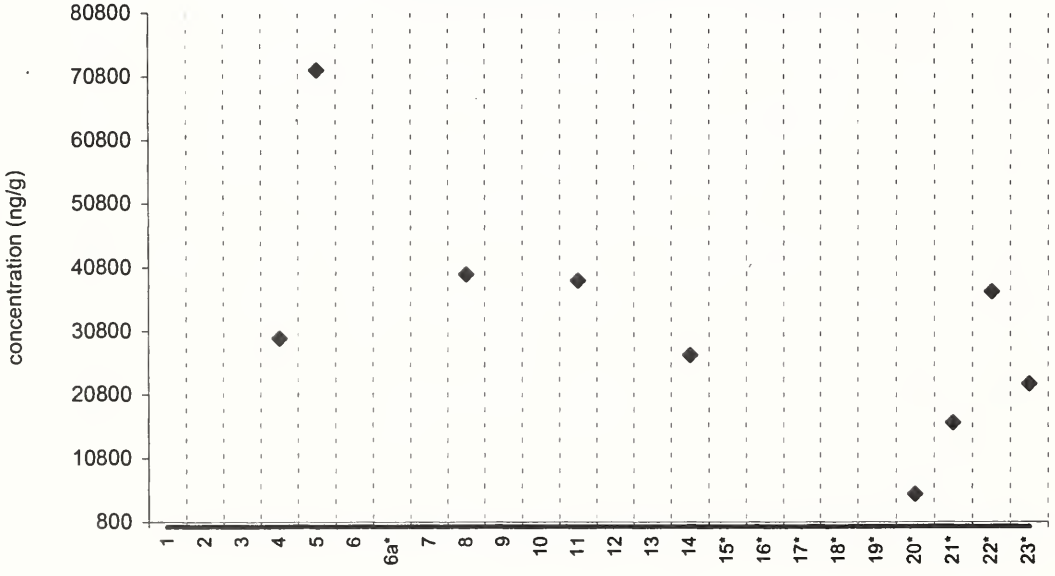


laboratory number
(*data received after initial discussion)

n-C24 **SRM 1649a**

Target Value = no target ng/g

Reported Results: 9 Quantitative Results: 9

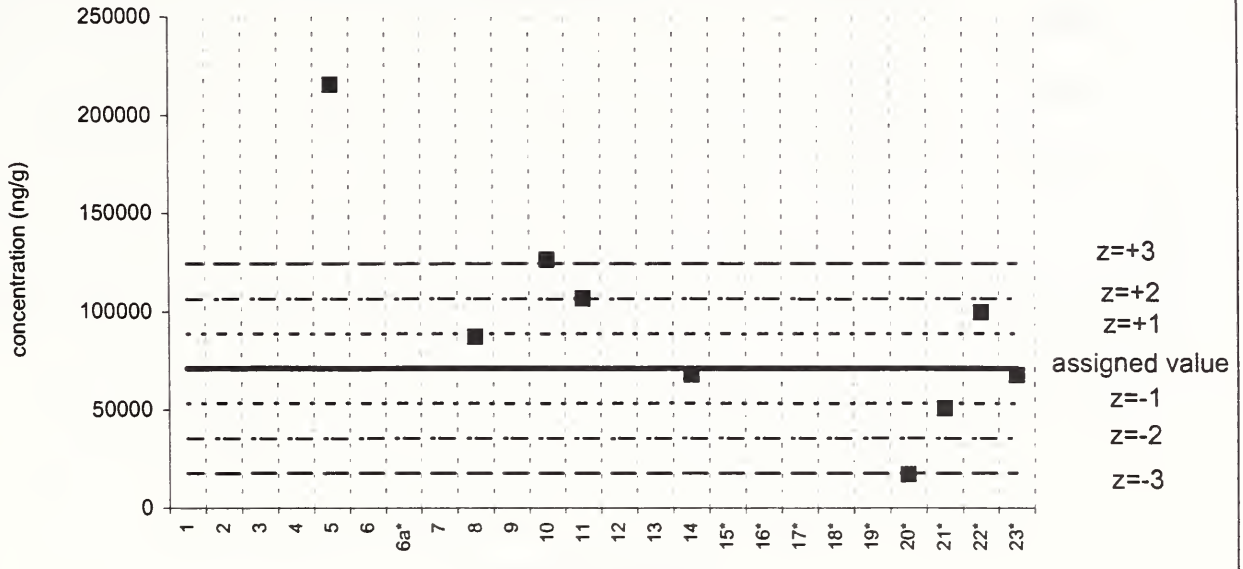


laboratory number
(*data received after initial discussion)

n-C26 **Air Particulate I (QA01APT01)**

Assigned value = 71051 ng/g s = 30813 ng/g 95% CL = 28497 ng/g

Reported Results: 9 Quantitative Results: 9

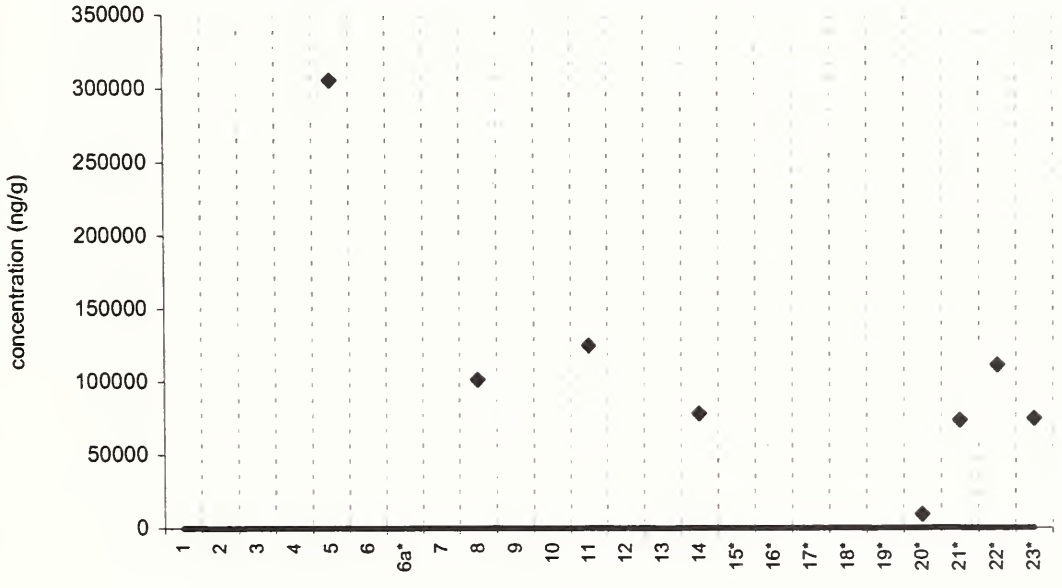


laboratory number
(*data received after initial discussion)

n-C26 **SRM 1649a**

Target Value = no target ng/g

Reported Results: 8 Quantitative Results: 8

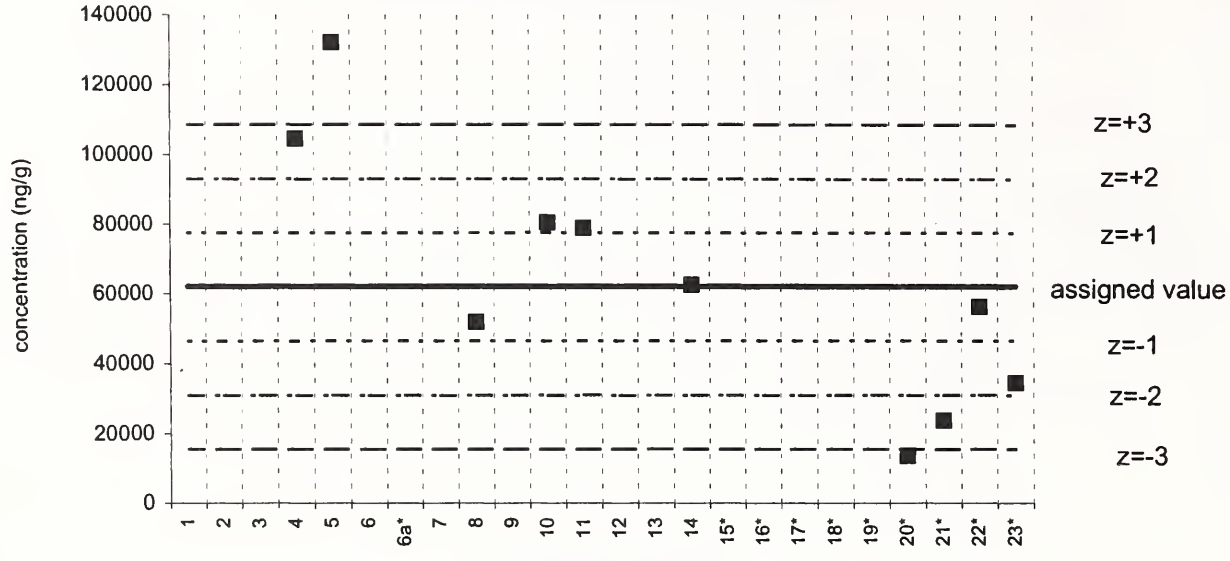


laboratory number
(*data received after initial discussion)

n-C28 **Air Particulate I (QA01APT01)**

Assigned value = 62008 ng/g s = 38227 ng/g 95% CL = 29384 ng/g

Reported Results: 10 Quantitative Results: 10

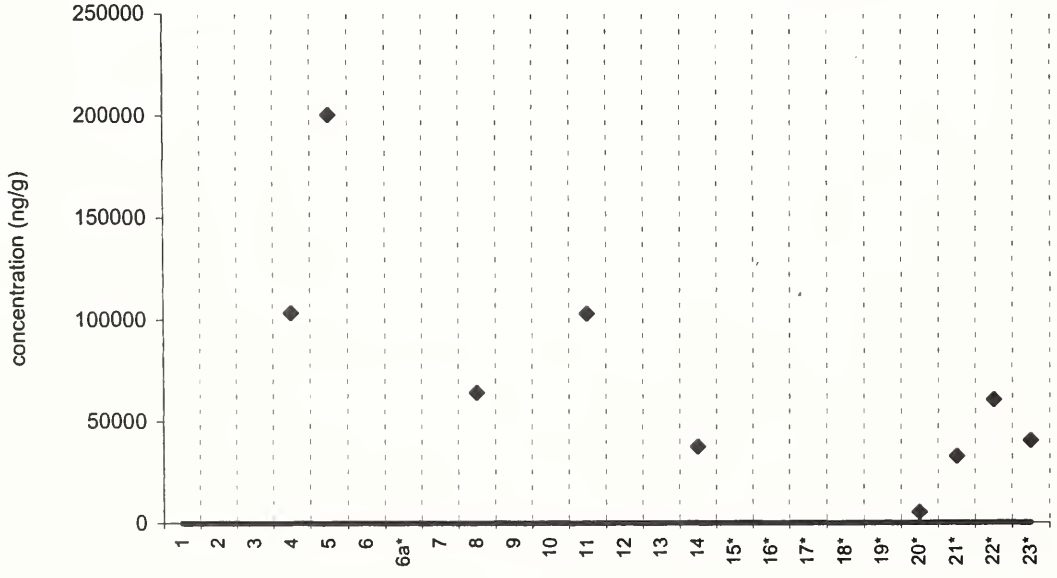


laboratory number
(*data received after initial discussion)

n-C28 **SRM 1649a**

Target Value = no target ng/g

Reported Results: 9 Quantitative Results: 9

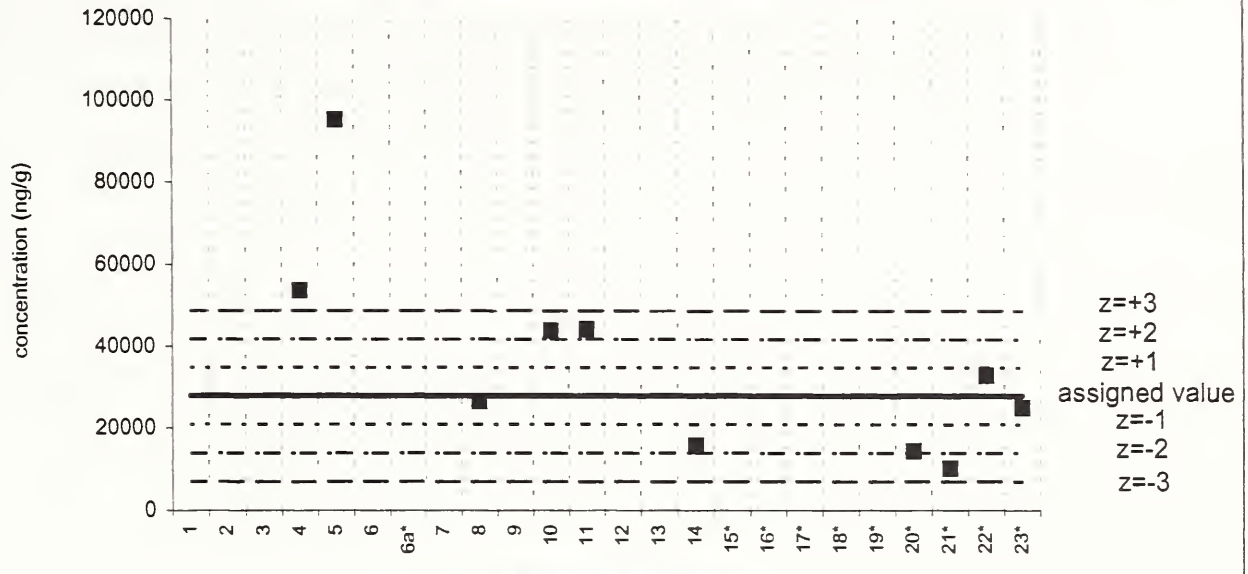


laboratory number
(*data received after initial discussion)

n-C30 **Air Particulate I (QA01APT01)**

Assigned value = 27855 ng/g s = 15152 ng/g 95% CL = 12668 ng/g

Reported Results: 10 Quantitative Results: 10

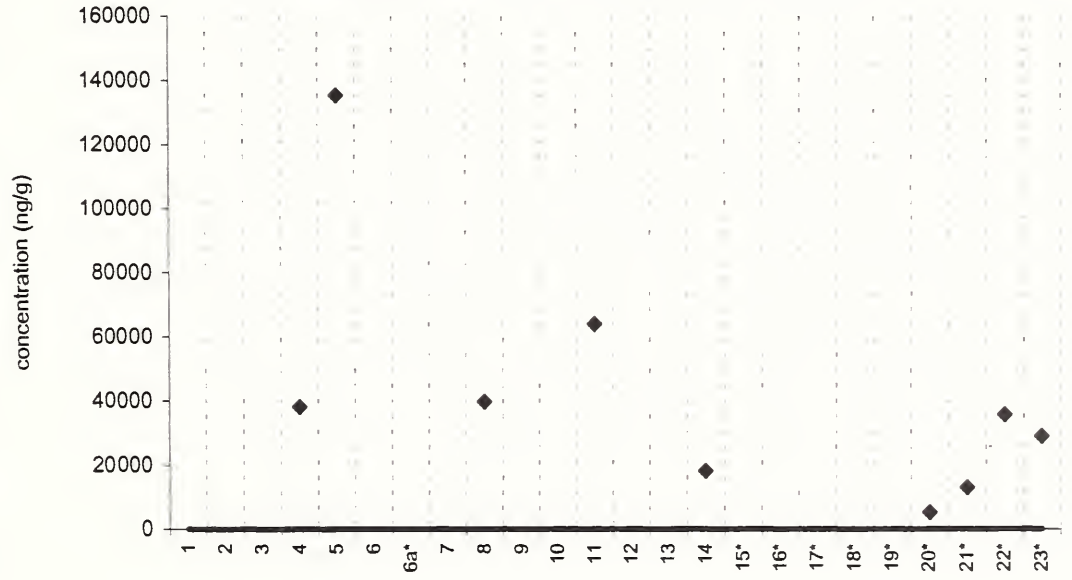


laboratory number
(*data received after initial discussion)

n-C30 **SRM 1649a**

Target Value = no target ng/g

Reported Results: 9 Quantitative Results: 9

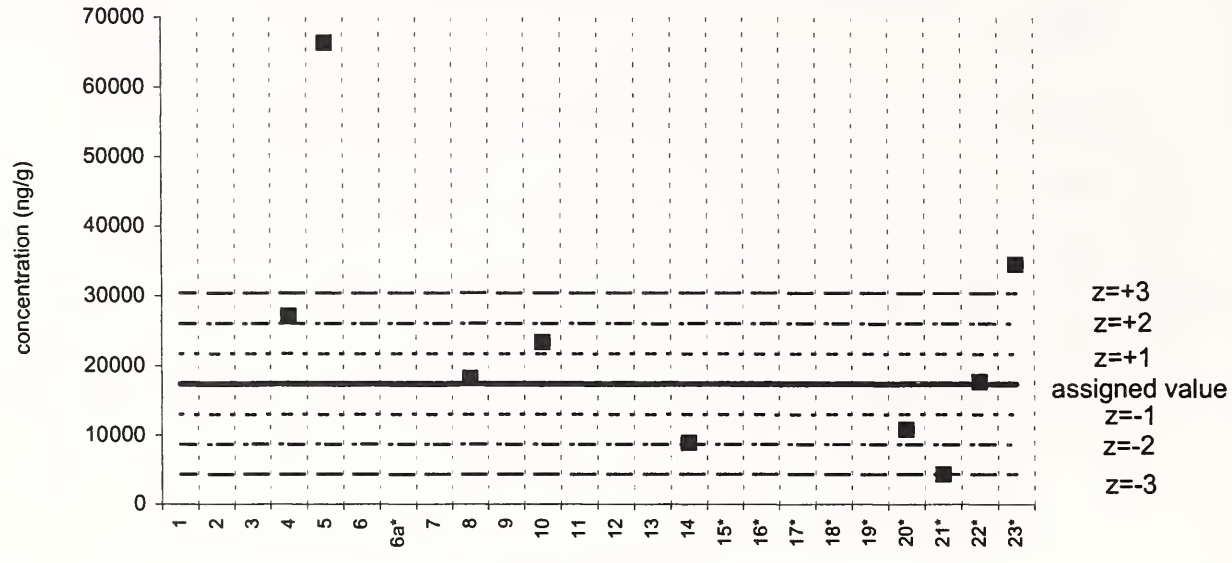


laboratory number
(*data received after initial discussion)

n-C32 **Air Particulate I (QA01APT01)**

Assigned value = 17364 ng/g s = 10594 ng/g 95% CL = 9797 ng/g

Reported Results: 9 Quantitative Results: 9

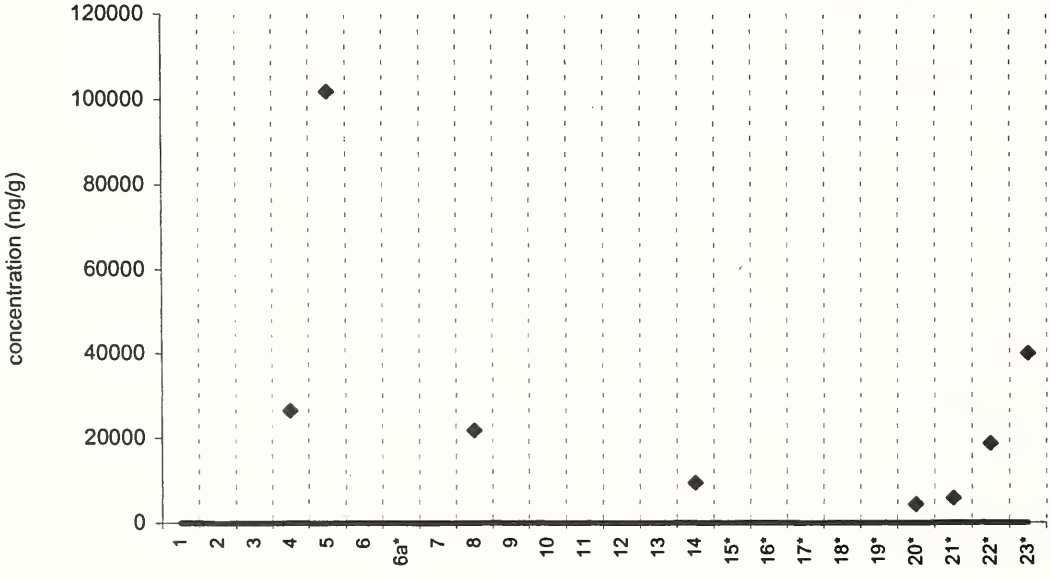


laboratory number
(*data received after initial discussion)

n-C32 **SRM 1649a**

Target Value = no target ng/g

Reported Results: 8 Quantitative Results: 8

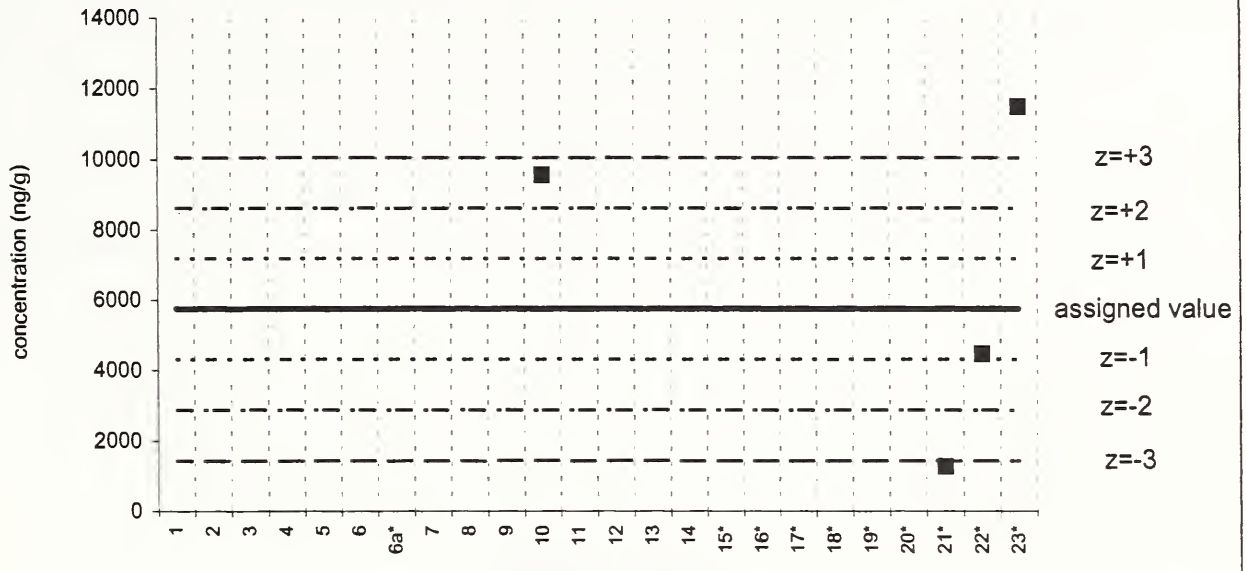


laboratory number
(*data received after initial discussion)

n-C36 **Air Particulate I (QA01APT01)**

Assigned value = 5747 ng/g s = 5231 ng/g 95% CL = not calc. ng/g

Reported Results: 5 Quantitative Results: 4

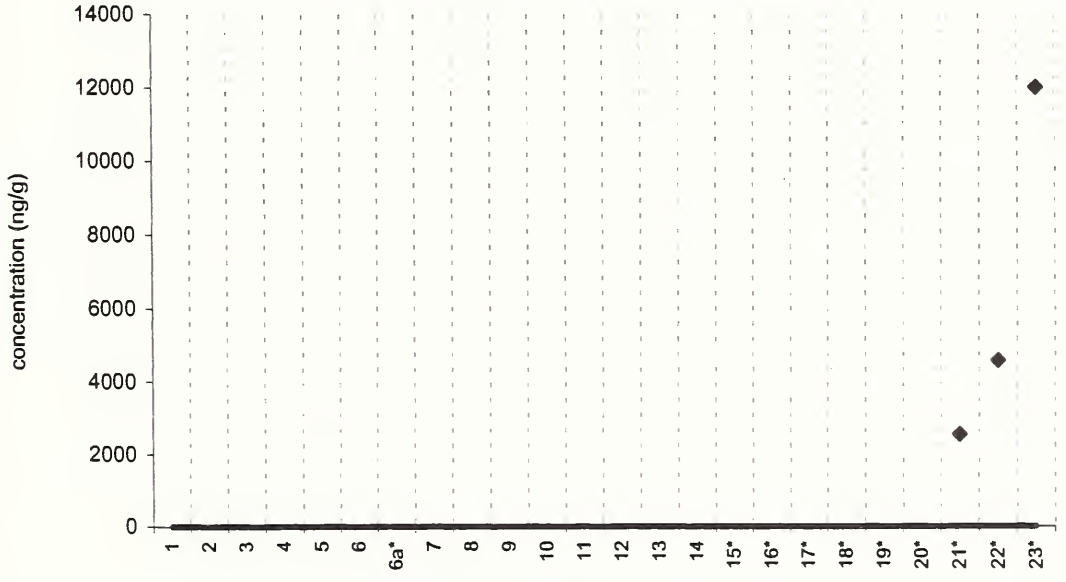


laboratory number
(*data received after initial discussion)

n-C36 **SRM 1649a**

Target Value = no target ng/g

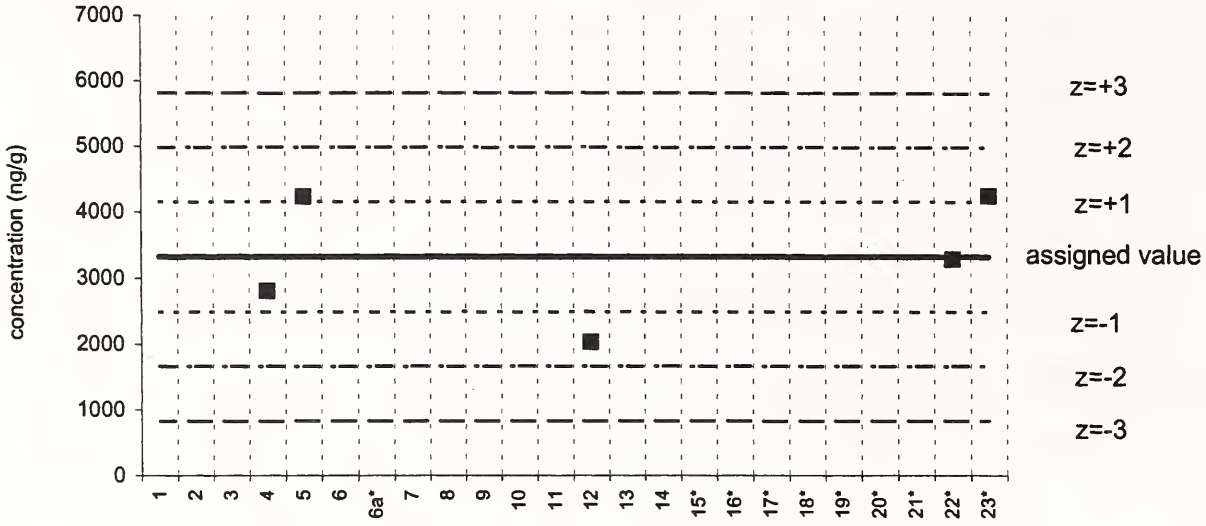
Reported Results: 4 Quantitative Results: 3



laboratory number
(*data received after initial discussion)

22, 29, 30-trisnorhopane — Air Particulate I (QA01APT01)

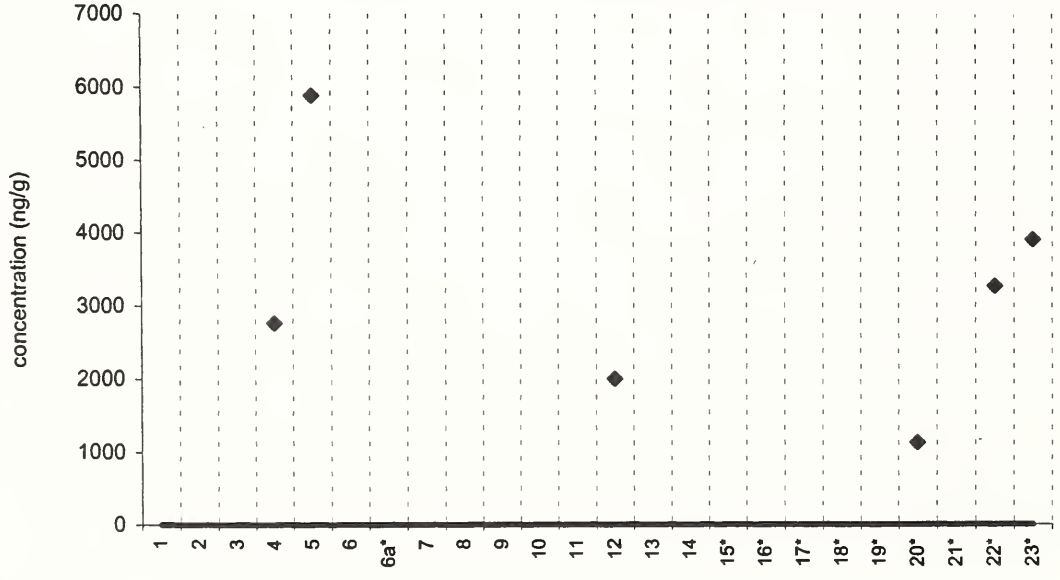
Assigned value = 3323 ng/g s = 951 ng/g 95% CL = 1181 ng/g
Reported Results: 6 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22, 29, 30-trisnorhopane — SRM 1649a

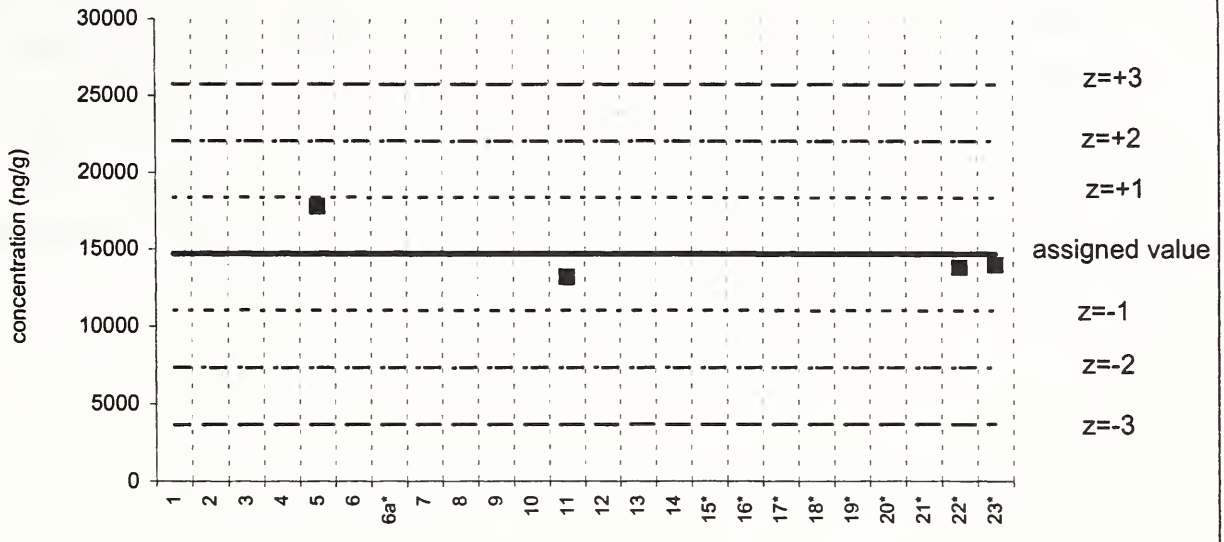
Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



laboratory number
(*data received after initial discussion)

17a(H), 21b(H)-29-norhopane — Air Particulate I (QA01APT01)

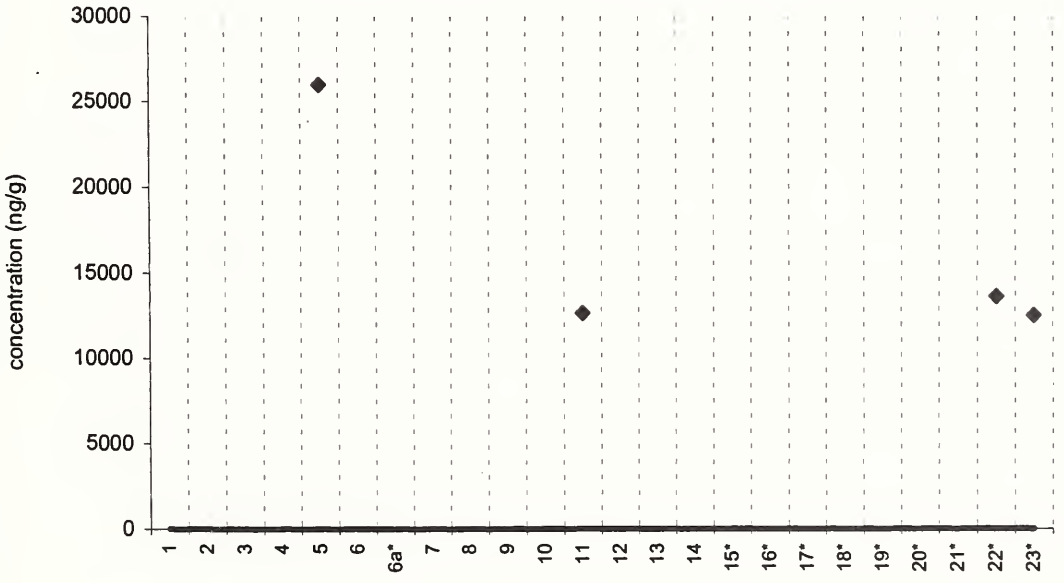
Assigned value = 14709 ng/g s = 2091 ng/g 95% CL = 3328 ng/g
Reported Results: 4 Quantitative Results: 4



laboratory number
(*data received after initial discussion)

17a(H), 21b(H)-29-norhopane — SRM 1649a

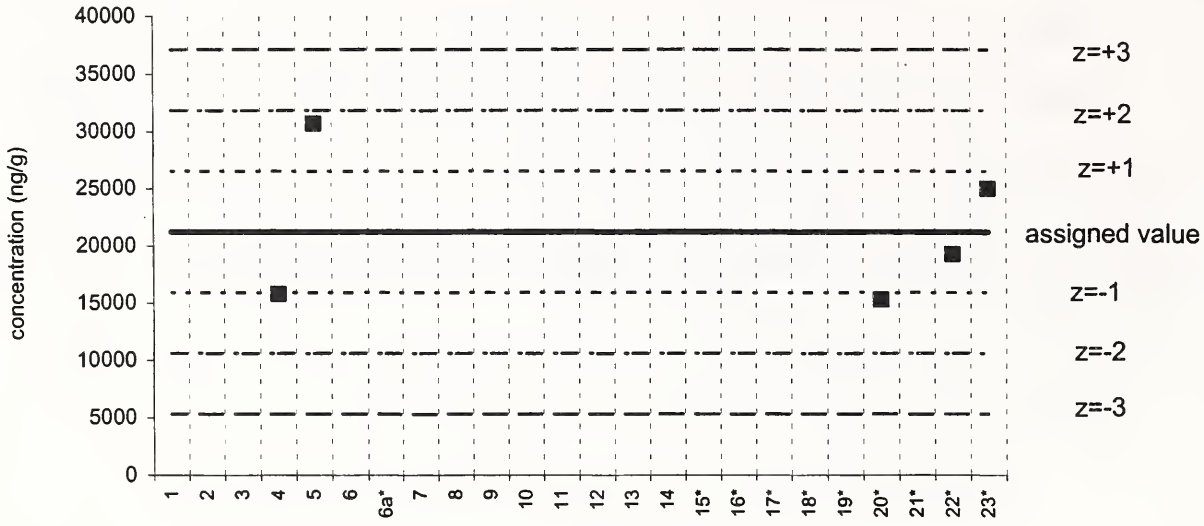
Target Value = no target ng/g
Reported Results: 4 Quantitative Results: 4



laboratory number
(*data received after initial discussion)

17a(H), 21b(H)-29-hopane — Air Particulate I (QA01APT01)

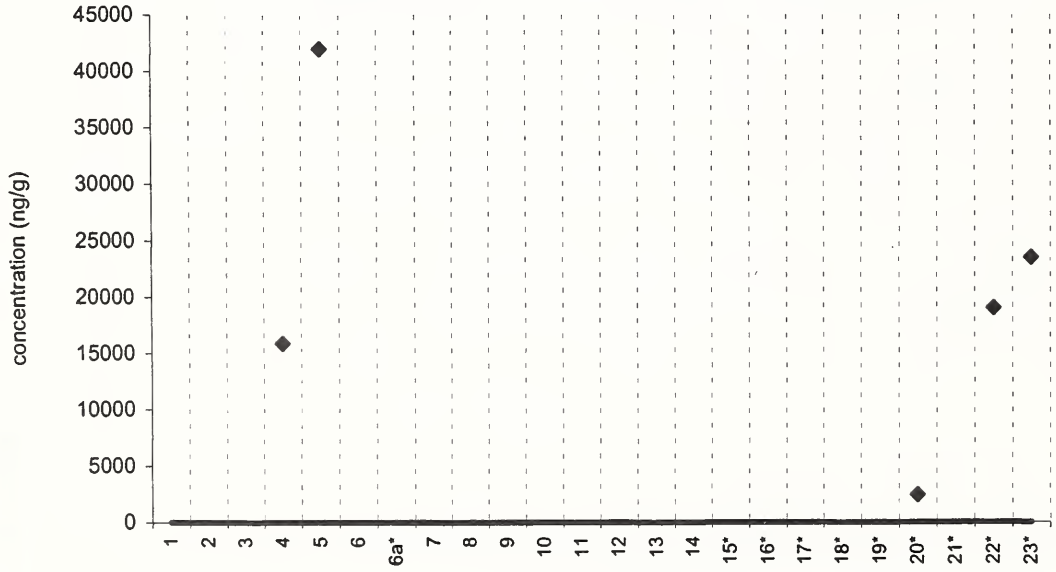
Assigned value = 21221 ng/g s = 6562 ng/g 95% CL = 8148 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

17a(H), 21b(H)-29-hopane — SRM 1649a

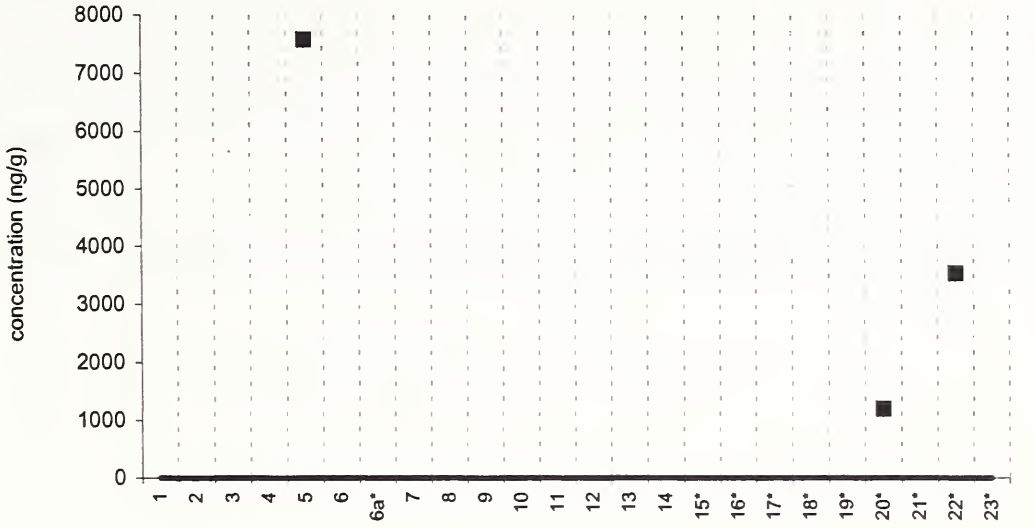
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

20R-5a(H), 14a(H), 17b(H)-cholestane — Air Particulate I (QA01APT01)

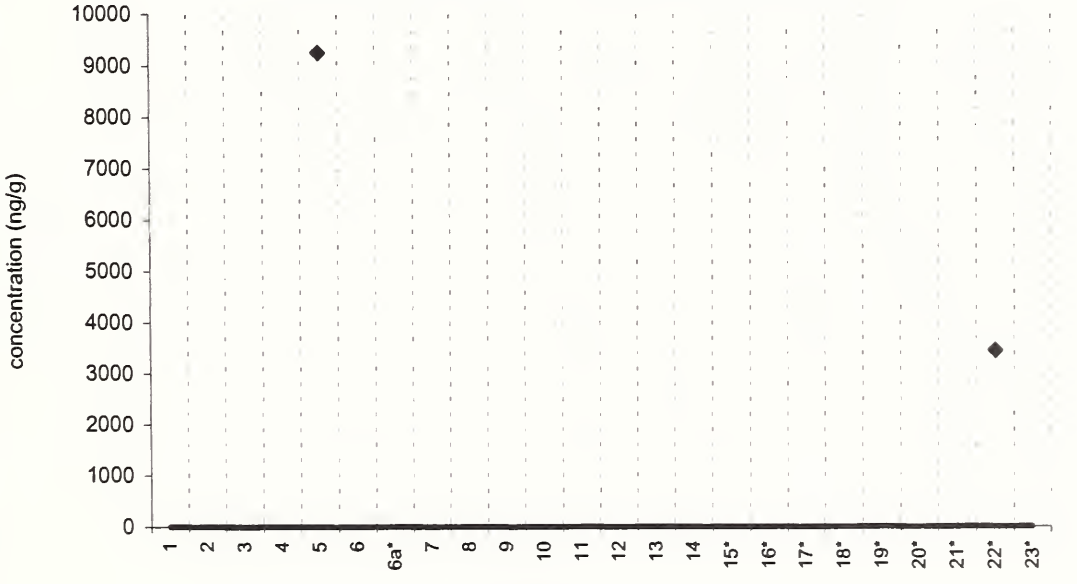
Assigned value = No assigned value ng/g
Reported Results: 3 Quantitative Results: 3



laboratory number
(*data received after initial discussion)

20R-5a(H), 14a(H), 17b(H)-cholestane — SRM 1649a

Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 2

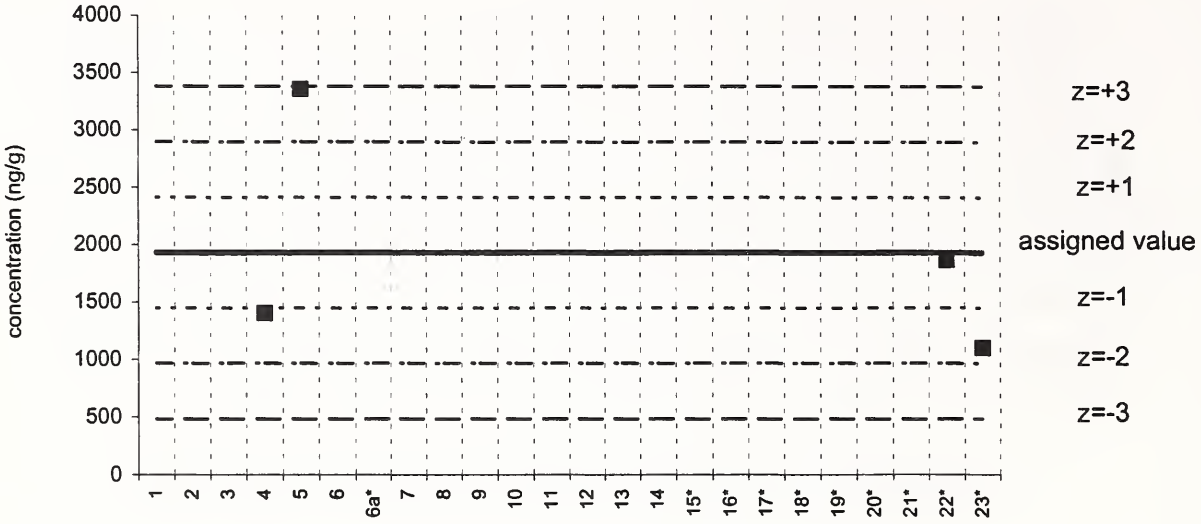


laboratory number
(*data received after initial discussion)

ABB-20R-C28-methylcholestane **Air Particulate I (QA01APT01)**

Assigned value = 1930 ng/g s = 1000 ng/g 95% CL = 1590 ng/g

Reported Results: 4 Quantitative Results: 4

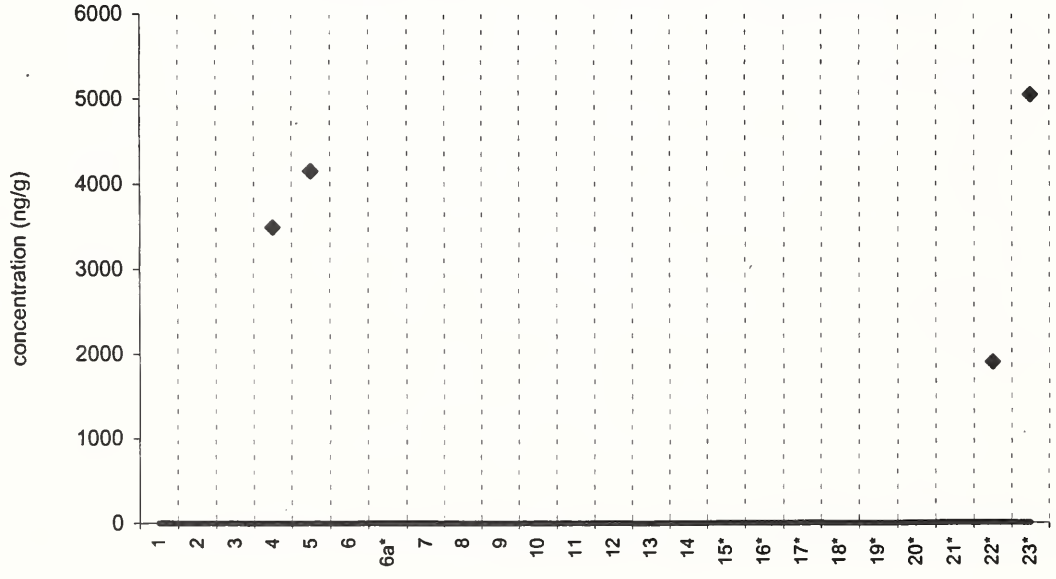


laboratory number
(*data received after initial discussion)

ABB-20R-C28-methylcholestane **SRM 1649a**

Target Value = no target ng/g

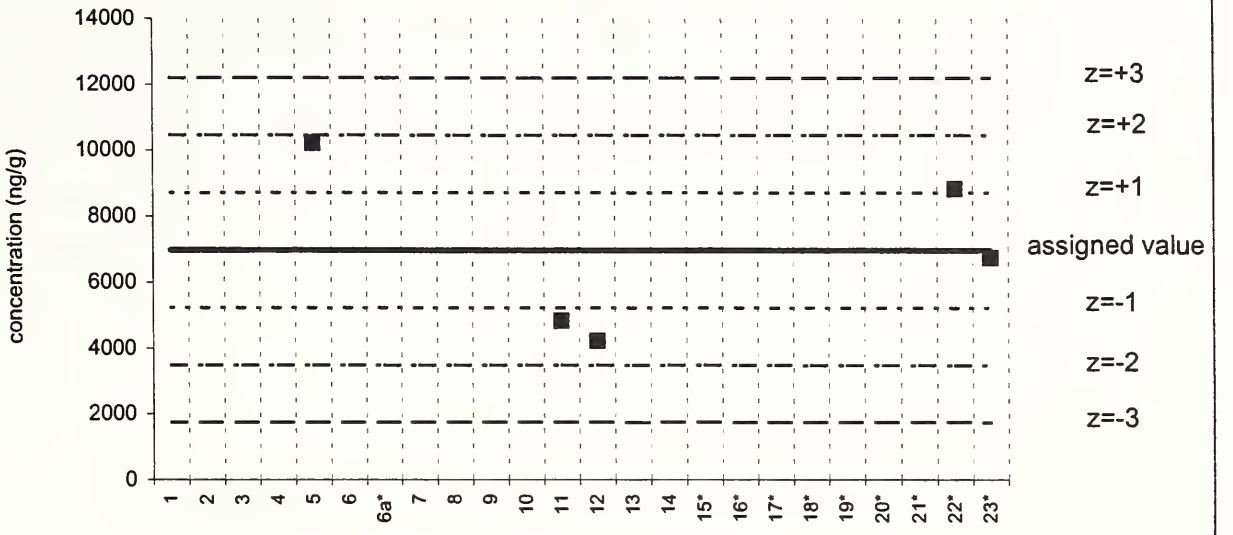
Reported Results: 4 Quantitative Results: 4



laboratory number
(*data received after initial discussion)

22S-17a(H), 21b(H)-30-homohopane — Air Particulate I (QA01APT01)

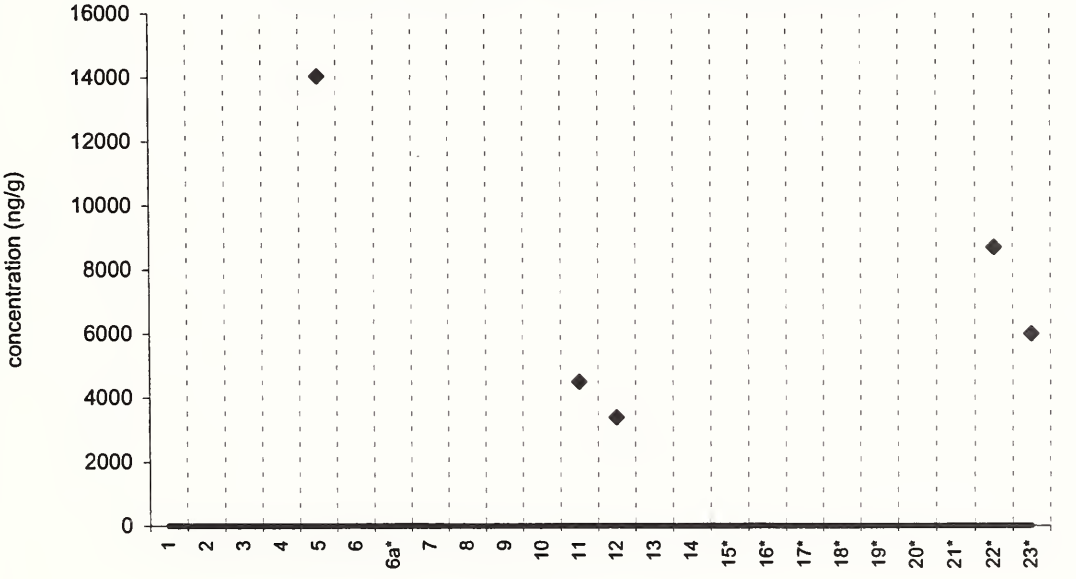
Assigned value = 6968 ng/g s = 2558 ng/g 95% CL = 3177 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22S-17a(H), 21b(H)-30-homohopane — SRM 1649a

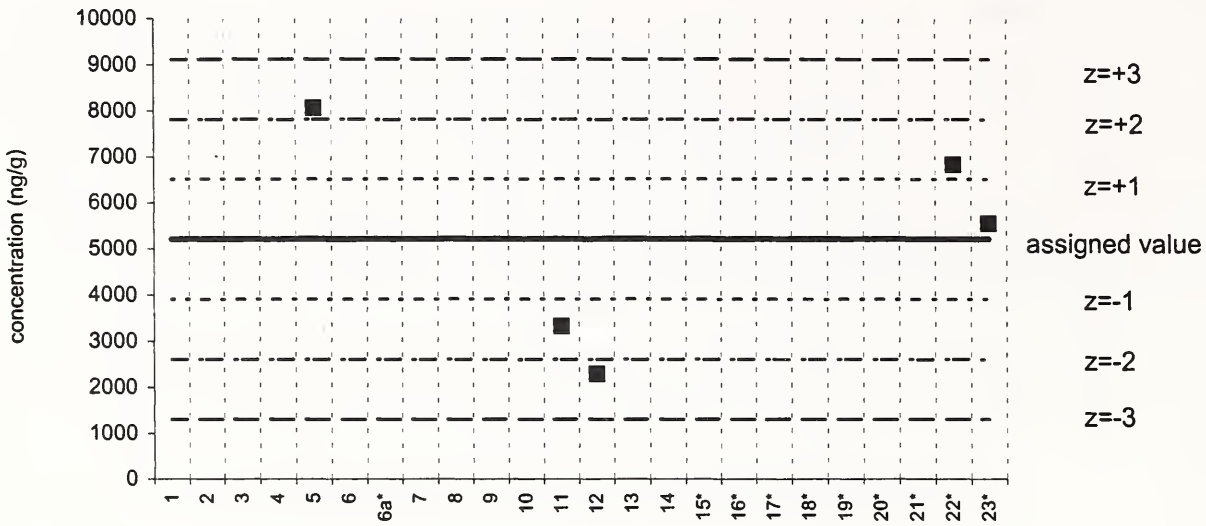
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22R-17a(H), 21b(H)-30-homohopane — Air Particulate I (QA01APT01)

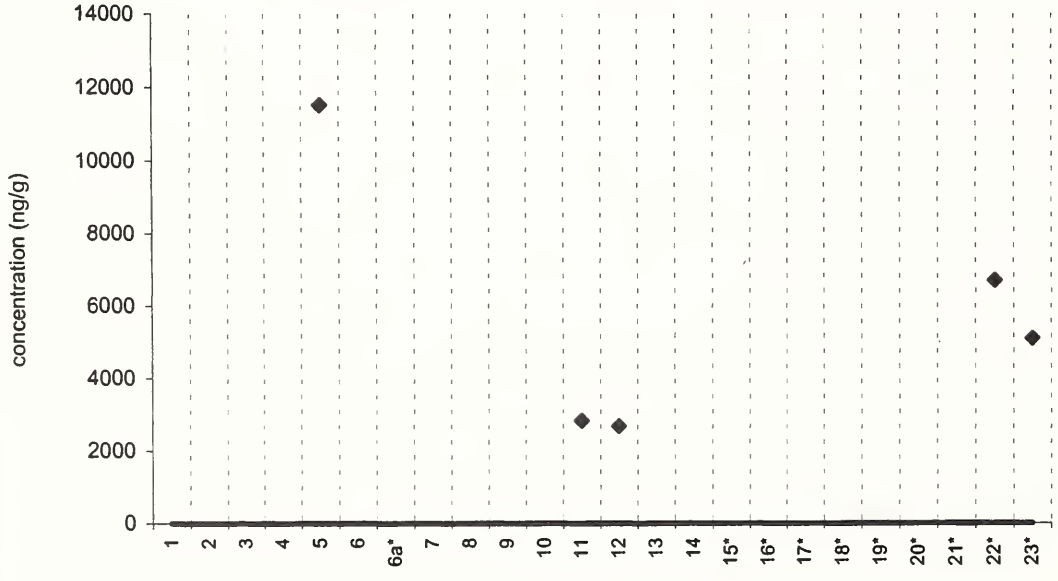
Assigned value = 5210 ng/g s = 2394 ng/g 95% CL = 2973 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22R-17a(H), 21b(H)-30-homohopane — SRM 1649a

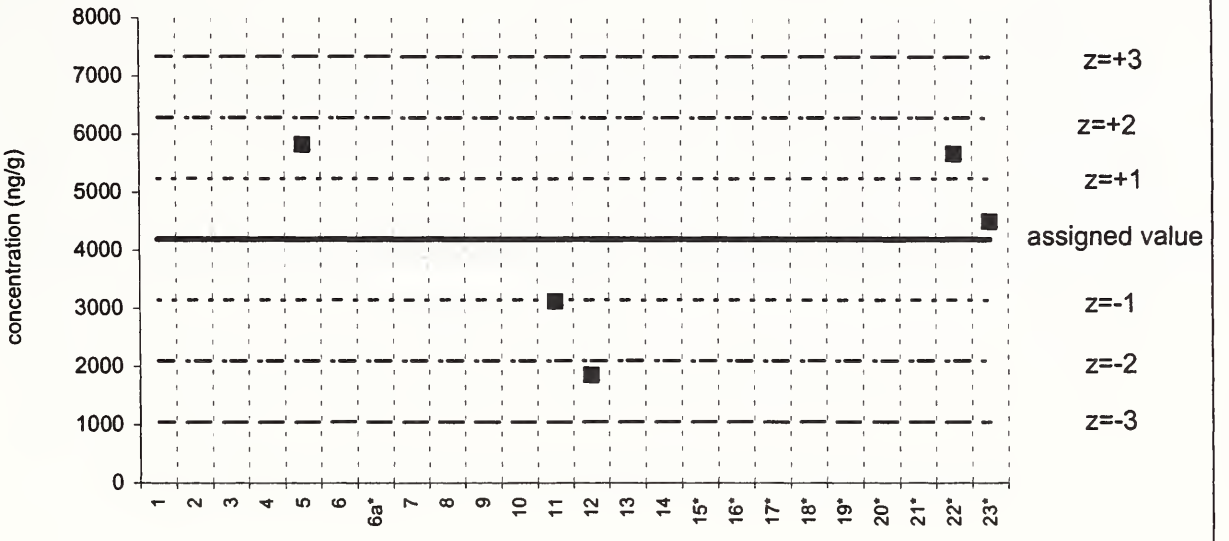
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22S-17a(H), 21b(H)-30-bishomohopane — Air Particulate I (QA01APT01)

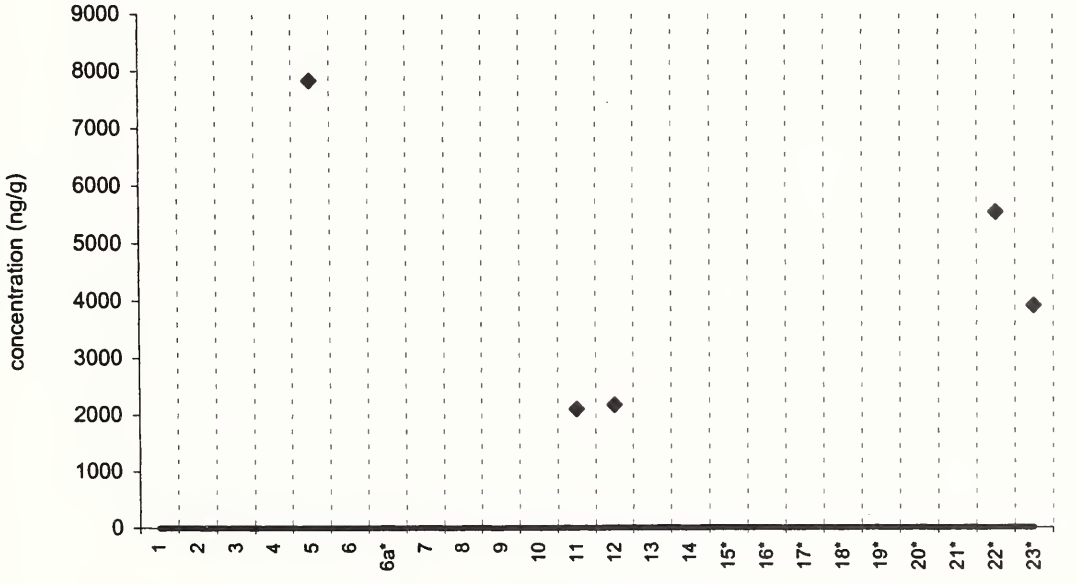
Assigned value = 4193 ng/g s = 1701 ng/g 95% CL = 2112 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22S-17a(H), 21b(H)-30-bishomohopane — SRM 1649a

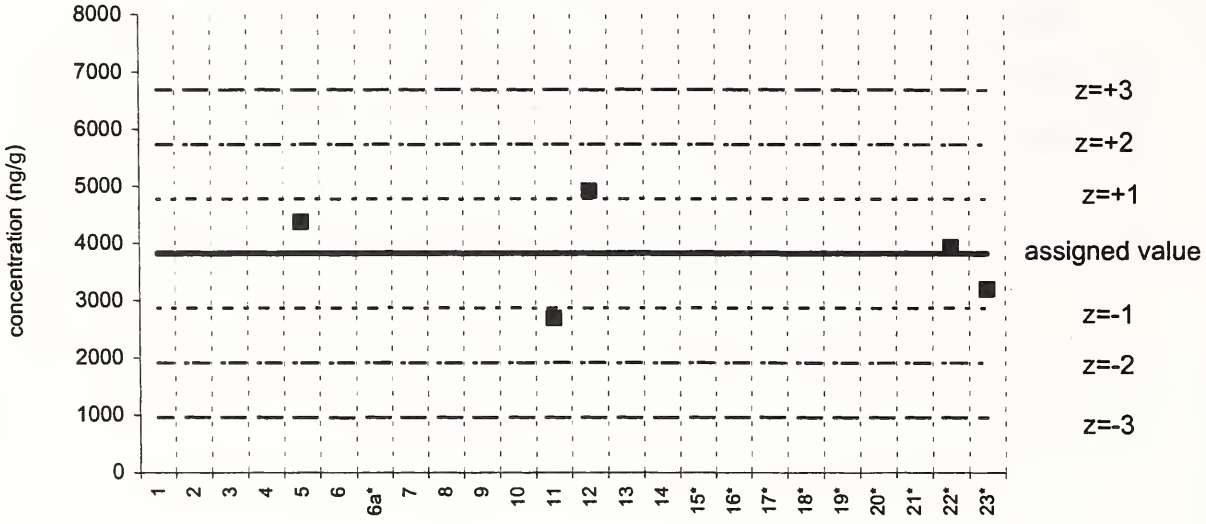
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22R-17a(H), 21b(H)-30-bishomohopane — Air Particulate I (QA01APT01)

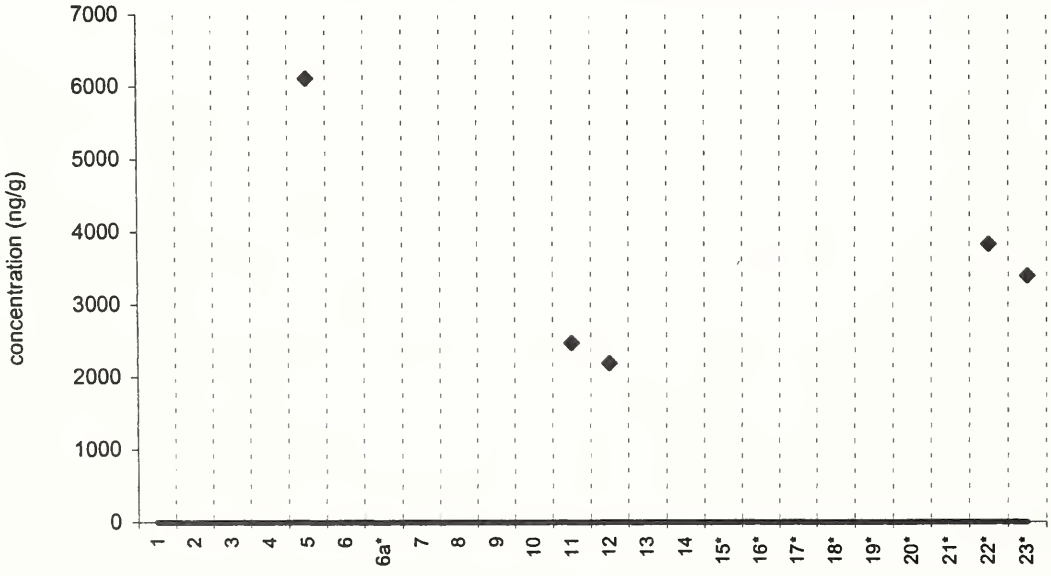
Assigned value = 3822 ng/g s = 892 ng/g 95% CL = 1107 ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

22R-17a(H), 21b(H)-30-bishomohopane — SRM 1649a

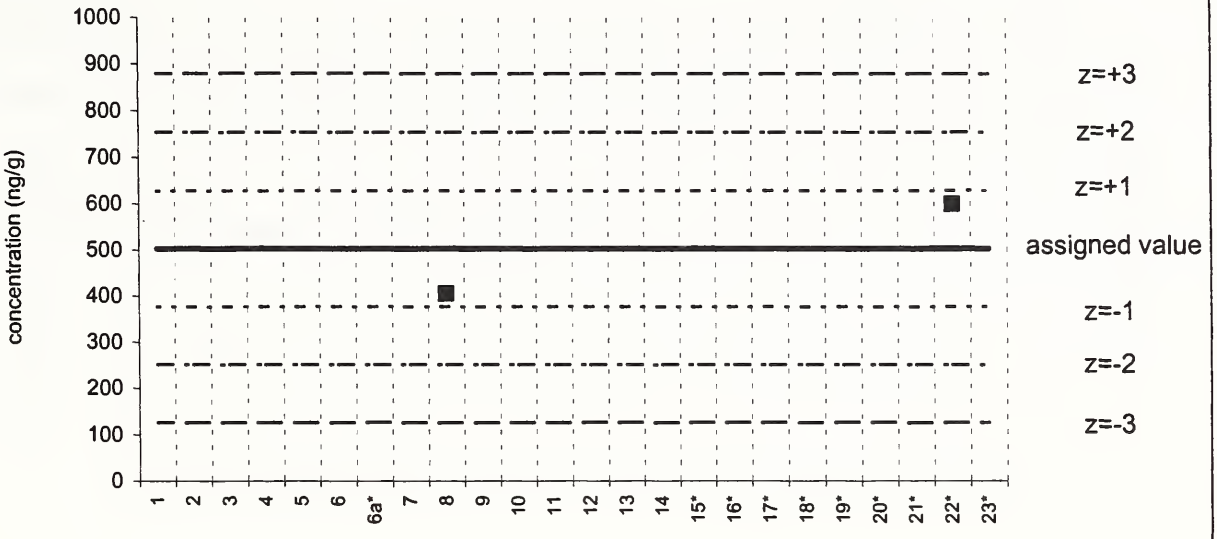
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



laboratory number
(*data received after initial discussion)

pristane **Air Particulate I (QA01APT01)**

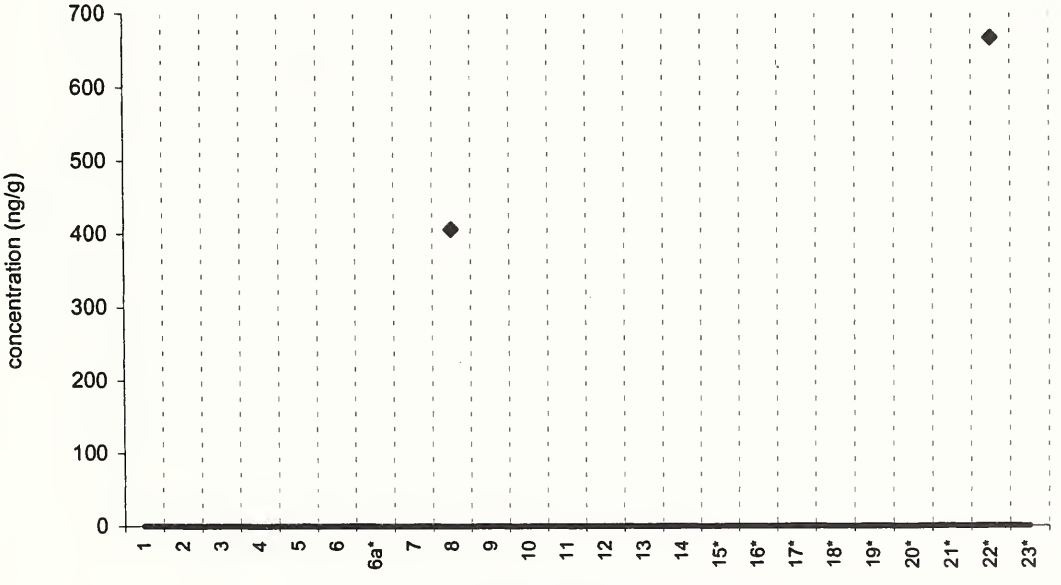
Assigned value = 503 ng/g s = not calc. ng/g 95% CL = not calc. ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

pristane **SRM 1649a**

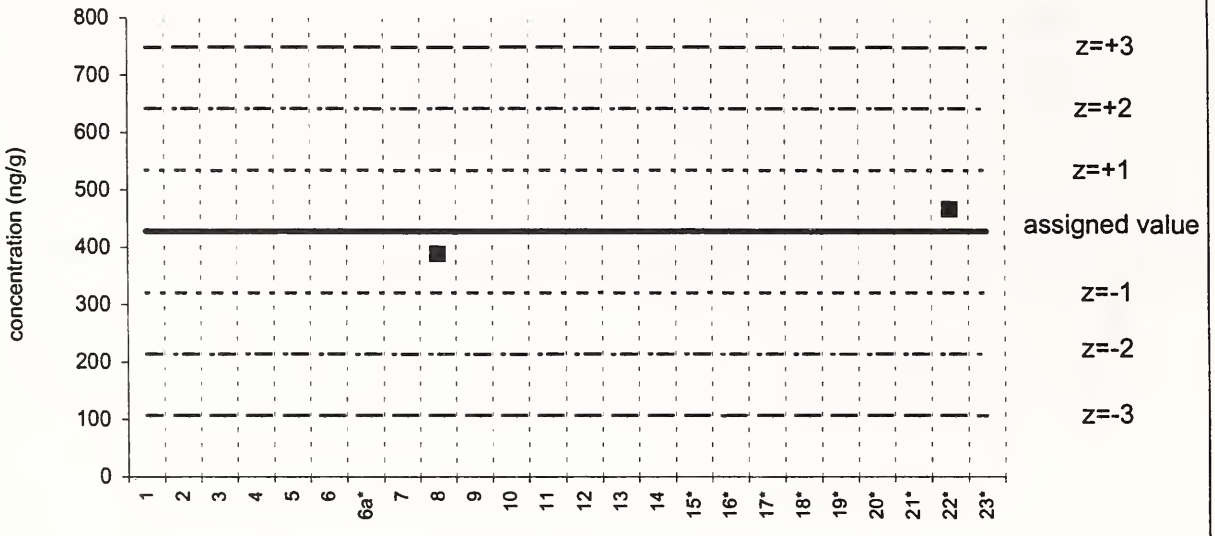
Target Value = no target ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

phytane **Air Particulate I (QA01APT01)**

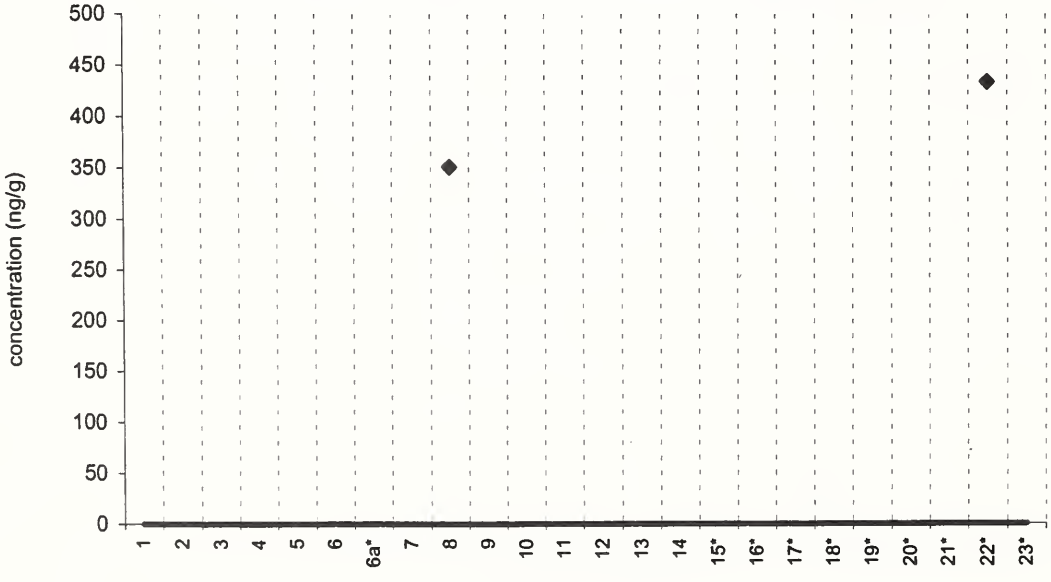
Assigned value = 428 ng/g s = not calc. ng/g 95% CL = not calc. ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

phytane **SRM 1649a**

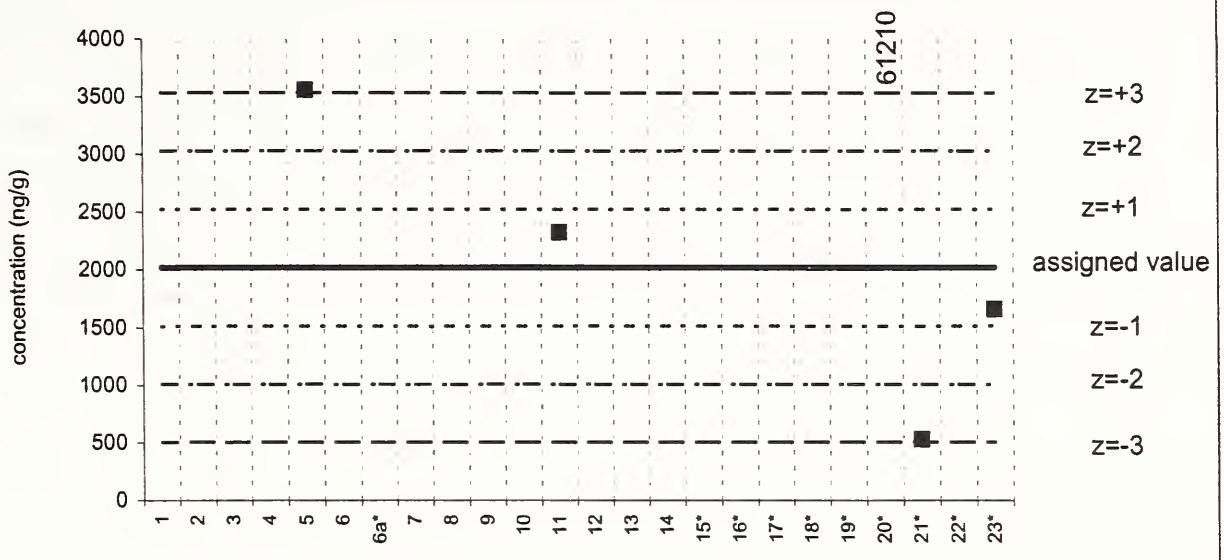
Target Value = no target ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

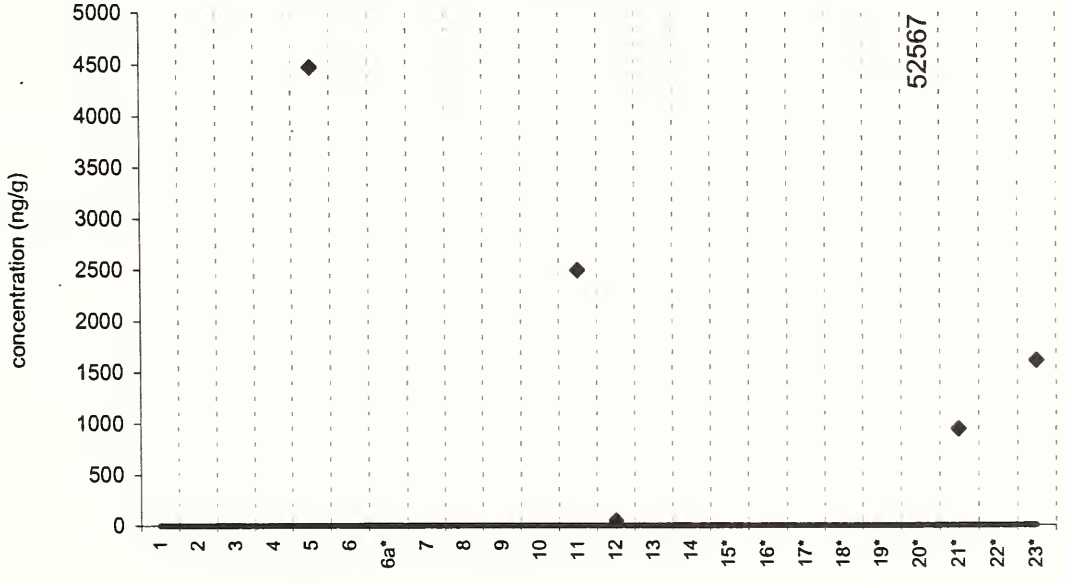
benzanthrone **Air Particulate I (QA01APT01)**

Assigned value = 2019 ng/g s = 1266 ng/g 95% CL = 2014 ng/g
Reported Results: 6 Quantitative Results: 5



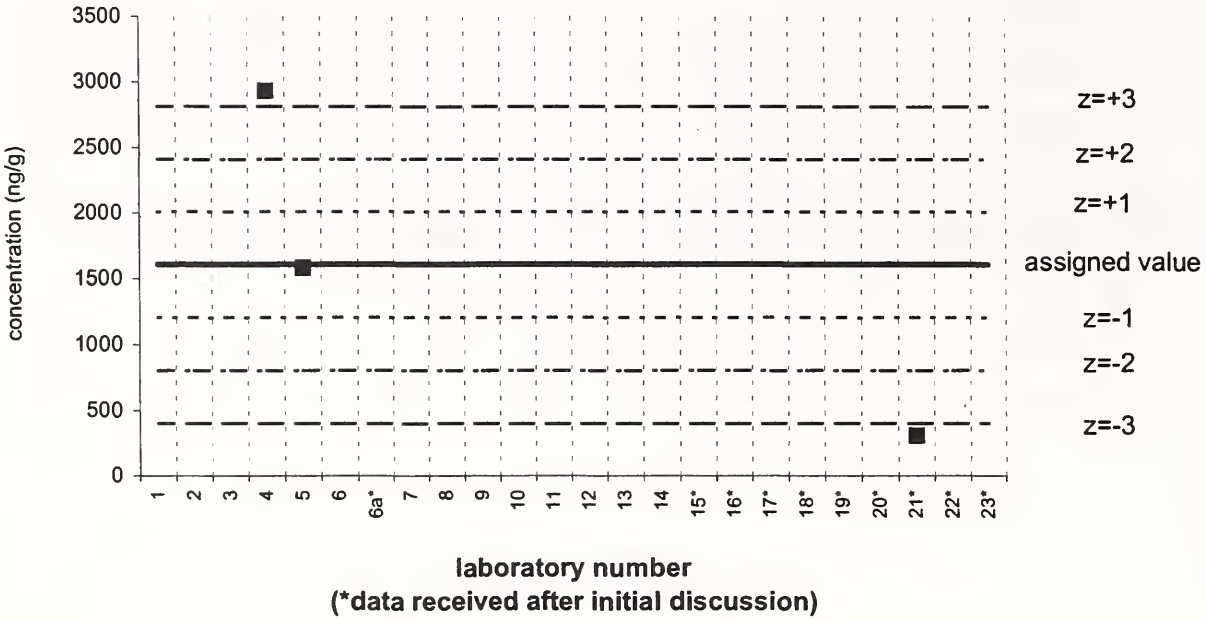
benzanthrone **SRM 1649a**

Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



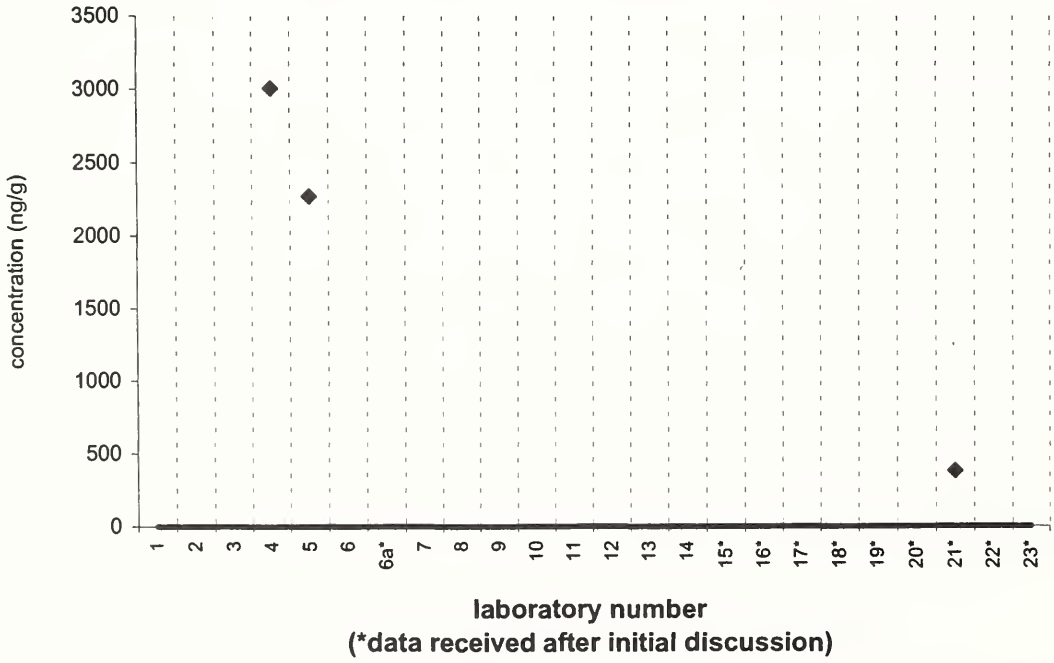
9-fluorenone **Air Particulate I (QA01APT01)**

Assigned value = 1607 ng/g s = 1312 ng/g 95% CL = not calc. ng/g
Reported Results: 4 Quantitative Results: 3



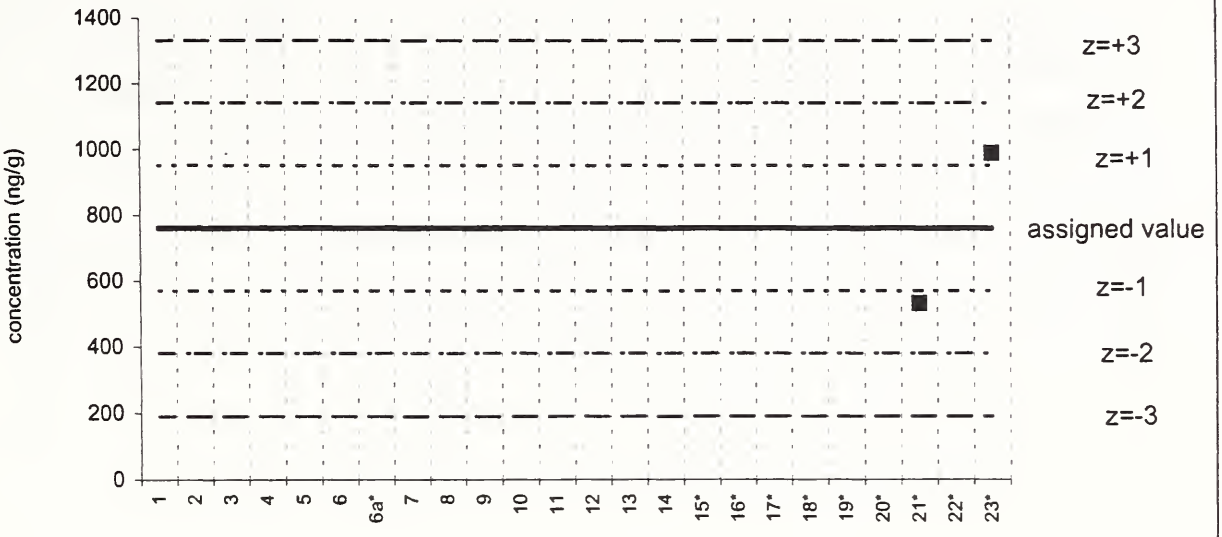
9-fluorenone **SRM 1649a**

Target Value = no target ng/g
Reported Results: 4 Quantitative Results: 3



anthroquinone **Air Particulate I (QA01APT01)**

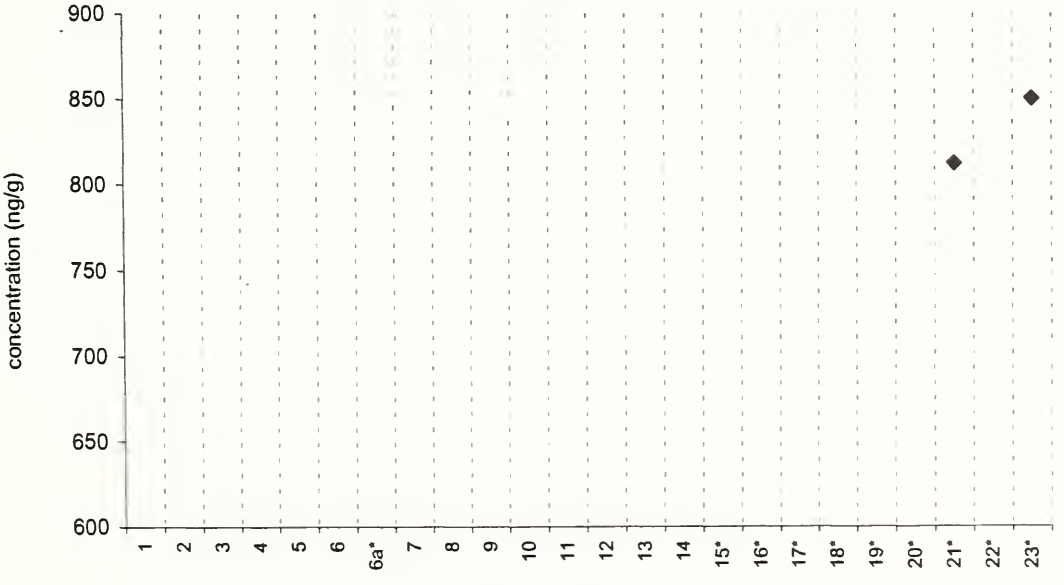
Assigned value = 762 ng/g s = not calc. ng/g 95% CL = not calc. ng/g
Reported Results: 2 Quantitative Results: 2



laboratory number
(*data received after initial discussion)

anthroquinone **SRM 1649a**

Target Value = no target ng/g
Reported Results: 2 Quantitative Results: 2

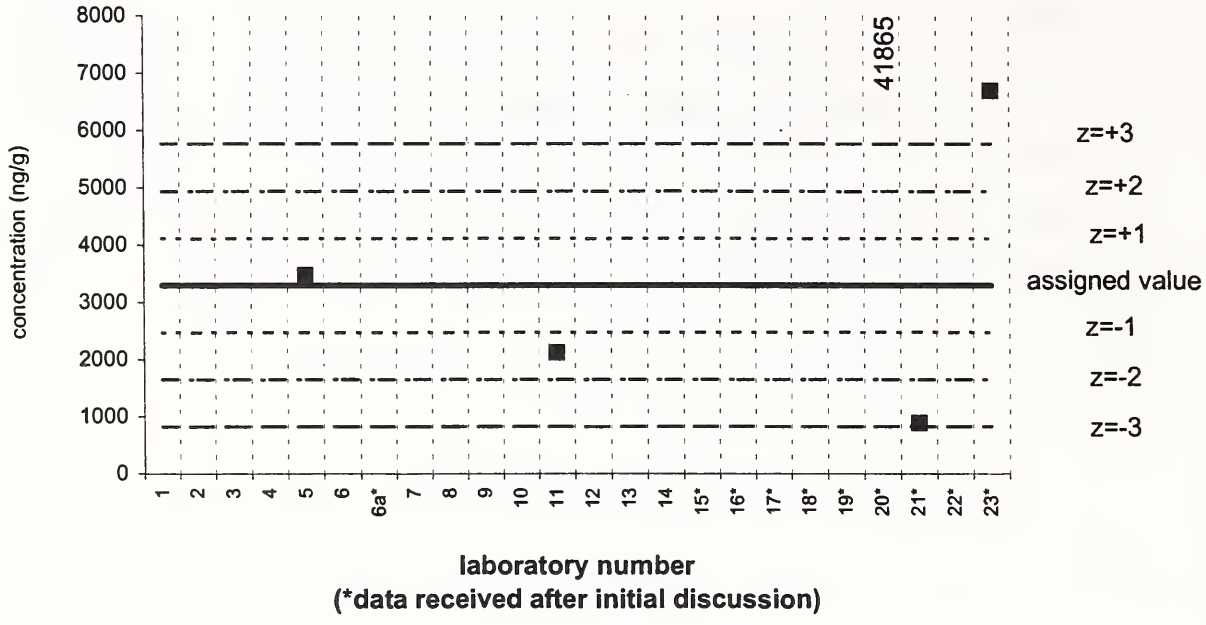


laboratory number
(*data received after initial discussion)

benz[a]anthracene-7, 12-dione **Air Particulate I (QA01APT01)**

Assigned value = 3295 ng/g s = 2505 ng/g 95% CL = 3985 ng/g

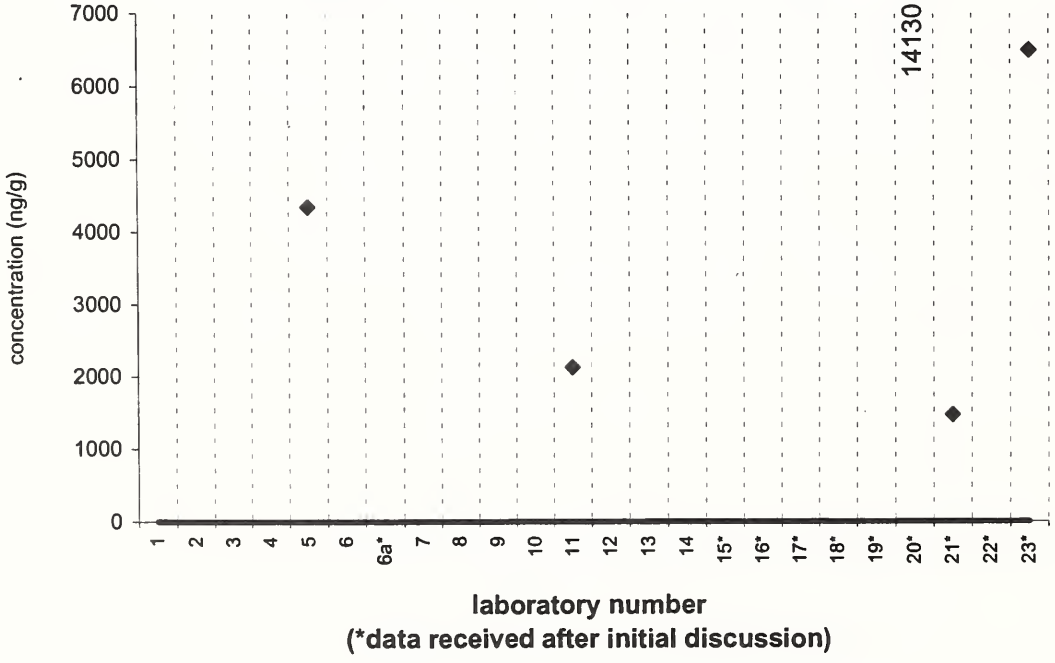
Reported Results: 5 Quantitative Results: 5



benz[a]anthracene-7, 12-dione **SRM 1649a**

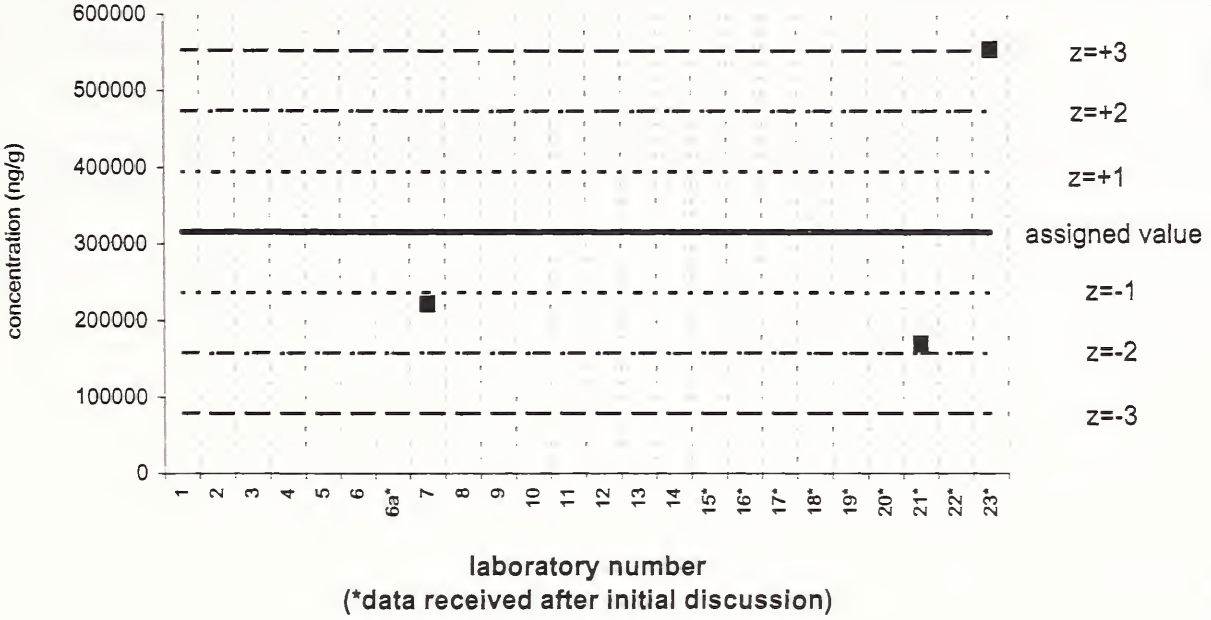
Target Value = no target ng/g

Reported Results: 5 Quantitative Results: 5



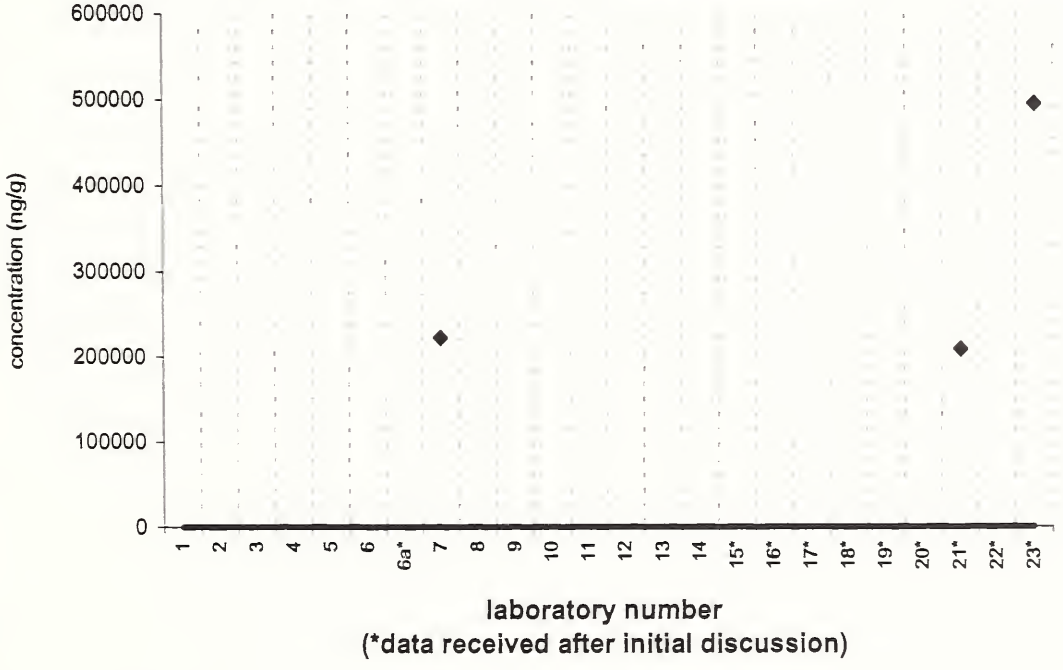
hexadecanoic acid **Air Particulate I (QA01APT01)**

Assigned value = 315896 ng/g s = 208695 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



hexadecanoic acid **SRM 1649a**

Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3



Appendix F

Charts of PM 2.5 Interim RM and SRM 1649a Results by Analyte

See Tables 9 and 10 for results reported as <*number*, detection limit, etc.
Charts for analytes with only one reported numerical result are not included in this appendix.

For PM 2.5 Interim RM plots:

Solid line: exercise assigned value

Dotted line: z = ± 1, i. e., 25 % from assigned value

Dotted/dashed line: z = ± 2, i. e., 50 % from assigned value

Dashed line: z = ± 3, i. e., 75 % from assigned value

For SRM 1649a plots:

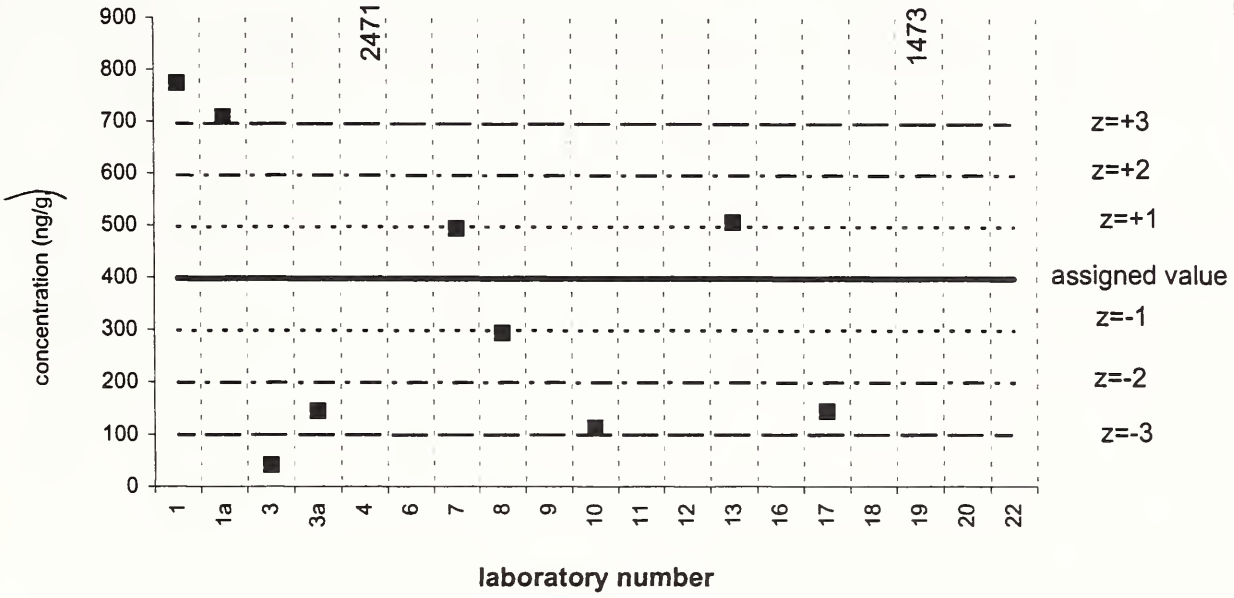
Solid line: material certified concentration or target value (see caption of each plot)

Dotted line: 95 % confidence interval (CI)

Dashed line: 30 % from 95 % confidence interval (CI)

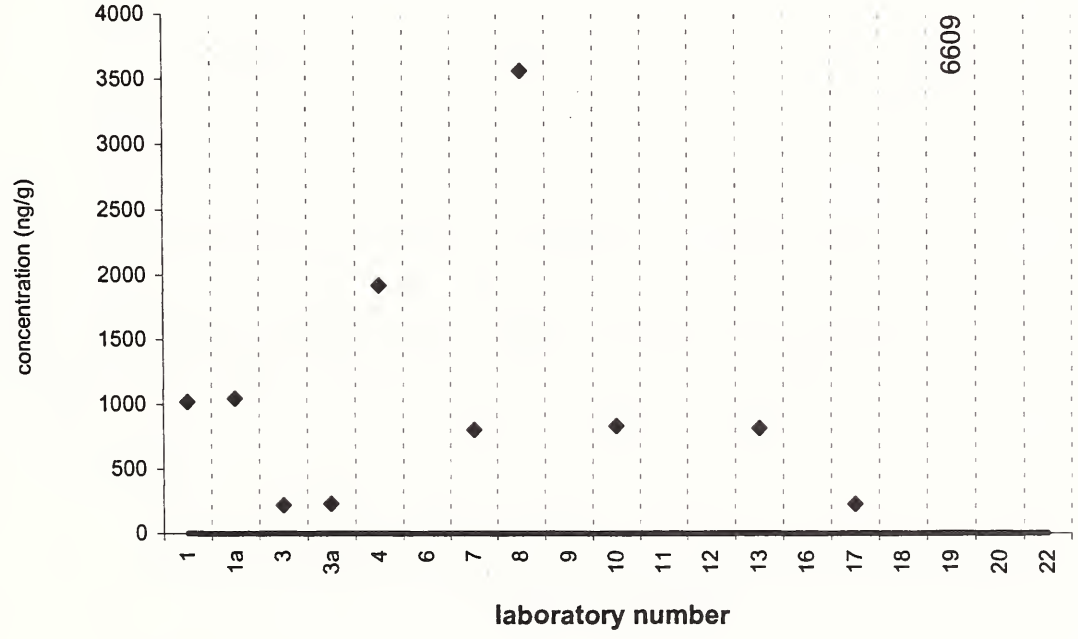
naphthalene **PM 2.5 Interim RM**

Assigned value = 397 ng/g s = 262 ng/g 95% CL = 219 ng/g
Reported Results: 11 Quantitative Results: 11



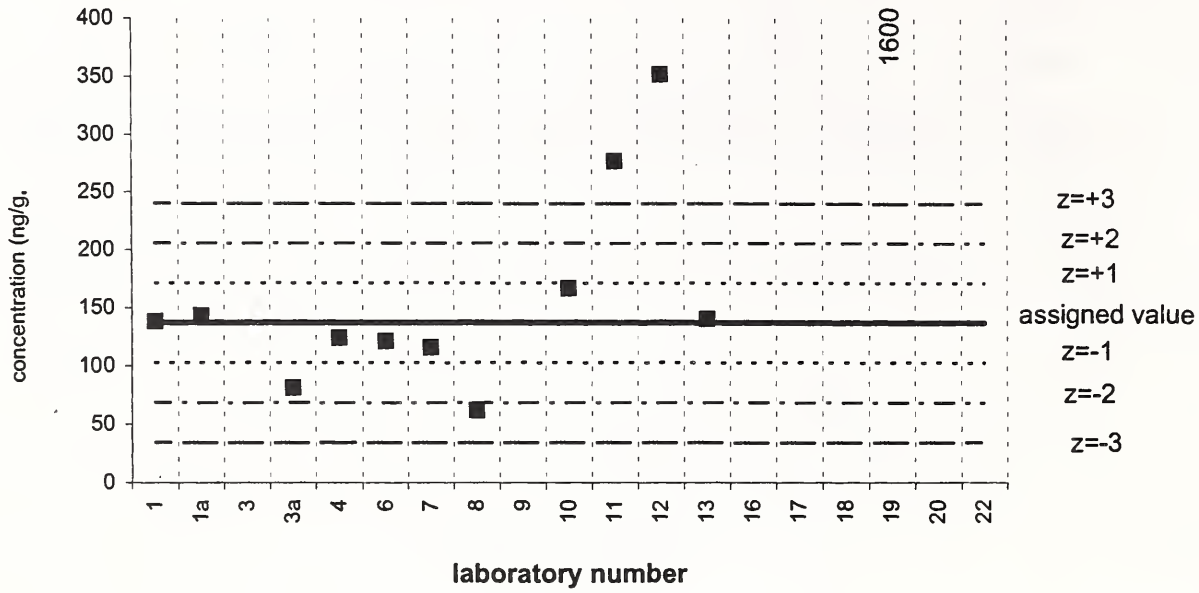
naphthalene **SRM 1649a**

Target Value = no target ng/g
Reported Results: 11 Quantitative Results: 11



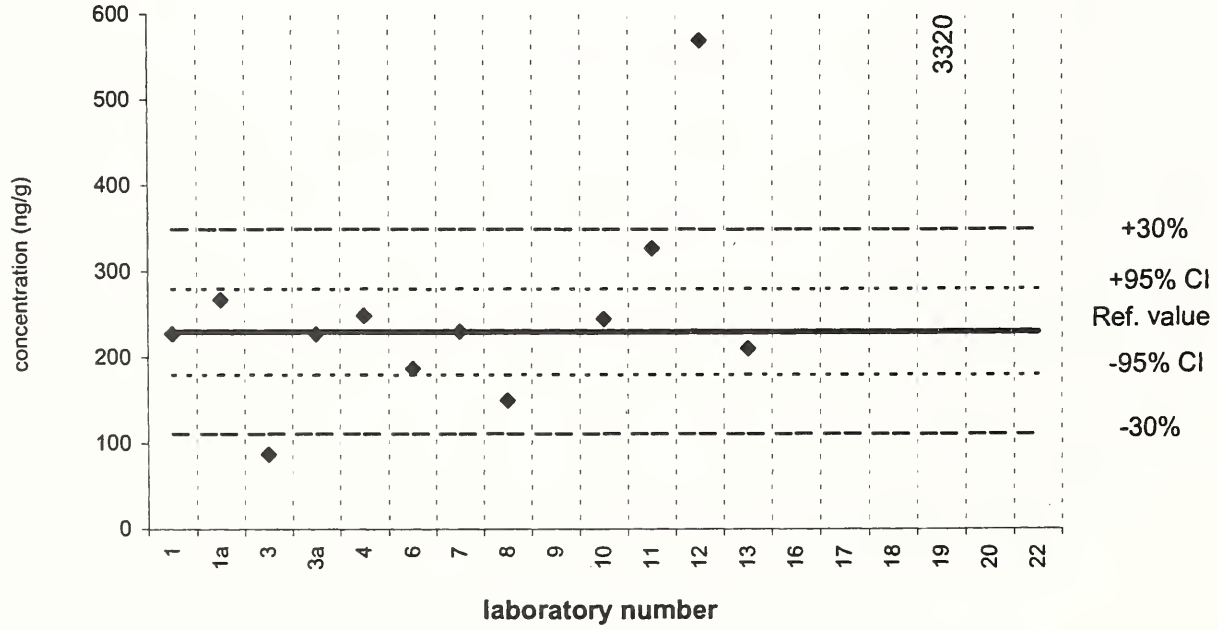
fluorene **PM 2.5 Interim RM**

Assigned value = 137 ng/g s = 58 ng/g 95% CL = 41 ng/g
Reported Results: 13 Quantitative Results: 12



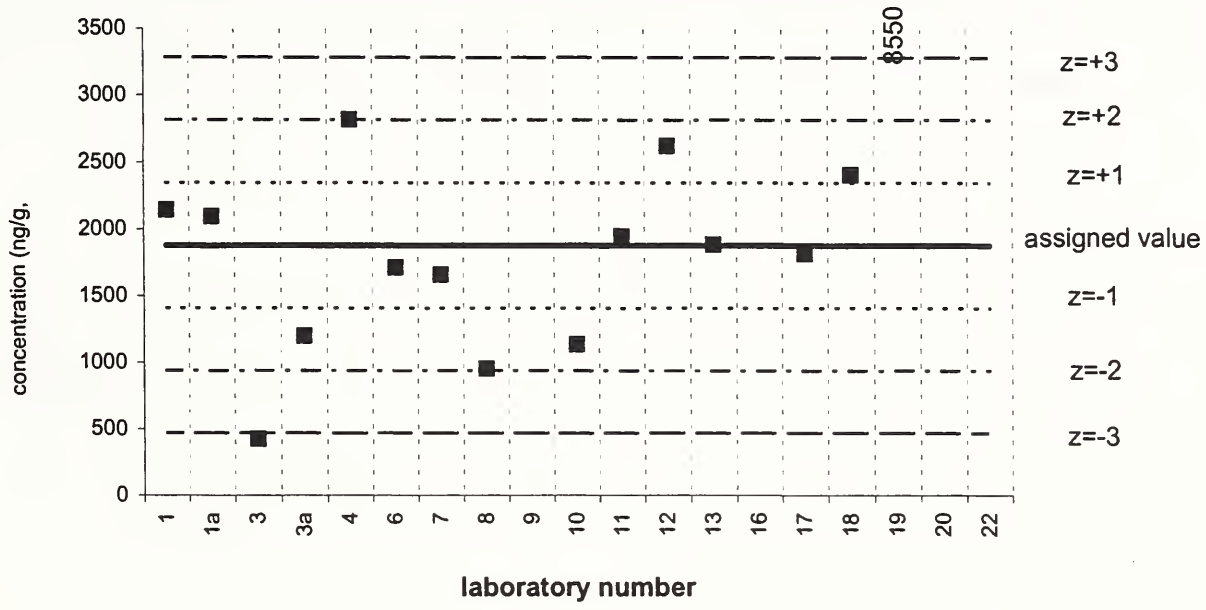
fluorene **SRM 1649a**

Reference Value = 230 ± 50 ng/g
Reported Results: 13 Quantitative Results: 13



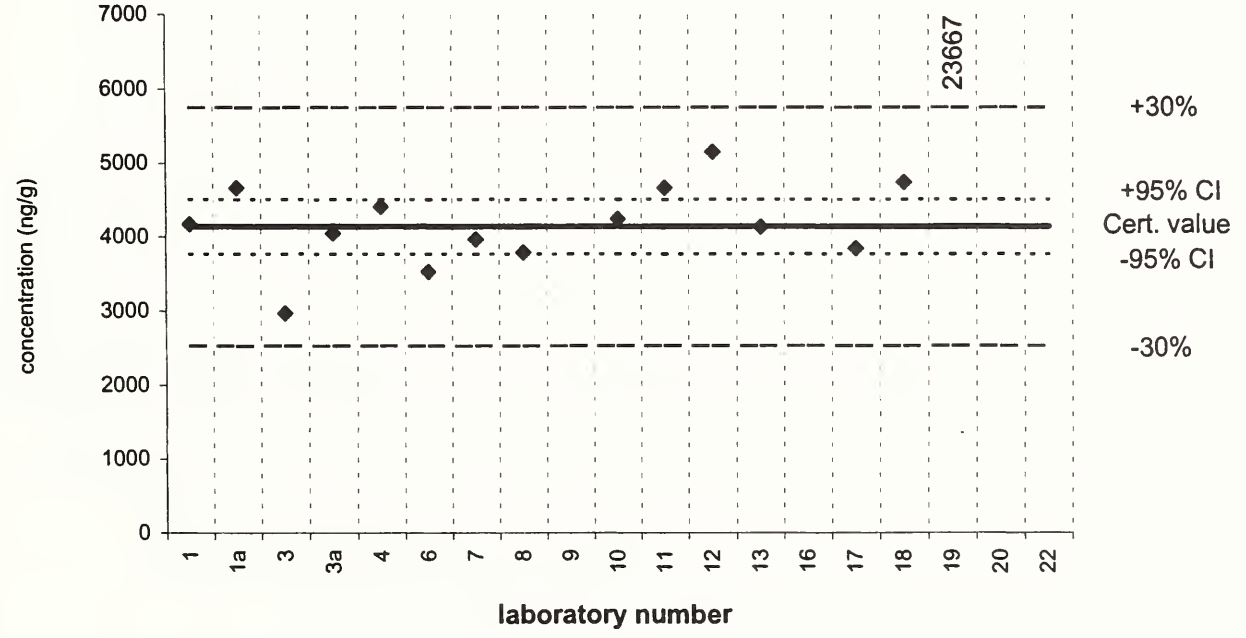
phenanthrene **PM 2.5 Interim RM**

Assigned value = 1877 ng/g s = 562 ng/g 95% CL = 339 ng/g
Reported Results: 15 Quantitative Results: 15



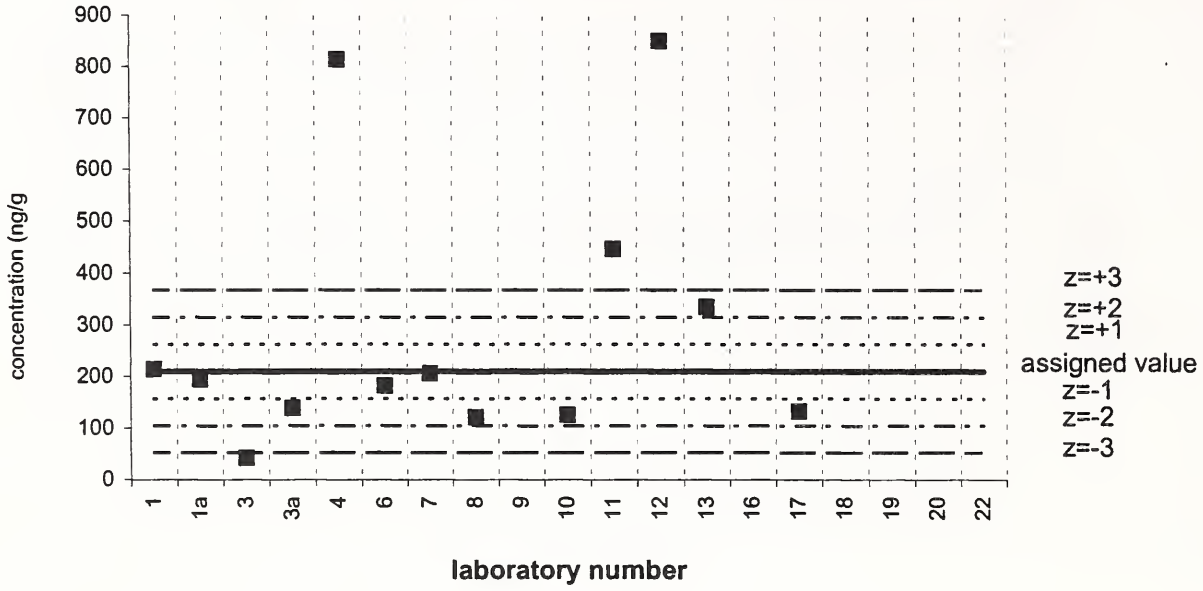
phenanthrene **SRM 1649a**

Certified Value = 4140 ± 370 ng/g
Reported Results: 15 Quantitative Results: 15



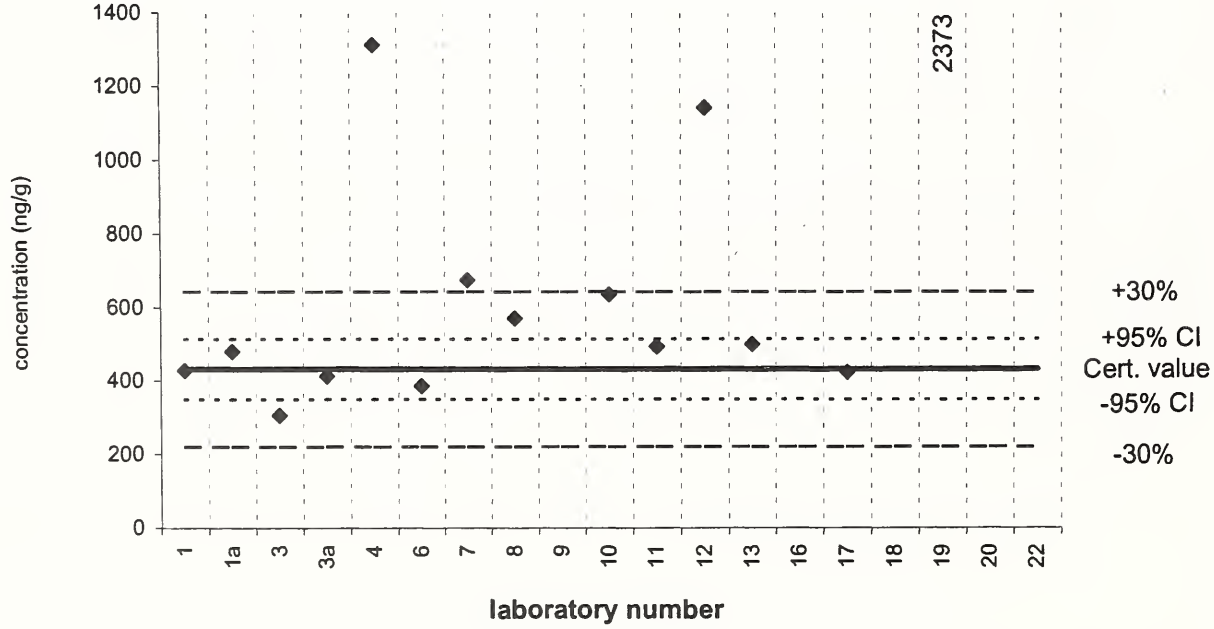
anthracene **PM 2.5 Interim RM**

Assigned value = 210 ng/g s = 105 ng/g 95% CL = 75 ng/g
Reported Results: 13 Quantitative Results: 13



anthracene **SRM 1649a**

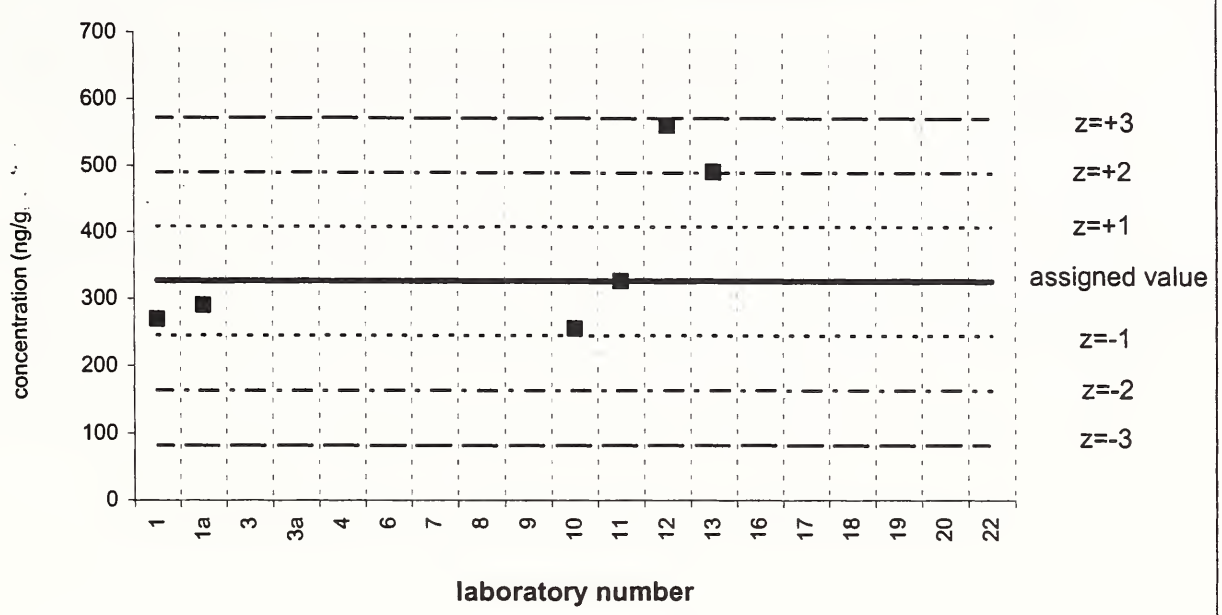
Certified Value = 432 ± 82 ng/g
Reported Results: 14 Quantitative Results: 14



1-methylphenanthrene

PM 2.5 Interim RM

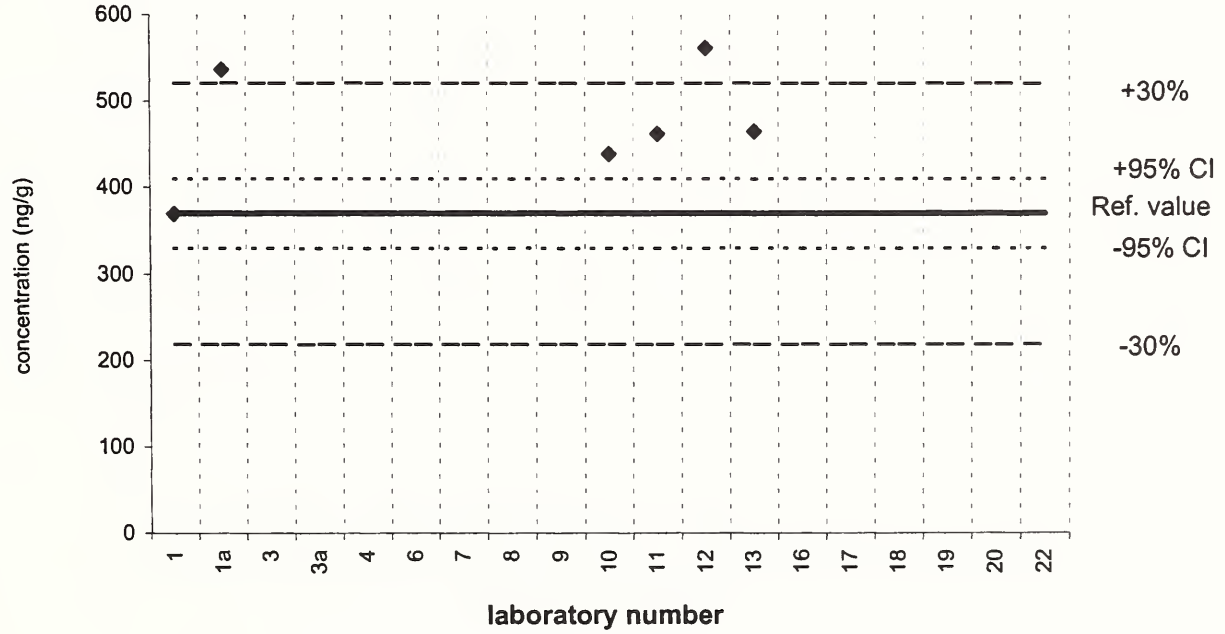
Assigned value = 327 ng/g s = 96 ng/g 95% CL = 119 ng/g
Reported Results: 6 Quantitative Results: 6



1-methylphenanthrene

SRM 1649a

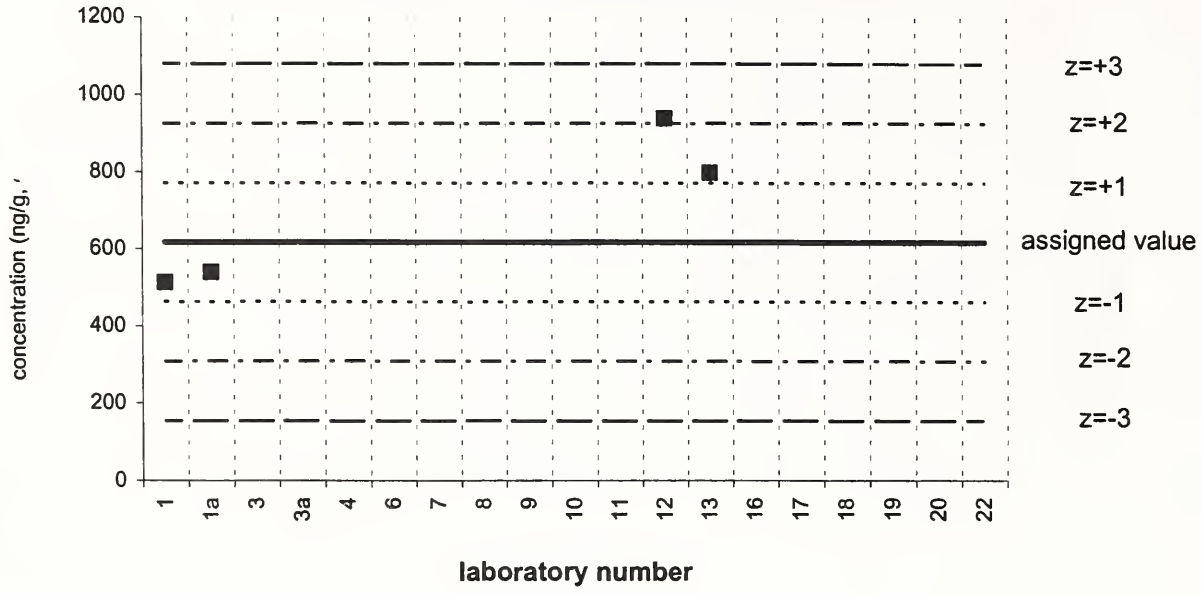
Reference Value = 370 ± 40 ng/g
Reported Results: 6 Quantitative Results: 6



2-methylphenanthrene

PM 2.5 Interim RM

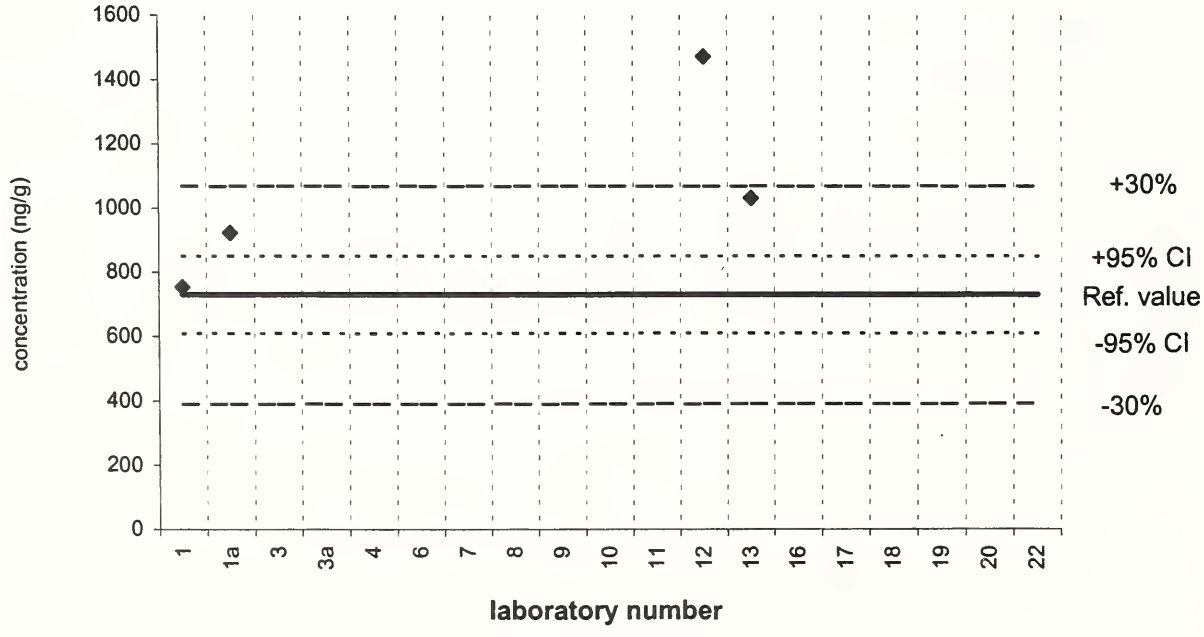
Assigned value = 617 ng/g s = 158 ng/g 95% CL = not calc. ng/g
Reported Results: 4 Quantitative Results: 4



2-methylphenanthrene

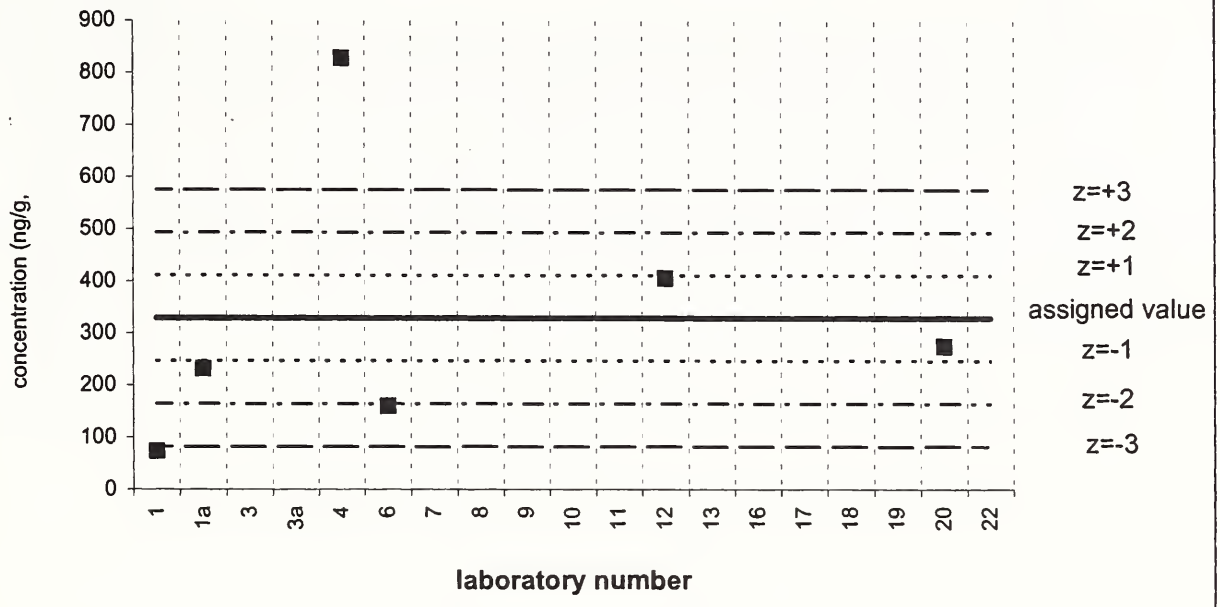
SRM 1649a

Reference Value = 730 ± 120 ng/g
Reported Results: 4 Quantitative Results: 4



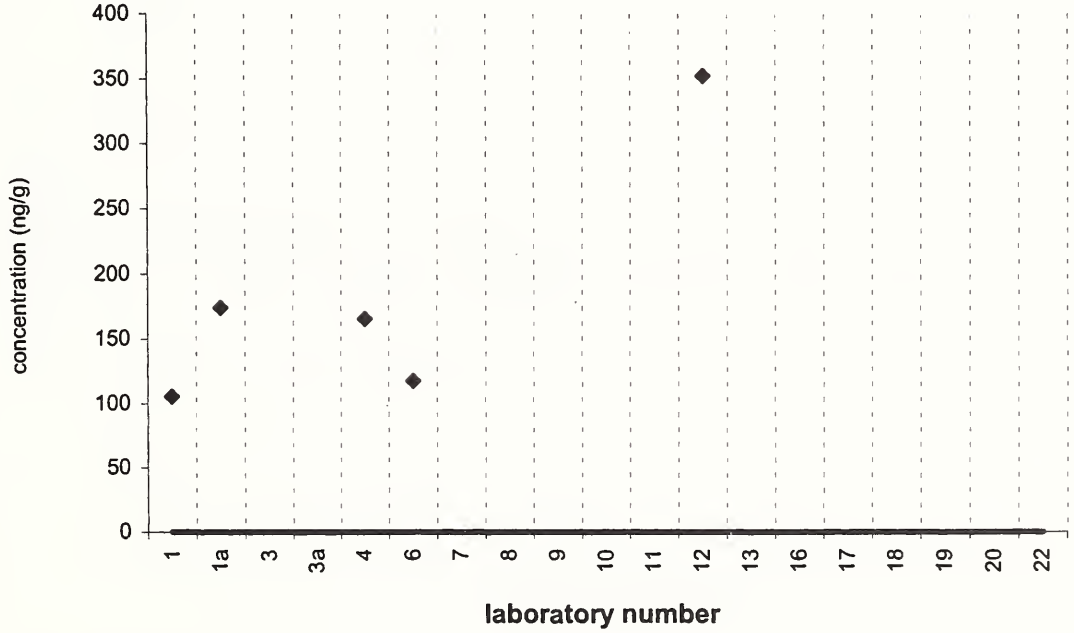
retene **PM 2.5 Interim RM**

Assigned value = 329 ng/g s = 269 ng/g 95% CL = 282 ng/g
Reported Results: 7 Quantitative Results: 6



retene **SRM 1649a**

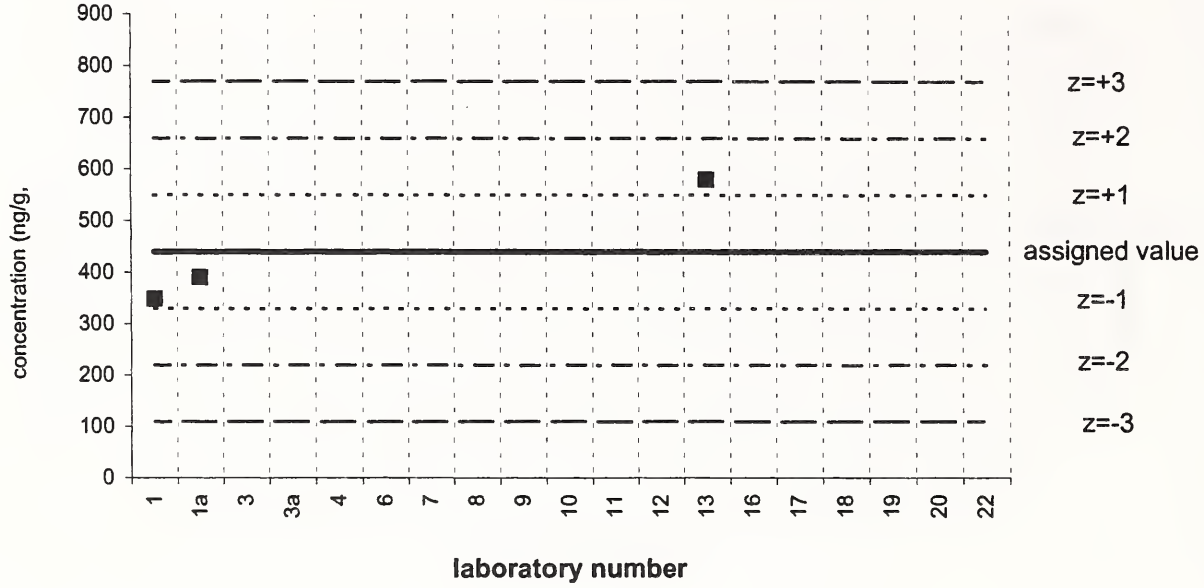
Target Value = no target ng/g
Reported Results: 7 Quantitative Results: 5



3-methylphenanthrene

PM 2.5 Interim RM

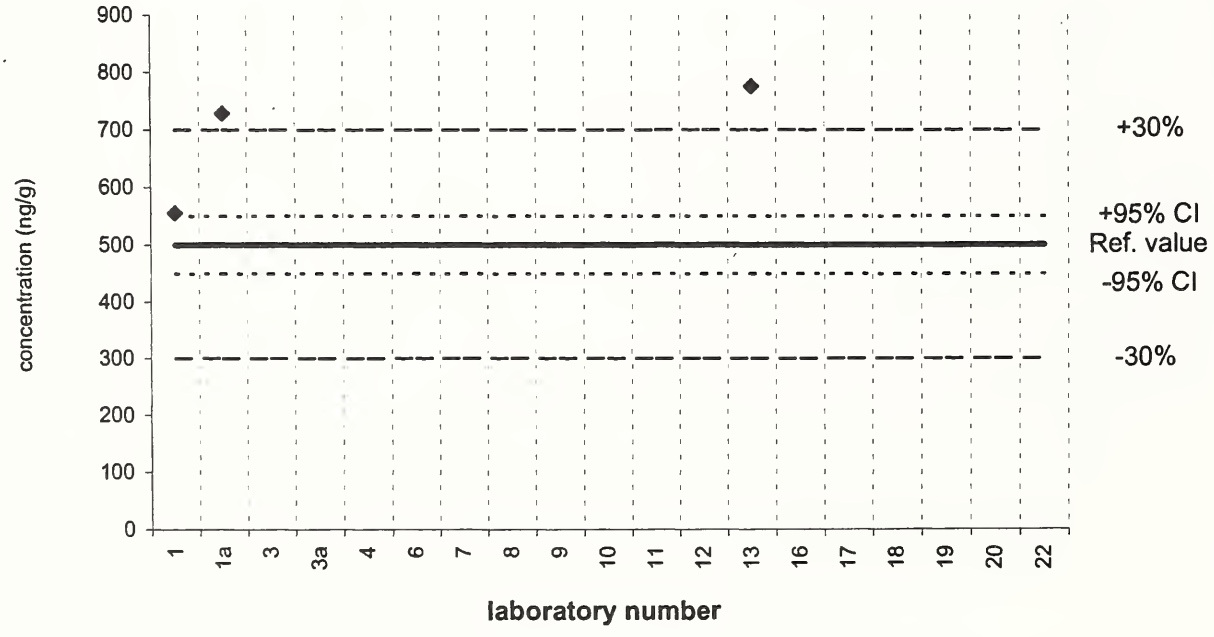
Assigned value = 440 ng/g s = 123 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



3-methylphenanthrene

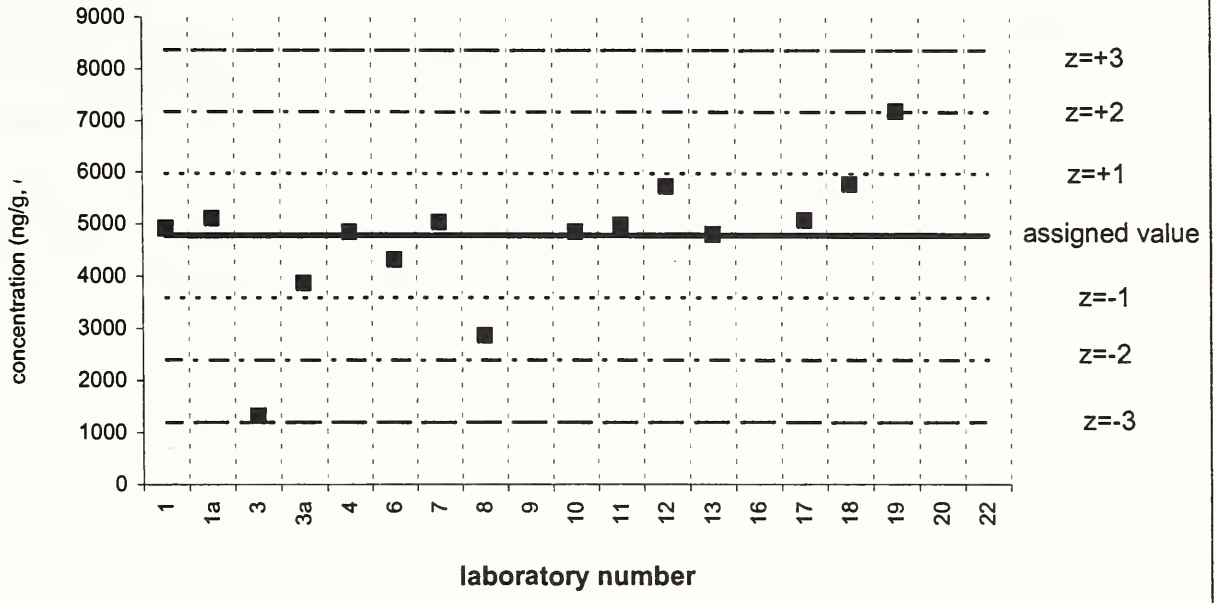
SRM 1649a

Reference Value = 500 ± 50 ng/g
Reported Results: 3 Quantitative Results: 3



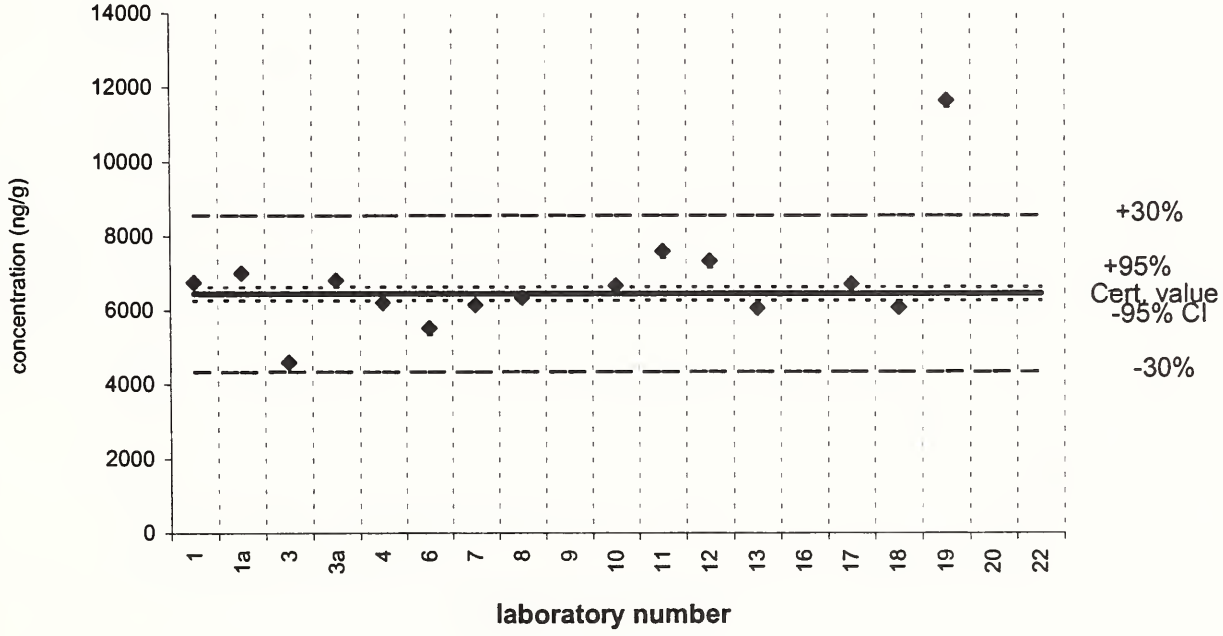
fluoranthene **PM 2.5 Interim RM**

Assigned value = 4780 ng/g s = 758 ng/g 95% CL = 458 ng/g
Reported Results: 15 Quantitative Results: 15



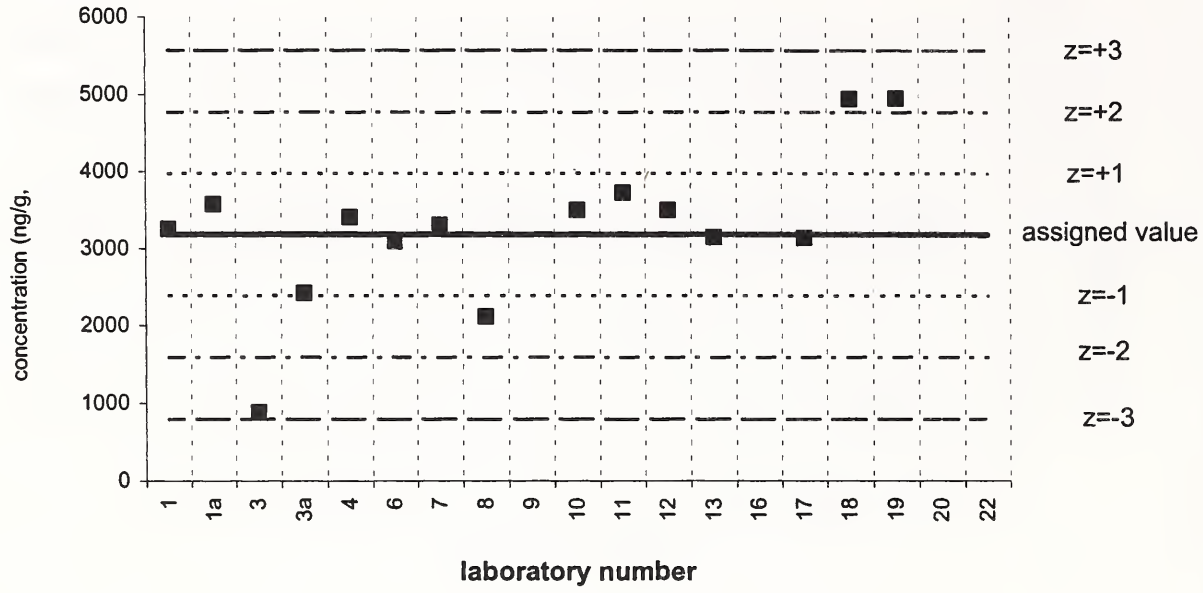
fluoranthene **SRM 1649a**

Certified Value = 6450 ± 180 ng/g
Reported Results: 15 Quantitative Results: 15



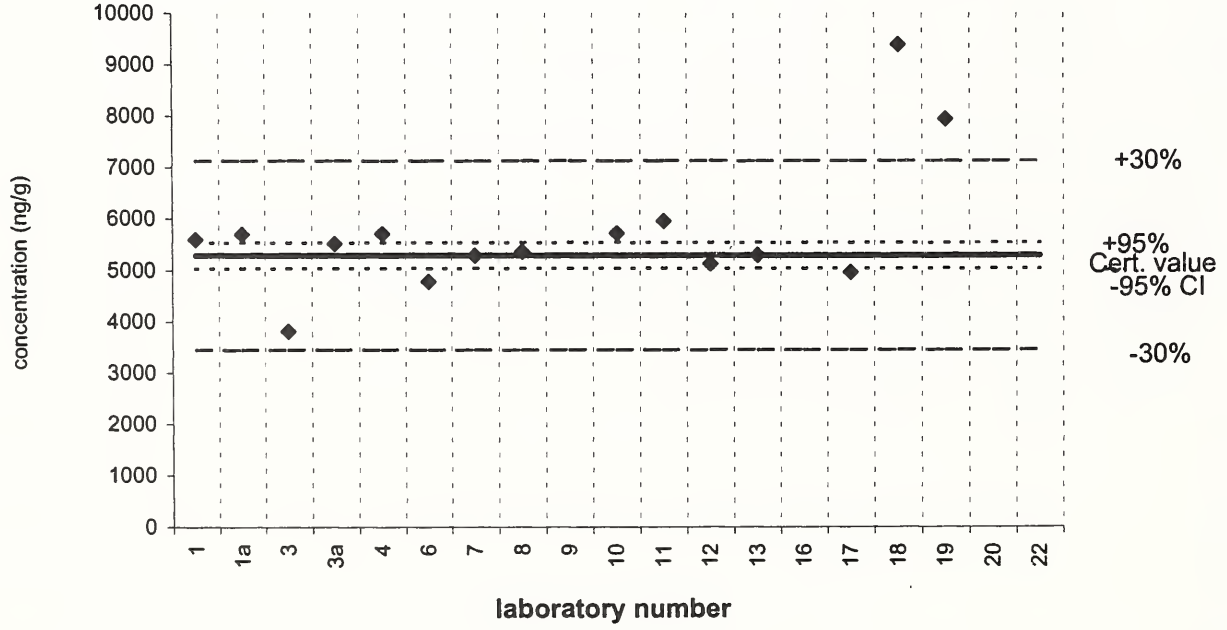
pyrene **PM 2.5 Interim RM**

Assigned value = 3183 ng/g s = 472 ng/g 95% CL = 300 ng/g
Reported Results: 15 Quantitative Results: 15



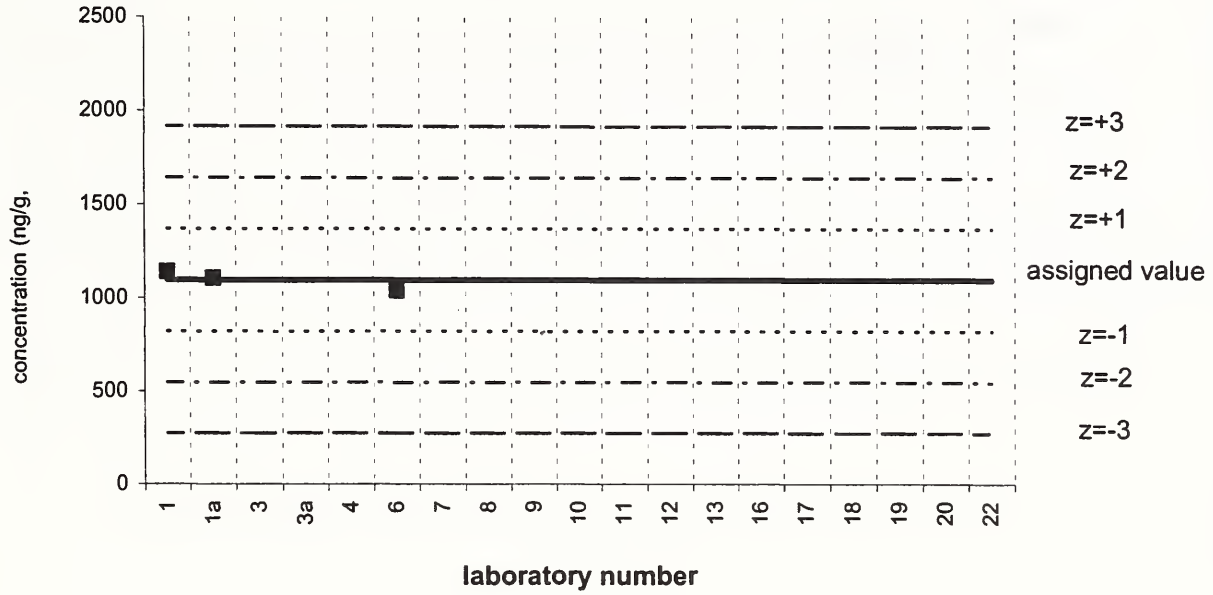
pyrene **SRM 1649a**

Certified Value = 5290 ± 250 ng/g
Reported Results: 15 Quantitative Results: 15



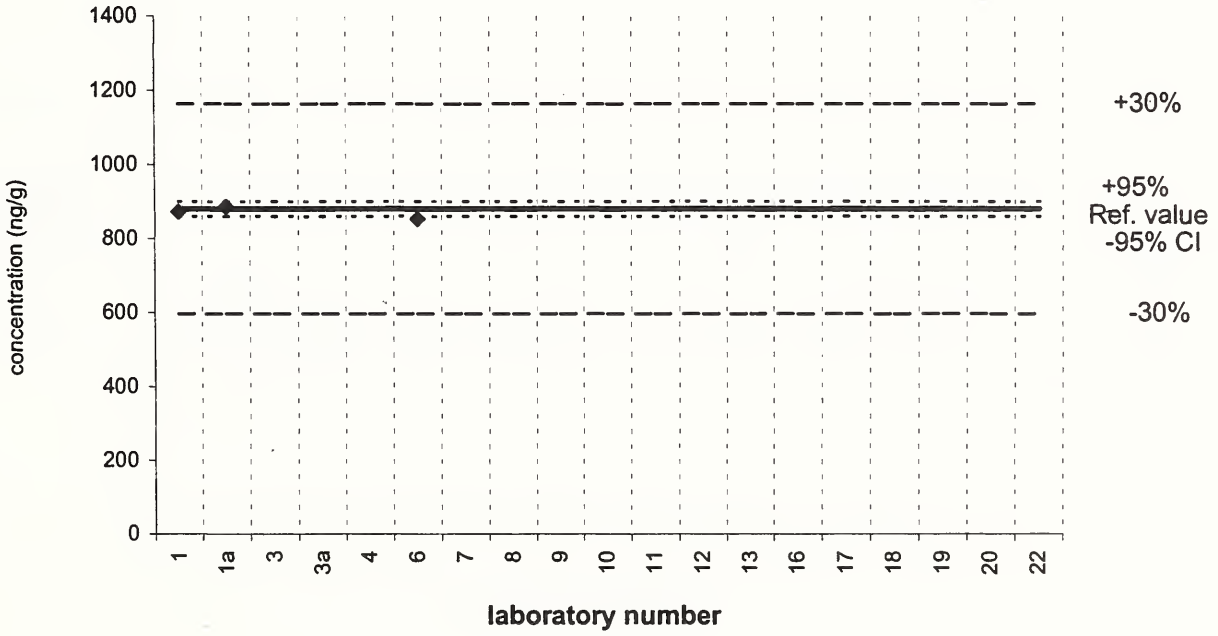
benzo[ghi]fluoranthene **PM 2.5 Interim RM**

Assigned value = 1095 ng/g s = 51 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



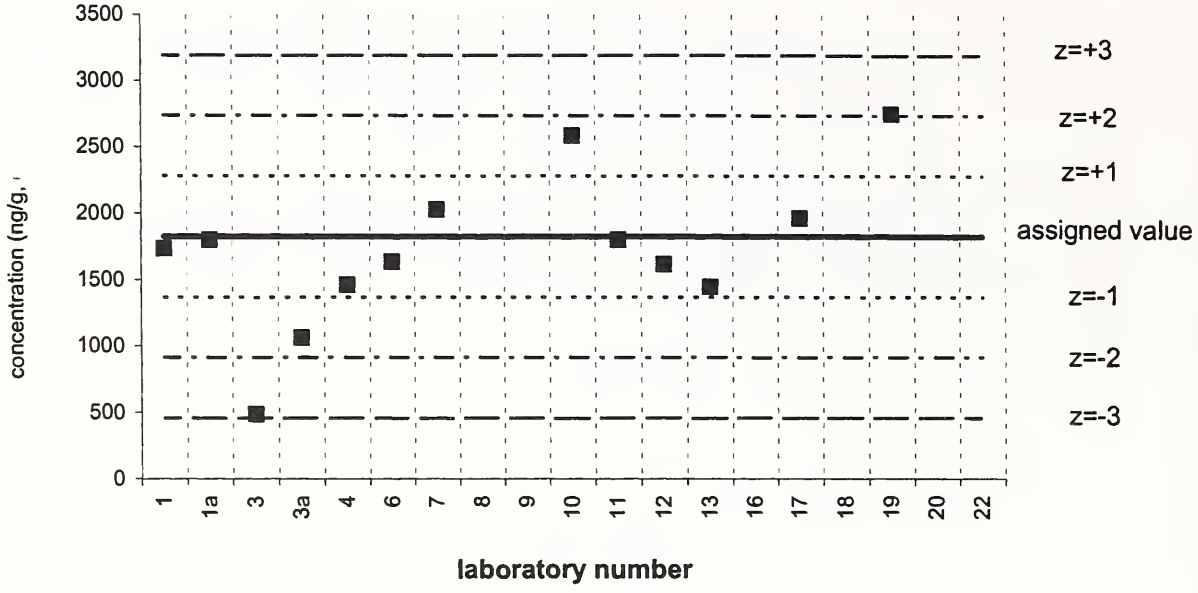
benzo[ghi]fluoranthene **SRM 1649a**

Reference Value = 880 ± 20 ng/g
Reported Results: 3 Quantitative Results: 3



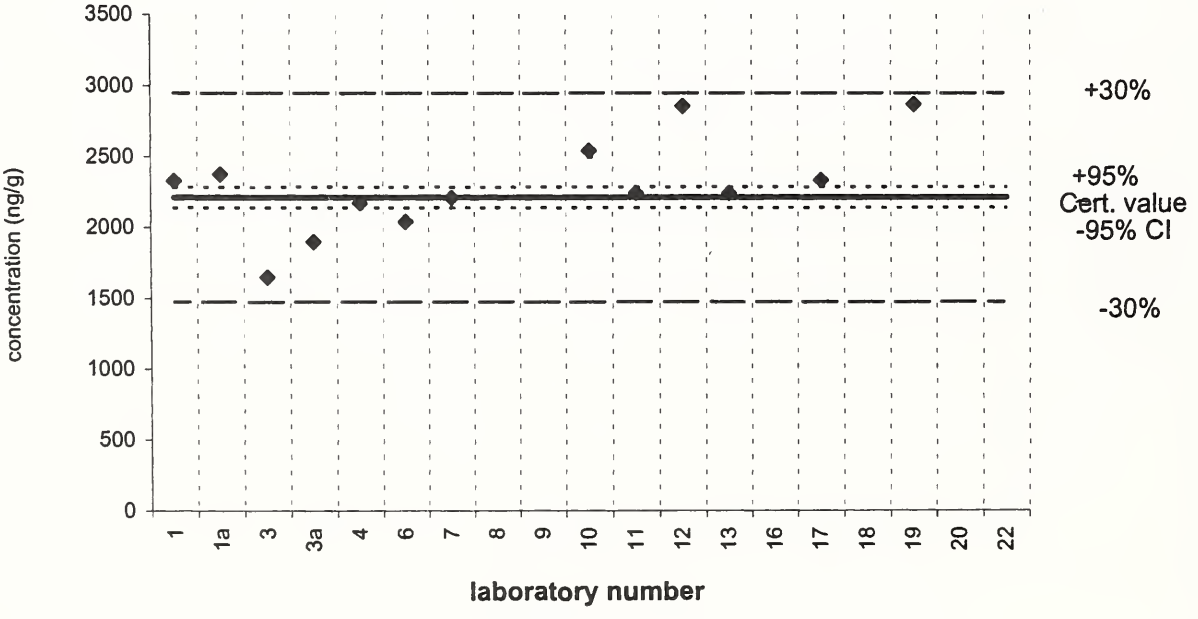
benz[a]anthracene **PM 2.5 Interim RM**

Assigned value = 1824 ng/g s = 471 ng/g 95% CL = 299 ng/g
Reported Results: 13 Quantitative Results: 13



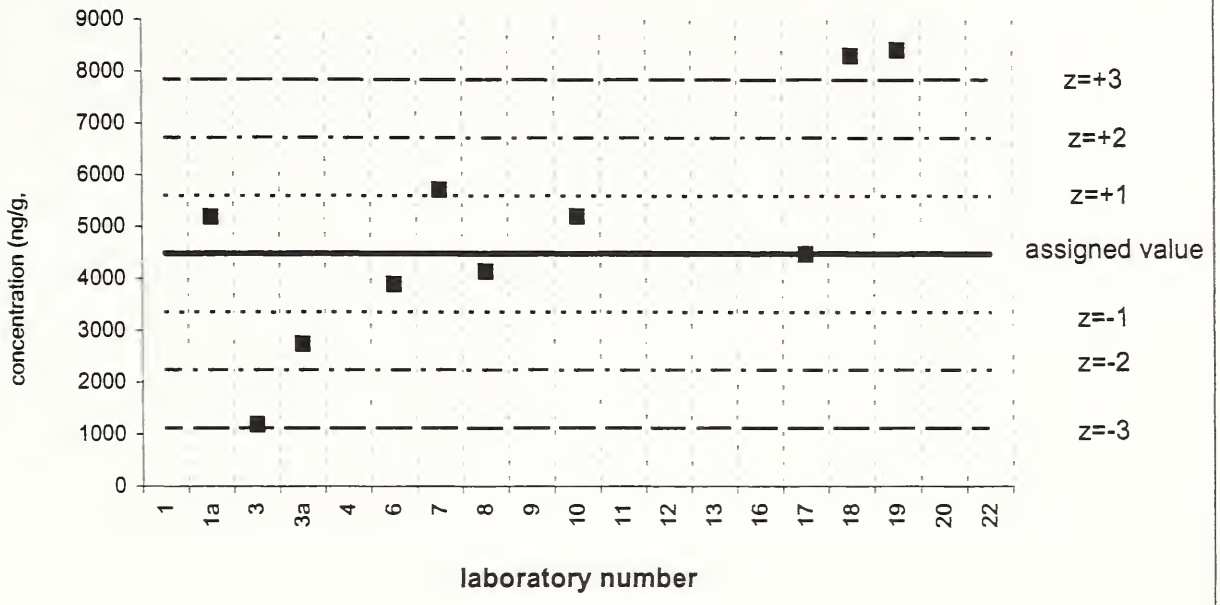
benz[a]anthracene **SRM 1649a**

Certified Value = 2210 ± 73 ng/g
Reported Results: 13 Quantitative Results: 13



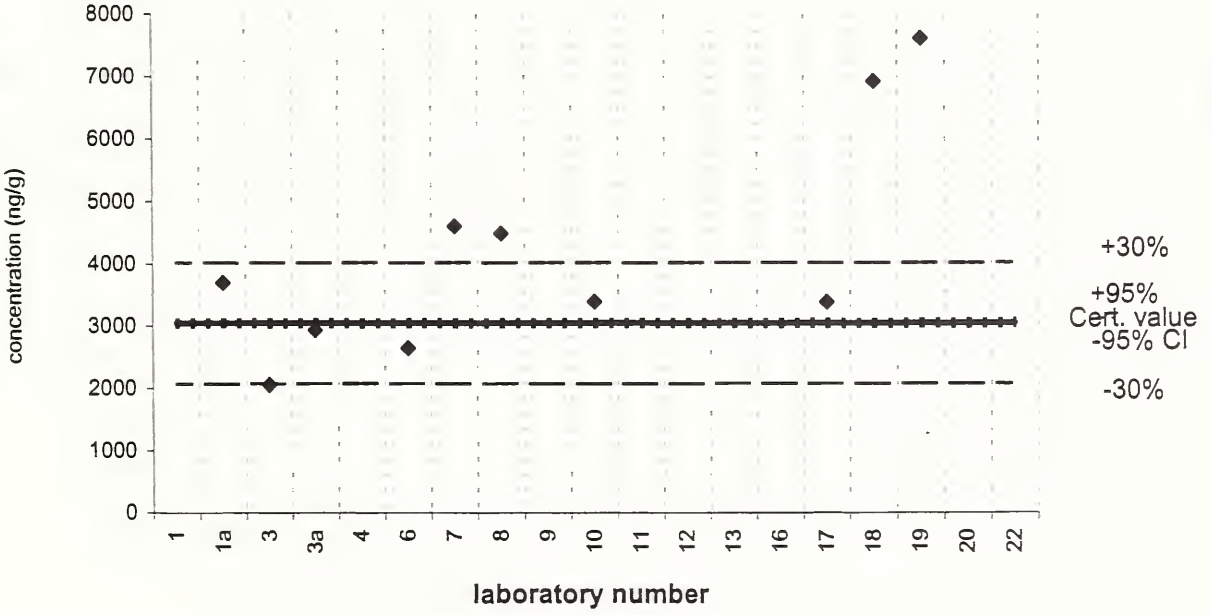
chrysene **PM 2.5 Interim RM**

Assigned value = 4483 ng/g s = 1004 ng/g 95% CL = 839 ng/g
Reported Results: 10 Quantitative Results: 10



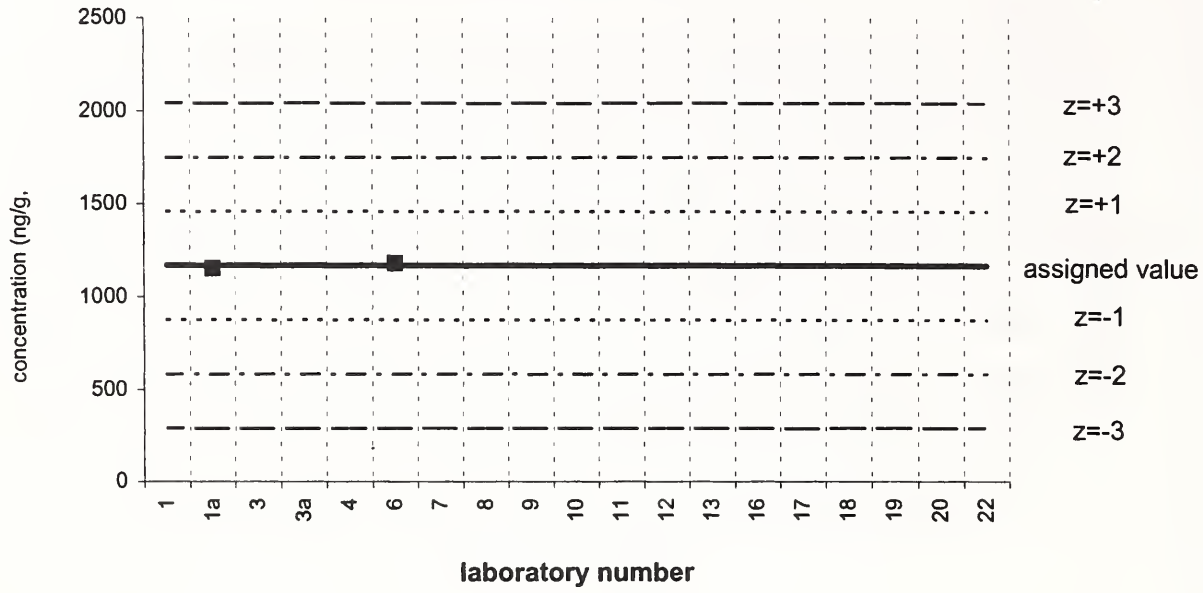
chrysene **SRM 1649a**

Certified Value = 3049 ± 60 ng/g
Reported Results: 10 Quantitative Results: 10



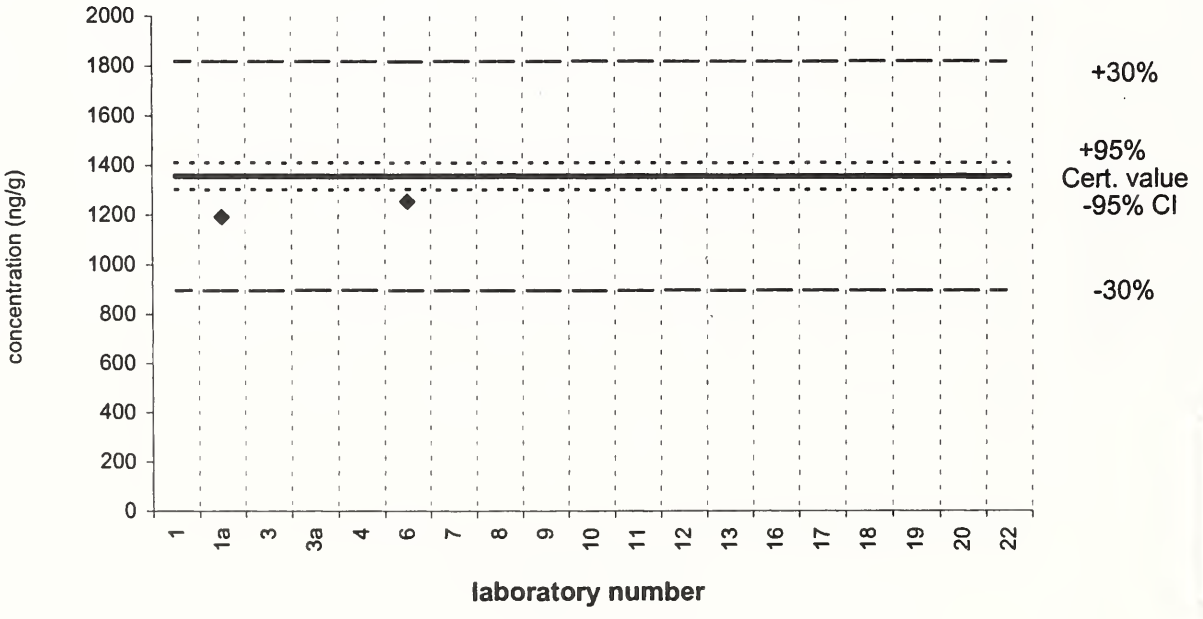
triphenylene **PM 2.5 Interim RM**

Assigned value = 1167 ng/g s = not calc ng/g 95% CL = not calc. ng/g
Reported Results: 2 Quantitative Results: 2



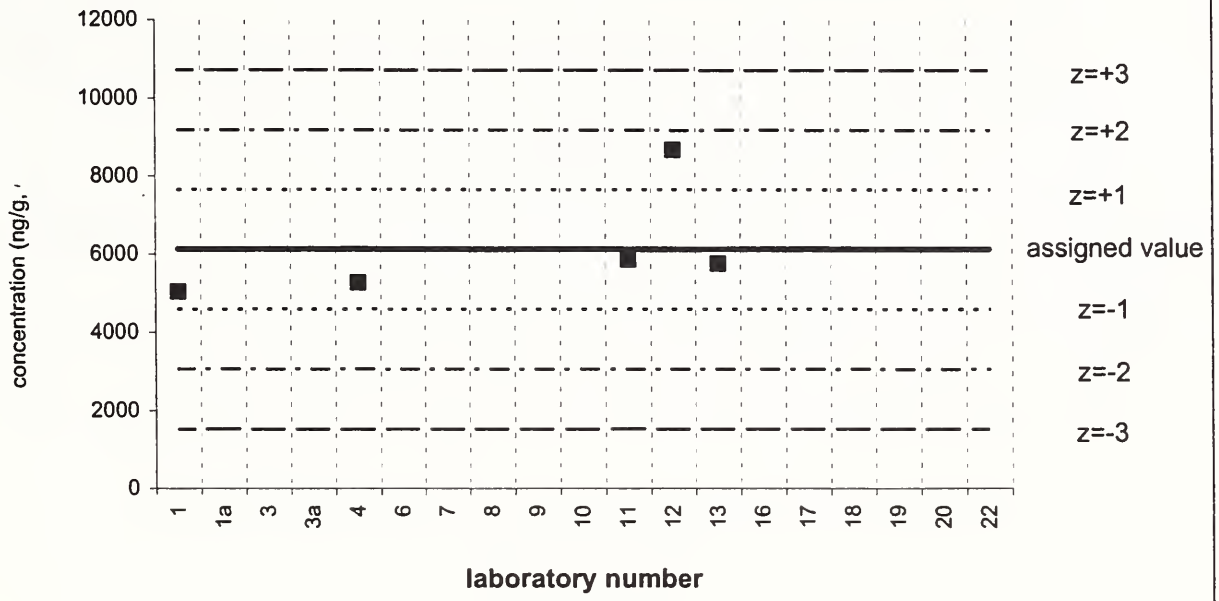
triphenylene **SRM 1649a**

Certified Value = 1357 ± 54 ng/g
Reported Results: 2 Quantitative Results: 2



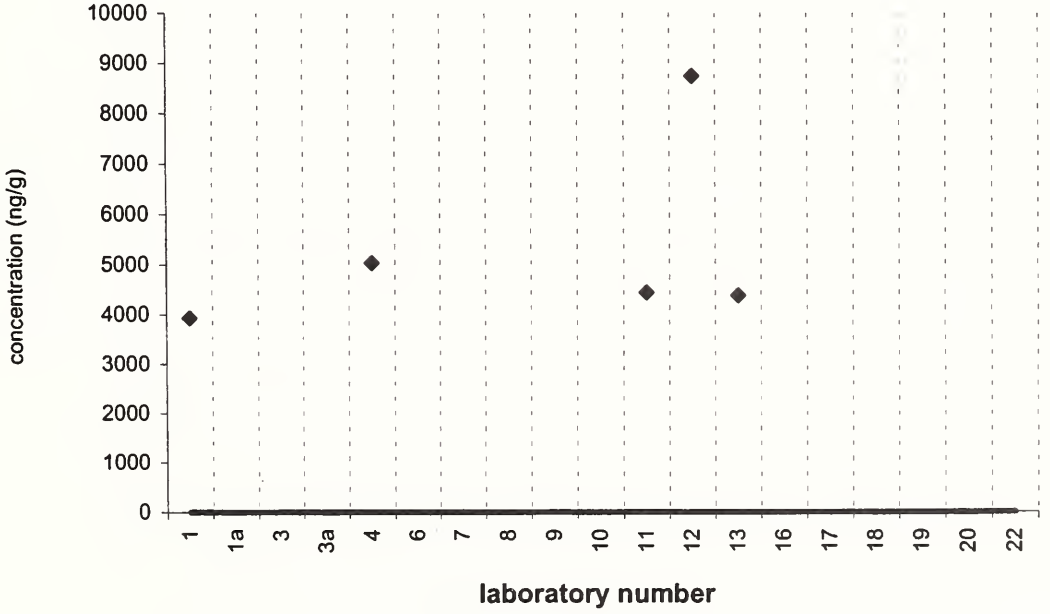
chrysene+triphenylene **PM 2.5 Interim RM**

Assigned value = 6125 ng/g s = 1471 ng/g 95% CL = 1827 ng/g
Reported Results: 5 Quantitative Results: 5



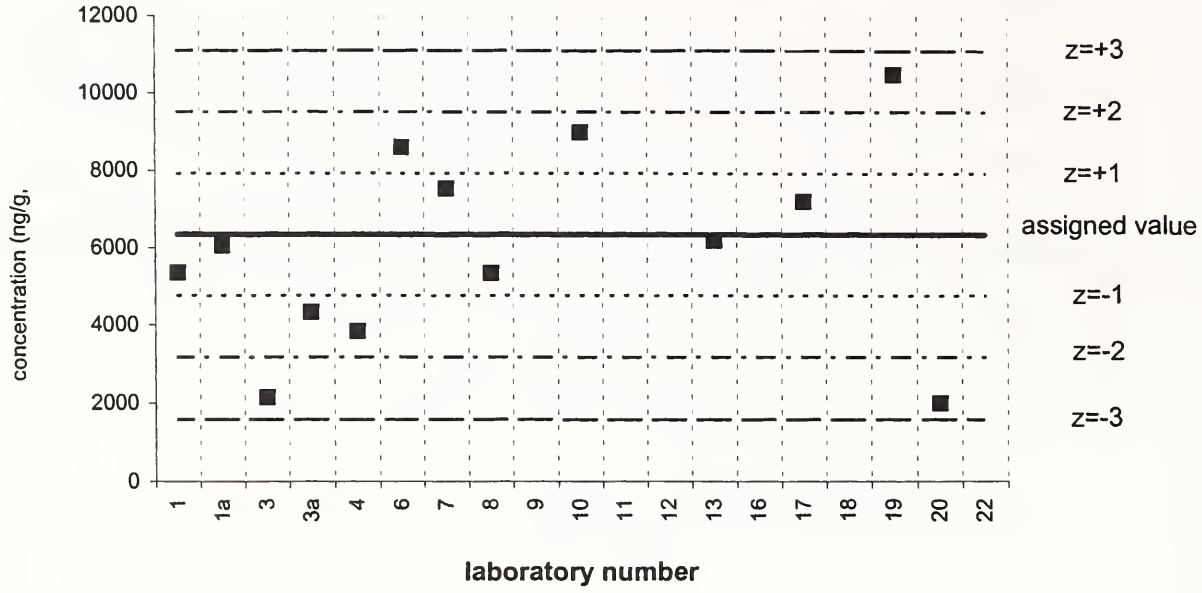
chrysene+triphenylene **SRM 1649a**

Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



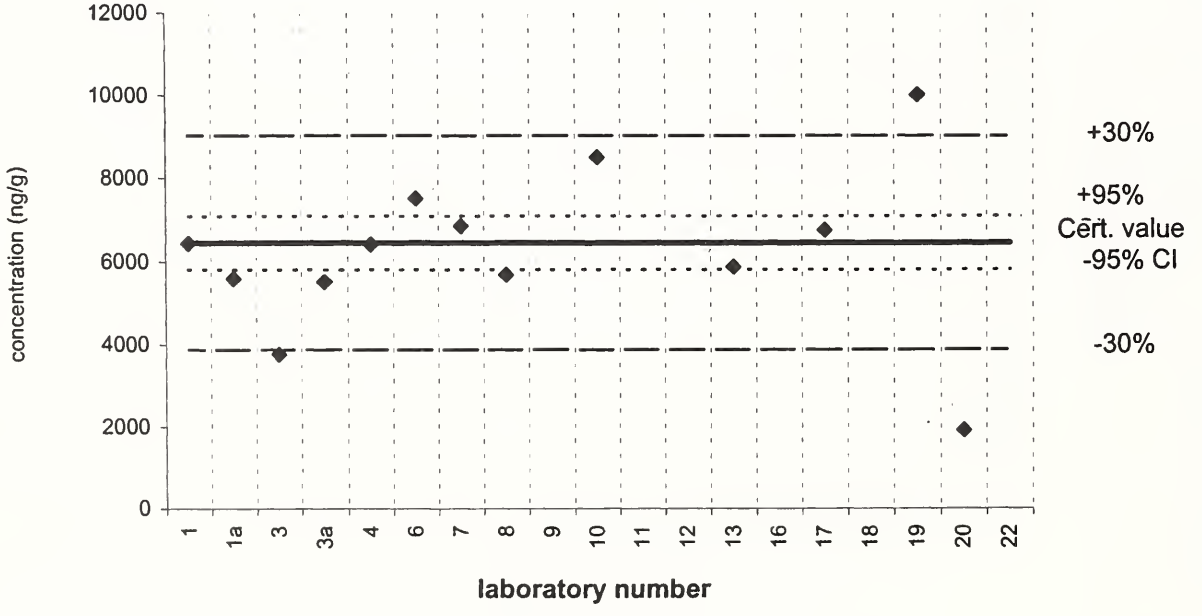
benzo[b]fluoranthene **PM 2.5 Interim RM**

Assigned value = 6346 ng/g s = 1724 ng/g 95% CL = 1233 ng/g
Reported Results: 13 Quantitative Results: 13



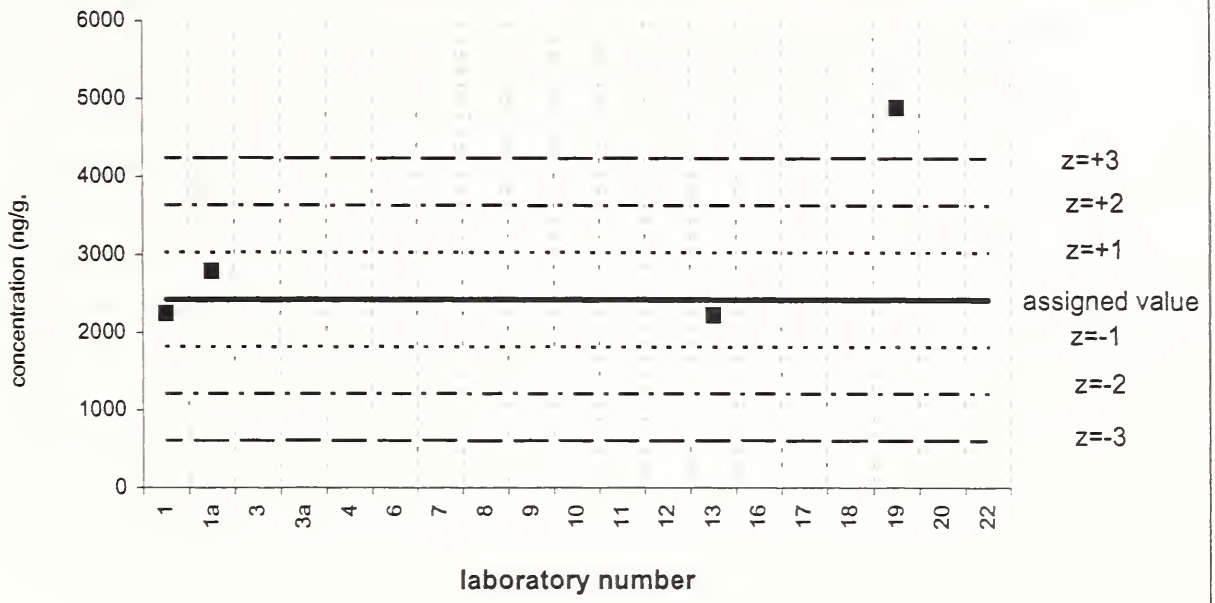
benzo[b]fluoranthene **SRM 1649a**

Certified Value = 6450 ± 640 ng/g
Reported Results: 13 Quantitative Results: 13



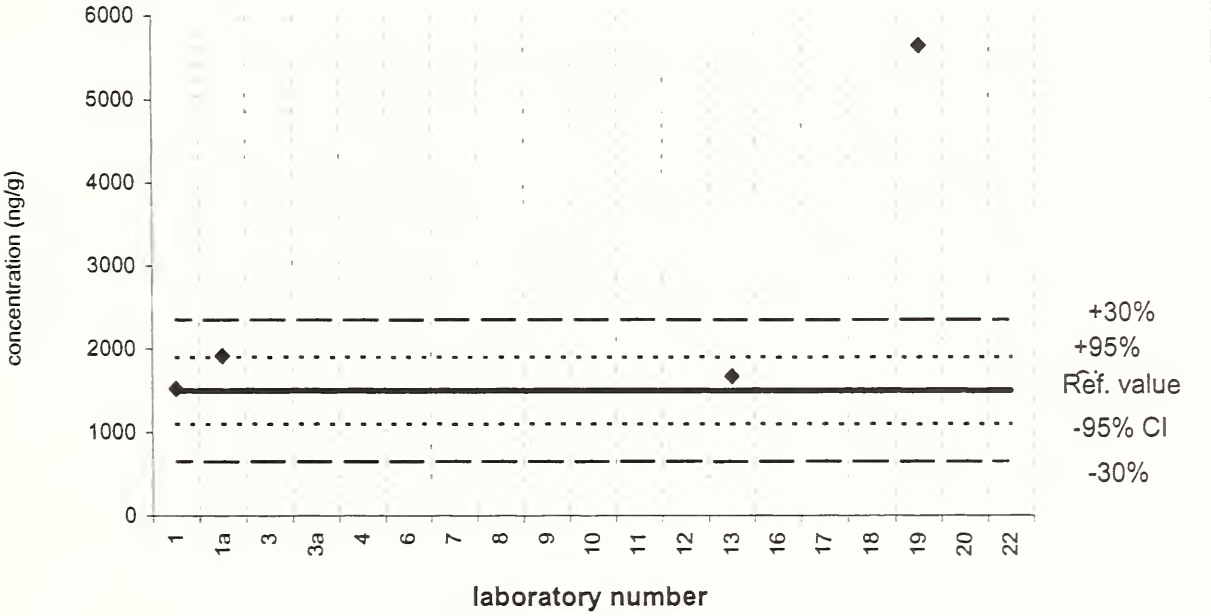
benzo[j]fluoranthene **PM 2.5 Interim RM**

Assigned value = 2424 ng/g s = 320 ng/g 95% CL = not calc. ng/g
Reported Results: 4 Quantitative Results: 4



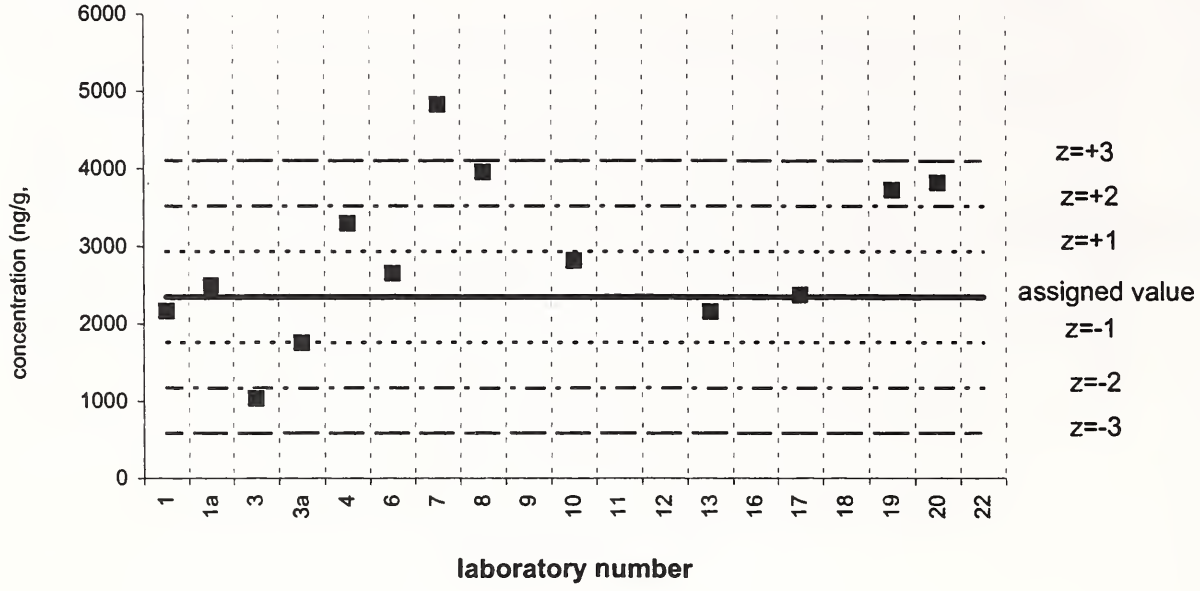
benzo[j]fluoranthene **SRM 1649a**

Reference Value = 1500 ± 400 ng/g
Reported Results: 4 Quantitative Results: 4



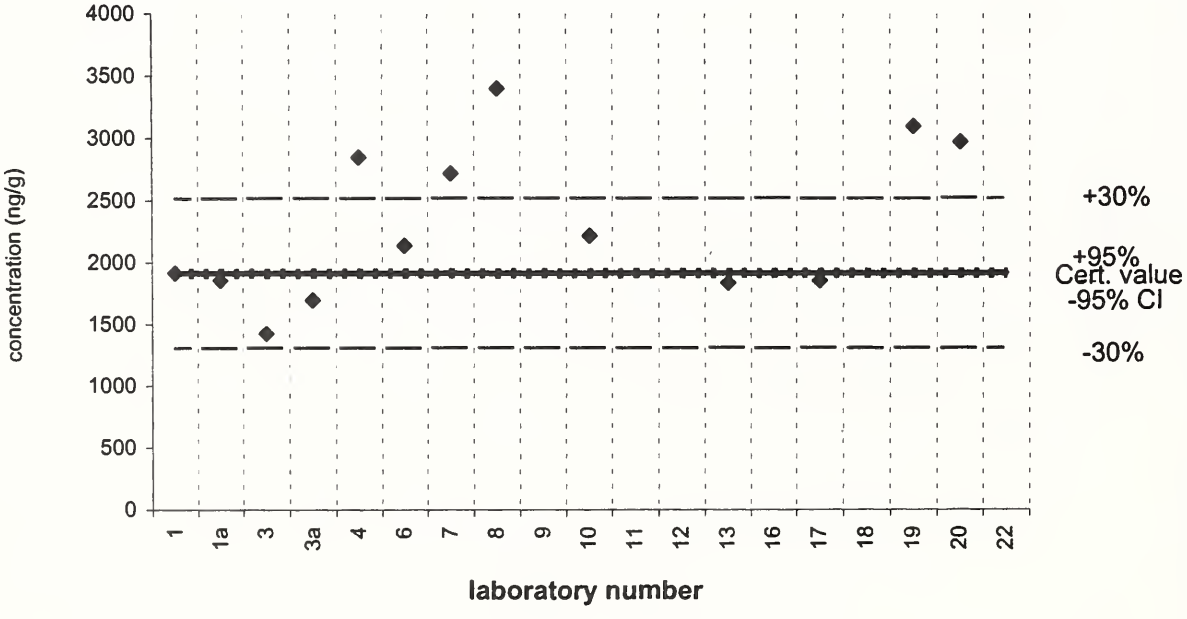
benzo[k]fluoranthene **PM 2.5 Interim RM**

Assigned value = 2346 ng/g s = 355 ng/g 95% CL = 328 ng/g
Reported Results: 13 Quantitative Results: 13



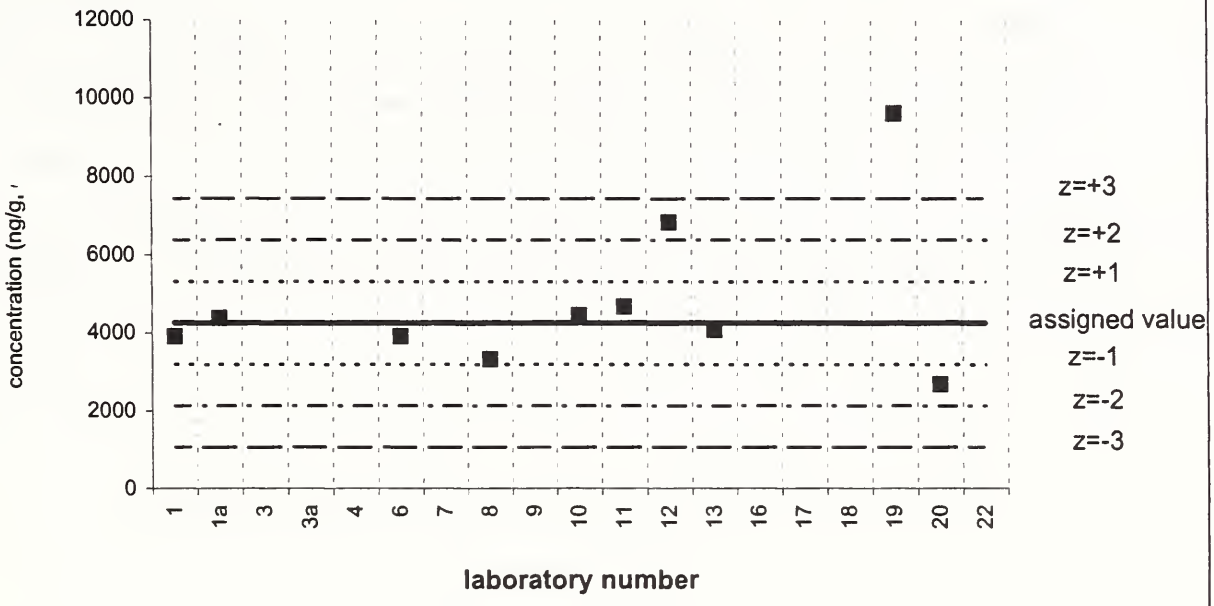
benzo[k]fluoranthene **SRM 1649a**

Certified Value = 1913 ± 31 ng/g
Reported Results: 13 Quantitative Results: 13



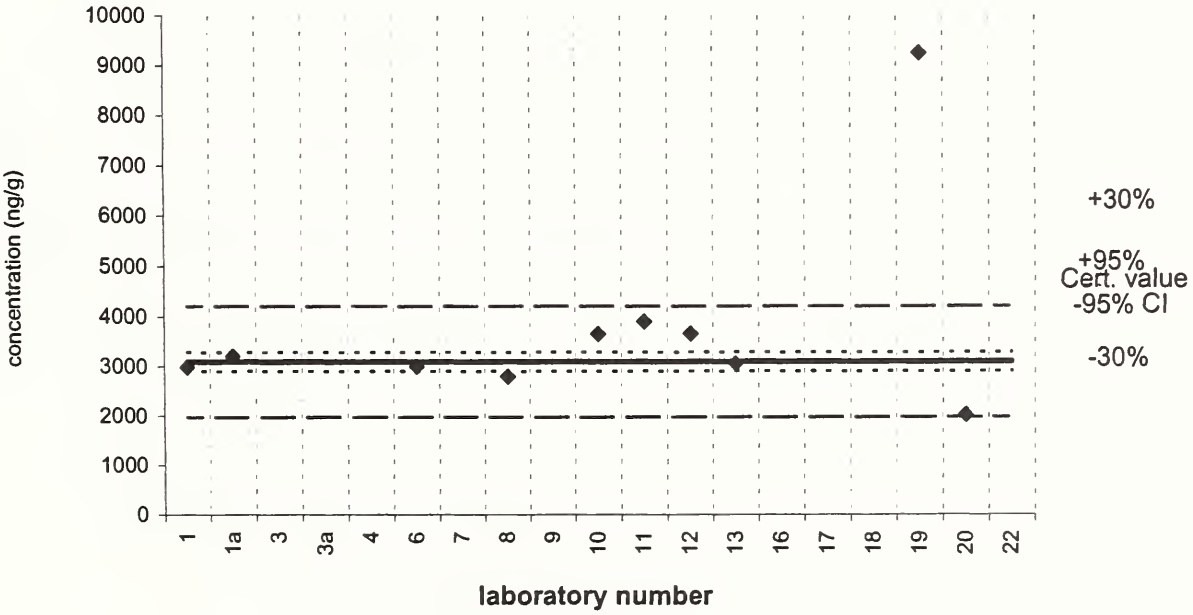
benzo[e]pyrene **PM 2.5 Interim RM**

Assigned value = 4251 ng/g s = 1145 ng/g 95% CL = 880 ng/g
Reported Results: 10 Quantitative Results: 10



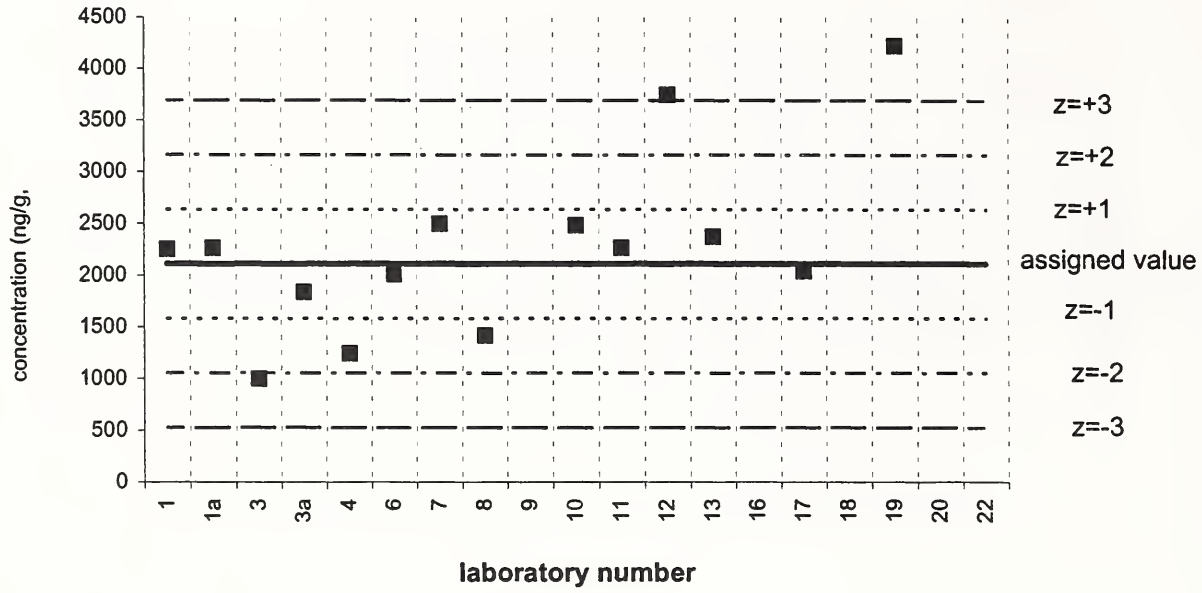
benzo[e]pyrene **SRM 1649a**

Certified Value = 3090 ± 190 ng/g
Reported Results: 10 Quantitative Results: 10



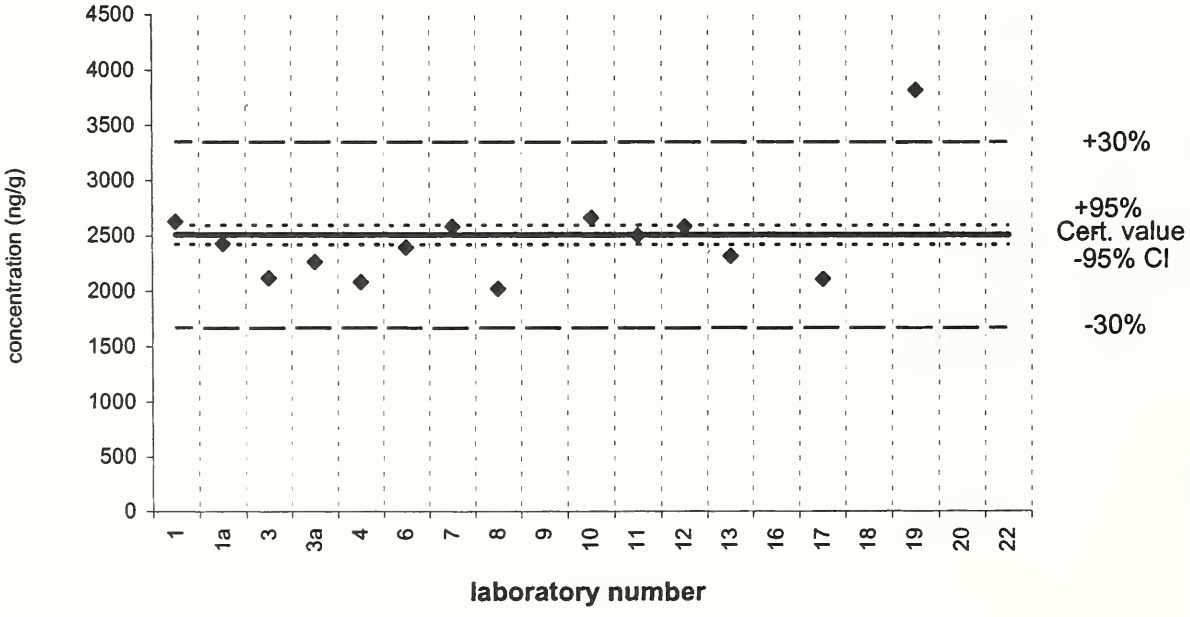
benzo[a]pyrene **PM 2.5 Interim RM**

Assigned value = 2109 ng/g s = 687 ng/g 95% CL = 415 ng/g
Reported Results: 14 Quantitative Results: 14



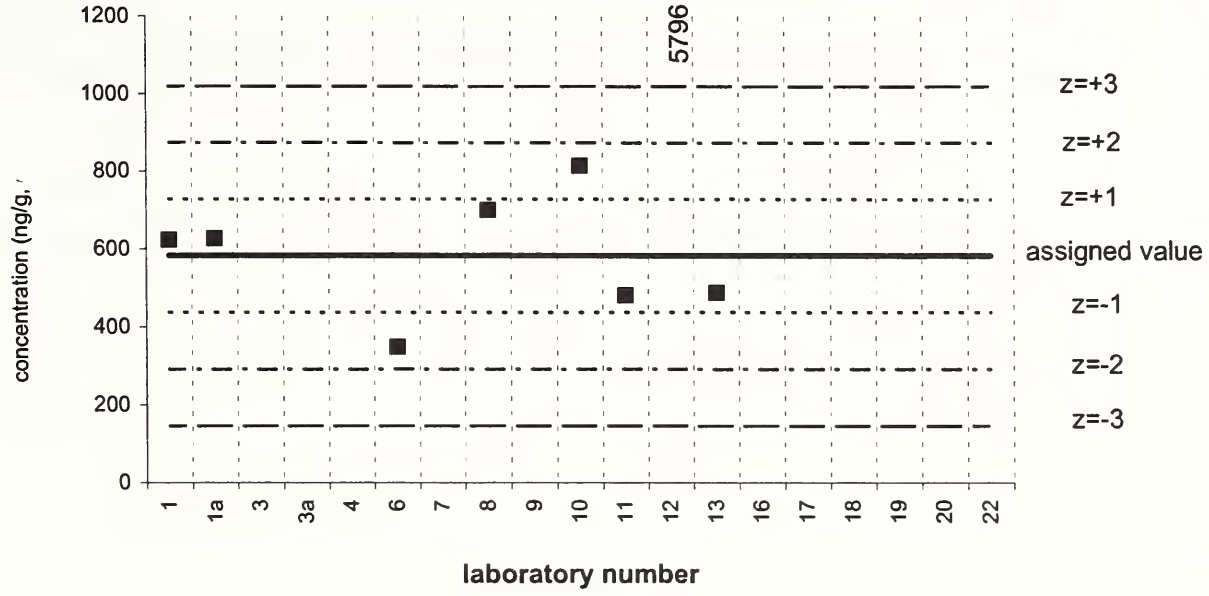
benzo[a]pyrene **SRM 1649a**

Certified Value = 2509 ± 87 ng/g
Reported Results: 14 Quantitative Results: 14



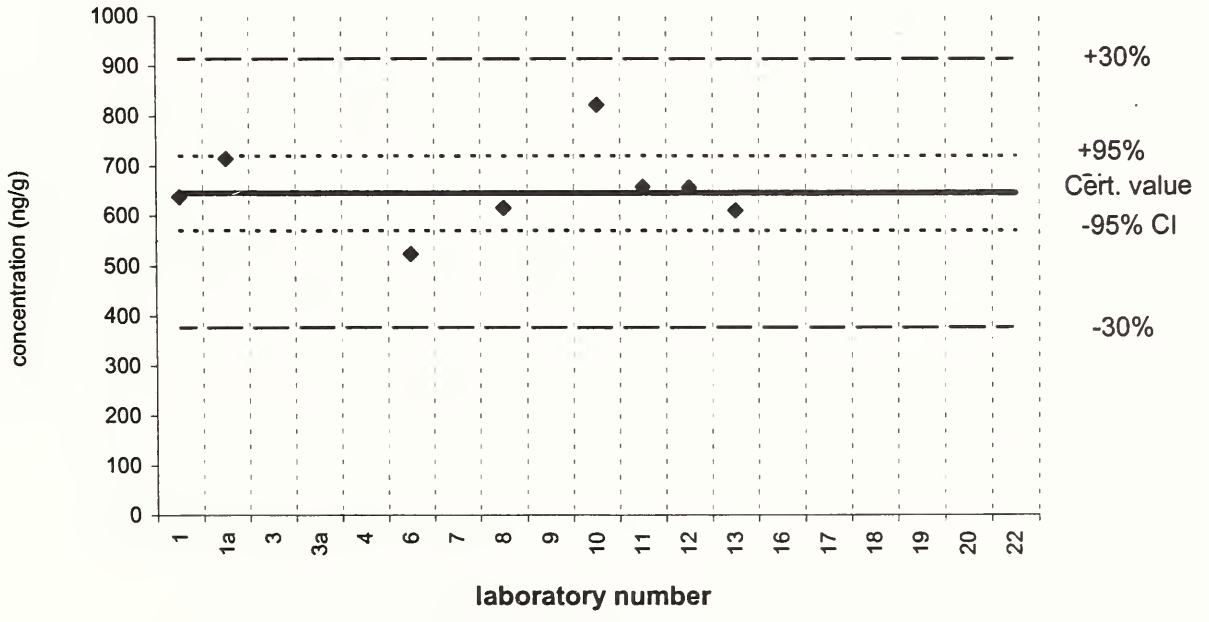
perylene **PM 2.5 Interim RM**

Assigned value = 582 ng/g s = 156 ng/g 95% CL = 144 ng/g
Reported Results: 8 Quantitative Results: 8



perylene **SRM 1649a**

Certified Value = 646 ± 75 ng/g
Reported Results: 8 Quantitative Results: 8

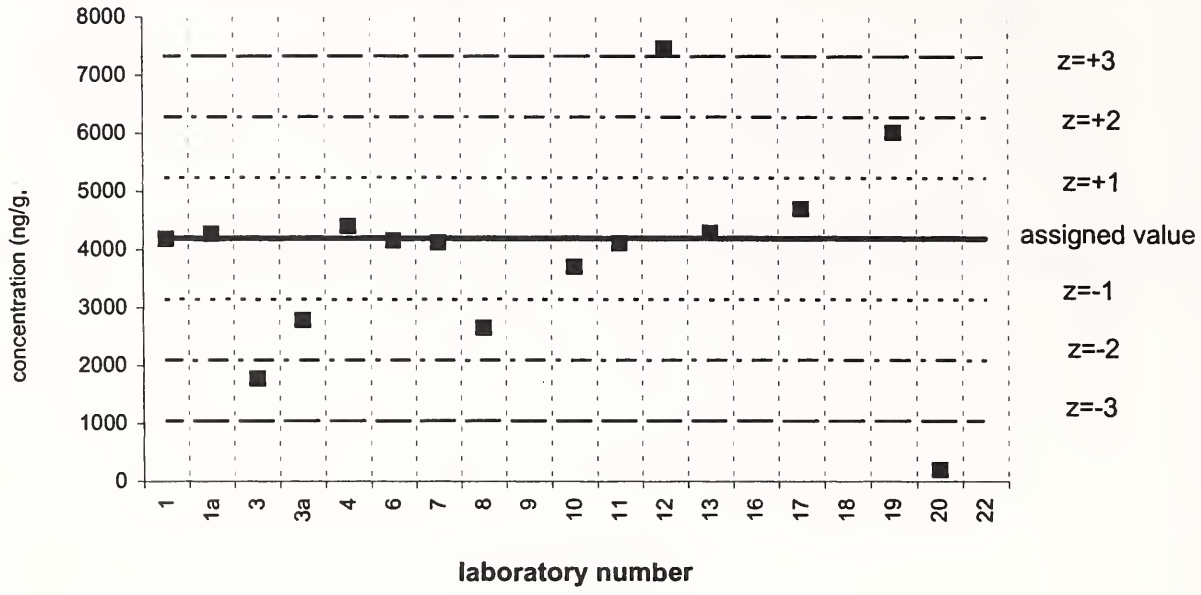


indeno[1,2,3-cd]pyrene

PM 2.5 Interim RM

Assigned value = 4188 ng/g s = 1383 ng/g 95% CL = 798 ng/g

Reported Results: 15 Quantitative Results: 15

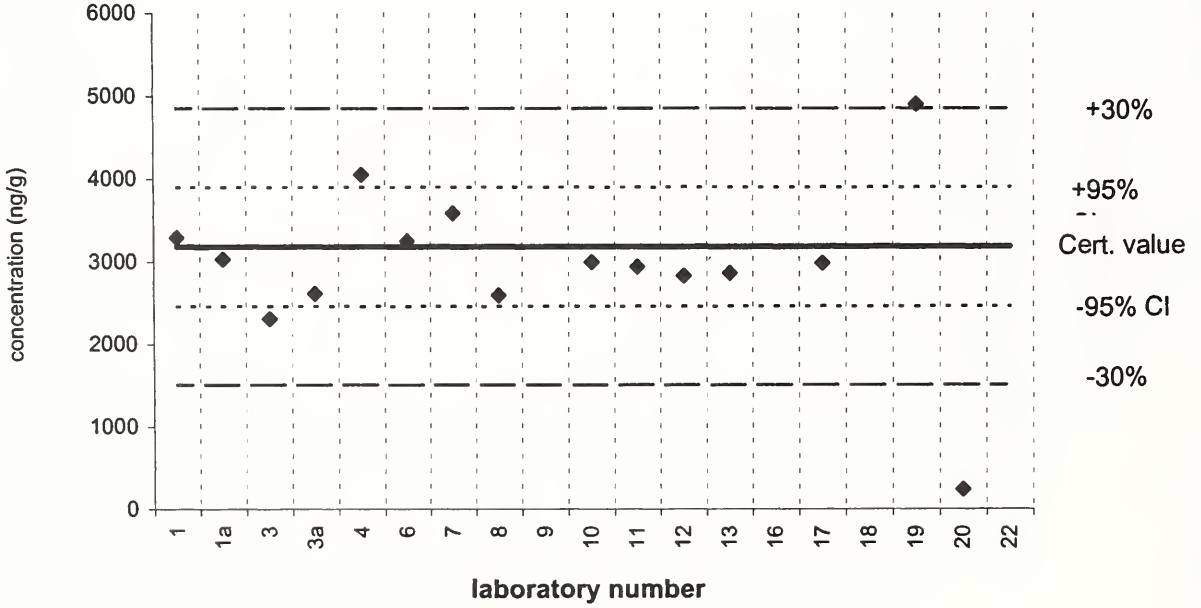


indeno[1,2,3-cd]pyrene

SRM 1649a

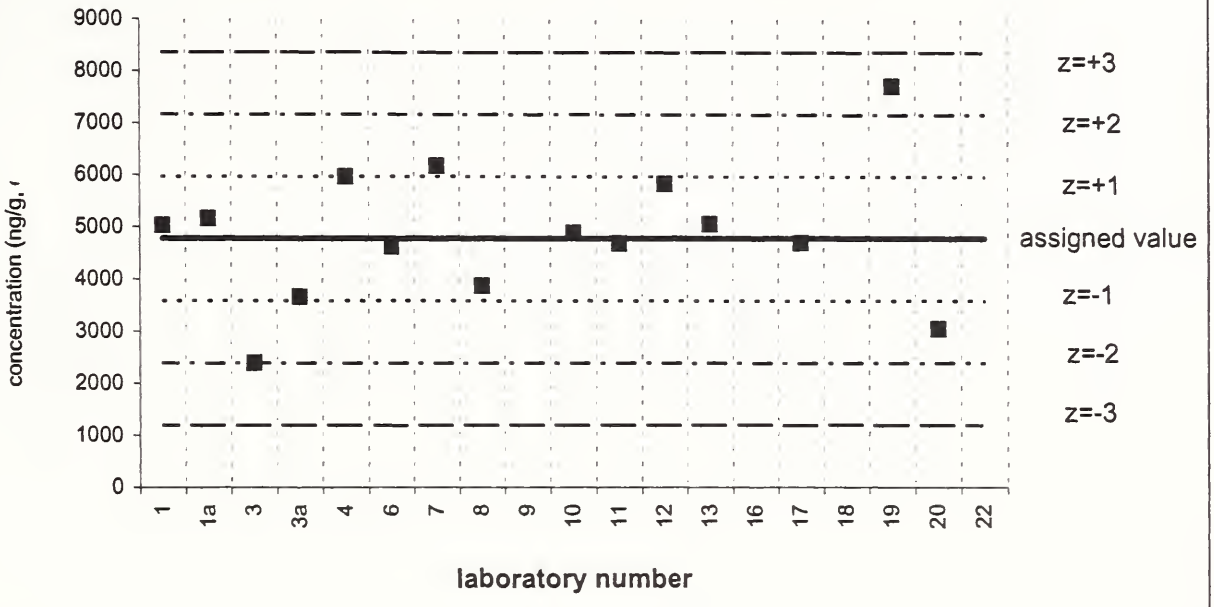
Certified Value = 3180 ± 720 ng/g

Reported Results: 15 Quantitative Results: 15



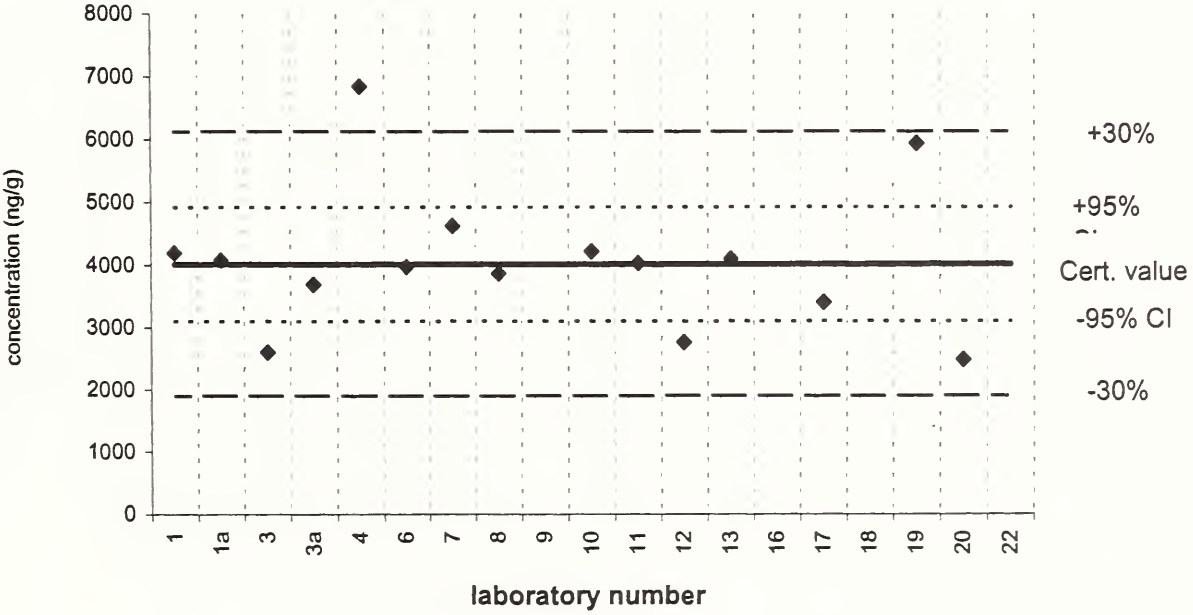
benzo[ghi]perylene **PM 2.5 Interim RM**

Assigned value = 4776 ng/g s = 1326 ng/g 95% CL = 765 ng/g
Reported Results: 15 Quantitative Results: 15



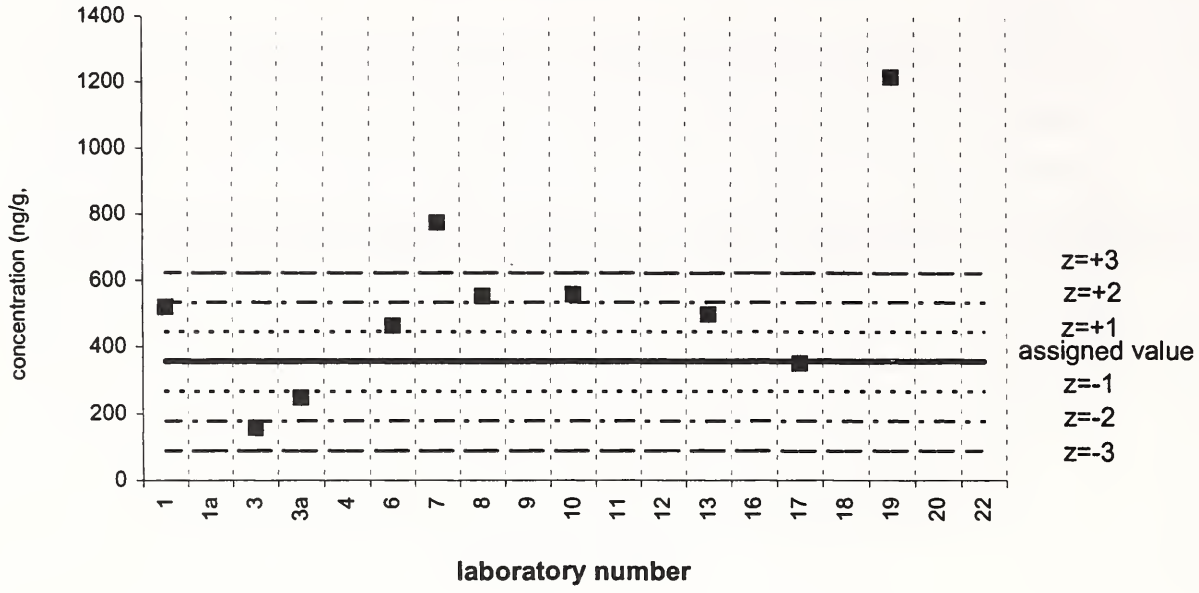
benzo[ghi]perylene **SRM 1649a**

Certified Value = 4010 ± 910 ng/g
Reported Results: 15 Quantitative Results: 15



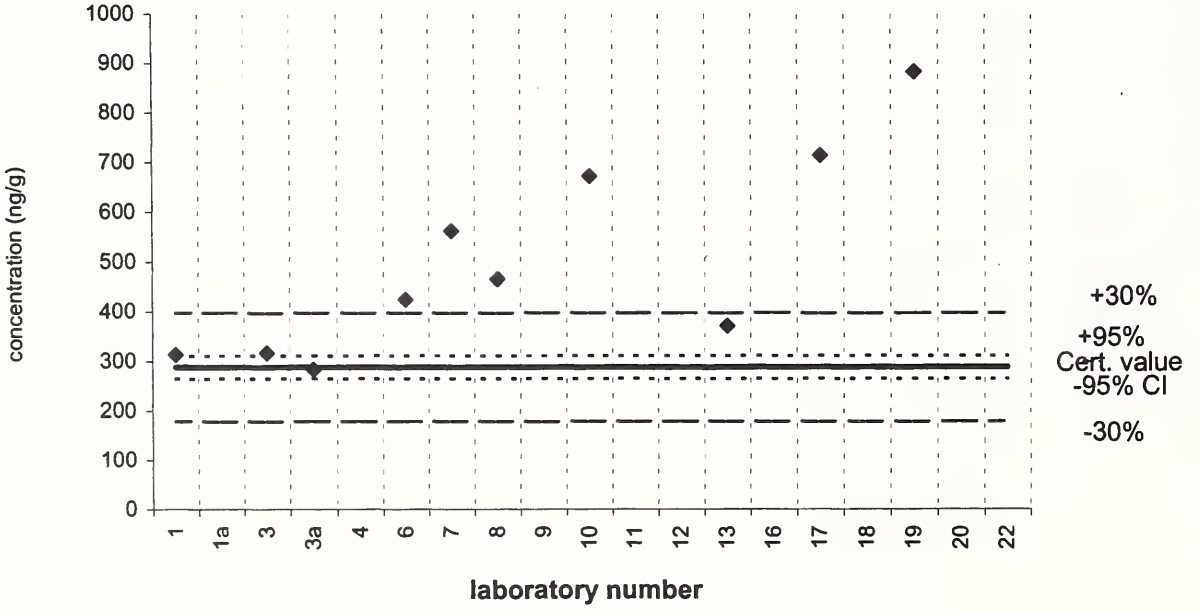
dibenz[a,h]anthracene **PM 2.5 Interim RM**

Assigned value = 356 ng/g s = 180 ng/g 95% CL = not calc. ng/g
Reported Results: 10 Quantitative Results: 10



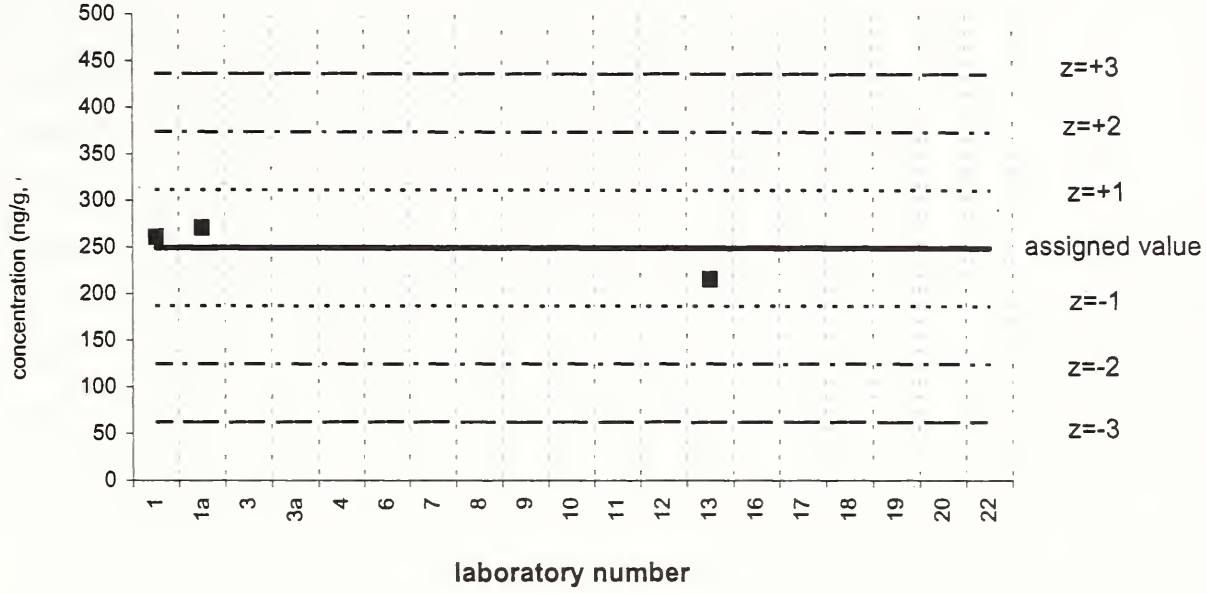
dibenz[a,h]anthracene **SRM 1649a**

Certified Value = 288 ± 23 ng/g
Reported Results: 10 Quantitative Results: 10



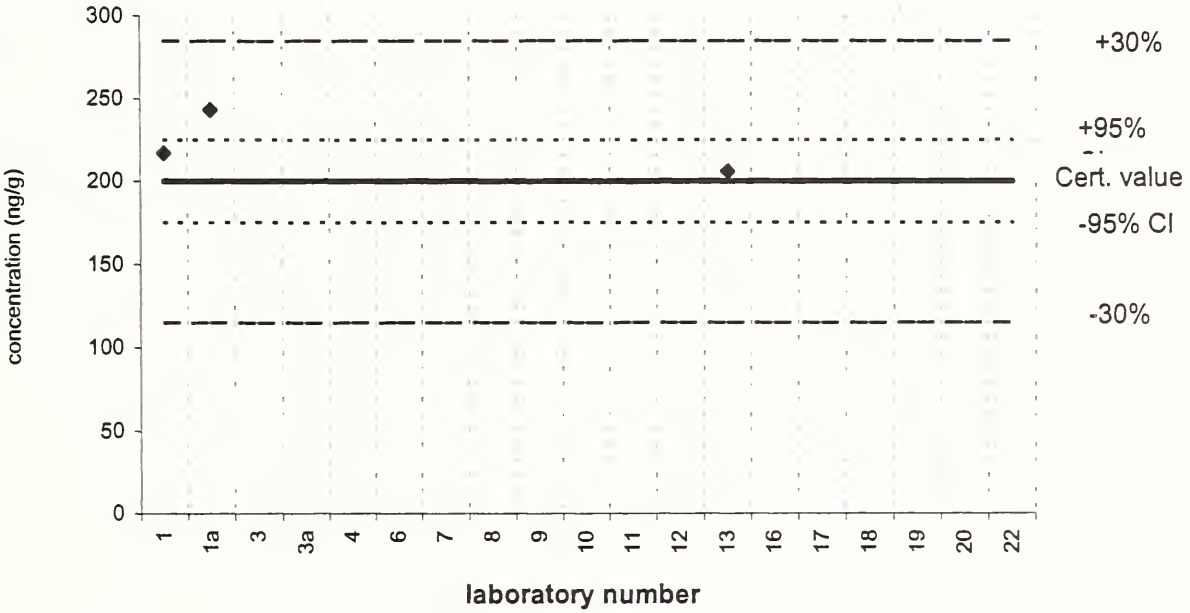
dibenz[a,c]anthracene **PM 2.5 Interim RM**

Assigned value = 249 ng/g s = 29 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



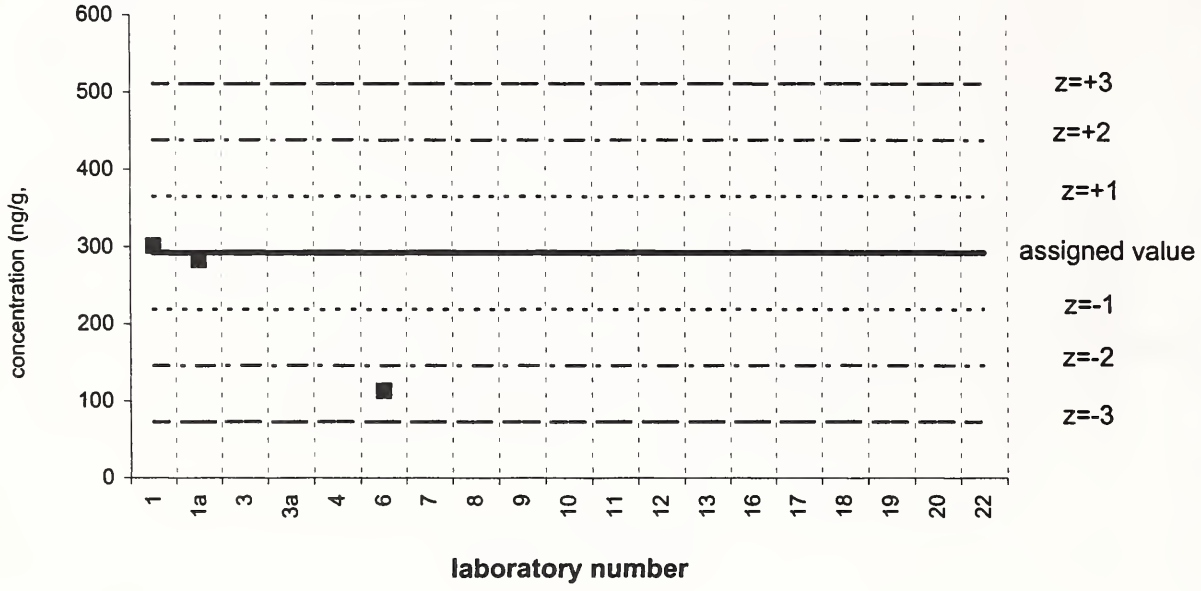
dibenz[a,c]anthracene **SRM 1649a**

Certified Value = 200 ± 25 ng/g
Reported Results: 3 Quantitative Results: 3



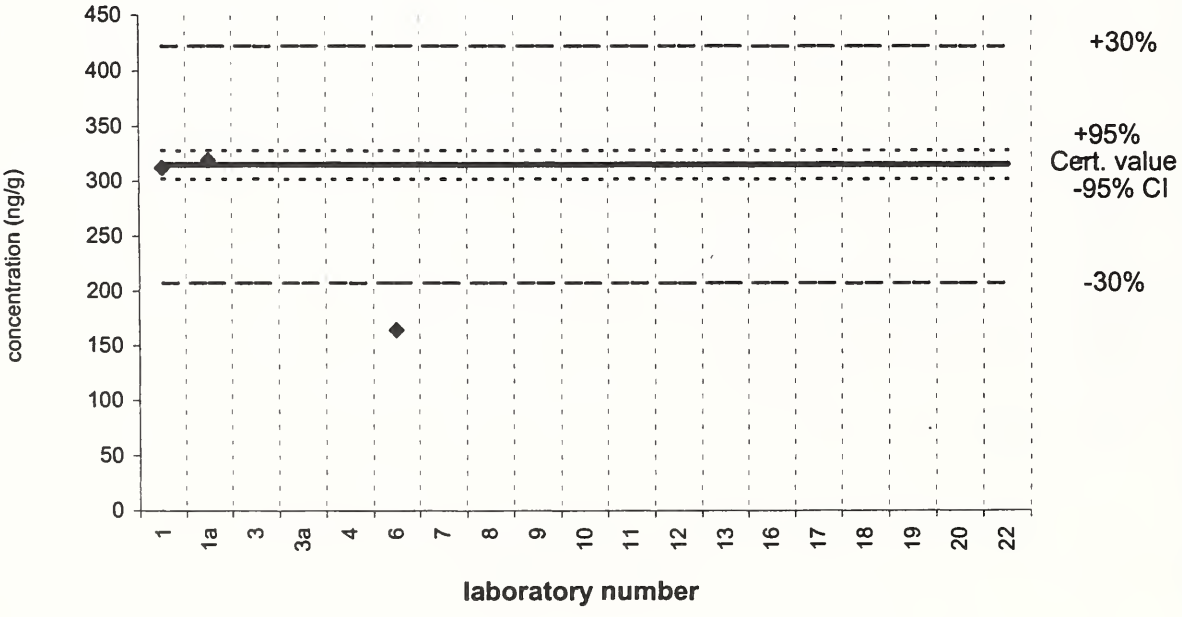
benzo[b]chrysene **PM 2.5 Interim RM**

Assigned value = 292 ng/g s = not calc ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



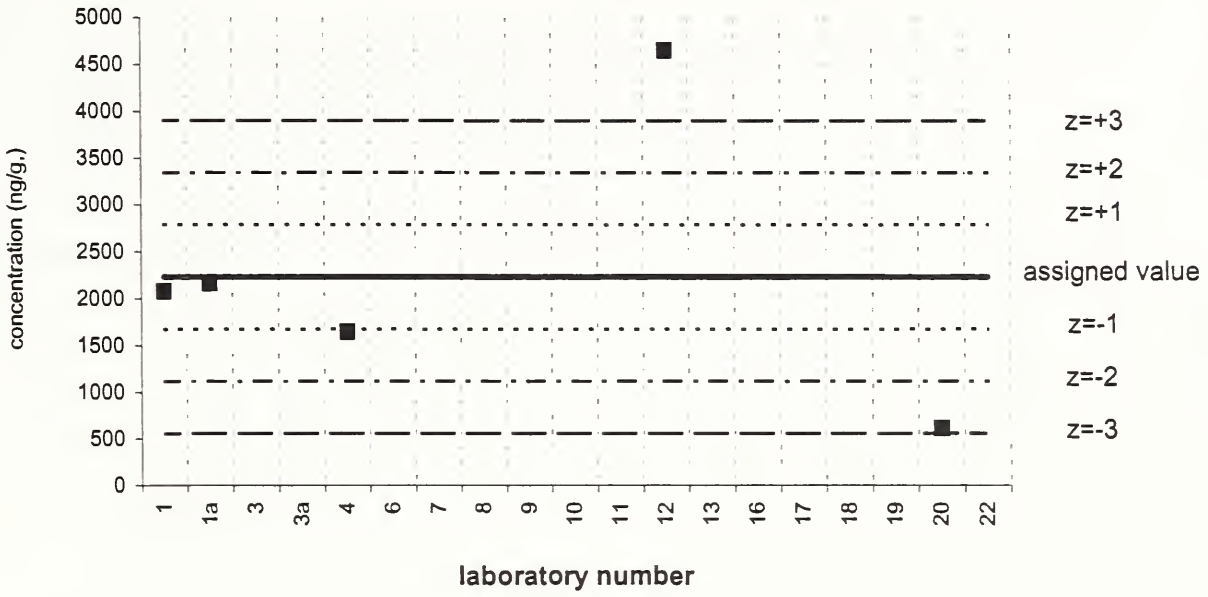
benzo[b]chrysene **SRM 1649a**

Certified Value = 315 ± 13 ng/g
Reported Results: 3 Quantitative Results: 3



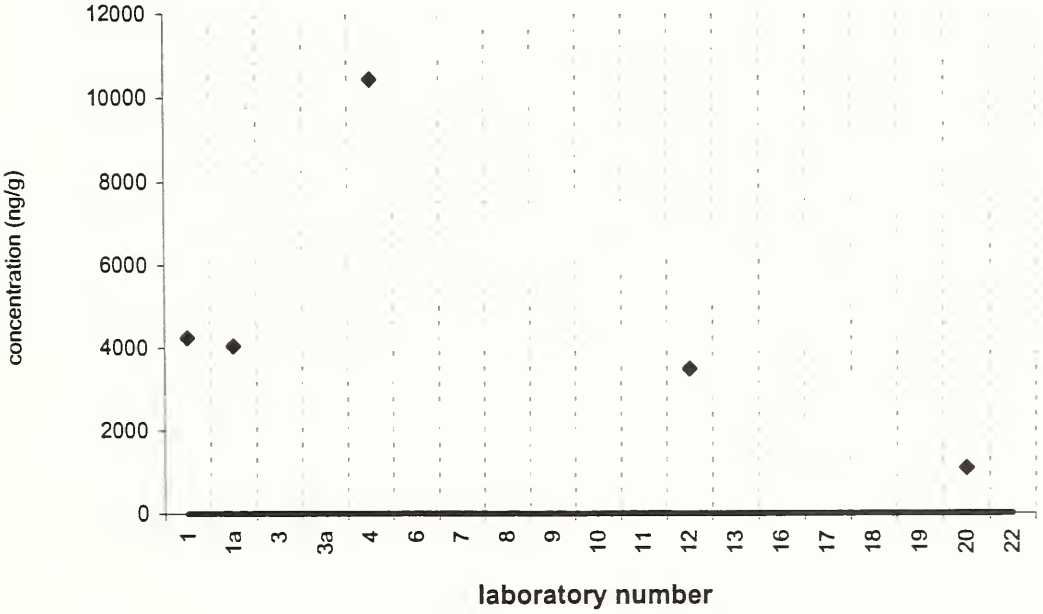
coronene **PM 2.5 Interim RM**

Assigned value = 2230 ng/g s = 1488 ng/g 95% CL = 1847 ng/g
Reported Results: 5 Quantitative Results: 5



coronene **SRM 1649a**

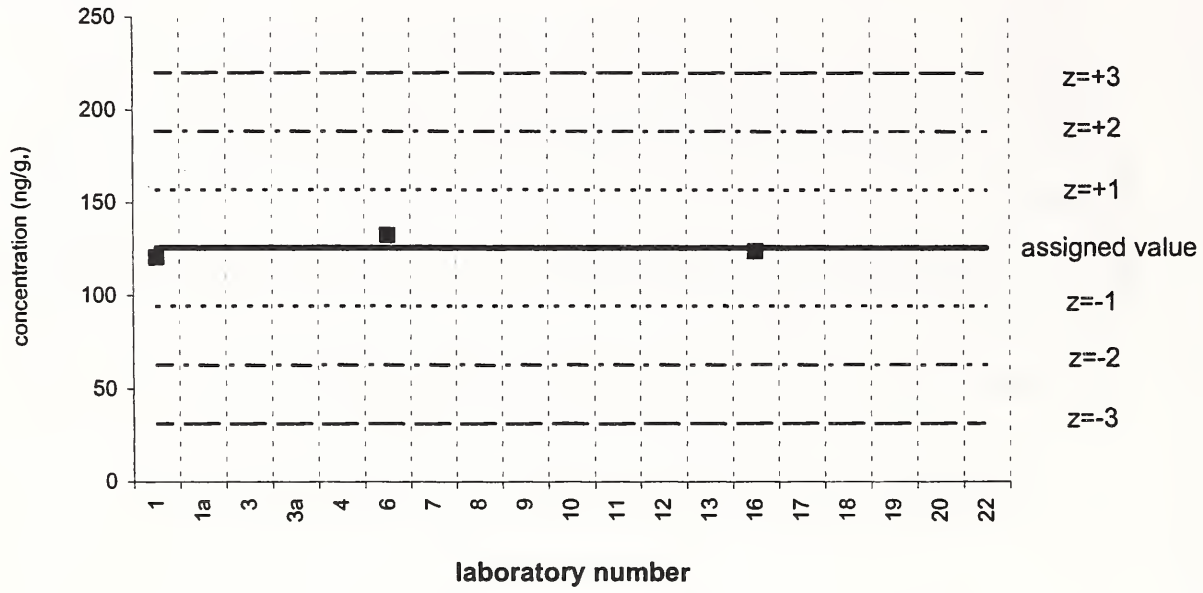
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



9-nitroanthracene

PM 2.5 Interim RM

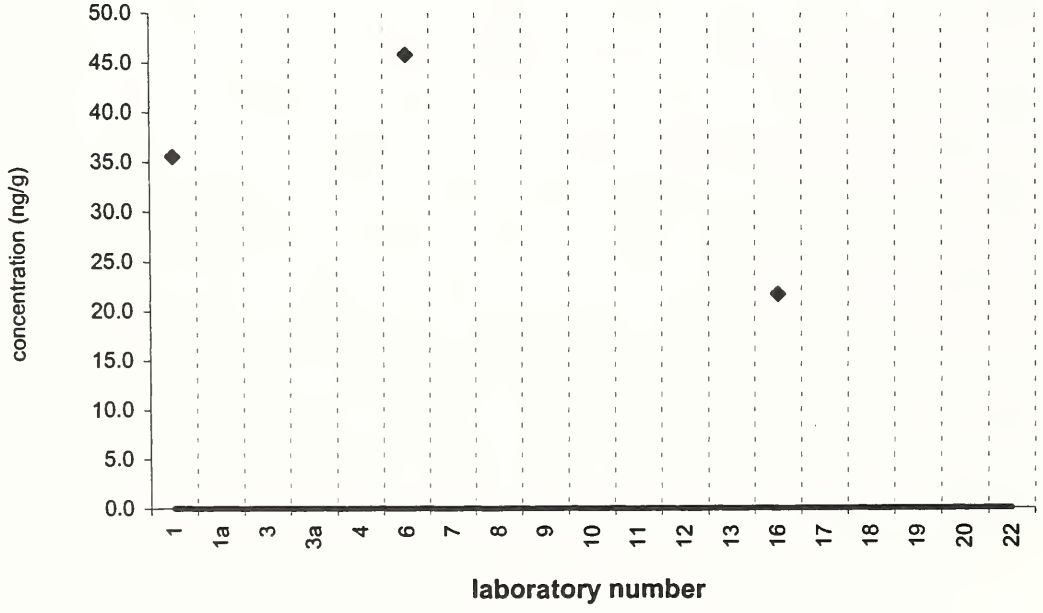
Assigned value = 126 ng/g s = 6 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



9-nitroanthracene

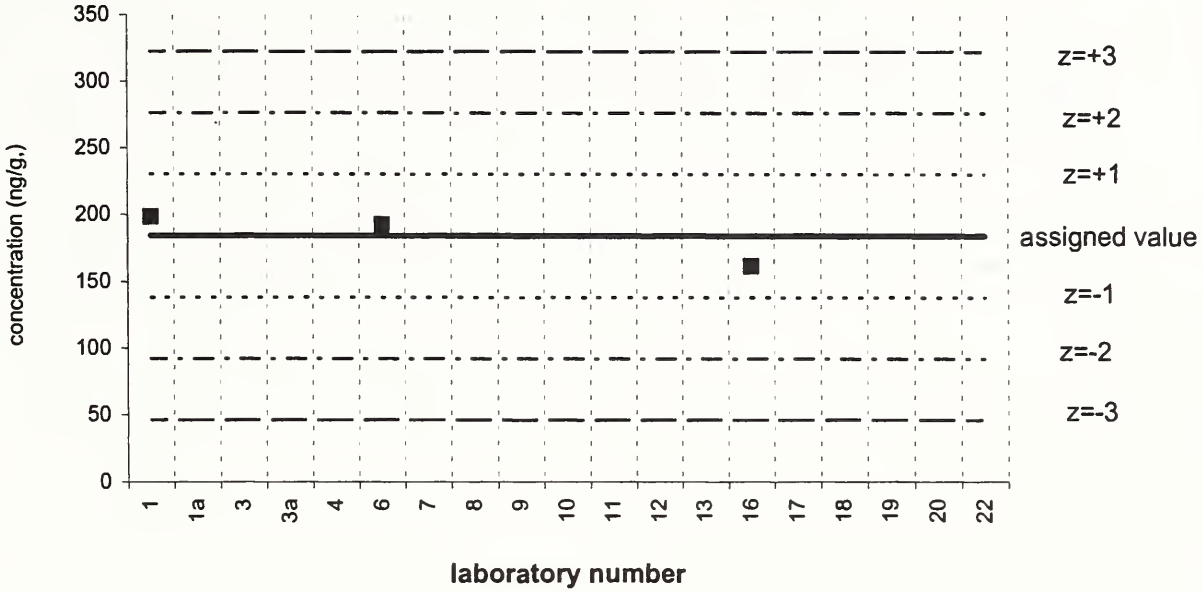
SRM 1649a

Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3



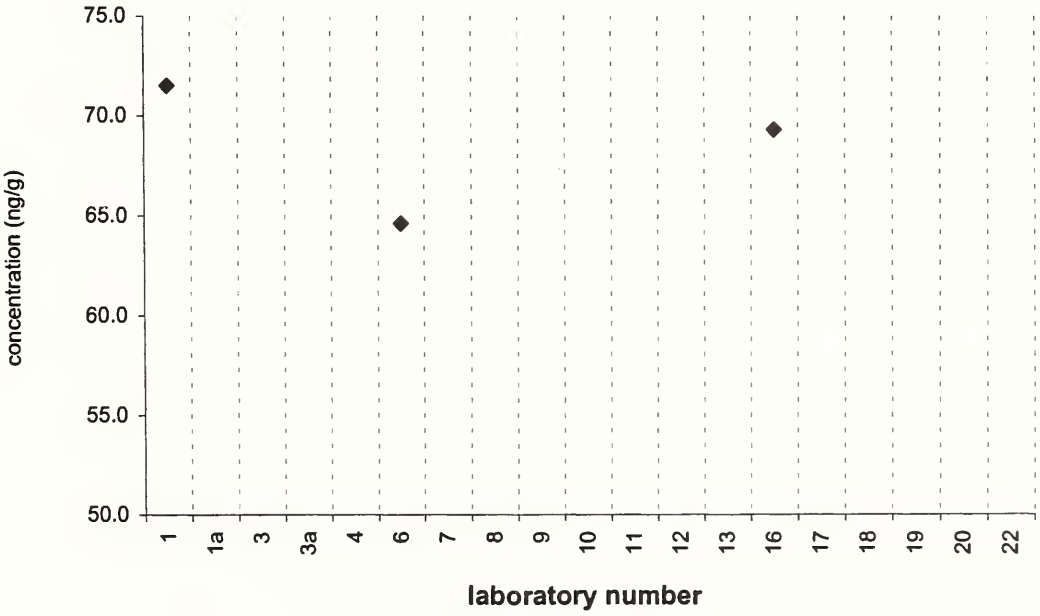
1-nitropyrene **PM 2.5 Interim RM**

Assigned value = 184 ng/g s = 20 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



1-nitropyrene **SRM 1649a**

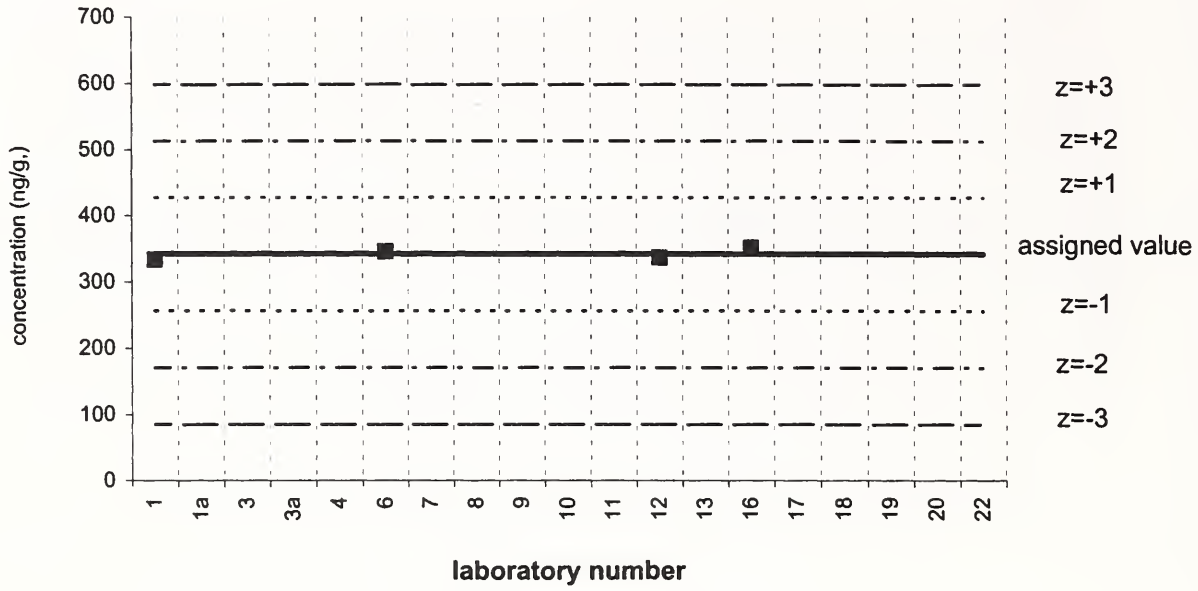
Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3



2-nitrofluoranthene

PM 2.5 Interim RM

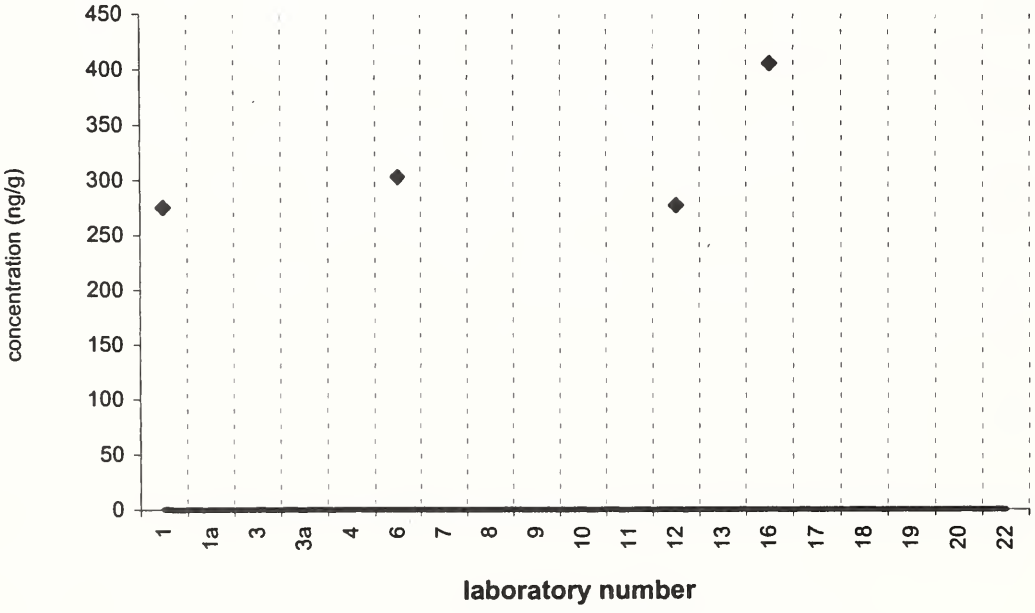
Assigned value = 342 ng/g s = 8 ng/g 95% CL = 13 ng/g
Reported Results: 4 Quantitative Results: 4



2-nitrofluoranthene

SRM 1649a

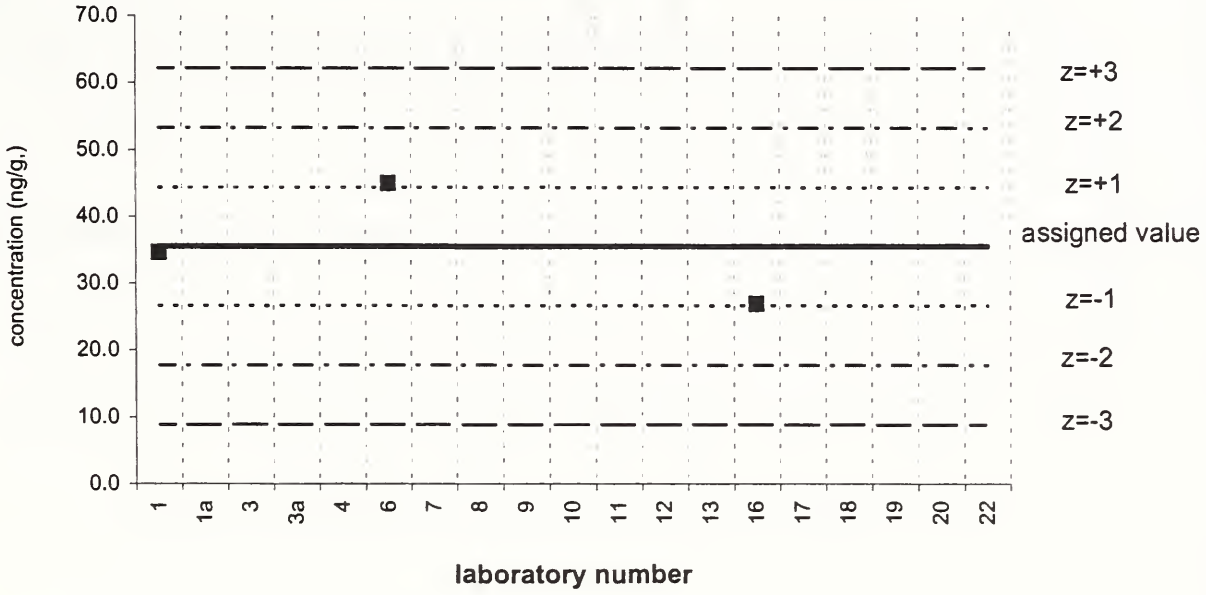
Target Value = no target ng/g
Reported Results: 4 Quantitative Results: 4



7-nitrobenz[a]anthracene

PM 2.5 Interim RM

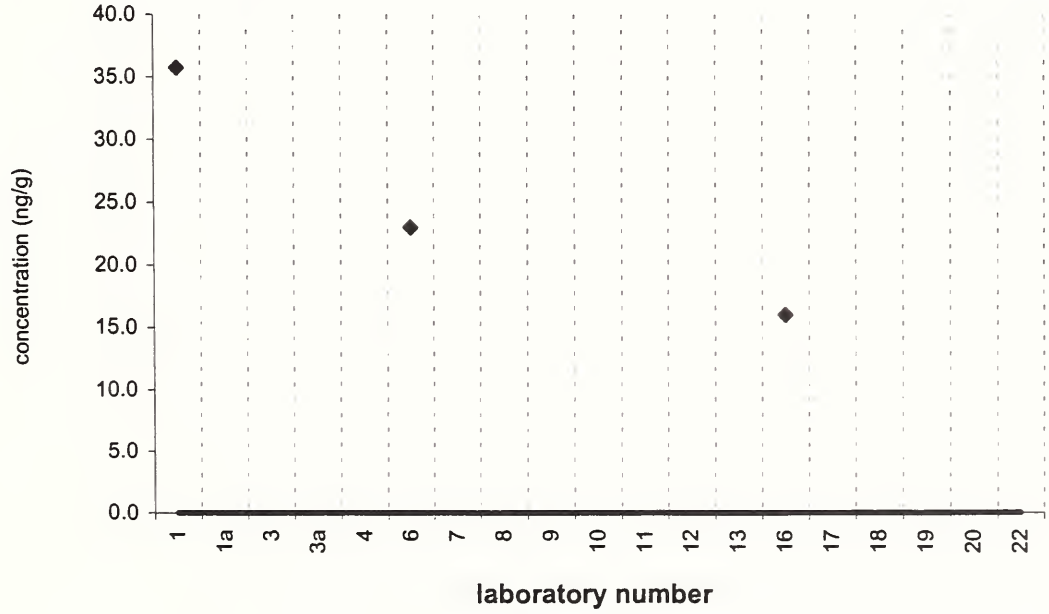
Assigned value = 35.5 ng/g s = 9.1 ng/g 95% CL = not calc. ng/g
Reported Results: 3 Quantitative Results: 3



7-nitrobenz[a]anthracene

SRM 1649a

Target Value = no target ng/g
Reported Results: 3 Quantitative Results: 3

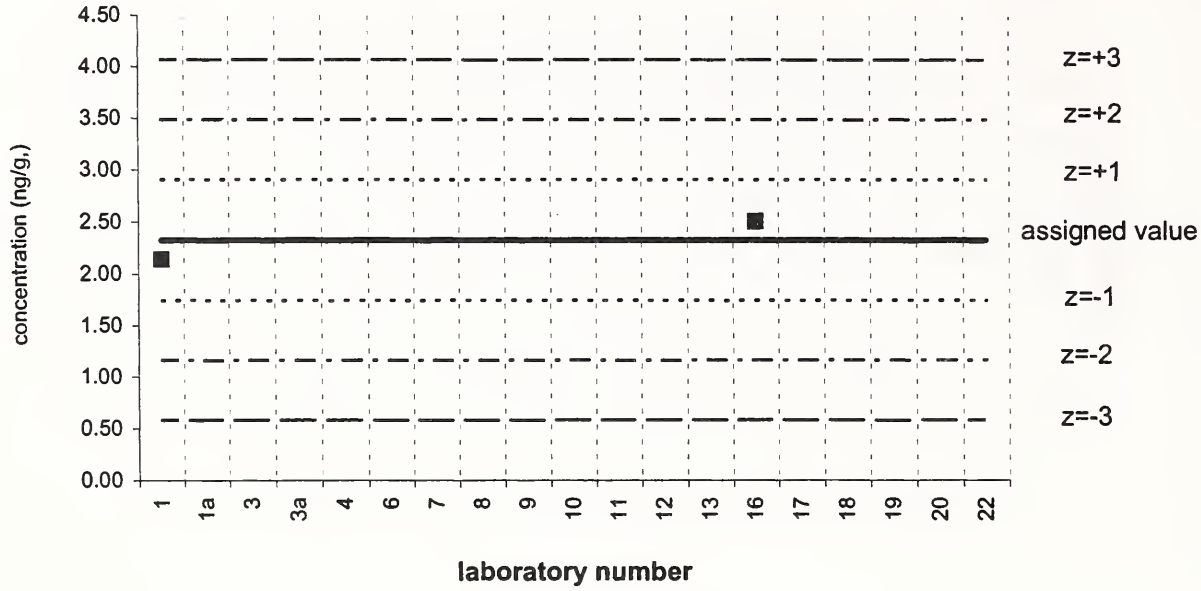


6-nitrochrysene

PM 2.5 Interim RM

Assigned value = 2.32 ng/g s = 0.26 ng/g 95% CL = not calc. ng/g

Reported Results: 3 Quantitative Results: 2

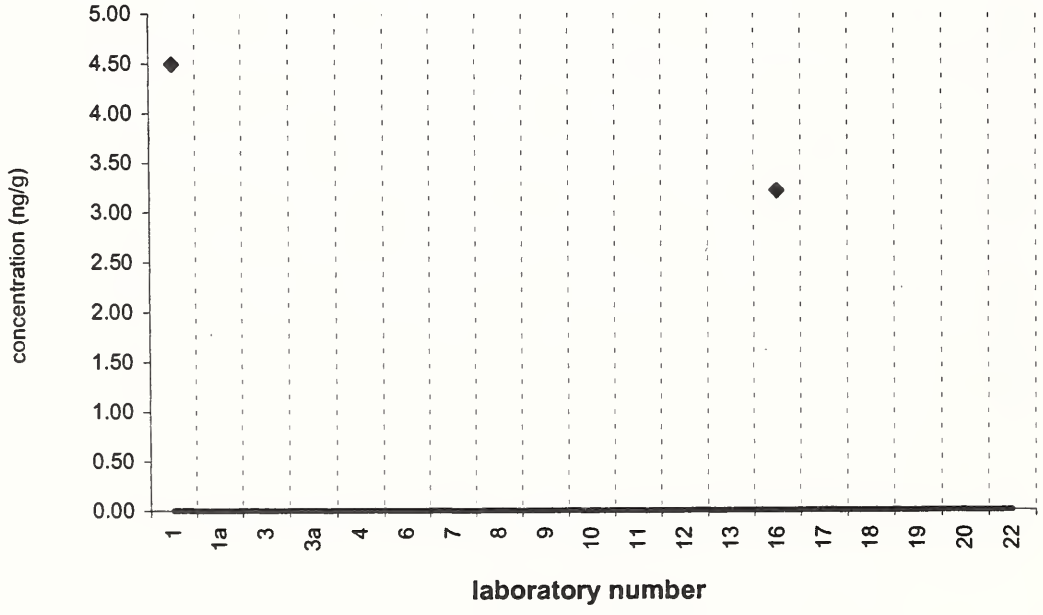


6-nitrochrysene

SRM 1649a

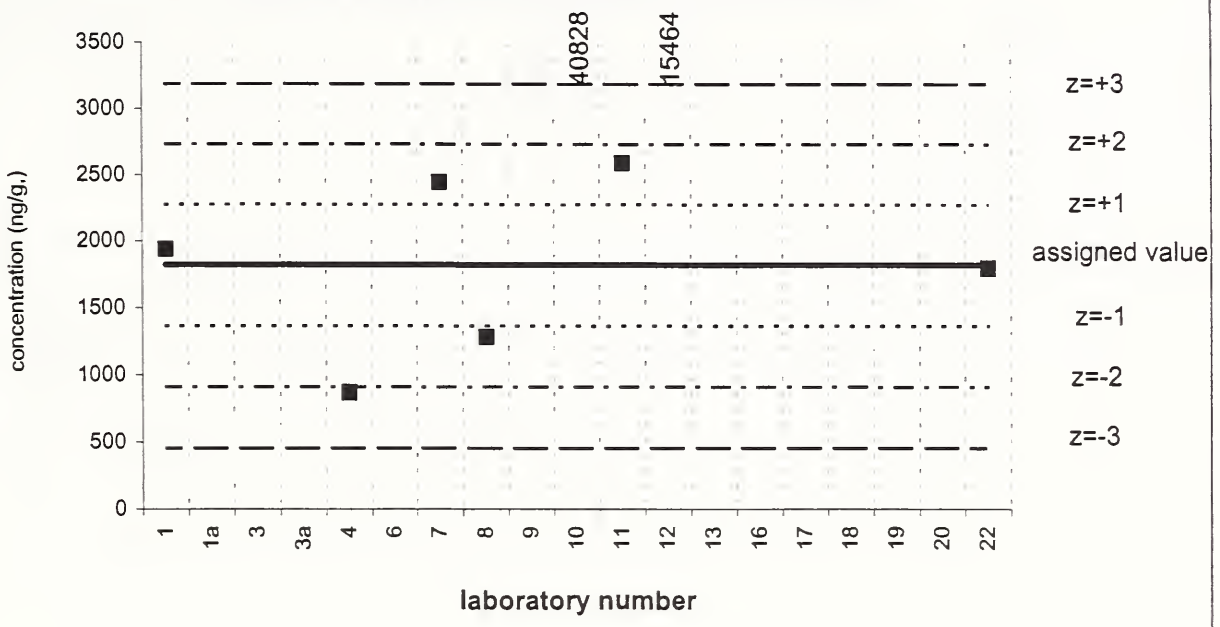
Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 2



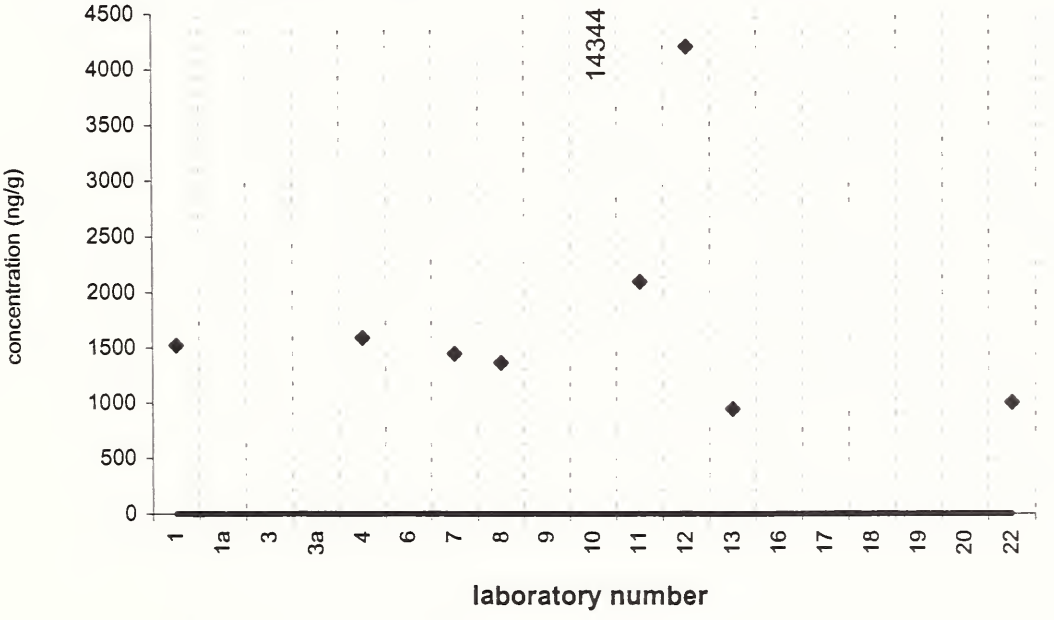
n-C20 **PM 2.5 Interim RM**

Assigned value = 1823 ng/g s = 662 ng/g 95% CL = 695 ng/g
Reported Results: 8 Quantitative Results: 8



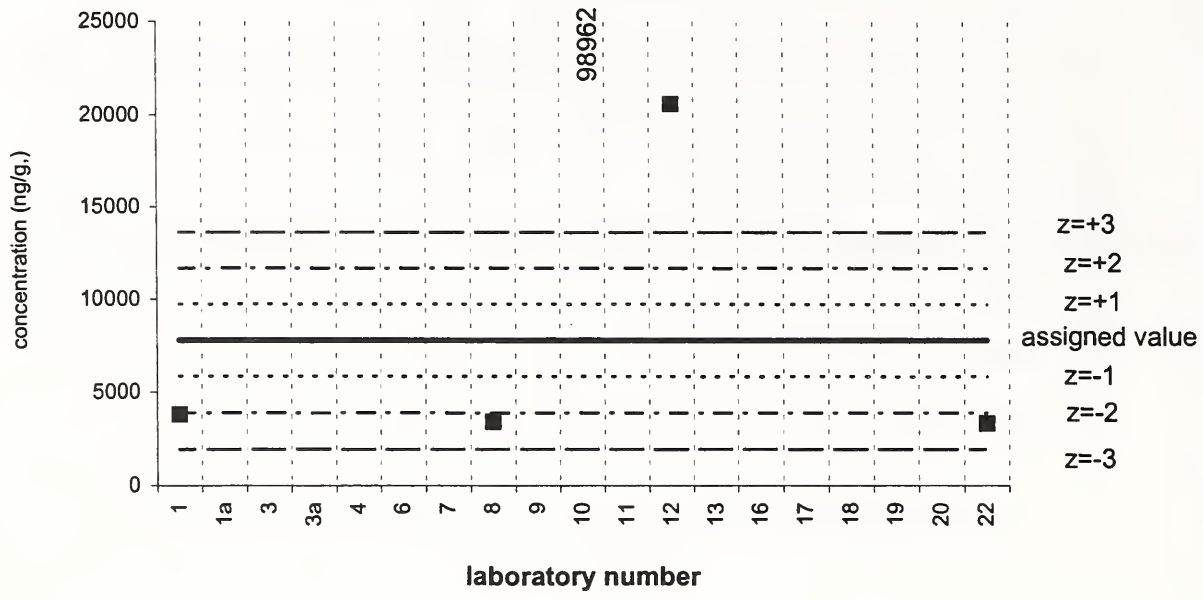
n-C20 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 9 Quantitative Results: 9



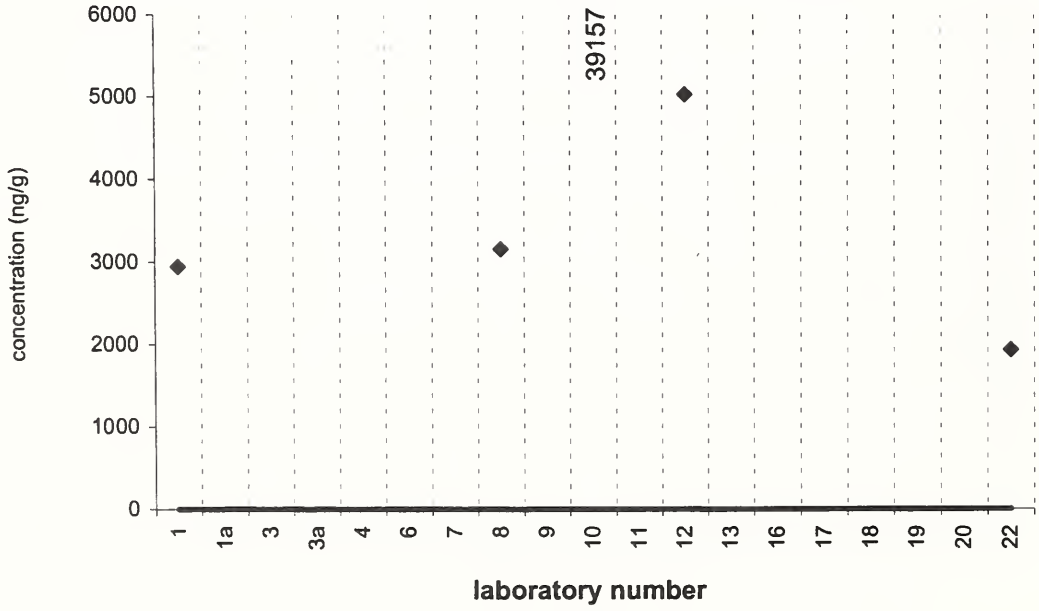
n-C21 **PM 2.5 Interim RM**

Assigned value = 7789 ng/g s = 8536 ng/g 95% CL = 13582 ng/g
Reported Results: 5 Quantitative Results: 5



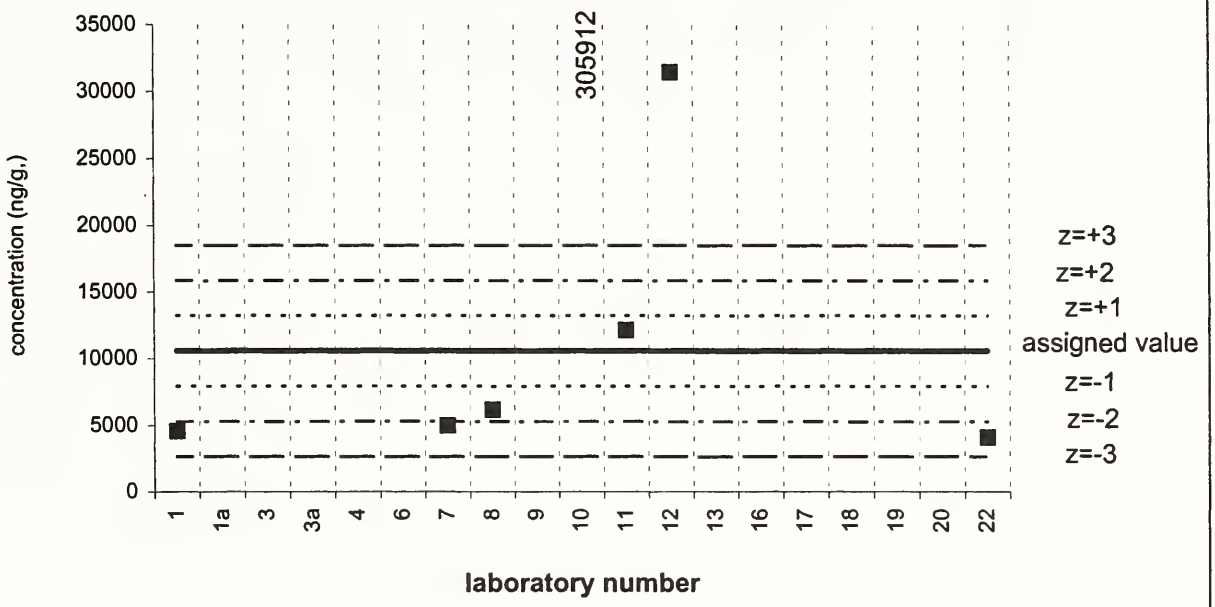
n-C21 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



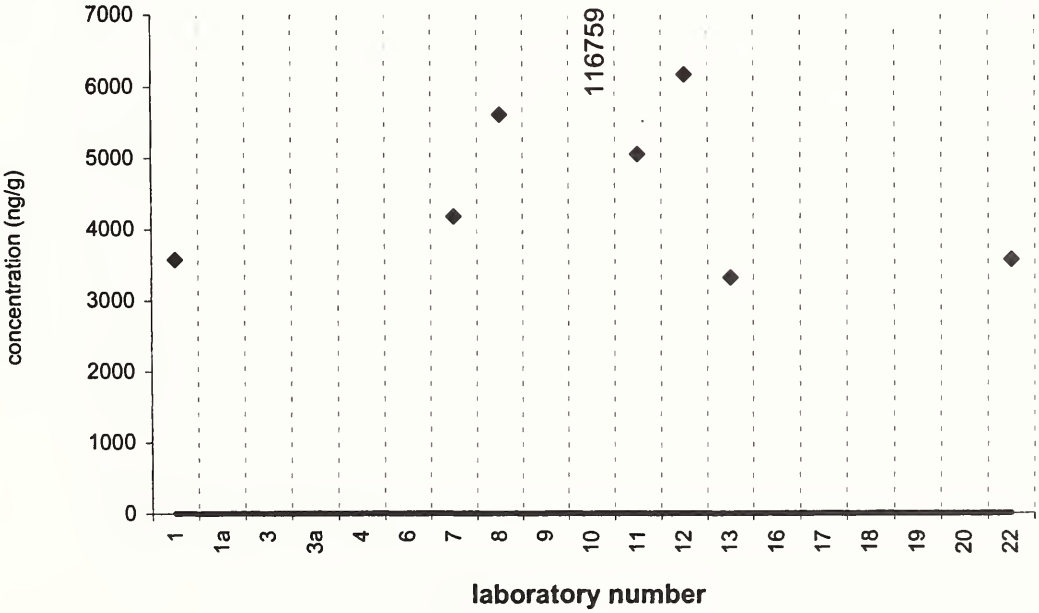
n-C22 **PM 2.5 Interim RM**

Assigned value = 10575 ng/g s = 10646 ng/g 95% CL = 11172 ng/g
Reported Results: 7 Quantitative Results: 7



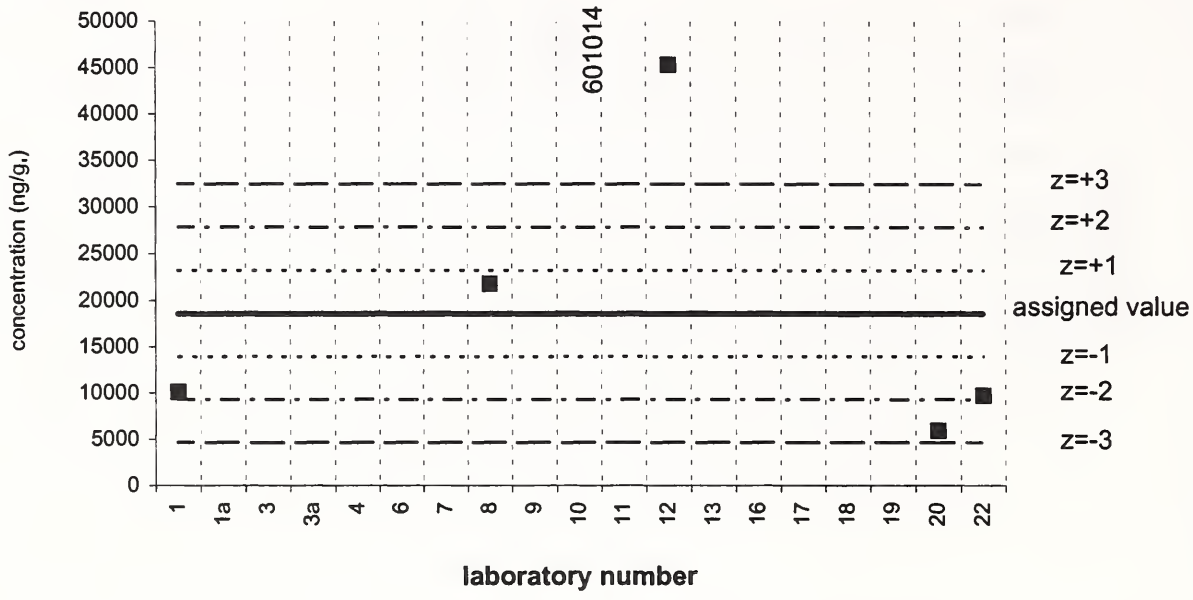
n-C22 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 8 Quantitative Results: 8



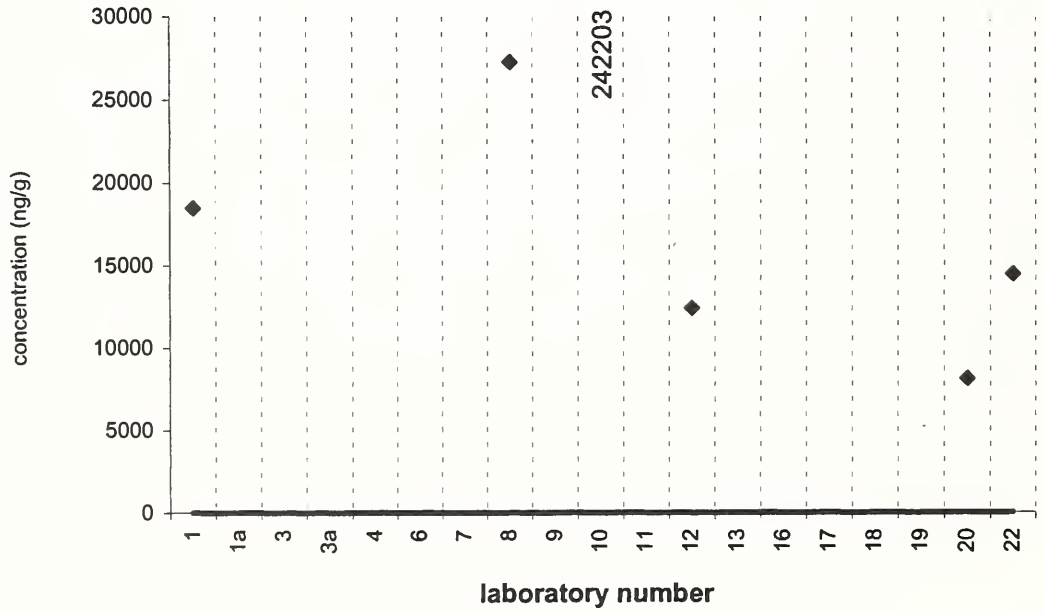
n-C23 **PM 2.5 Interim RM**

Assigned value = 18545 ng/g s = 16089 ng/g 95% CL = 19977 ng/g
Reported Results: 6 Quantitative Results: 6



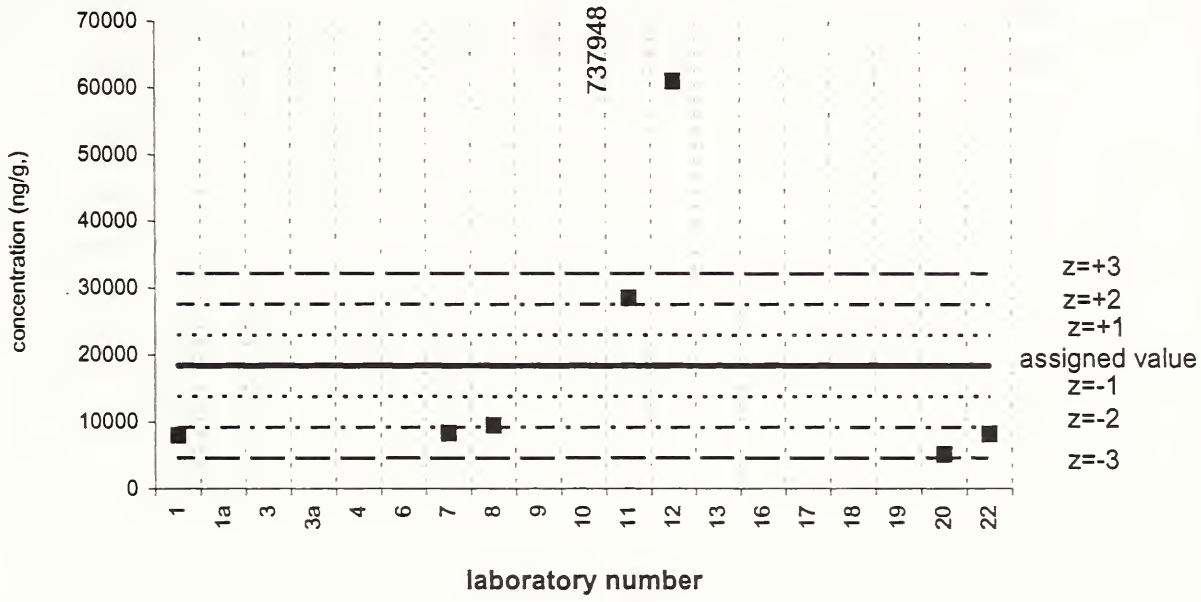
n-C23 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



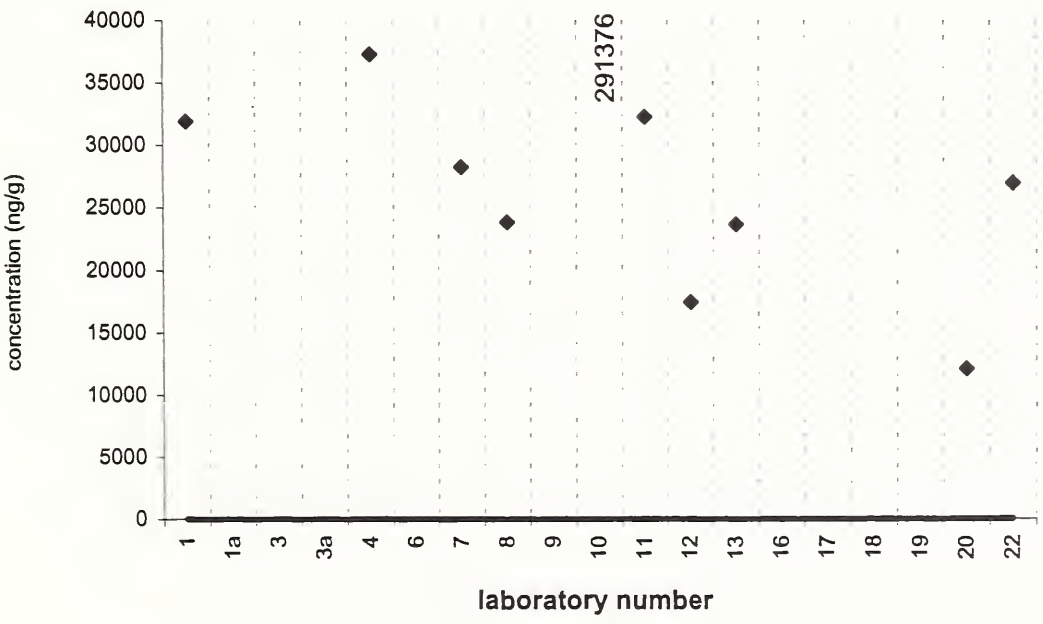
n-C24 **PM 2.5 Interim RM**

Assigned value = 18378 ng/g s = 20378 ng/g 95% CL = 18847 ng/g
Reported Results: 8 Quantitative Results: 8



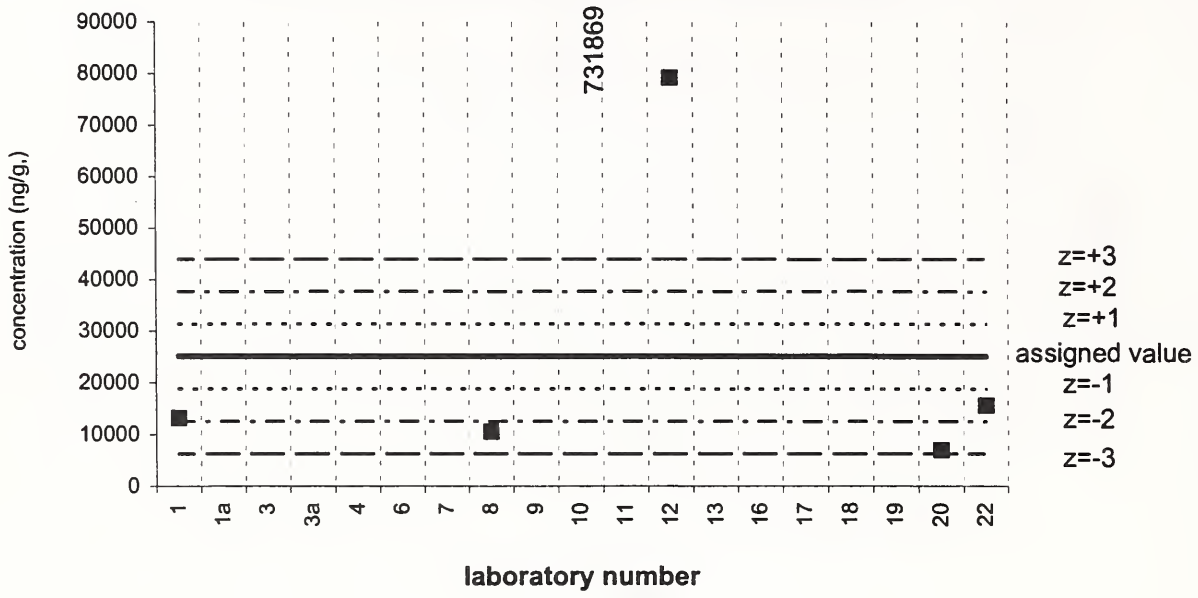
n-C24 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 10 Quantitative Results: 10



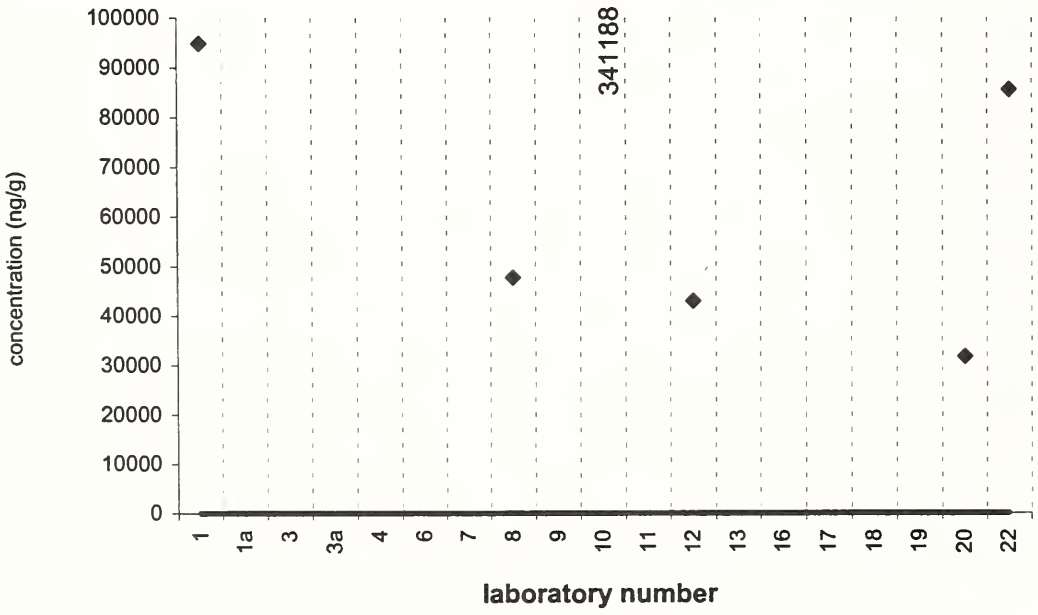
n-C25 **PM 2.5 Interim RM**

Assigned value = 25125 ng/g s = 30387 ng/g 95% CL = 37731 ng/g
Reported Results: 6 Quantitative Results: 6



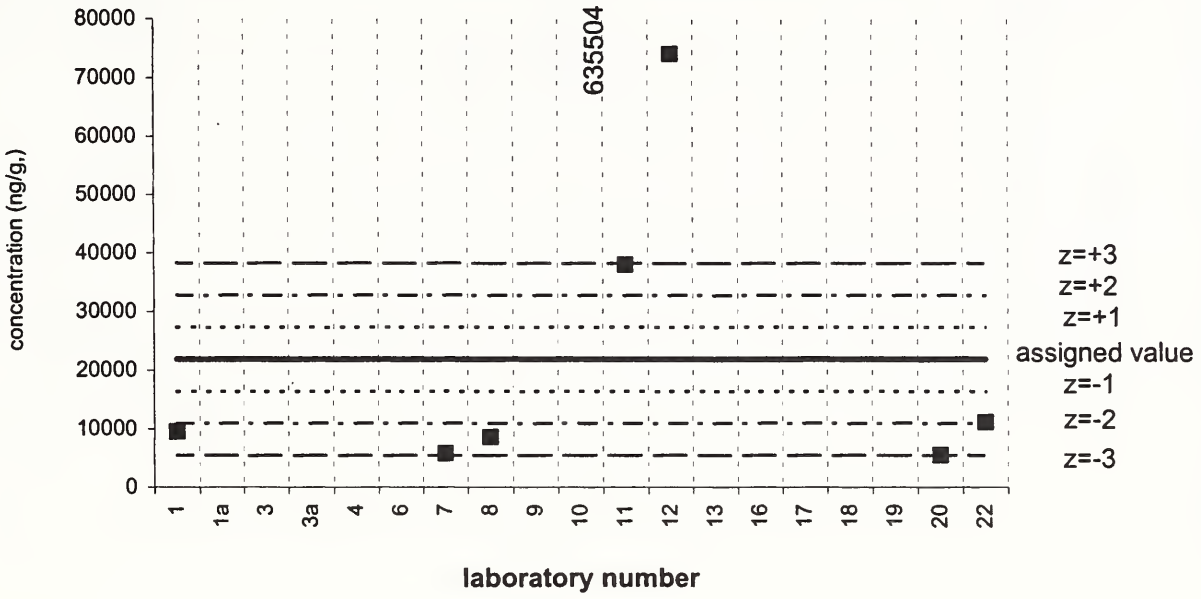
n-C25 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



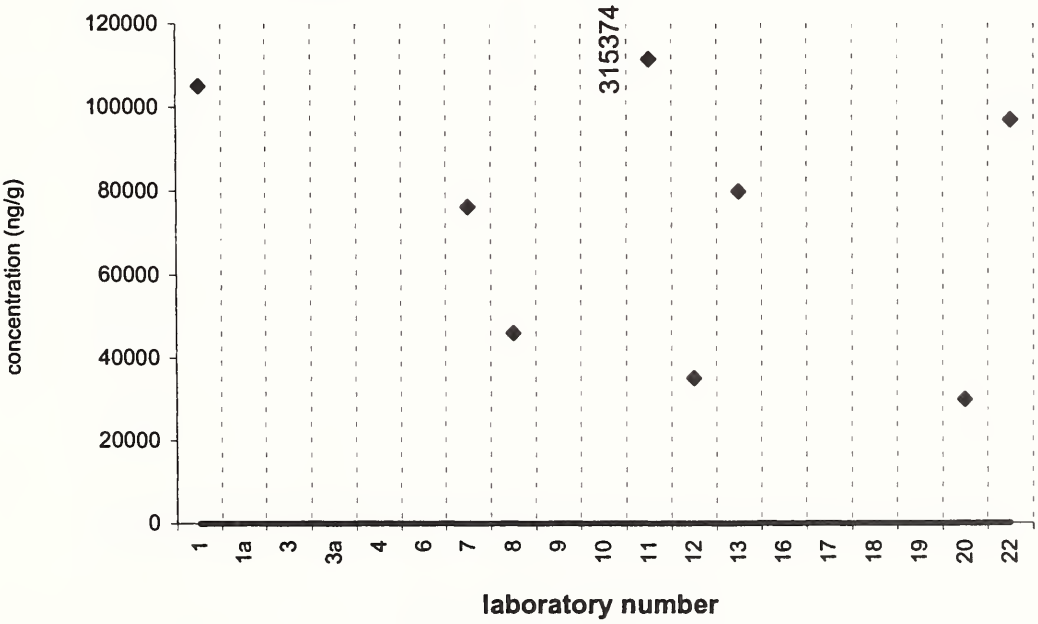
n-C26 **PM 2.5 Interim RM**

Assigned value = 21834 ng/g s = 25697 ng/g 95% CL = 23766 ng/g
Reported Results: 8 Quantitative Results: 8



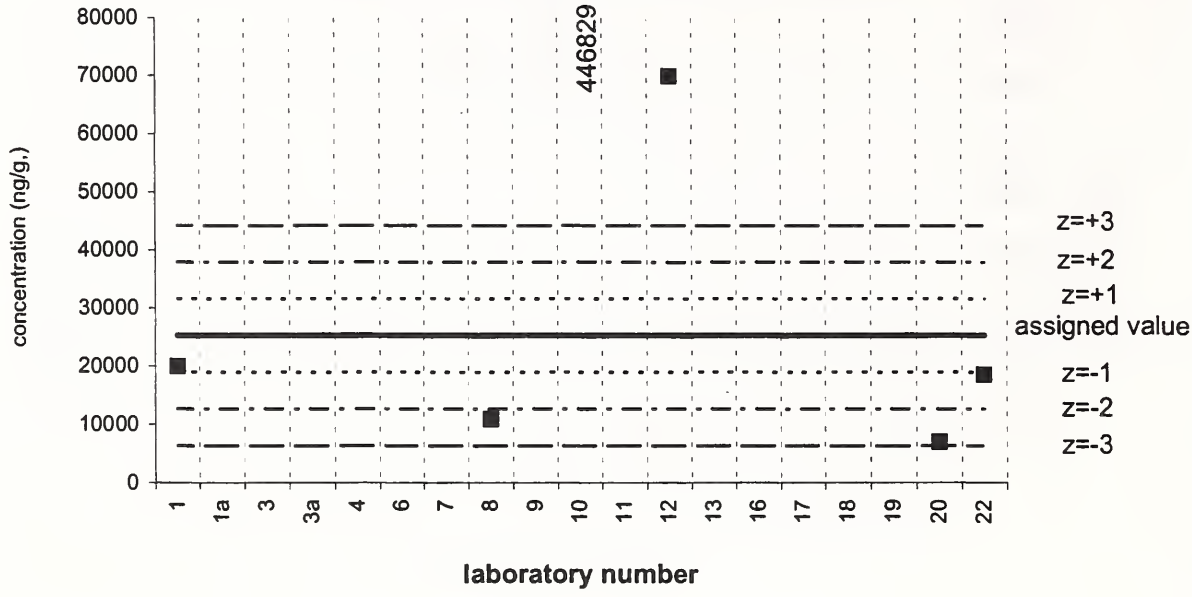
n-C26 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 9 Quantitative Results: 9



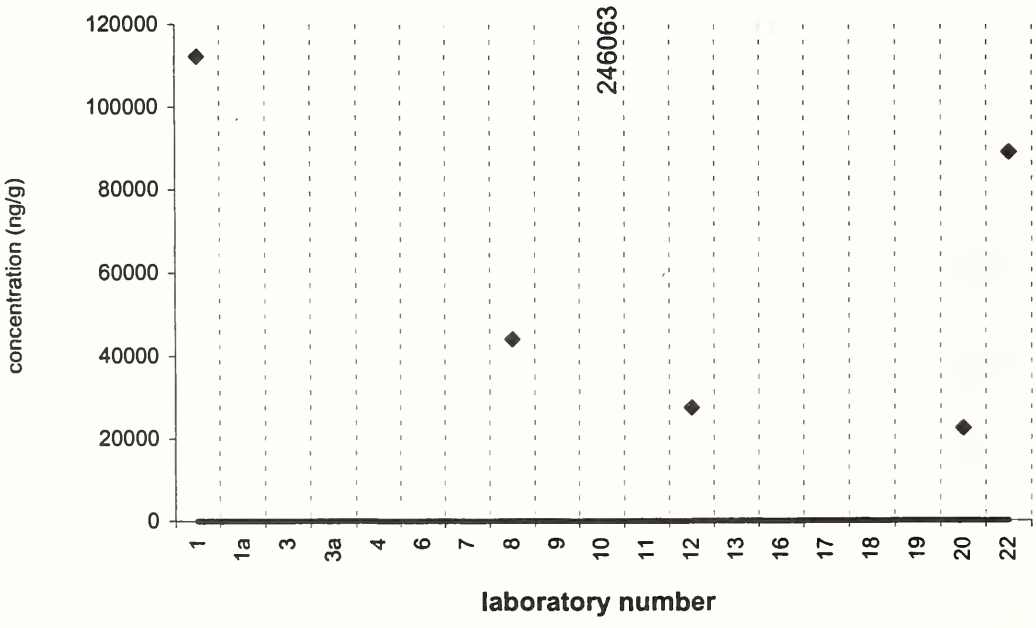
n-C27 **PM 2.5 Interim RM**

Assigned value = 25273 ng/g s = 25531 ng/g 95% CL = 31700 ng/g
Reported Results: 6 Quantitative Results: 6



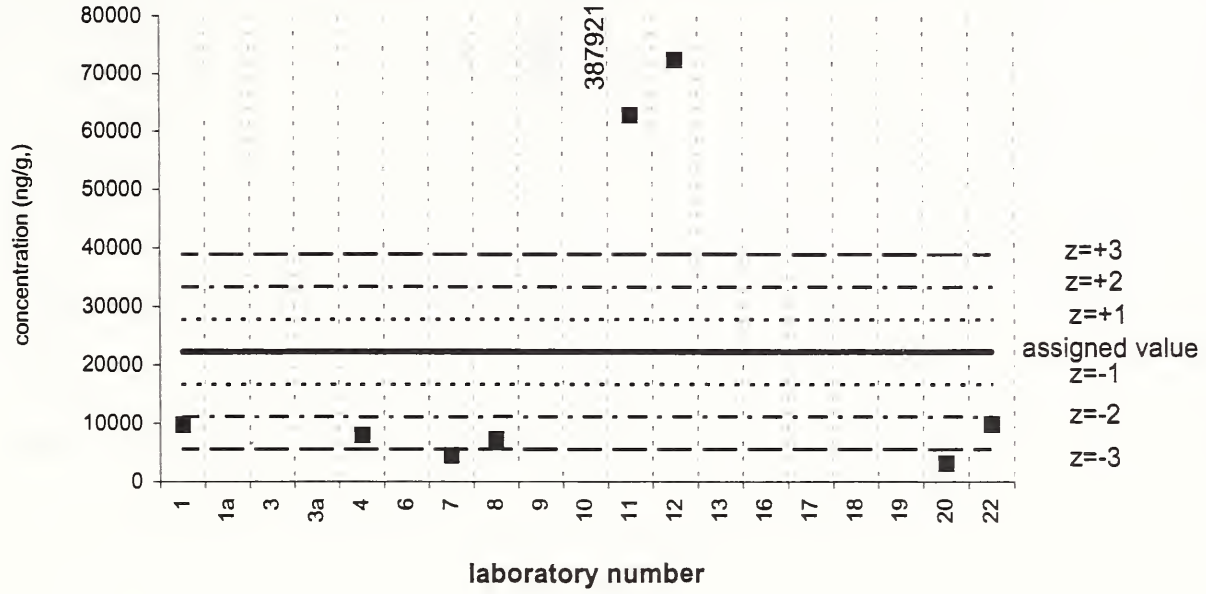
n-C27 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



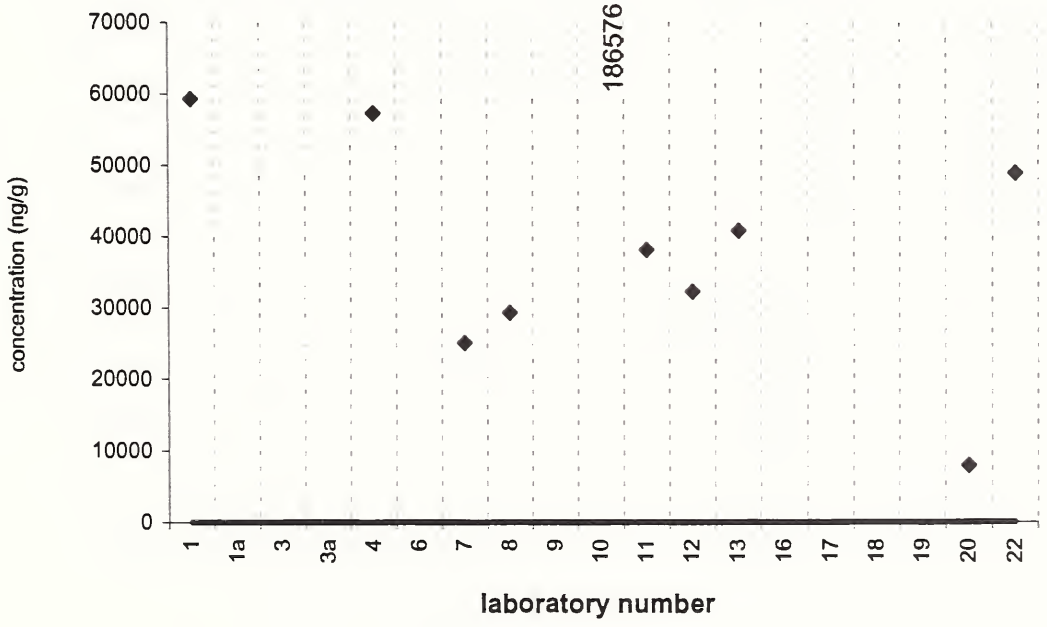
n-C28 **PM 2.5 Interim RM**

Assigned value = 22229 ng/g s = 28239 ng/g 95% CL = 23609 ng/g
Reported Results: 9 Quantitative Results: 9



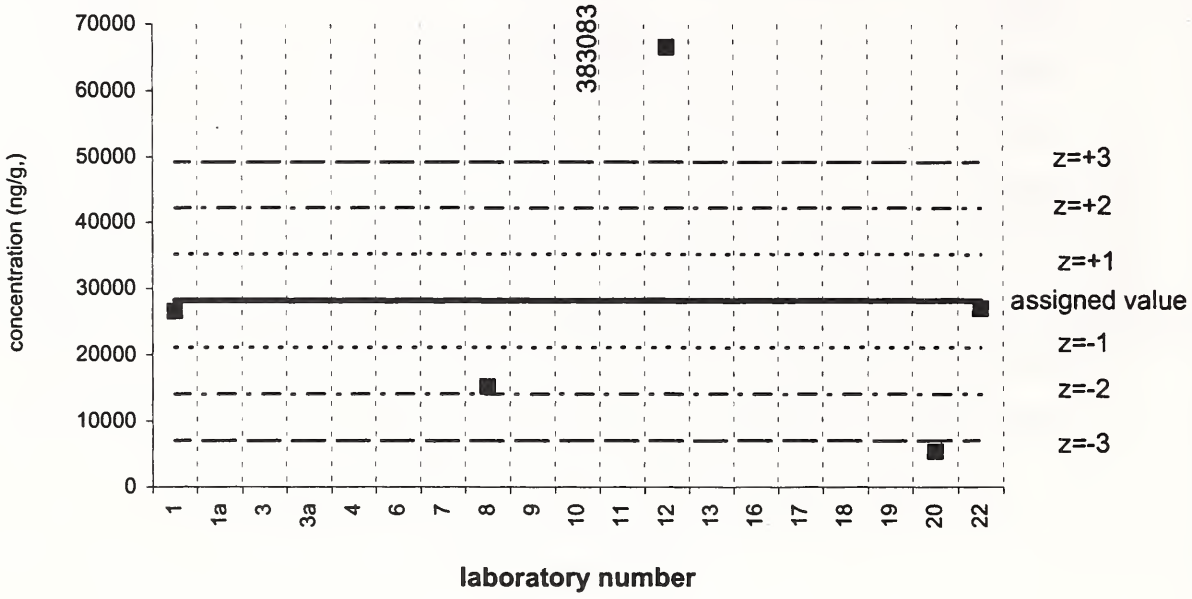
n-C28 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 10 Quantitative Results: 10



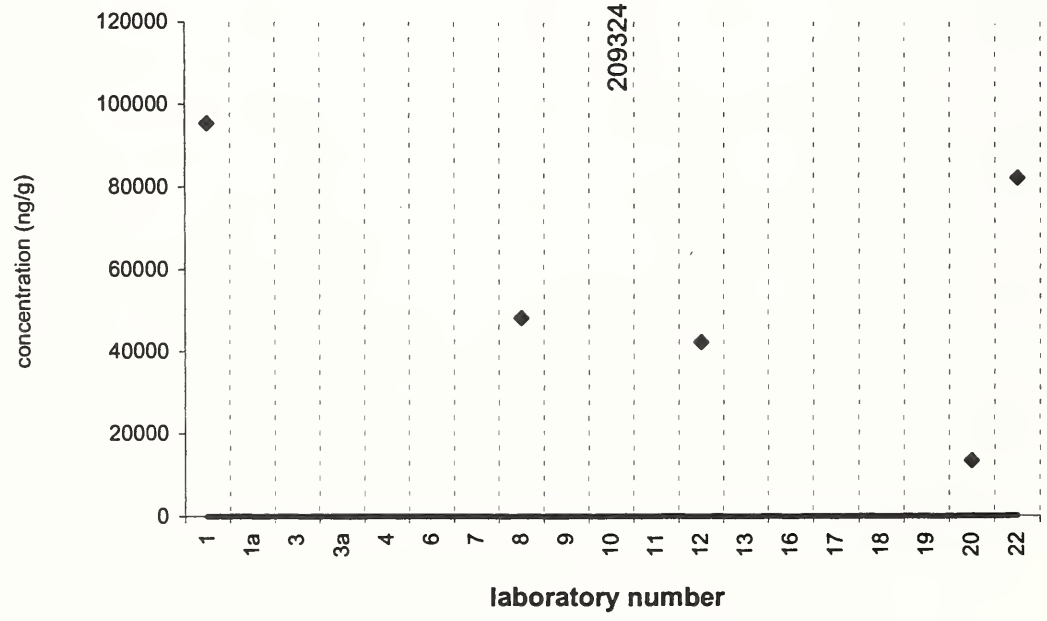
n-C29 **PM 2.5 Interim RM**

Assigned value = 28135 ng/g s = 23245 ng/g 95% CL = 28863 ng/g
Reported Results: 6 Quantitative Results: 6



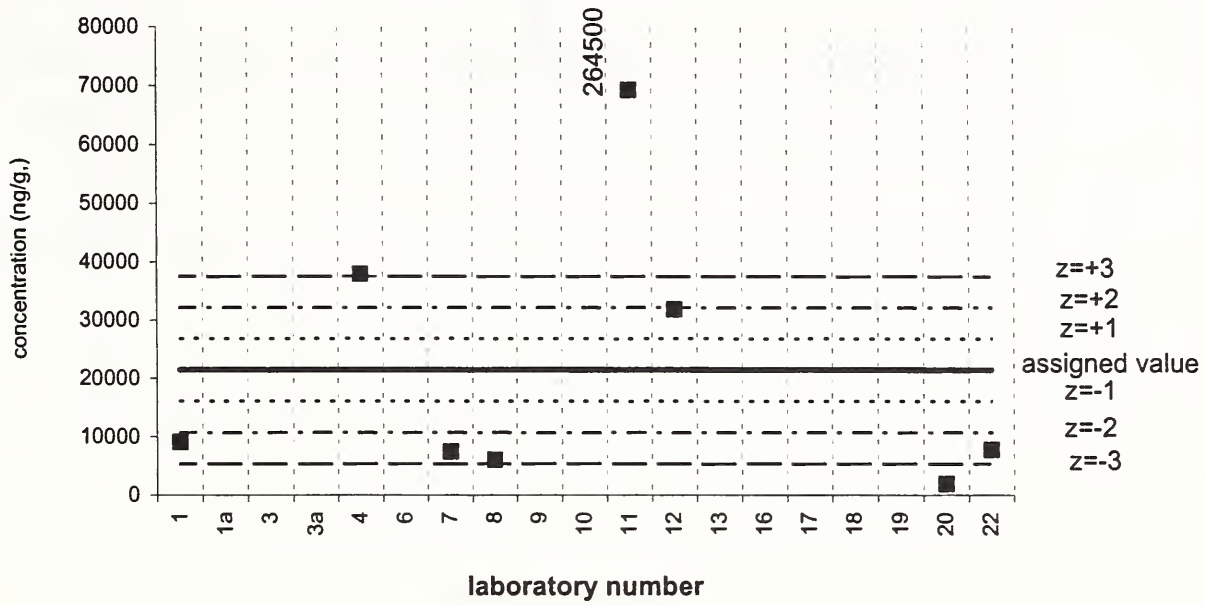
n-C29 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



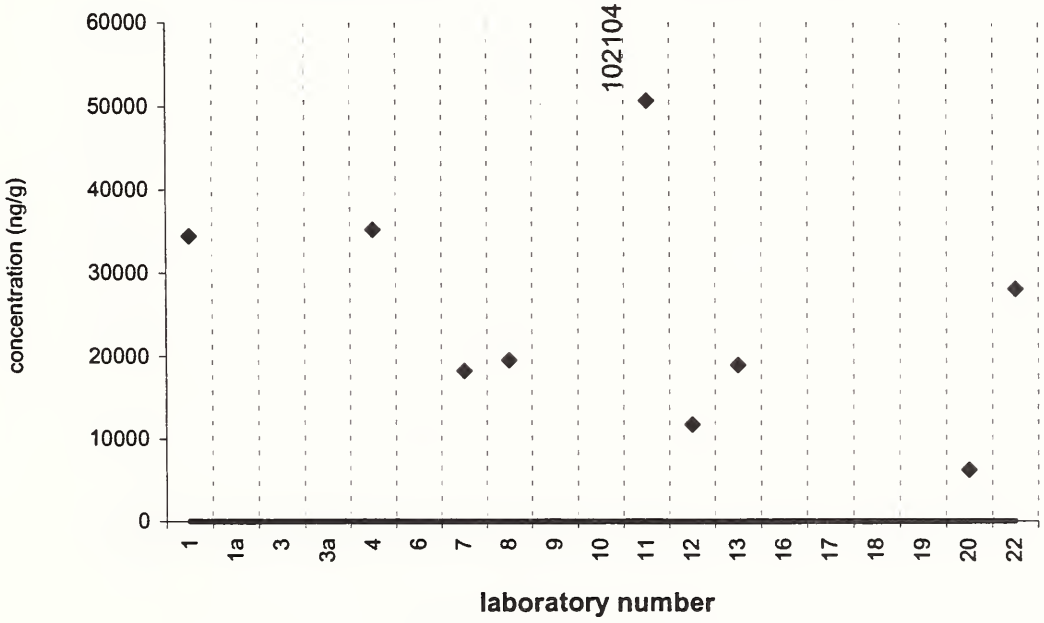
n-C30 **PM 2.5 Interim RM**

Assigned value = 21443 ng/g s = 23386 ng/g 95% CL = 19551 ng/g
Reported Results: 9 Quantitative Results: 9



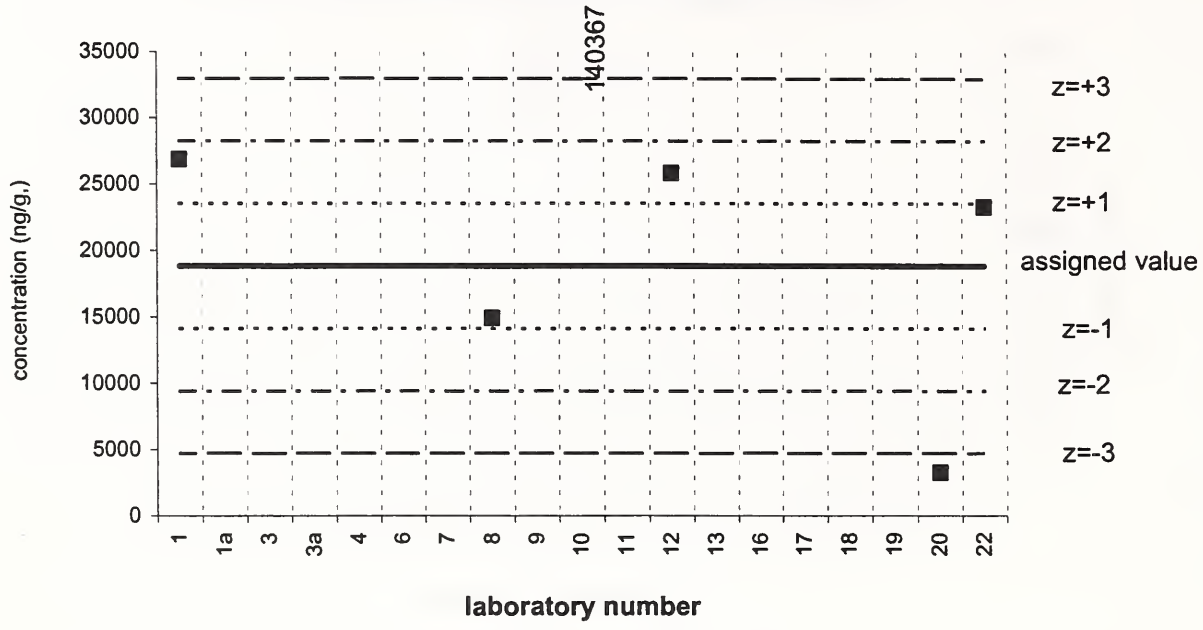
n-C30 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 10 Quantitative Results: 10



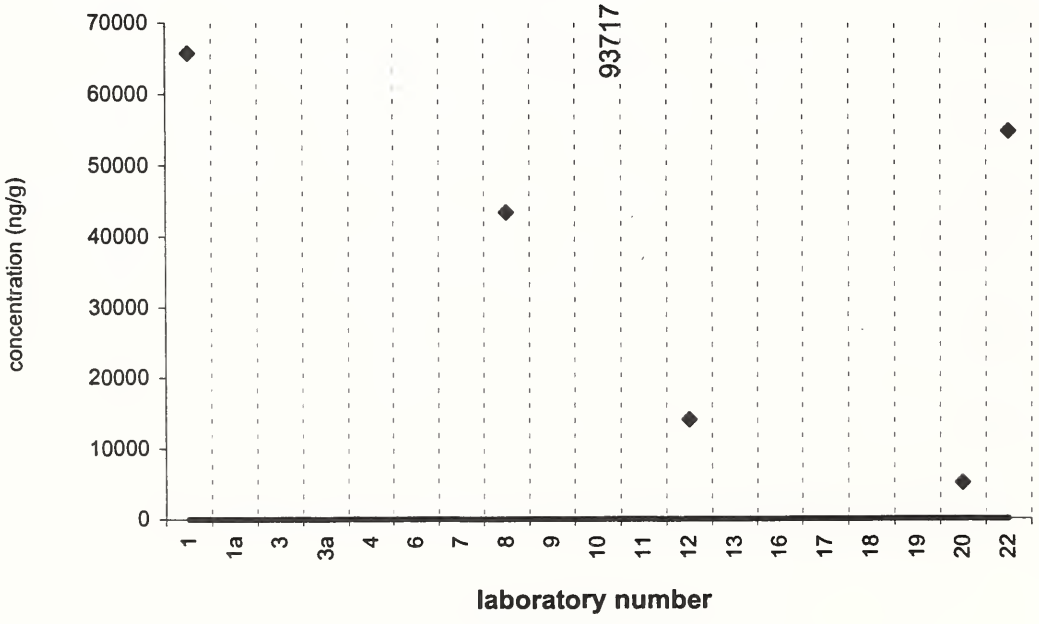
n-C31 **PM 2.5 Interim RM**

Assigned value = 18838 ng/g s = 9888 ng/g 95% CL = 12277 ng/g
Reported Results: 6 Quantitative Results: 6



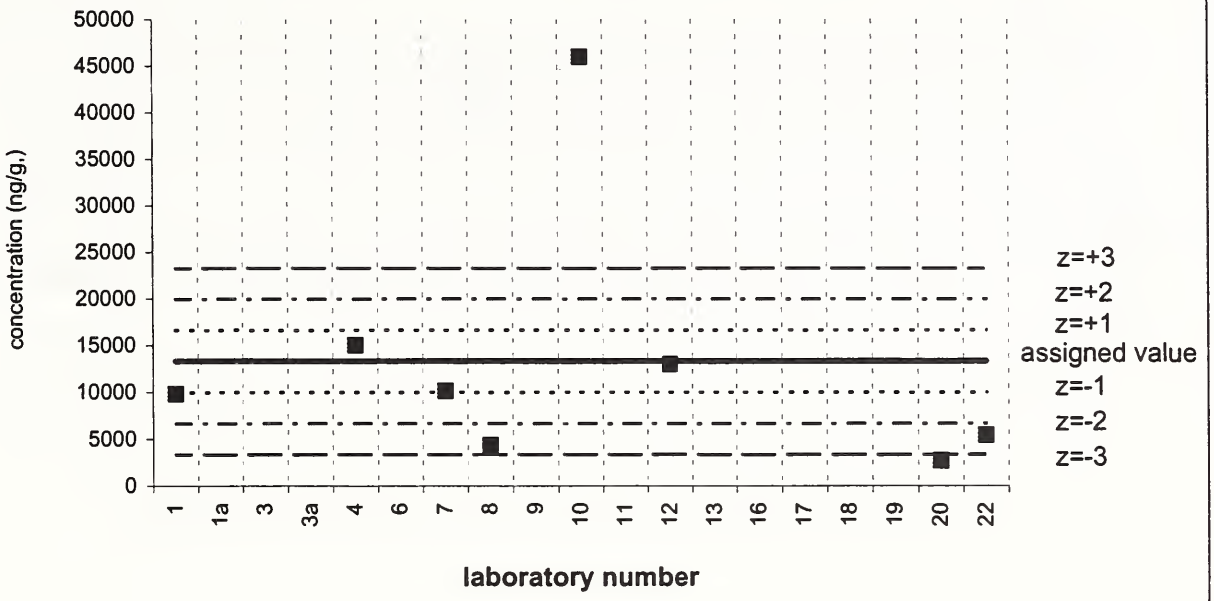
n-C31 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 6 Quantitative Results: 6



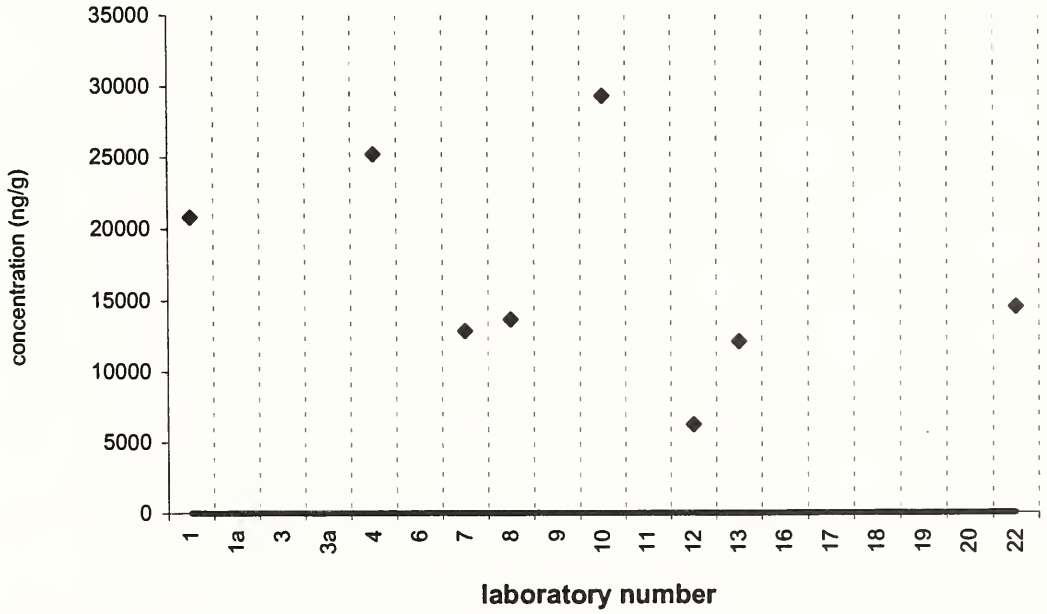
n-C32 **PM 2.5 Interim RM**

Assigned value = 13302 ng/g s = 13869 ng/g 95% CL = 11594 ng/g
Reported Results: 8 Quantitative Results: 8



n-C32 **SRM 1649a**

Target Value = no target ng/g
Reported Results: 9 Quantitative Results: 8

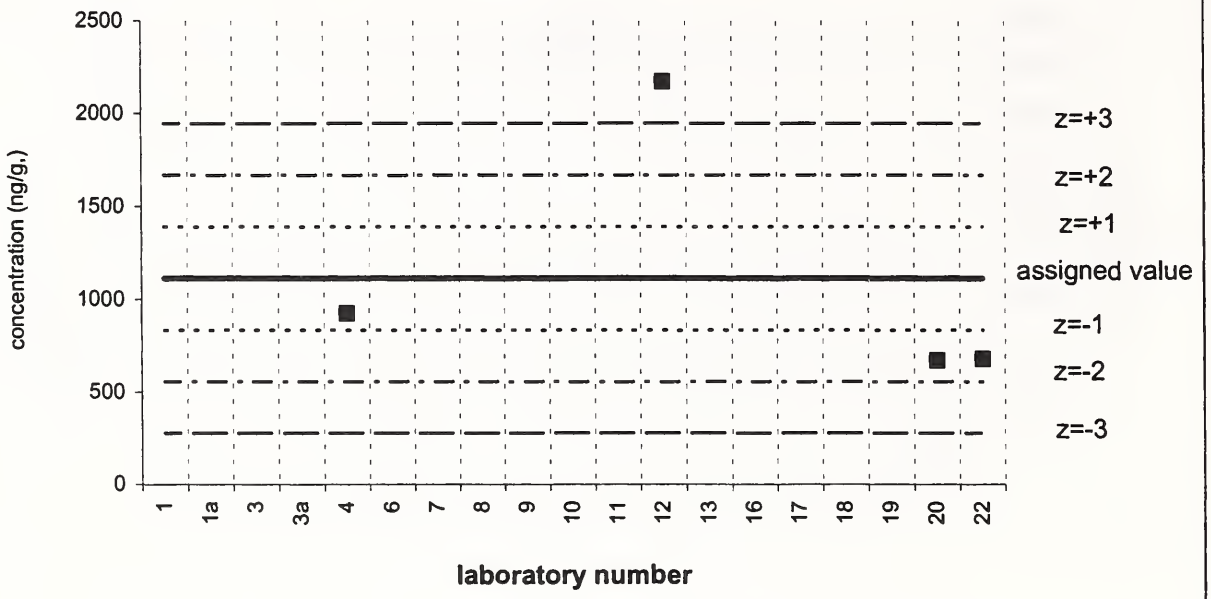


17a(H)-22, 29, 30-trisnorhopane

PM 2.5 Interim RM

Assigned value = 1112 ng/g s = 716 ng/g 95% CL = 1139 ng/g

Reported Results: 4 Quantitative Results: 4

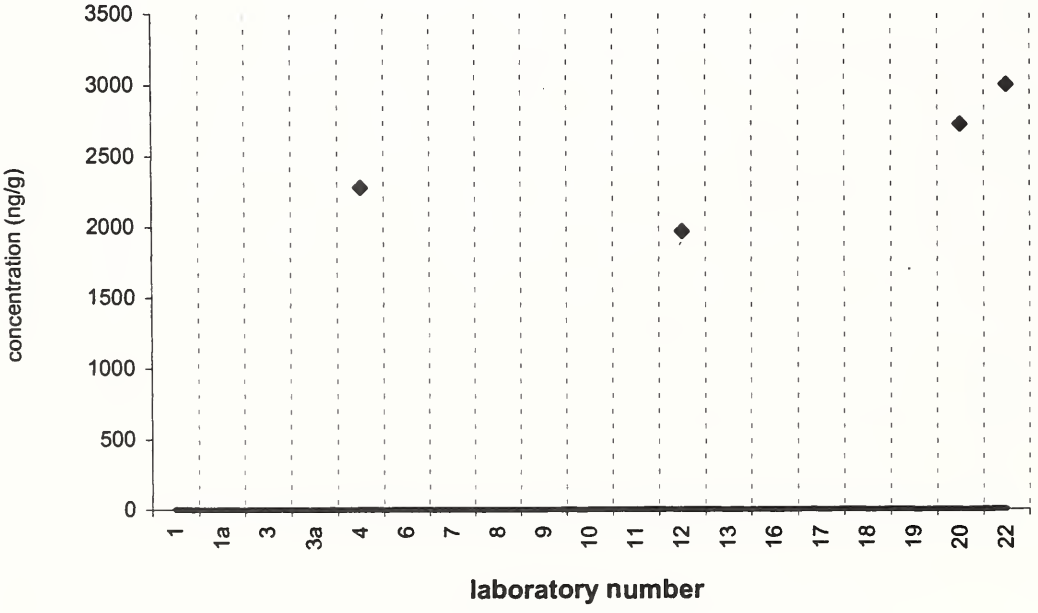


17a(H)-22, 29, 30-trisnorhopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 4 Quantitative Results: 4

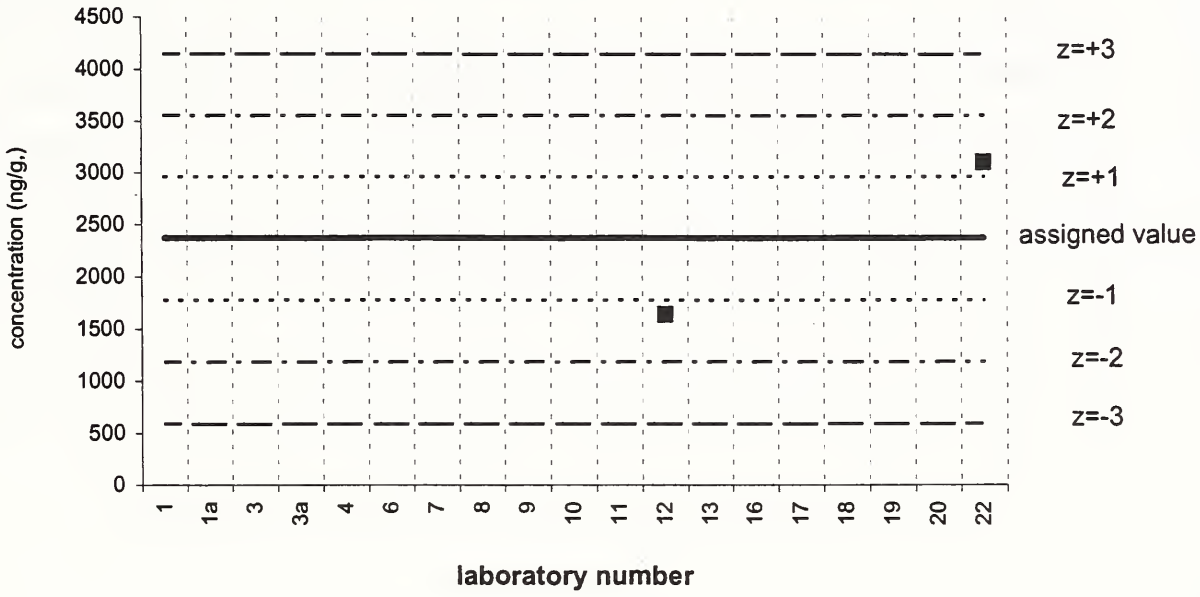


17a(H), 21b(H)-29-norhopane

PM 2.5 Interim RM

Assigned value = 2370 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

Reported Results: 2 Quantitative Results: 2

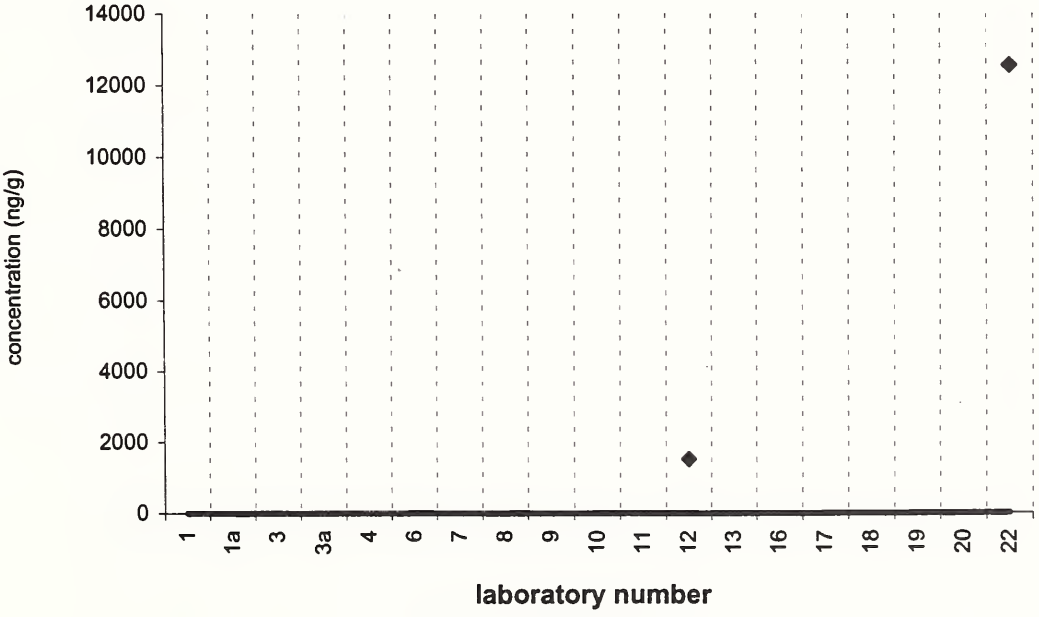


17a(H), 21b(H)-29-norhopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

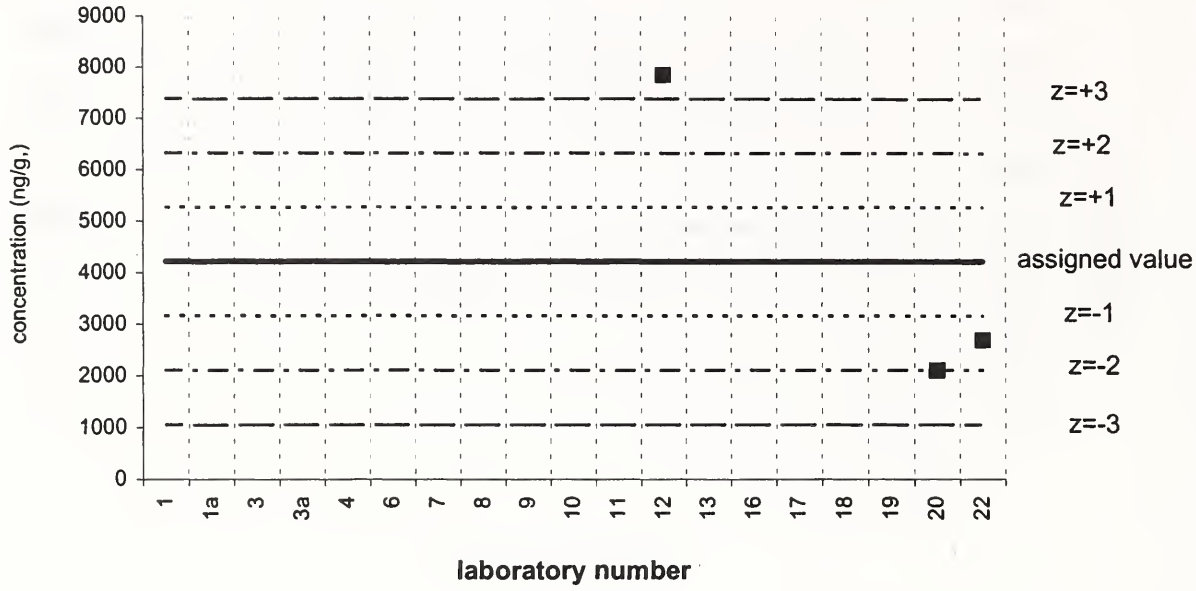


17a(H), 21b(H)-29-hopane

PM 2.5 Interim RM

Assigned value = 4218 ng/g s = 3158 ng/g 95% CL = not calc. ng/g

Reported Results: 3 Quantitative Results: 3

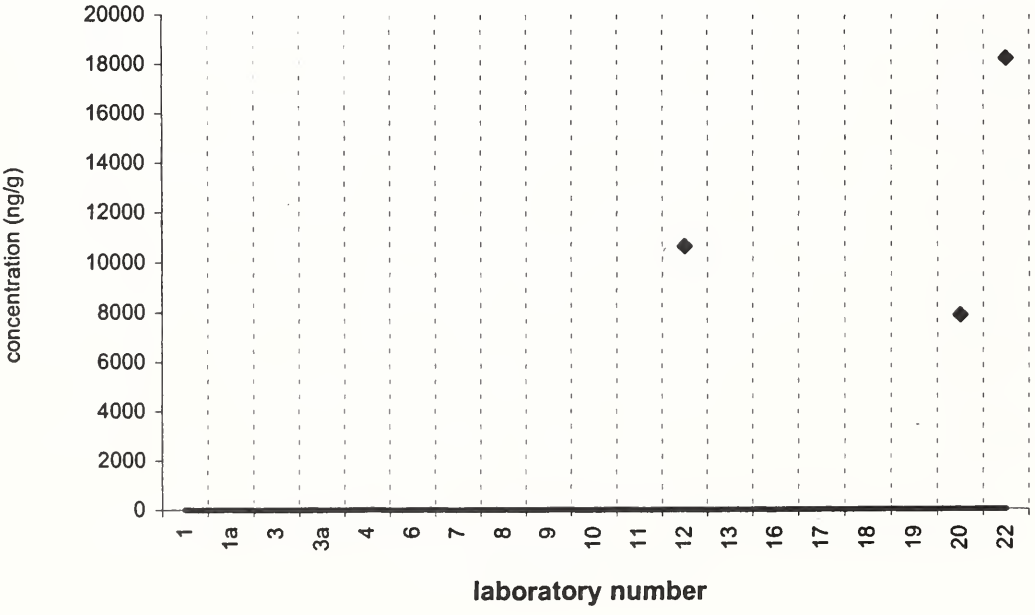


17a(H), 21b(H)-29-hopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

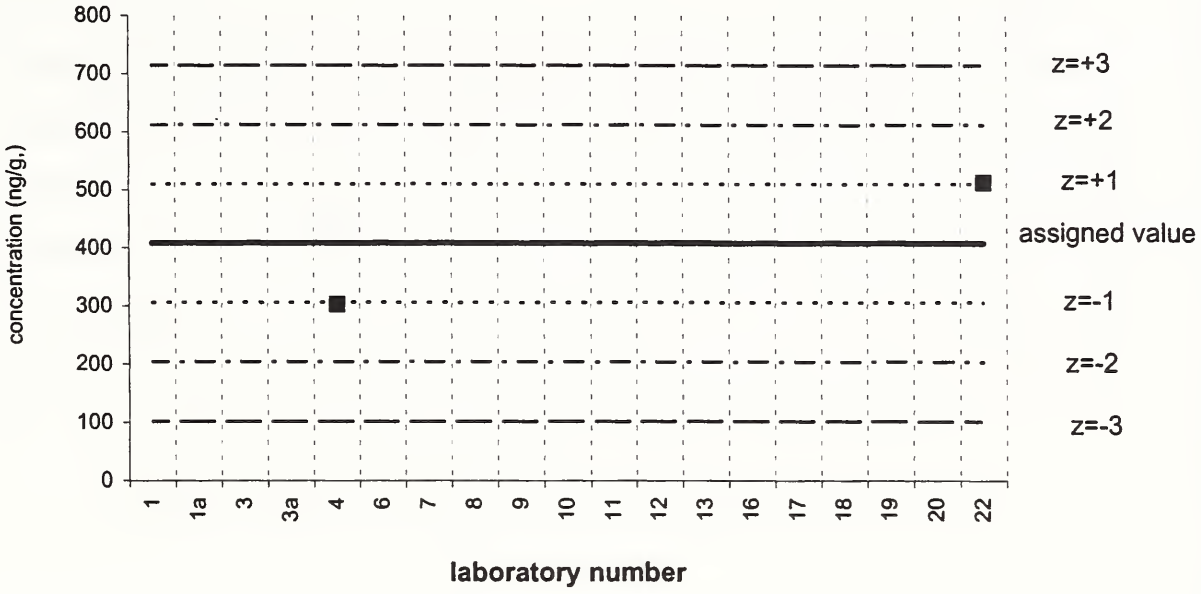


20R-5a(H), 14b(H), 17b(H)-cholestane

PM 2.5 Interim RM

Assigned value = 408 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

Reported Results: 3 Quantitative Results: 2

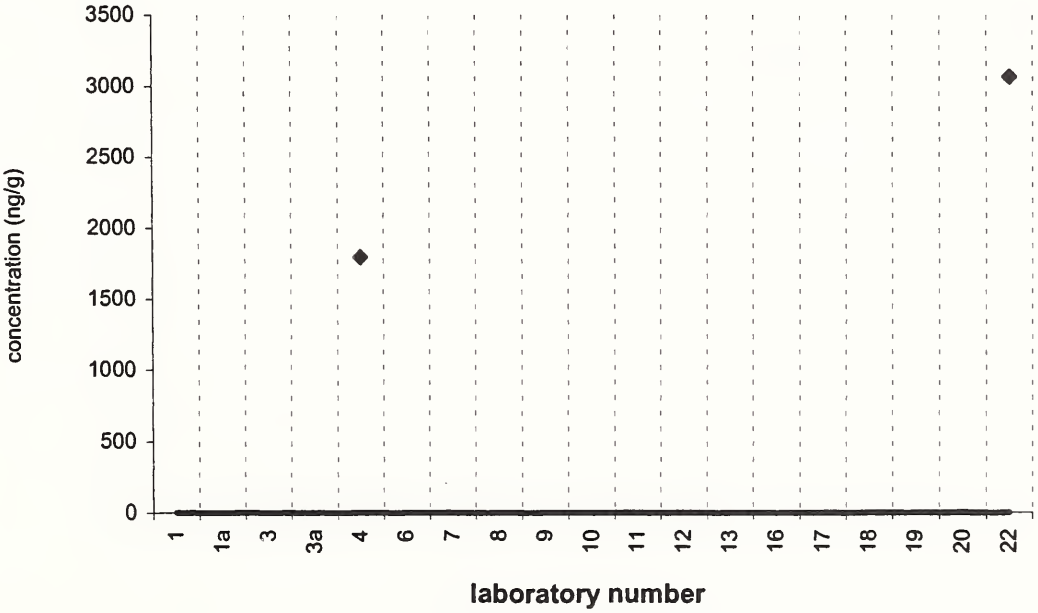


20R-5a(H), 14b(H), 17b(H)-cholestane

SRM 1649a

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 2

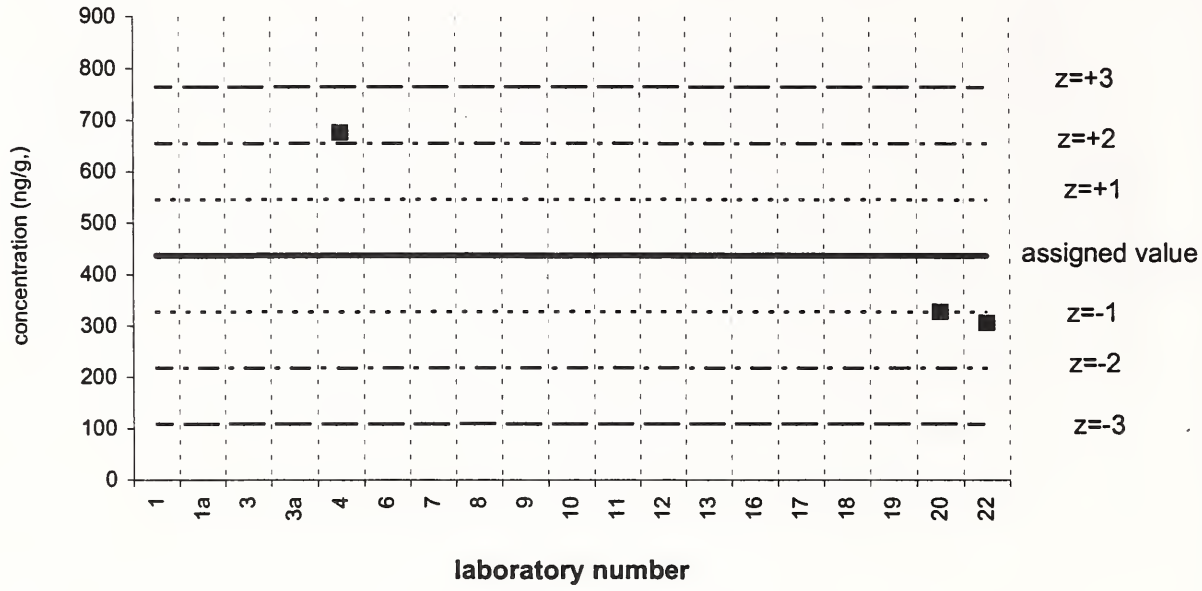


20R-5a(H), 14a(H), 17a(H)-cholestane

PM 2.5 Interim RM

Assigned value = 437 ng/g s = 207 ng/g 95% CL = not calc. ng/g

Reported Results: 3 Quantitative Results: 3

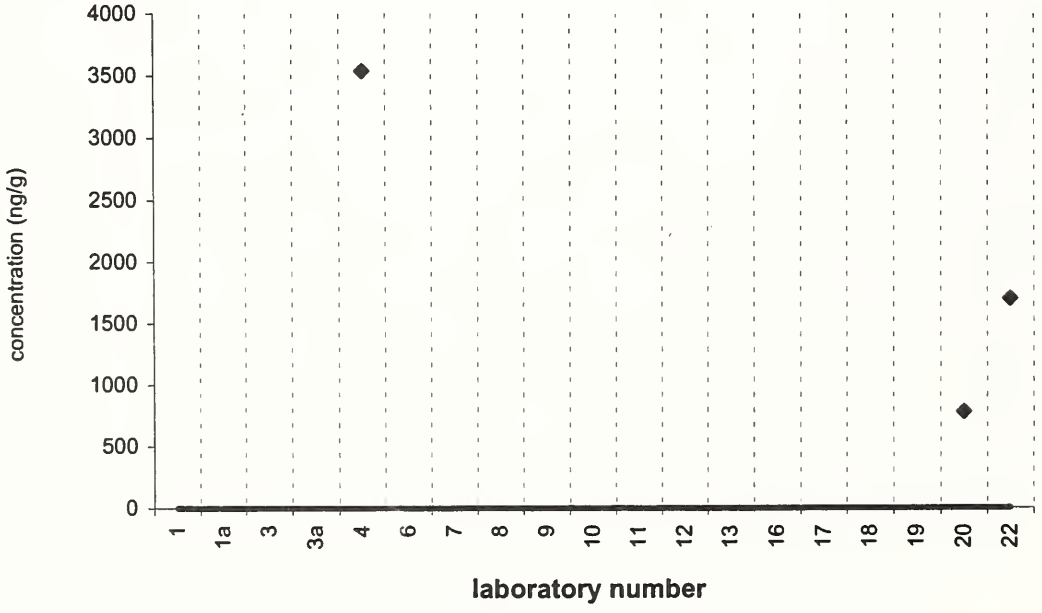


20R-5a(H), 14a(H), 17a(H)-cholestane

SRM 1649a

Target Value = no target ng/g

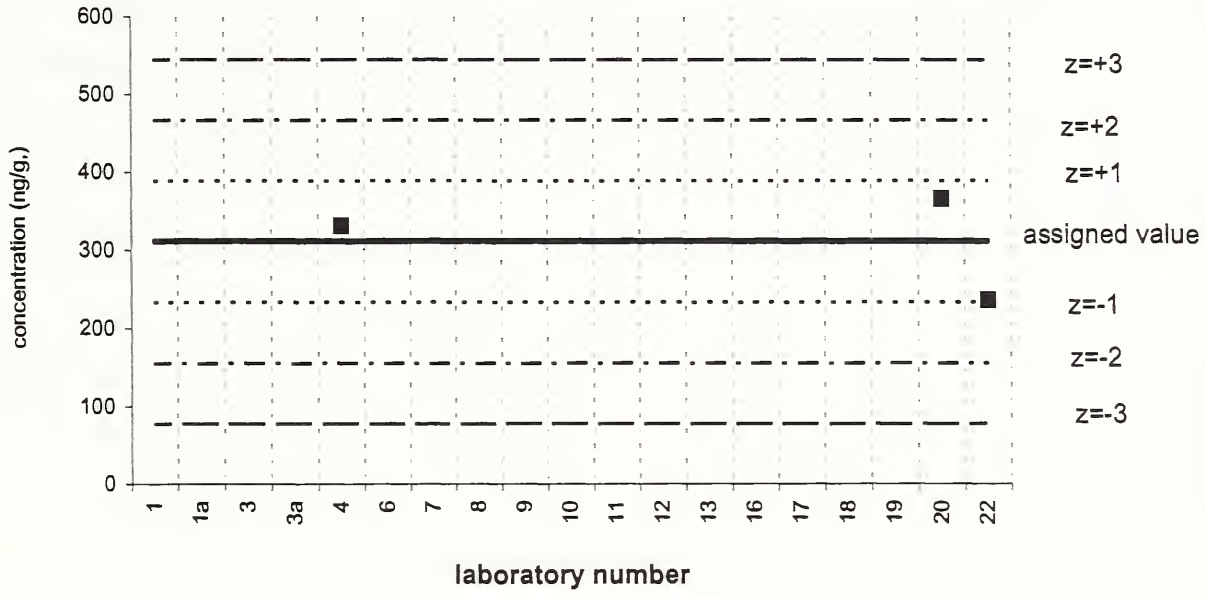
Reported Results: 3 Quantitative Results: 3



20R,5a(H),14b(H),17b(H)-ergostane **PM 2.5 Interim RM**

Assigned value = 311 ng/g s = 67 ng/g 95% CL = not calc. ng/g

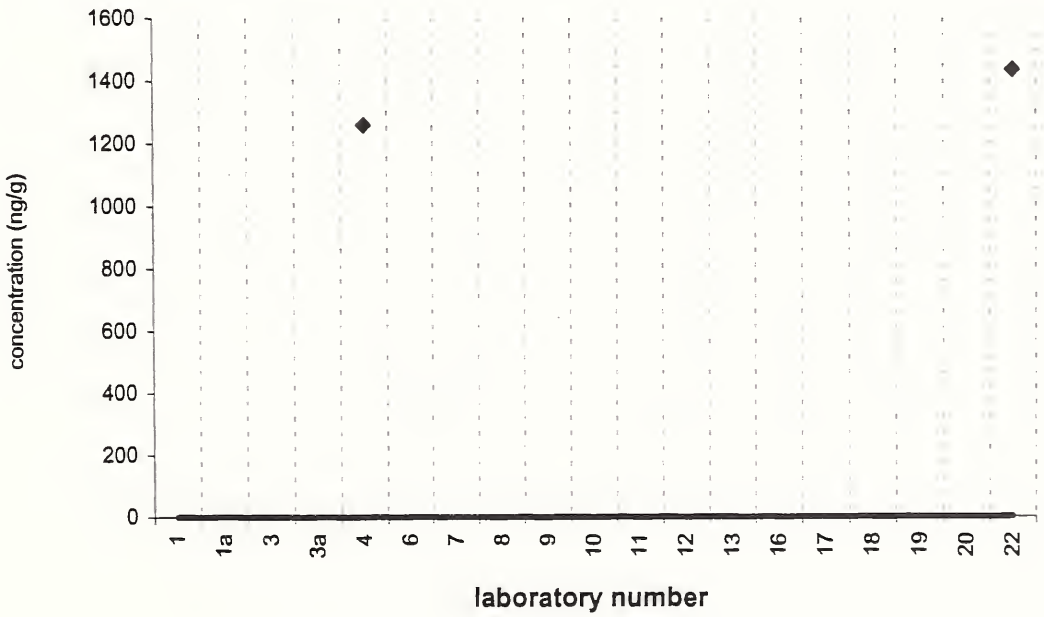
Reported Results: 3 Quantitative Results: 3



20R,5a(H),14b(H),17b(H)-ergostane **SRM 1649a**

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 2

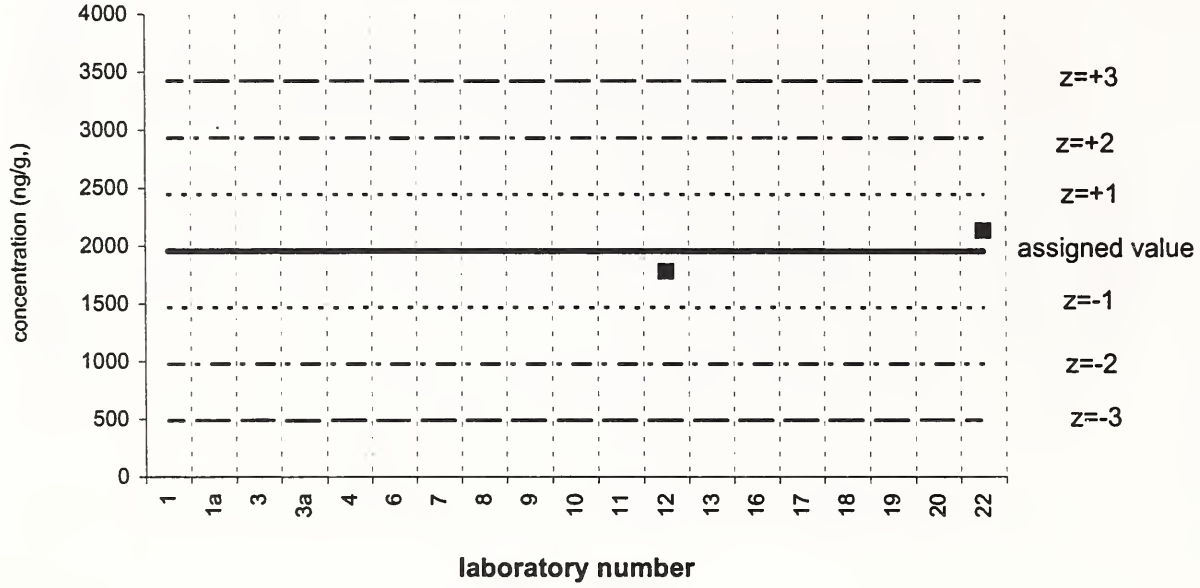


22S-17a(H), 21b(H)-30-homohopane

PM 2.5 Interim RM

Assigned value = 1956 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

Reported Results: 2 Quantitative Results: 2

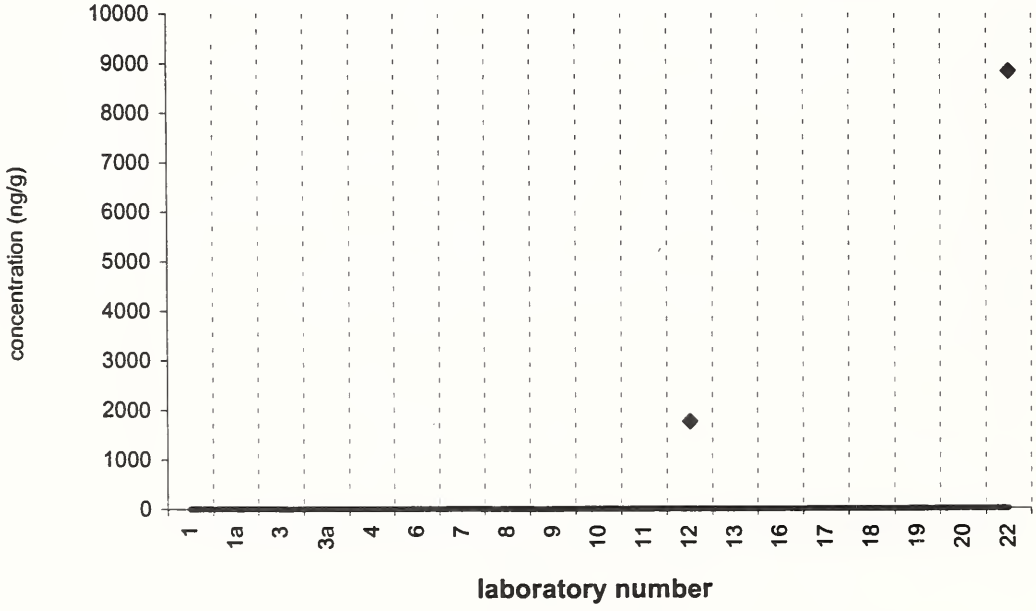


22S-17a(H), 21b(H)-30-homohopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

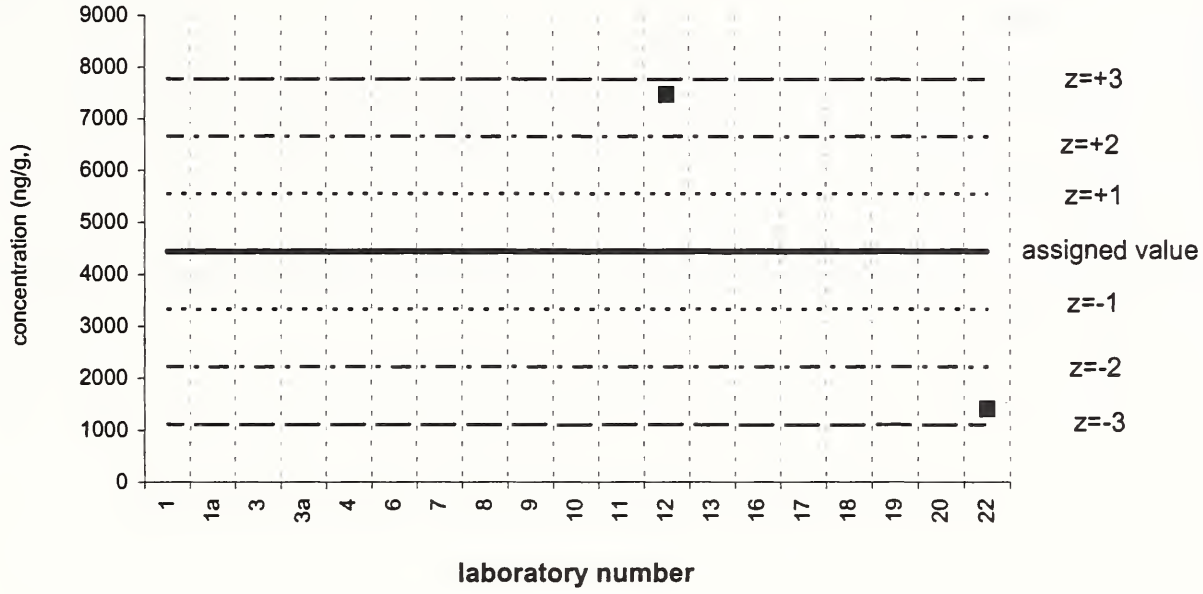


22S-17a(H), 21b(H)-30-bishomohopane

PM 2.5 Interim RM

Assigned value = 4438 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

Reported Results: 2 Quantitative Results: 2

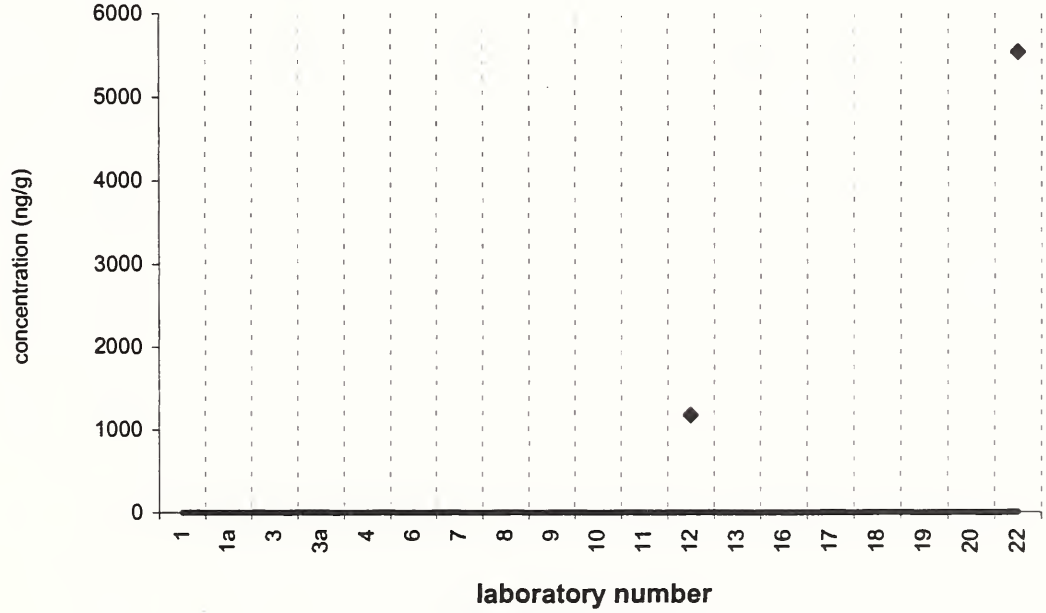


22S-17a(H), 21b(H)-30-bishomohopane

SRM 1649a

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2

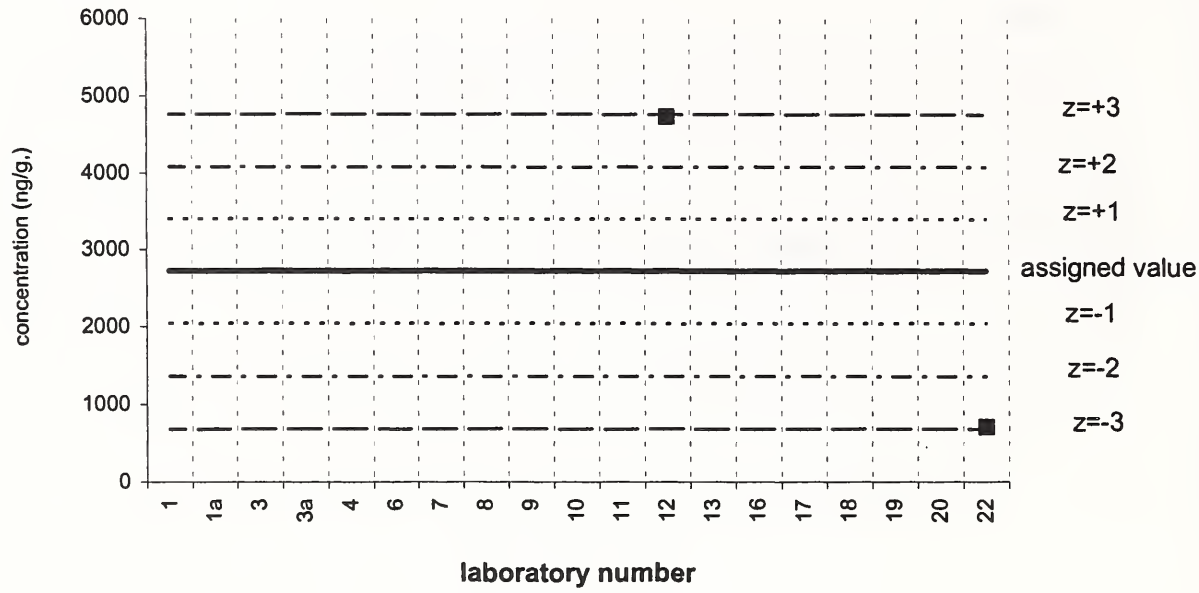


22R-17a(H), 21b(H)-30-bishomohopane

PM 2.5 Interim RM

Assigned value = 2723 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

Reported Results: 2 Quantitative Results: 2

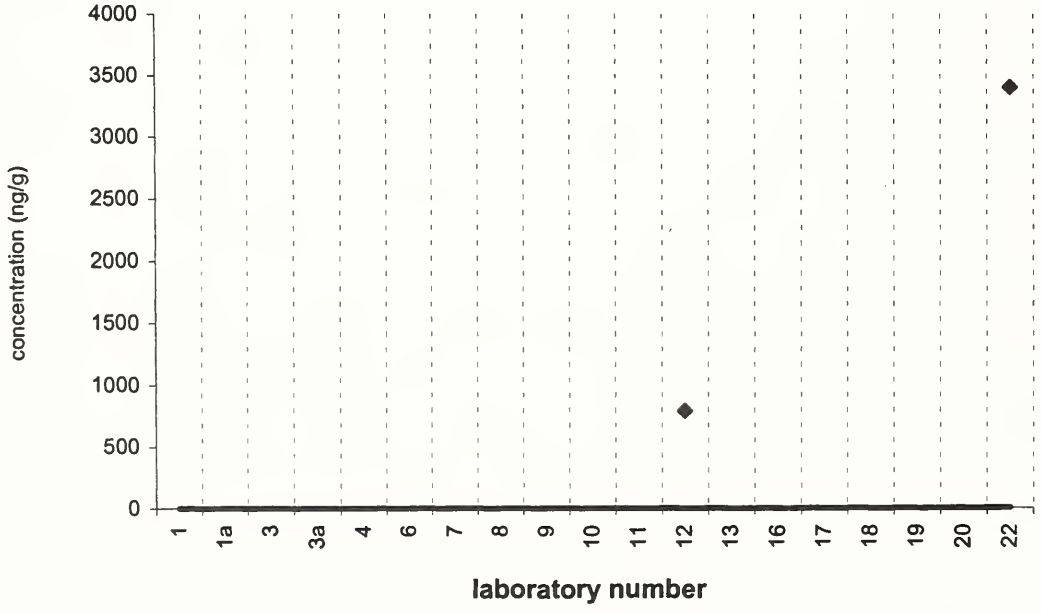


22R-17a(H), 21b(H)-30-bishomohopane

SRM 1649a

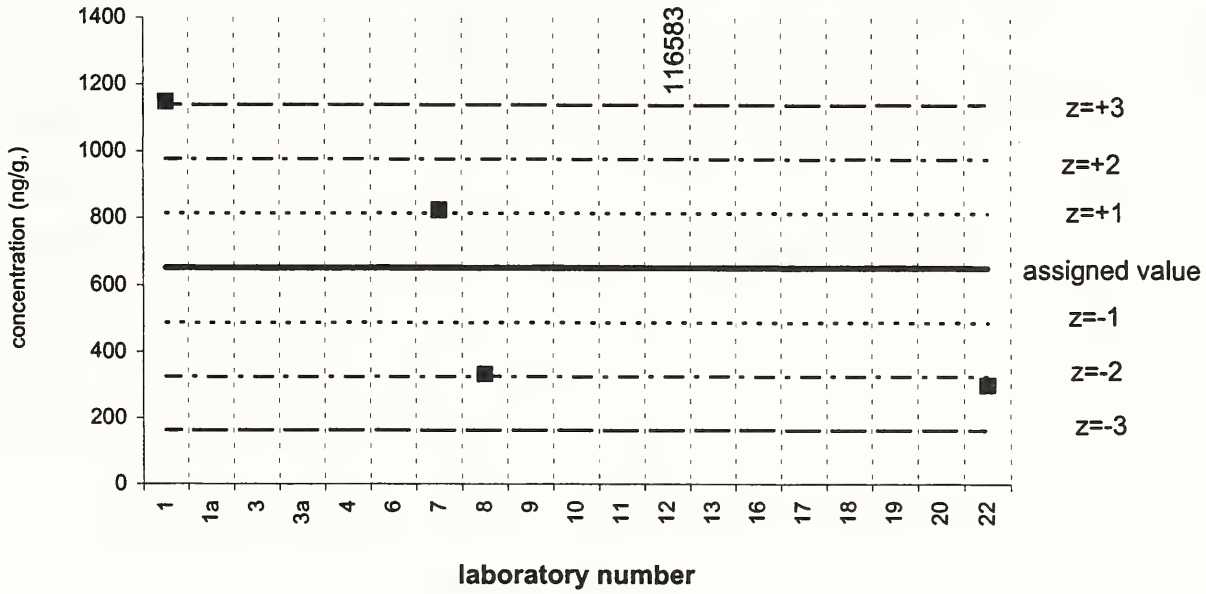
Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2



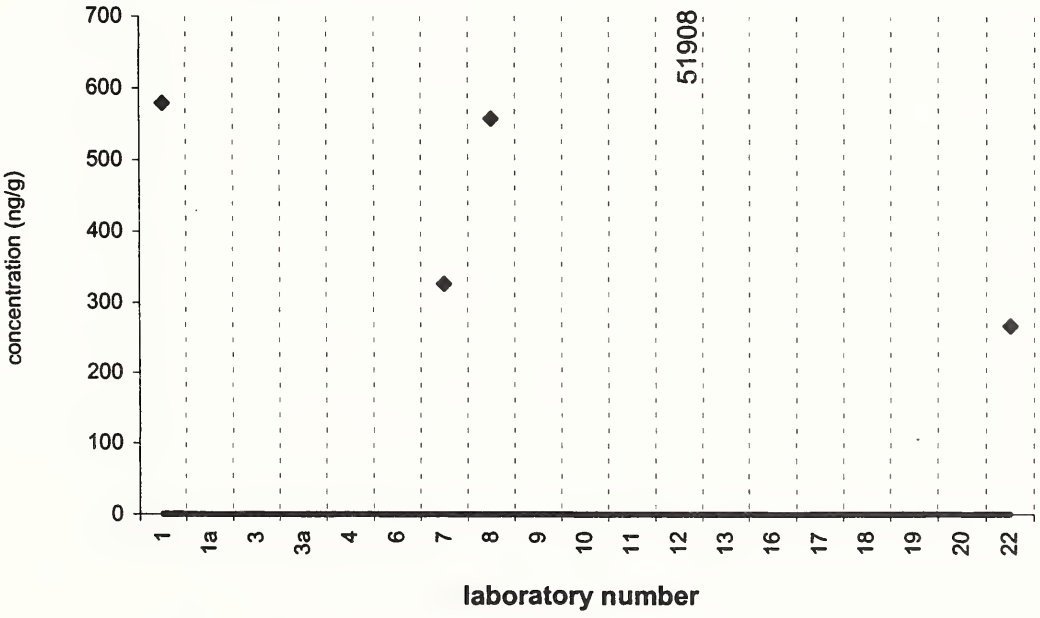
pristane **PM 2.5 Interim RM**

Assigned value = 651 ng/g s = 409 ng/g 95% CL = 651 ng/g
Reported Results: 5 Quantitative Results: 5



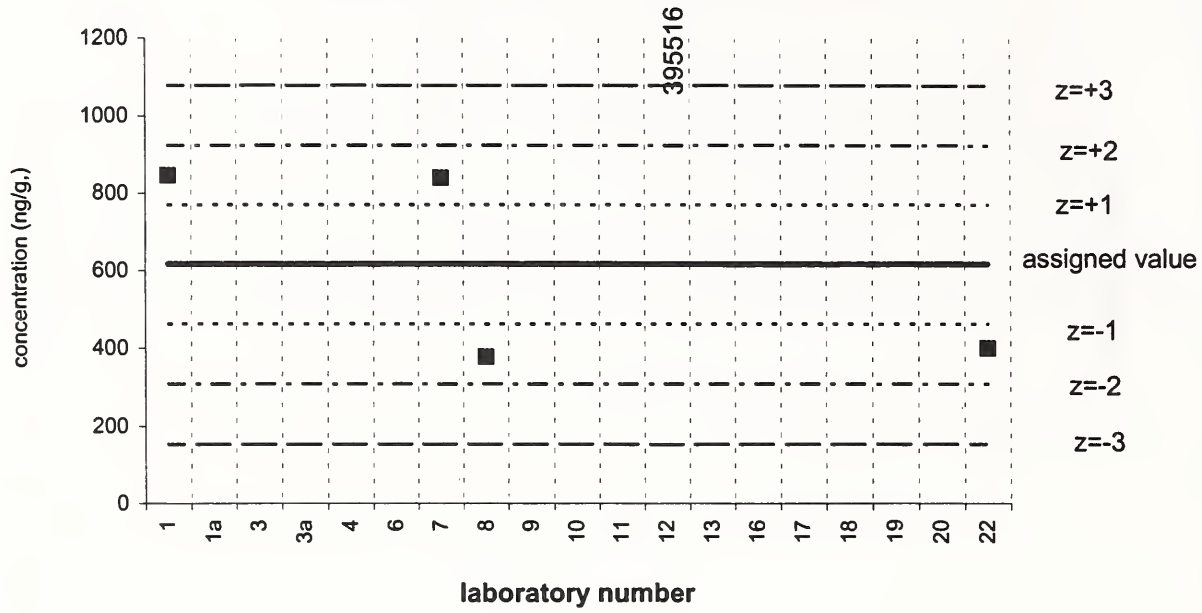
pristane **SRM 1649a**

Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



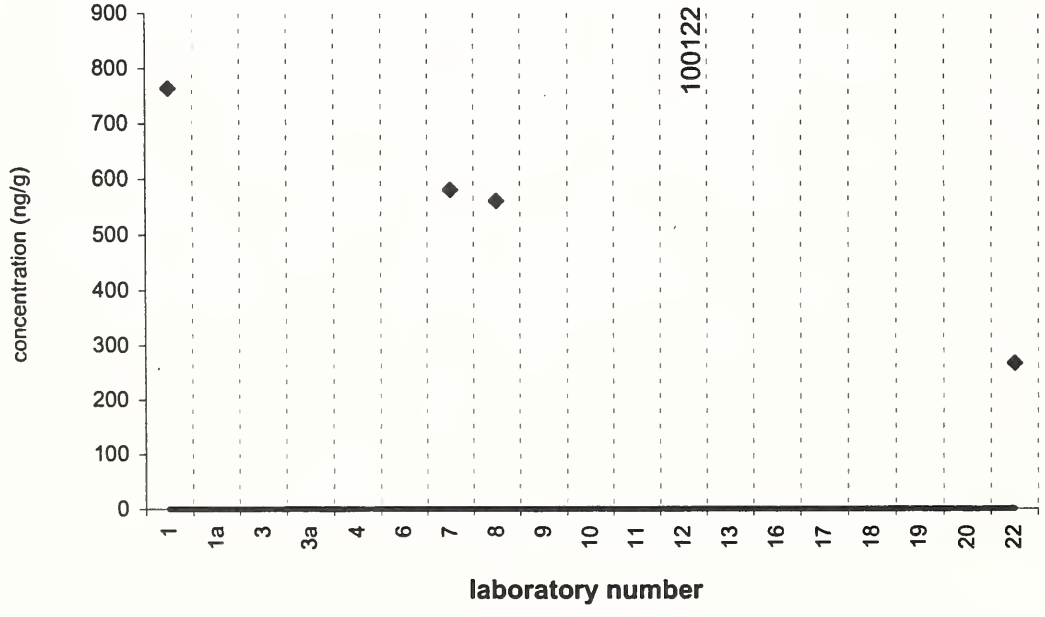
phytane **PM 2.5 Interim RM**

Assigned value = 616 ng/g s = 262 ng/g 95% CL = 418 ng/g
Reported Results: 5 Quantitative Results: 5



phytane **SRM 1649a**

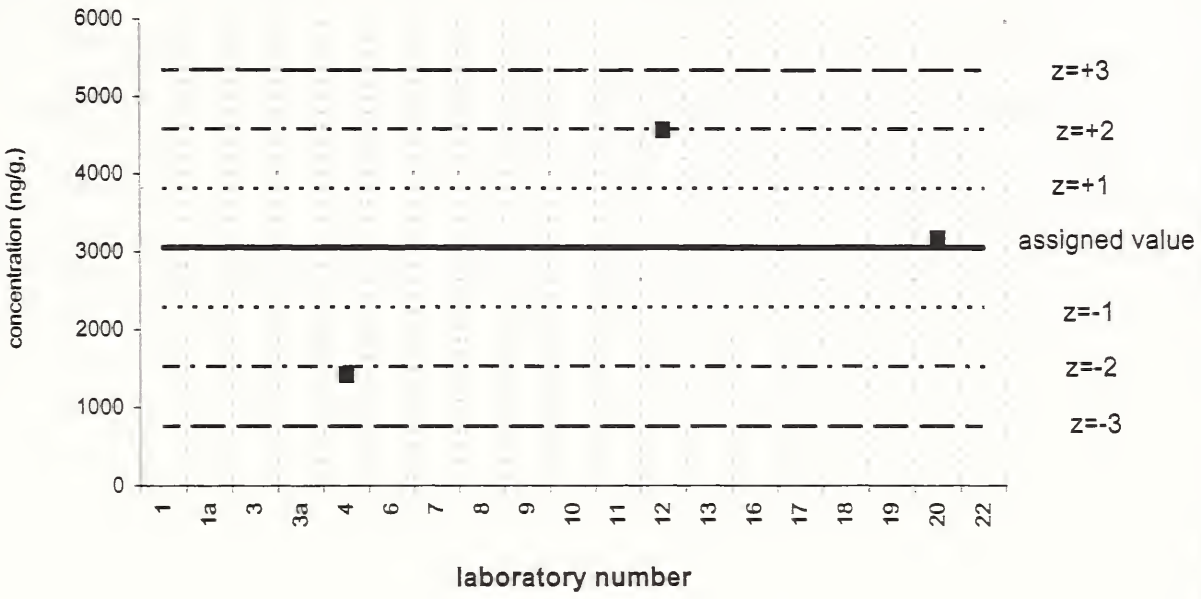
Target Value = no target ng/g
Reported Results: 5 Quantitative Results: 5



benz[a]anthracene-7, 12-dione **PM 2.5 Interim RM**

Assigned value = 3055 ng/g s = 1577 ng/g 95% CL = not calc. ng/g

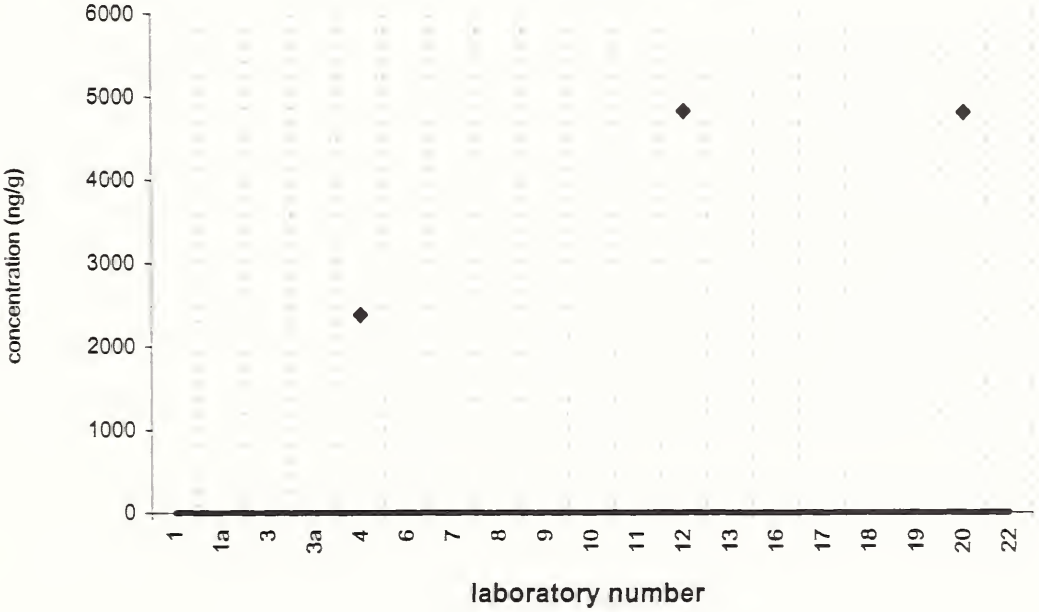
Reported Results: 3 Quantitative Results: 3



benz[a]anthracene-7, 12-dione **SRM 1649a**

Target Value = no target ng/g

Reported Results: 3 Quantitative Results: 3

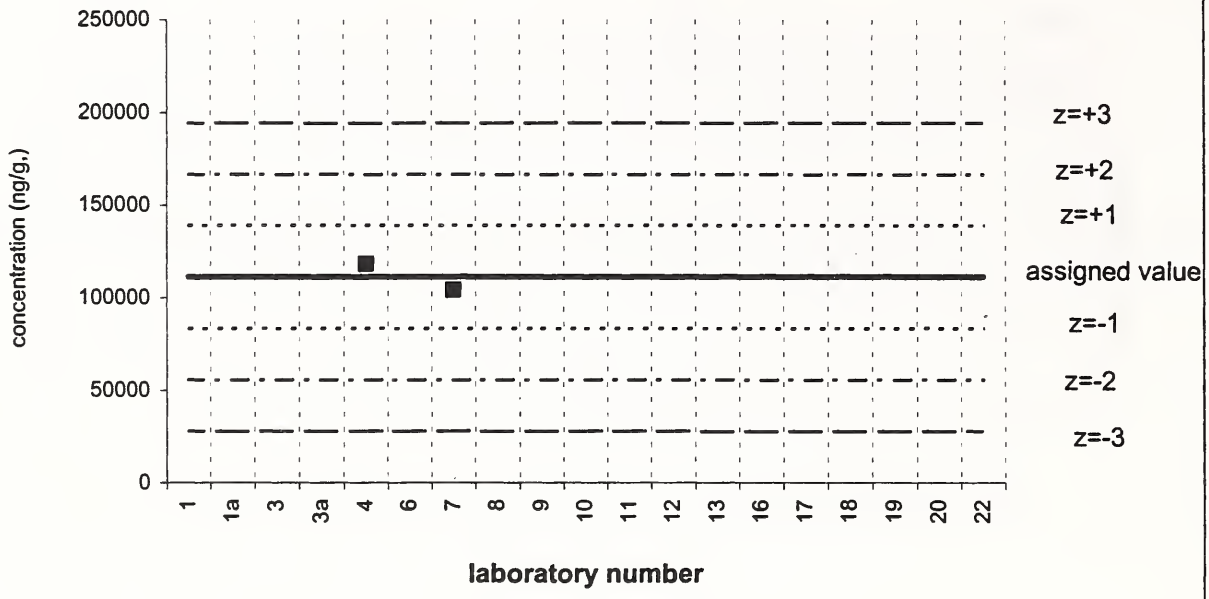


hexadecanoic acid

PM 2.5 Interim RM

Assigned value = 111084 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

Reported Results: 2 Quantitative Results: 2

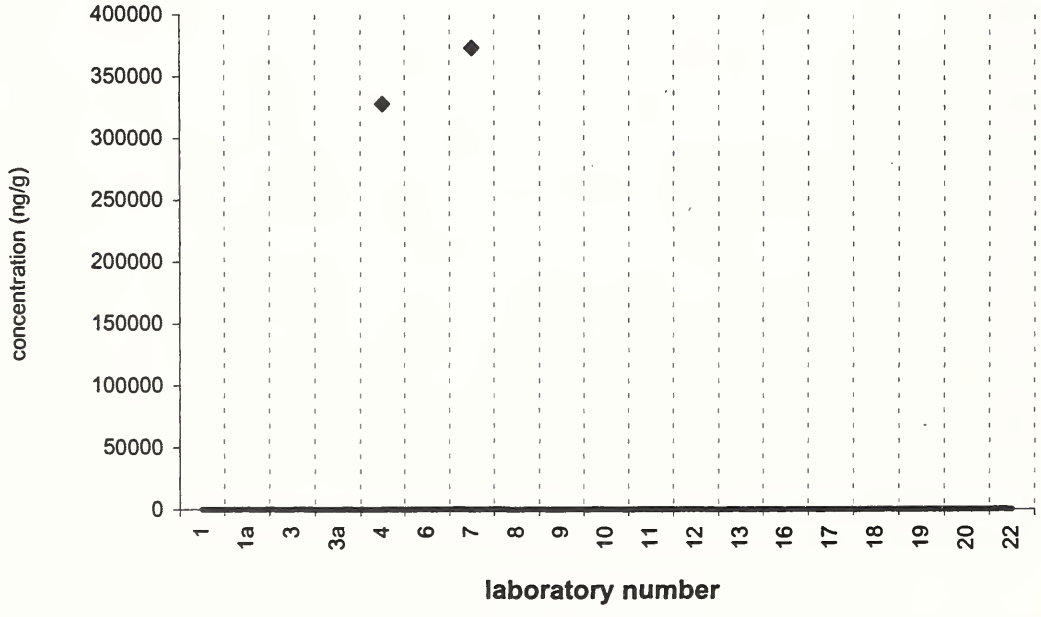


hexadecanoic acid

SRM 1649a

Target Value = no target ng/g

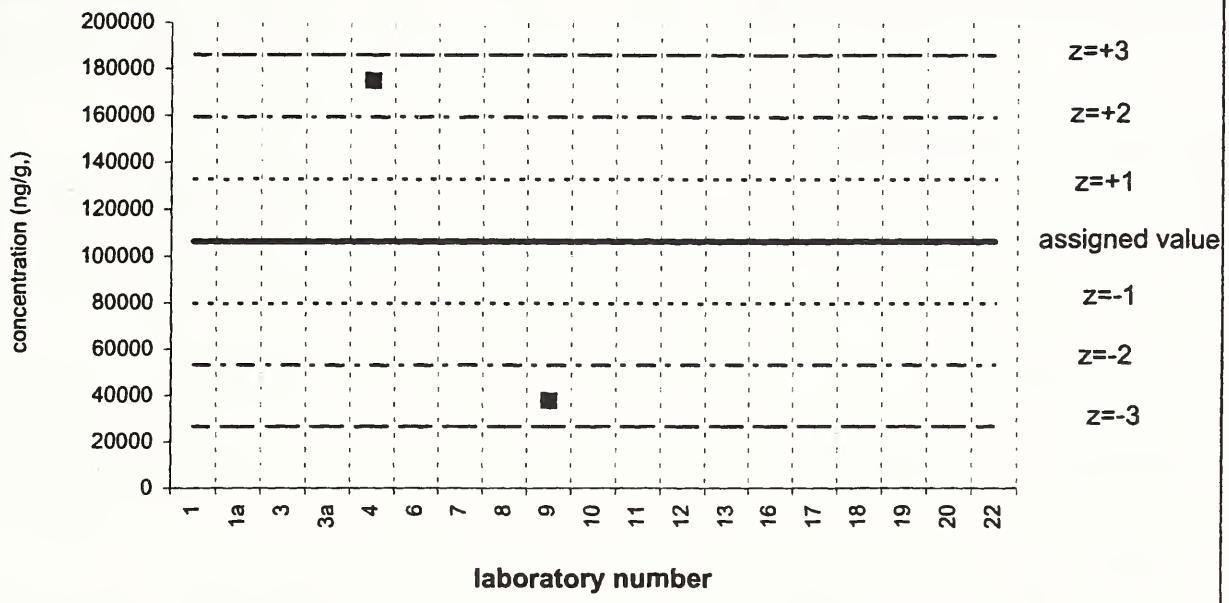
Reported Results: 2 Quantitative Results: 2



levoglucosan **PM 2.5 Interim RM**

Assigned value = 106243 ng/g s = not calc. ng/g 95% CL = not calc. ng/g

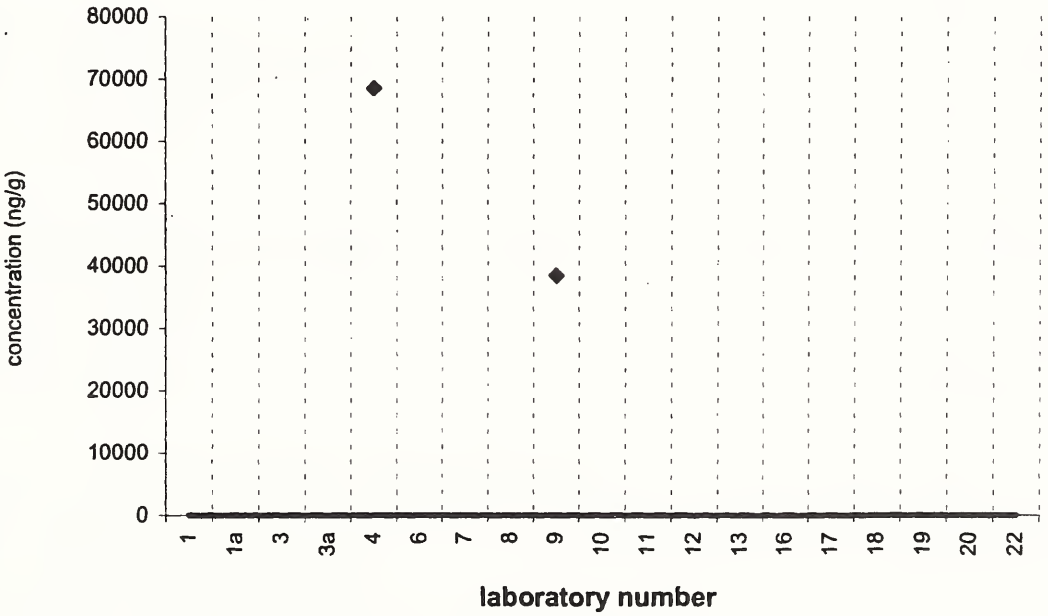
Reported Results: 2 Quantitative Results: 2



levoglucosan **SRM 1649a**

Target Value = no target ng/g

Reported Results: 2 Quantitative Results: 2



Appendix G
List of Participants in Alphabetical Order by Institution

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