

NWRI CONTRIBUTION NO. 86-81

National Interlaboratory Quality Control
Study No. 34 - Analysis of PAH in Solution
and Sediment Samples

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Control No. AM297

NATIONAL INTERLABORATORY QUALITY CONTROL
STUDY NO. 34 - ANALYSIS OF PAH
IN SOLUTION AND SEDIMENT SAMPLES

by
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EXECUTIVE SUMMARY

The first national QC study for PAH analysis was successfully organized and completed. Most of the participants in this study were set up to analyze the 16 PAH listed by US EPA as priority pollutants. By using naturally-contaminated sediment samples, the performance of 15 Canadian laboratories was evaluated under "real world" situation. A large between-laboratory disparity in PAH results was observed for all samples and, in many cases, interlaboratory relative standard deviations were 40% or higher. Therefore, interlaboratory PAH data should only be compared and interpreted with great care.

RÉSUMÉ ADMINISTRATIF

La première étude nationale portant sur le contrôle de la qualité de l'analyse des hydrocarbures aromatiques polychlorés a été organisée avec succès et menée à bien. La plupart des participants à cette étude étaient en mesure d'analyser les 16 hydrocarbures aromatiques polychlorés qui apparaissent dans la liste de polluants que l'EPA des États-Unis a déclarés prioritaires. Les 15 laboratoires canadiens se sont servi d'échantillons de sédiments contaminés naturellement et leur rendement a été évalué comme s'il s'agissait d'une situation réelle. On a noté un énorme écart dans les résultats sur ces produits d'un laboratoire à l'autre pour tous les échantillons et, dans bien des cas, des déviations relatives de 40 p. 100 ou plus. Par conséquent, il y a lieu de faire preuve de la plus grande prudence en comparant et en interprétant les données sur les hydrocarbures aromatiques polychlorés d'un laboratoire à l'autre.

Titre : Étude interlaboratoires nationale portant sur le contrôle de la qualité n° 34 - Analyse des hydrocarbures aromatiques polychlorés dans des échantillons de solutions et de sédiments
par Hing-Biu Lee et Alfred S.Y. Chau

ABSTRACT

An interlaboratory round-robin study for PAH analysis in sediment and solution samples was organized. Results from 15 Canadian laboratories were received and evaluated. The interlaboratory results on a standard solution of PAH revealed a surprisingly large degree of disparity with a median relative standard deviation (RSD) of 40%. RSD's for PAH results in the two sediment extracts and two sediment samples of relatively high PAH levels (ca. 1 to 20 µg/g) were very similar. For most of the results the interlaboratory RSD was close to 100%. Various extraction and cleanup methods were used by the participants and identification and quantification of PAH were done by either the HPLC, GC-FID or GS-MS techniques.

On a organisé une étude comparative interlaboratoires pour l'analyse des hydrocarbures aromatiques polychlorés dans des échantillons de sédiments et de solutions. On a recueilli et évalué les résultats de 15 laboratoires canadiens. On a noté un écart étonnamment grand dans les résultats de laboratoires qui ont analysé une solution étalon d'hydrocarbures aromatiques polychlorés, la déviation relative de la médiane étant de 40 p. 100. Cette déviation pour les résultats de l'analyse des hydrocarbures aromatiques polychlorés de deux extraits de sédiments et de deux échantillons de sédiments dont la teneur en hydrocarbures était relativement élevée (1 à 20 ug/g) étaient très semblables. Pour la plupart des résultats, la déviation relative de la médiane était près de 100 p. 100. On a eu recours à diverses méthodes d'extraction et de nettoyage et les laboratoires participants se sont servi de techniques HPLC, GC-FID ou GS-MS pour identifier et quantifier les hydrocarbures aromatiques polychlorés.

INTRODUCTION

Polynuclear aromatic hydrocarbons (PAH) are ubiquitous environmental pollutants since they are both naturally occurring and formed by pyrolysis of carbonaceous materials at high temperatures. Occurrence of PAH in surface water, biota and lake, river or marine sediments have been reported in many parts of the world. In particular, relatively high levels of PAH are found in sediment samples since they readily adsorb and accumulate PAH.

Numerous PAH and their nitro and alkyl derivatives are present in the environment. Among them, 16 are identified by US EPA as priority pollutants. Many analytical methods have been developed for PAH; these include HPLC methods using UV and/or fluorescence detectors, as well as gas chromatographic methods using a flame or mass spectrometric detector with packed or capillary columns. US EPA Method 610 for the analysis of PAH in water and industrial discharge involves both HPLC and GC methods for determination. The identities and quantities of PAH in the sample extracts are then confirmed by a GC-MS technique (Method 625).

Since the environmental samples are usually a complex mixture of many PAH, and the fact that different laboratories employ different analytical methods, it is necessary to establish the compatibility of results generated by various laboratories. Thus the Interlaboratory Study N34 for the analysis of PAH in solutions and in naturally

contaminated sediments was organized. This report summarizes and evaluates the results contributed by 15 Canadian laboratories participating in this study.

EXPERIMENTAL DESIGN

The identities of the ampule and sediment samples distributed in Study N34 are shown in Table 1. Sample A1 is a standard solution of a mixture of 14 PAH. The true concentrations of each parameter in A1 are given in Table 2. Samples A2 and A3 are extracts of sediments S1 and S2, respectively, after appropriate cleanups. All ampule samples were prepared in toluene and were suitable for direct GC-FID or GC-MS analysis. After dilution with the mobile phase, these ampule samples were also suitable for HPLC analysis. Three sediment samples, S1, S2 and S3, were also distributed. These samples were subsamples of three freeze-dried naturally contaminated certified reference materials or reference materials. They had been analyzed for PAH, however, their true concentrations were not known with absolute certainty. Preparation of these sediment reference materials has been reported elsewhere (1, 2). All participants were requested to analyze the following 14 PAH in the samples: phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[h]fluoranthene, benzo[e]pyrene, benzo[a]pyrene, perylene, indeno[1,2,3-cd]pyrene, dibenz[ah]anthracene and benzo[ghi]perylene.

RESULTS AND DISCUSSION

A summary of the analytical methodology employed by participants in Study N34 is summarized in Table 3. Extraction of sediments was mostly done by the Soxhlet method, although sonication, refluxing, and shaking of the samples were also used by some laboratories. A variety of solvents were used in the extraction, including acetone, acetone/hexane mixtures, methanol, ethanol, cyclohexane and dichloromethane. Cleanup of sediment extracts was mostly done by column chromatography with either Florisil, silica gel, or alumina. Some participants also tried GPC (Gel Permeation Chromatography) with either Sephadex LH-20 or Bio-Beads S-X3 for the cleanup of coextractives. Sulfur and sulfur compounds were removed by metallic mercury or activated copper. Detection and quantitation of PAH were done by HPLC, GC-FID and GC-MS or a combination of the above techniques. In the case of HPLC analysis, a system consisting of a reverse-phase column interfaced with a uv and/or fluorescent detector was most often used. All participants using GC-FID or GC-MS techniques analyzed PAH with bonded-phase fused silica capillary columns such as DB-1, DB-5, DB-1701, and SPB-5. Quantitative analysis of PAH by GC-MS was done by selected ion monitoring of the characteristic ions using either an external standard method or a multiple internal standard method involving several deuterated PAH or similar compounds. Injection of samples in the HPLC systems were done by a loop injector and in the GC analysis by splitless injection.

All raw data received for Study N34 are summarized in Appendix I. An existing computer program was used to sort the data by parameter and to arrange them by increasing laboratory and sample number. Correction, updating, retrieving, and merging of data files could be done without unnecessary manual inputting and calculation. The mean, standard deviation, and median values for each sample were also given in the data summary. If a laboratory did not provide results for all samples, for a particular parameter, then this laboratory was not included in the data summary for that parameter. If a laboratory did not provide results for some samples, then blank spaces were inserted in those places where no results were received. If a laboratory analyzed a parameter and found it below their detection limit, then an N code was used in the data summary. When a laboratory provided two sets of results per sample, these results were identified by their laboratory number with an A or B suffix.

Many laboratories analyzed for all 14 PAH requested. Since benzo[e]pyrene and perylene are not US EPA priority pollutants, some laboratories did not analyze for them. A few laboratories were not able to resolve some isomeric pairs. For example, phenanthrene and anthracene were not resolved by laboratory N120, benzo[a]anthracene and chrysene were not resolved by laboratories N031 and N120, benzo[b]fluoranthene and beno[k]fluranthene were not resolved by laboratories N090, N120, and N136. In these cases, they all provided

a result for the sum of unresolved isomers. Since these results could not be statistically interpreted, they were not used in the preparation of data summaries and were not further evaluated.

Table 2 summarizes the calculated % recoveries (reported vs. design concentrations) of the PAH reported by each laboratory for sample A1. The design values of most PAH in sample A1 were within $\pm 10\%$ of the interlaboratory medians, indicating that these values could be used as true concentrations. Thus the calculated % recoveries in this sample provide a good estimate of the accuracy of the participant's in-house PAH standard. With the exception of laboratory N010, the results on A1 provided by all laboratories were not entirely satisfactory. For laboratory N116, five of the 14 PAH present in A1 were reported as not detected. As shown in Table 2, the % recoveries of all PAH calculated for laboratory N053 were extremely high (between 240 and 606%), indicating that their standard solution was low by a factor of 2 to 6. Laboratories N017 and N136 were likely to have in-house PAH standards which were biased low since the calculated % recoveries in sample A1 were consistently high for all PAH reported by these two laboratories. On the other hand, laboratory N072 seemed to have a biased high in-house standard as the calculated % recoveries were low for all but one PAH. For the other laboratories reporting results for A1, one or more of their results were erratic. Apart from those biased results described above, the interlaboratory data for A1 tended to be more comparable for the PAH with lower molecular weights than those with higher.

All ampule and sediment results were evaluated (Appendix II) using an established flagging technique (3). This technique utilizes the interlaboratory medians, which are usually good estimates of the true values in unknown samples, as a basis to provide a semi-quantitative evaluation of the accuracy of each result. The results are then classified into five groups, namely, VH (very high), H (high), unflagged, L (low), and VL (very low). The unflagged results are closest to the interlaboratory median and are therefore most accurate. On the other hand, VH and VL results are the least accurate since they are farthest away from the median. (See Appendix III for a more detailed explanation of this flagging technique.)

Since the ampule and sediment results provided by laboratory N053 were distinctly different from the rest of the interlaboratory results, this laboratory was declared as an outlier and thus its results were not included in the flagging exercise.

The performance of a laboratory for the analysis of a certain PAH can easily be evaluated from the tables included in Appendix II. A glance at the summary of flags in the lower half of the table will tell whether the results reported by a laboratory are satisfactory (no flags), low (presence of multiple VL or L flags), high (presence of multiple VH or H flags), or erratic (presence of both VH and VL flags).

In order to tell the overall performance of a laboratory on PAH analysis, a summary (Table 4) of the total number of VH and VL flags

received by a laboratory for all samples was prepared. Since the participants did not provide an equal volume of results, the percentages of results flagged in each laboratory were also calculated. These numbers can serve as a rough indication of the overall accuracy of the PAH data in this study since lower percentages of results flagged mean more accurate results and vice versa. In this study, three laboratories (N010, N090, and N115A) had less than 10% of their results flagged VH and/or VL and thus they were the most accurate. Another group of six laboratories (N004, N031, N043, N087, N116, and N72B) had between 10 and 33% of their results flagged VH and/or VL and therefore they were less accurate than the first group. A third group of seven laboratories (N017, N024, N042, N120, N136, N72A, and N115B) had more than 33% of their results flagged VH and/or VL, and were, therefore, the least accurate in this study. Note that laboratory N004 did not provide any sediment results, so its performance on such samples was not assessed. Also, laboratory N115 provided two sets of results, one by fluorescence detection (N115A) and the other by UV detection (N115B) but no ampule results were submitted. It was obvious from Table 4 that the fluorescence results from laboratory N115 were more accurate than the corresponding uv results.

The interlaboratory relative standard deviations (RSD) of each PAH in the six test samples are summarized in Table 5. The between-laboratory disparity for sample A1 was apparently the smallest among

the six samples. This was not unexpected since A1 was an injection-ready standard solution of PAH. However, the median RSD for this sample was still high (40%). The interlaboratory precision was generally worse in the other two ampule samples, as reflected by the larger RSD for A2 and A3. Since the latter are sediment extracts, it was likely that sample coextractives were causing interference in the quantitation step. Interlaboratory RSD of PAH results for sediments S1 and S2 were very similar to, and in a few cases, even smaller than those of A2 and A3. Also, as shown in Table 6, the medians for the major components in S1 and A2 (extract of S1) as well as those in S2 and A3 (extract of S2) were in good agreement with each other. These results strongly suggested that, at least for S1 and S2, the various extraction and cleanup steps in PAH analysis were not likely to be the major cause of disparity in interlaboratory data. It was probably for the participants in this study that incorrect in-house PAH standards, and to a smaller extent, interference by sample coextractives in the quantitation step, were the major causes of inaccurate PAH results, with the following exception. As shown in Table 4, laboratory N136 had 27 VH flags for the ampule results but none for the sediments. Normally, a laboratory will be assigned a similar number of VH or VL flags if incorrect calibration standard was the major source of error. Thus, it was speculated that laboratory N136 also had low recoveries of PAH in sediment samples and this, combined with the biased high standard, gave sediment results close to the inter-

laboratory medians (i.e. unflagged). The interlaboratory RSD for PAH in sediment S3 were, however, close to 100% and thus much larger than those for S1 and S2. This larger disparity of results was possibly due to the lower levels (0.5 $\mu\text{g/g}$ or lower) of PAH present in S3. In this case, the extraction and cleanup steps might be playing a more important role on the accuracy of results.

SUMMARY

This report compiles and evaluates the results of our first national QC study organized for PAH analysis. By using naturally contaminated sediment samples, the performance of 15 Canadian laboratories for such analysis was assessed under "real world" situations. Qualitatively, most laboratories were set up for the determination of the PAH listed in Method 610 by US EPA, although a few of them had difficulties resolving the closely-eluted isomeric pairs. Results for the standard solution sample indicated that, except for one laboratory, the participants had at least one or more erratic PAH results due to inaccurate in-house standards. For sediment samples with PAH levels in 1 to 20 $\mu\text{g/g}$ range, the median interlaboratory RSD were between 40 and 55%. In those cases, the extraction and cleanup steps were less likely to be the major source of between-laboratory disparity as was the inaccuracy of in-house PAH standard. Interlaboratory sediment results were less comparable in a sample with PAH levels of 0.5 $\mu\text{g/g}$ or less.

REFERENCES

1. A.S.Y. Chau and H.B. Lee, 1980. "Analytical Reference Materials. III. Preparation and Homogeneity Test of Large Quantities of Wet and Dry Sediment Reference Materials for Long Term Polychlorinated Biphenyl Quality Control Studies". J. Assoc. Off. Anal. Chem., 63, 947-951.
2. H.B. Lee, R.L. Hong-You and A.S.Y. Chau, 1986. "Analytical Reference Materials. V. Development of a Sediment Reference Material for Chlorobenzenes and Hexachlorobutadiene". The Analyst, 111, 81-85.
3. J.L. Clark, 1981. "Evaluation of Performance of Laboratories Determining Water Quality Constituents through Natural Water Samples whose True Values are Unknown". In "Summary of Conference Presentations", Envirometrics 81, p. 54-55, Alexandria, Virginia, April 8-10, 1981.

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TABLE 1 Samples Distributed in Study N34.

Sample No.	Identity
A1	Standard solution of 14 PAH in toluene
A2	Extract of sediment sample S1 in toluene (1 g to 1 mL)
A3	Extract of sediment sample S2 in toluene (2g to 1 mL)
S1	Sediment reference material EC-1
S2	Sediment reference material EC-2
S3	Sediment reference material EC-3

TABLE 2 % Recovery of PAH in Sample A1.

Parameter	Design Value ng/ μ L	Interlab Median ^a ng/ μ L	% Recovery													
			004	010	017	024	031	042	043	053 ^b	072	087	090 ^b	116	120	136
Phenanthrene	10.80	11.02	136	93	145	102	82	102	96	258	-	97	124	ND ^c	-	161
Anthracene	2.75	2.65	95	-	-	109	40	72	98	240	-	88	129	ND	-	167
Fluoranthene	20.58	21.18	102	97	147	117	83	103	97	320	35	67	119	110	126	168
Pyrene	20.78	24.05	136	96	149	53	85	105	96	335	-	128	116	115	125	166
Benz[a]anthracene	5.04	4.70	91	89	-	93	-	83	101	606	52	135	106	ND	-	212
Chrysene	10.00	10.48	100	92	-	160	-	107	92	238	-	160	105	29	-	186
Benz[b]fluoranthene	8.50	8.40	100	92	-	106	138	136	99	279	62	65	-	84	-	-
Benz[k]fluoranthene	4.50	4.80	107	109	-	98	114	159	123	528	55	99	-	71	-	-
Benz[e]pyrene	5.00	5.61	70	88	-	-	136	-	-	-	81	150	ND	-	174	
Benz[a]pyrene	5.18	4.70	75	89	-	79	94	116	98	470	64	72	96	75	290	170
Perylene	5.00	6.20	72	-	-	-	-	120	ND	-	-	64	124	ND	-	182
Indeno[1,2,3-cd]pyrene	3.98	3.80	55	95	-	98	88	-	108	-	-	56	159	93	-	183
Dibenz[ah]anthracene	2.90	2.51	7	-	248	69	182	138	-	49	45	104	52	-	148	
Benz[ghi]perylene	4.27	3.80	47	94	-	208	84	-	66	-	141	14	119	7	-	164

^aResults after rejection of Lab N053.^bAverage of two results.^cND = none detected.

TABLE 3. Methodology for PAH Analysis.

Lab No.	Extraction Method and Solvent System	Cleanup Method	Detection	Analytical Column
N004	-	-	GC-MS	OV-1
N010	Reflux with basic ethanol	Alumina	HPLC-UVD and FLD	-
N017	Sonication with 1:1 acetone/hexane	GPC-Bio Beads	GC-FID	DB-1701
N024	Polytron and acetone	GPC-μ-Styragel	HPLC-UVD and FLD	Vydac C ₁₈
N031	Soxhlet with dichloromethane	GPC-Bio Beads S-X3, Florisil	HPLC-UVD	Ultrasphere ODS
N042	Soxhlet with methanol	Silica gel and GPC-Sephadex LH20	GC-FID	DB-1701
N043	Reflux with basic ethanol	Florisil	HPLC-UVD	Supelcosil LC-PAH
N053	Shaker with 1:1 acetone/hexane	Silica gel	GC-FID	DB-5
N072	Reflux with basic methanol and soxhlet with cyclohexane	Florisil	HPLC-FID	Ultrasphere ODS
N087	Soxhlet with dichloromethane	Alumina	GC-MS	S PB-5
N090	Soxhlet with dichloromethane	Silica gel	GC-MS	DB-5
N115	Soxhlet with 1:1 acetone/hexane	Silica gel	HPLC-UVD and FLD	Zorbax ODS
N116	-	-	-	-
N120	Soxhlet with acetone/hexane	Alumina	GC-FID and GC-MS	DB-1, DB-5
N136	Reflux with basic methanol	Florisil	GC-MS	DB-5

TABLE 4. Summary of Flags.

Lab No.	No. of Sediment Results ^a	No. of Ampule Results	No. of Flags				% of Results Flagged		
			Sediment		Ampule		VH	VL	Total
			(C)	(D)	(E)	(F)	C+E	D+F	C+D+E+F
							A+B	A+B	A+B
N004	0	38	-	-	2	8	5	21	26
N010	33	33	1	1	1	1	3	3	6
N017	7	9	4	0	2	0	38	0	38
N024	34	36	17	0	14	2	44	3	47
N031	25	29	4	0	10	1	26	2	28
N042	31	29	13	1	7	4	33	8	42
N043	36	36	6	4	6	4	17	11	28
N087	36	36	2	3	4	13	8	22	31
N116	28	35	6	0	3	2	14	3	17
N120	9	9	3	0	3	1	33	6	39
N136	36	36	0	0	27	0	38	0	38
N72A	21	21	4	0	1	10	12	24	36
N72B	21	9	4	0	0	2	13	7	20
N90A	35	36	0	2	3	0	4	3	7
N90B	26	12	0	1	-	-	0	3	3
N115A	18	0	0	0	-	-	0	0	0
N115B	22	0	6	3	-	-	27	14	41

^aResults that were given as a sum of 2 PAH were not counted.

TABLE 5. Interlaboratory Relative Standard Deviations (%) of PAH Results for Ampule and Sediment Samples.

Parameter	A1	A2	A3	S1	S2	S3
Phenanthrene	23	27	153	28	43	116
Anthracene	38	62	77	120	94	164
Fluoranthene	32	45	36	32	39	89
Pyrene	26	39	19	28	38	92
Benzo[a]anthracene	42	40	47	36	40	82
Chrysene	41	32	25	87	116	185
Benzo[b]fluoranthene	27	63	79	45	30	119
Benzo[k]fluoranthene	29	50	61	75	31	102
Benzo[e]pyrene	37	48	46	27	27	104
Benzo[a]pyrene	58	90	93	103	88	146
Perylene	42	54	26	32	59	93
Indeno[1,2,3-cd]pyrene	41	34	19	27	23	22
Dibenz[ah]anthracene	72	117	137	83	99	84
Benzo[ghi]perylene	69	72	113	89	58	58
Interlaboratory median	40	49	53	41	42	98

Note: These results were calculated after the data from laboratory N053 were rejected. The very high RSD were likely due to the presence of other outliers in the data set.

TABLE 6. Median Results from A2, S1, A3, and S2.

Parameter	A2	S1	A3	^a S2
Phenanthrene	15.72	16.80	1.65	1.60
Anthracene	1.15	1.50	0.19	0.86
Fluoranthene	24.00	21.81	4.05	3.23
Pyrene	19.98	18.50	3.34	2.64
Benzo[a]anthracene	8.70	7.60	1.10	1.05
Chrysene	11.00	8.80	2.03	1.94
Benzo[b]fluoranthene	9.30	6.75	1.60	2.06
Benzo[k]fluoranthene	4.20	3.63	1.13	1.13
Benzo[e]pyrene	6.00	5.36	2.14	1.37
Benzo[a]pyrene	4.90	4.50	0.88	0.67
Perylene	1.70	1.16	0.43	0.30
Indeno[1,2,3-cd]pyrene	7.25	4.90	1.98	1.40
Dibenz[ah]anthracene	2.79	2.35	0.63	0.73
Benzo[ghi]perylene	8.50	4.73	1.91	1.50

^aValues were divided by two since 2g of sample S2 was made up to 1 mL of sample A3.

APPENDIX I
Data Sumaries for Study N34

DATA SUMMARY

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 85/11/26.

PARAMETER: ANTHRACENE

NG/UL

PARAMETER: ANTHRACENE

UG/G

	SAMPLE RESULTS			SAMPLE RESULTS		
	A1	A2	A3	S1	S2	S3
LAB		LAB		LAB		
N004	2.6	1.1	.2	4.3	2.5	2.6
N024	3.0	3.8	.9	3.6	1.1	.1
N031	1.1	.8	.1	1.18	1.33	.74
N042	1.98					
N043	2.7					
N067	2.42	1.00	.2	1.05	.1	.10
N116				2.8	.82	.09
N136	4.6	1.2	.1	1.5	.1	.1
N53A	6.52	2.1	.4	4.48	.93	.10
N53B	6.68	4.9	.6	1.01	.09	.05
N90A			.33			
TOTAL LABS REPORTING	11	11	11	TOTAL LABS REPORTING	10	10
TOTAL LABS USED	10	10	10	TOTAL LABS USED	10	10
MEAN	3.51400	2.17100	.49900	MEAN	3.057200	1.03571
STD DEV	1.86724	1.50162	.32498	STD DEV	4.56659	.89816
MEDIAN	2.05000	1.50500	.43000	MEDIAN	1.25500	.90000
MEAN*	2.74250	1.60125	.46125	MEAN*	3.91556	.95667
STD DEV*	1.03909	.99313	.35627	STD DEV*	4.70453	.89757
MEDIAN*	2.65000	1.15000	.36500	MEDIAN*	1.50000	.86000

* results after rejection of lab 53

DATA SUMMARY

2

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 3/5/11/26.

PARAMETER: BENZO(A)ANTHRACENE

NG/UL

PARAMETER: BENZO(A)ANTHRACENE

UG/G

SAMPLE RESULTS

A1	A2	A3
LA3		
N094	4.6	7.9
N010	4.5	8.0
N024	4.7	12.0
N042	5.19	10.50
N043	5.5	11.82
N087	6.54	9.44
N116	7.3	12.3
N136	10.7	12.3
N53A	30.8	30.3
N53B	30.3	23.5
N72A	2.621	1.472
N72B	2.621	1.399
N90A	5.33	10.51
N90B		2.427
		2.38

S1

S2

S3

LAB

LAB	S1	S2	S3
N010	7.2	1.76	.28
N024	11.07	1.21	1.19
N042	10.07	.21	.32
N043	4.6	.73	.21
N087	7.74	1.33	N
N116	15.6	1.9	.21
N136	7.6	1.7	.5
N53A	7.43	1.59	.67
N72A	7.399	1.319	.195
N72B	9.400	.933	.34
N90A	5.95	.93	.37
N90B	5.93	1.25	.25
N115B			

TOTAL LABS REPORTING 14

TOTAL LABS REPORTING

14

14

14

14

14

14

14

14

14

14

14

14

14

14

14

14

14

14

14

14

TOTAL LABS USED 11

TOTAL LABS USED

12

12

12

12

12

12

12

12

12

12

12

12

12

12

12

12

12

12

12

12

MEAN

MEAN

9.96918

11.84350

3.15614

STD DEV

STD DEV

10.37712

8.75711

2.61055

MEDIAN

MEDIAN

5.10000

9.35000

2.40000

MEAN*	5.39567	6.47220	2.19883
STD DEV*	2.27269	3.38783	1.02397
MEDIAN*	4.70000	8.70000	2.19000

* results after rejection of lab 53

DATA SUMMARY

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 8/5/11/26.

PARAMETER: BENZO(A)PYRENE

NG/JUL

PARAMETER: BENZO(A)PYRENE

UG/G

	SAMPLE RESULTS			
A1	A2	A3		
LA3			LAB	
N004	3.9	4.8	N010	4.5
N010	4.6	4.3	N024	8.6
N024	4.8	1.1	N031	8.8
N031	4.8	26.1	N042	3.38
N042	6.02	7.8	N043	6.7
N043	5.1	1.36	N087	3.17
N087	3.71	4.9	N116	5.9
N116	3.9	1.9	N120	3.0
N120	1.5	3.2	N136	5.7
N136	8.8	9.3	NE3A	<
N53A	2.46	4.35	N72A	20
N53B	2.41	4.05	N72B	0.077
N72A	3.292	3.766	N90A	4.400
N72B			N90B	2.65
N90A			115A	2.61
N90B			115B	4.10
				3.15
				.69
TOTAL LABS REPORTING	16	16	TOTAL LABS REPORTING	16
TOTAL LABS USED	14	13	TOTAL LABS USED	15
MEAN	8.35066	12.32200	MEAN	6.58247
STD DEV	7.41763	14.37889	STD DEV	6.76695
MEDIAN	4.89500	5.66000	MEDIAN	4.50000

MEAN *	5.68433	7.50782	3.11900
STD DEV *	3.27362	6.76482	2.89772
MEDIAN *	4.70000	4.90000	1.75000

MEAN *	5.68433	7.50782	3.11900
STD DEV *	3.27362	6.76482	2.89772
MEDIAN *	4.70000	4.90000	1.75000

* results after rejection of lab 53

DATA SUMMARY

4

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 6/5/11/26.

PARAMETER: BENZO(a)FLUORANTHENE

NG/UL

PARAMETER: BENZO(a)FLUORANTHENE

UG/G

SAMPLE RESULTS

LAB	A1	A2	A3
N004	8.5	16.0	6.5
N010	7.8	6.6	3.5
N024	9.0	9.3	1.4
N031	11.7	19.8	8.9
N042	11.60	16.34	9.86
N043	8.4	5.53	2.74
N087	7.1	2.74	.56
N116	2.3	2.6	4.9
N53A	2.3	2.0	1.58
N53B	2.3	2.0	1.43
N72B	5.8	3.452	1.172
			1.971

SAMPLE RESULTS

LAB	S1	S2	S3
N010	6.0	1.4	.40
N024	8.1	2.8	.55
N031	15.2	3.1	2.8
N042	6.75	1.97	.85
N043	4.25	1.17	.27
N087	3.68	1.44	.17
N116	12.9	2.2	N
N53A	9.83	3.37	.99
N72B	9.798	2.166	.4022
N72A	1.06	2.504	.522
	6.23	2.06	.35
	5.67	1.80	

TOTAL LABS REPORTING 12

TOTAL LABS USED	A1	A2	A3
11	11	12	
MEAN	11.11627	12.45745	5.98192
STD DEV	6.54795	8.18437	5.18745
MEDIAN	8.50000	9.60000	4.20000

TOTAL LABS REPORTING 12	A1	A2	A3
12	12	12	
MEAN	7.47167	2.15917	.72540
STD DEV	4.05272	.69233	.78521
MEDIAN	6.49000	2.11300	.45100

MEAN *	8.31969	9.87022	4.16830
STD DEV *	2.28194	6.17331	3.29190
MEDIAN *	8.40000	9.30000	3.20000
MEAN *	8.07545	2.04909	.69600
STD DEV *	3.64072	.60607	.82698
MEDIAN *	6.75000	2.06000	.40200

* results after rejection of lab 53

DATA SUMMARY

5

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 8/5/11/26.

PARAMETER: BENZO(A)PYRENE

NG/UL

PARAMETER: BENZO(A)PYRENE

UG/G

	SAMPLE RESULTS			
	A1	A2	A3	
LAB				
N094	3.5	6.0	2.2	
N010	4.4	9.7	3.7	
N042	6.31	4.30	5.59	
N087	4.06	1.33	5.54	
N116	8.7	5.9	3.55	
N136	7.51	9.3	5.4	
N90A			4.85	
N90B			4.94	
N90B			4.22	
115B			2.28	
TOTAL LABS REPORTING	8	8	8	
TOTAL LABS USED	6	7	8	
MEAN	5.08300	6.00857	3.84000	
STD DEV	2.12727	3.17829	1.75014	
MEDIAN	5.60500	6.00000	4.27500	
TOTAL LABS REPORTING	8	8	8	
TOTAL LABS USED	6	7	8	
MEAN	5.055125	1.51125	0.90300	
STD DEV	1.50066	0.40428	0.94598	
MEDIAN	5.36000	1.37000	0.50000	

DATA SUMMARY

6

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 85/11/26.

PARAMETER: BENZOL(G,H,I)PERYLENE

NG/UL

PARAMETER: BENZOL(G,H,I)PERYLENE

UG/G

	A1	A2	SAMPLE RESULTS A3		SAMPLE RESULTS S1	S2	S3
LAB				LAB			
N004	2.0	2.4		N010	7.1	1.6	1.57
N010	4.0	8.5	3.9	N024	1.6	3.7	1.2
N024	8.9	18.0	19.6	N031	4.7	1.2	.4
N031	3.6	22.6	2.8	N043	4.45	1.5	.13
N043	2.8	1.0	.4	N087	1.16	.71	
N087	.59	6.3	4.2	N116	6.0	N	
N116	.3	9.7	3.3	N136	4.9	.4	
N136	7.0	10.737	3.327	N72A	2.0305	3.523	.5
N72A	6.022		4.327	N72B	18.144	3.060	.283
N90A	5.08	7.37	3.78	N90A	3.79	1.99	.727
N90B			3.084	N90B	3.77	1.09	.46
				115A	4.06	.46	.34
				115B	4.73	1.53	

TOTAL LABS REPORTING	12	12	12	TOTAL LABS REPORTING	13	13	13
TOTAL LABS USED	10	9	12	TOTAL LABS USED	13	13	10
MEAN	4.02920	9.62300	4.34492	MEAN	7.31531	1.778E9	.50700
STD DEV	2.77237	6.92578	4.91691	STD DEV	6.47562	1.02398	.29226
MEDIAN	3.60000	8.50000	3.81600	MEDIAN	4.73000	1.50000	.46000

DATA SUMMARY

7

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 85/11/26.

PARAMETER: BENZO(K)FLUORANTHENE

NG/UL

PARAMETER: BENZO(K)FLUORANTHENE

UG/G

SAMPLE RESULTS

LAB	A1	A2	A3	SL	S2	S3
N004	4.8	2.7	1.7	3.7	.76	.22
N010	4.9	4.2	2.2	3.0	.8	.2
N024	4.4	6.7	2.4	8.0	1.7	.59
N031	5.1	10.5	4.3	6.61	1.99	2.4
N042	5.17	6.12	4.37	2.88	1.02	.25
N043	5.5	3.32	2.35	5.38	1.4	N
N087	4.45	3.22	4.65	8.5	1.25	.78
N116	3.2	9.1	4.6	2.20	1.26	.135
N53B	2.6	16.8	13.9	3.451	1.249	.240
N72A	2.9	27.9	14.4	3.63	1.09	.19
N72B	2.463	3.337	1.033	1.158	1.09	1.23
TOTAL LABS REPORTING	12	12	12	TOTAL LABS REPORTING	12	12
TOTAL LABS USED	11	11	12	TOTAL LABS USED	11	12
MEAN	8.13482	8.62513	4.47008	MEAN	5.58136	1.20958
STD DEV	7.81300	7.93125	4.73661	STD DEV	4.17173	.35833
MEDIAN	4.90000	6.12000	2.35000	MEDIAN	3.63090	1.17800
MEAN *	4.66478	5.35300	2.53410	MEAN *	5.58136	1.20591
STD DEV *	1.33914	2.68414	1.55650	STD DEV *	4.17173	.37558
MEDIAN *	4.80000	4.20000	2.25000	MEDIAN *	3.63000	1.12600

* results after rejection of lab 53

DATA SUMMARY

8

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 65/11/26.

PARAMETER: CHRYSENE

NG/UL

PARAMETER: CHRYSENE

UG/G

SAMPLE RESULTS

A1 A2 A3

LAB

N004	10.9
N010	9.2
N024	16.0
N042	10.71
N043	9.2
N087	16.0
N116	2.9
N136	18.6
N53A	23.6
N53B	23.8
N90A	10.48
N90B	11.81

S1

S2

S3

LAB

N010	6.7
N024	4.4
N042	7.51
N043	8.3
N087	10.6
N116	12.4
N136	9.3
N53A	5.58
N90A	7.06
N90B	6.92
N90B	24.18

S1

S2

S3

LAB

TOTAL LABS REPORTING	12
TOTAL LABS USED	11
MEAN	13.6900
STD DEV	6.53251
MEDIAN	10.71000

TOTAL LABS REPORTING	11
TOTAL LABS USED	11
MEAN	12.50455
STD DEV	11.92279
MEDIAN	8.30000

TOTAL LABS REPORTING	12
TOTAL LABS USED	11
MEAN	14.25455
STD DEV	10.04098
MEDIAN	11.10000

TOTAL LABS REPORTING	11
TOTAL LABS USED	11
MEAN	13.69700
STD DEV	3.18277
MEDIAN	11.00000

TOTAL LABS REPORTING	11
TOTAL LABS USED	11
MEAN	13.69700
STD DEV	3.18277
MEDIAN	11.00000

TOTAL LABS REPORTING	11
TOTAL LABS USED	11
MEAN	13.69700
STD DEV	3.18277
MEDIAN	11.00000

* results after rejection of lab 53

DATA SUMMARY

9

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 85/11/26.

PARAMETER: DIBENZ (A,H)ANTHRACENE

NG/UL

PARAMETER: DIBENZ (A,H)ANTHRACENE

UG/G

SAMPLE RESULTS			SAMPLE RESULTS		
A1	A2	A3	S1	S2	S3
LAB	LAB	LAB	LAB	LAB	LAB
N004	N024	N031	N024	N031	N042
7.2	7.2	2.0	11.	4.0	4.0
N024	N031	N042	N031	N042	N043
5.28	5.0	1.23	1.80	3.60	3.1
N043	N087	N116	N087	N116	N136
4.00	1.30	2.5	1.44	2.2	2.2
N116	N136	N72A	N72B	N72B	N90A
1.5	4.3	1.98	5.64	5.64	1.412
N72A	N72B	N90A	N90B	N90B	N90B
1.412	1.98	1.614	1.49	1.49	2.78
N90A	N90B	N90B	1.47	1.47	1.21
N90B			9.54	9.54	9.54
TOTAL LABS REPORTING	12	12	TOTAL LABS REPORTING	12	12
TOTAL LABS USED	10	6	TOTAL LABS USED	10	8
MEAN	3.02020	5.02667	MEAN	3.61950	1.30213
STD DEV	2.16092	5.88701	STD DEV	3.00137	1.29123
MEDIAN	2.50500	2.79000	MEDIAN	2.35000	1.26000

DATA SUMMARY

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 6/11/26.

PARAMETER: FLUORANTHENE

NG/UL

PARAMETER: FLUORANTHENE

UG/UG

SAMPLE RESULTS			SAMPLE RESULTS			
A1	A2	A3	S1	S2	S3	
LAB	LAB	LAB	LAB	LAB	LAB	
N004 N010 N017 N024 N031 N042 N043 N067 N116 N120 N136 N136 N53A N53B N72A N72B N90A N90B N90B	21. 20. 30. 24. 23. 21. 20. 13. 22. 26. 34. 64. 67. 7. 18. 24. 49.	22. 24. 30. 30. 23. 14. 47. 20. 25. 30. 41. 79. 82. 87. 32. 39.	5.0 8.1 8.91 8.91 7.6 7.71 12. 1.56 1.44 1.07 11.7 19.9 20.1 3.265 8.33	23. 19. 29. 26. 21. 45. 16. 26. 26. 26. 34. 14. 18. 18. 18. 21.	2.6 3.63 3.66 3.66 3.26 3.26 20.01 3.9 3.9 3.9 4.01 3.988 3.955 2.71 .75	5.4 5.18 5.5 5.7 6.2 6.2 2.24 3.3 1.3 1.8 6.46 7.83 7.1 .75

TOTAL	LABS REPORTING	17	17	17	16	16
TOTAL	LABS USED	15	15	17	16	15
MEAN						
STO DEV						
MEDIAN						
TOTAL	LABS REPORTING	16	16	16	16	16
TOTAL	LABS USED	16	16	15	15	15
MEAN						
STO DEV						
MEDIAN						
MEAN *	21.70231	25.76915	7.69067	23.45273	3.11843	.99779
STD DEV *	6.89669	11.47811	2.73898	7.38969	1.21184	.88903
MEDIAN *	21.18000	24.00000	8.10000	21.81000	3.23000	.73000

* results after rejection of lab 53

DATA SUMMARY

11

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 5/11/26.

PARAMETER: INDENO(1,2,3CD) PYRENE

NG/UL

PARAMETER: INDENO(1,2,3CD) PYRENE

UG/G

SAMPLE RESULTS			SAMPLE RESULTS		
A1	A2	A3	S1	S2	S3
LAB			LAB		
N004	2.2	3.2	N010	4.7	1.1
N010	3.8	6.0	N024	3.5	.54
N024	3.9	7.5	N031	5.4	.3
N031	3.5	1.2	N043	7.2	.4
N043	4.3	7.0	N087	3.12	.62
N087	2.22	N	N116	7.6	
N116	3.7	6.5	N136	5.7	
N136	7.3	3.6	N90A	4.53	.6
N90A	6.34	10.45	N90B	4.90	.52
N90B		4.30	115A	4.49	.62
			115B	4.97	
TOTAL LABS REPORTING	10	10	TOTAL LABS REPORTING	11	11
TOTAL LABS USED	9	8	TOTAL LABS USED	11	8
MEAN	4.14000	7.49375	MEAN	5.10091	1.54618
STD DEV	1.69844	2.52168	STD DEV	1.36030	.48875
MEDIAN	3.80000	3.95000	MEDIAN	4.90000	.10816
					.51500

DATA SUMMARY

12

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 85/11/26.

PARAMETER: PERYLENE

NG/UL

PARAMETER: PERYLENEN

UG/G

SAMPLE RESULTS			SAMPLE RESULTS		
A1	A2	A3	S1	S2	S3
LAB	LAB	LAB	LAB	LAB	LAB
N004	3.6	1.2	N042	1.05	.92
N042	6.23	.25	N087	1.9	.29
N087	3.22	N	N116	1.9	N
N116	N	N	N136	1.9	.14
N136	9.1	1.7	N90A	1.16	.24
N90A	6.20	1.9	N90B	1.15	.18
N90B		2.36	N15A	1.10	.16
		.85	N15B	2.19	.16
TOTAL LABS REPORTING	7	7	TOTAL LABS REPORTING	8	8
TOTAL LABS USED	5	5	TOTAL LABS USED	7	4
MEAN	5.67000	1.48200	MEAN	1.49286	4
STD DEV	2.37943	.80475	STD DEV	.48241	.38750
MEDIAN	6.20000	1.70000	MEDIAN	.86000	.35957
					.23500

DATA SUMMARY

13

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 8/5/11/26.

PARAMETERS: PHENANTHRENE

NG /UL

PARAMETERS: PHENANTHRENE

UG/G

SAMPLE RESULTS

	S1	S2	S3
LAB			
N004	9.9	.89	.28
N010	24.35	3.87	3.87
N017	19.0	1.9	1.9
N024	19.4	3.4	2.58
N031	12.4	1.1	1.41
N042	19.79	1.72	1.67
N043	15.0	1.6	1.47
N087	20.9	1.78	1.78
N116	19.7	1.5	1.5
N136	16.8	1.4	1.46
N53A	16.47	1.78	1.47
N53B	13.4	1.78	1.47
N90A	11.03	1.41	1.47
N90B			

SAMPLE RESULTS

LAB	A1	A2	A3
N004	14.0	20.0	3.0
N010	10.0	14.0	2.6
N017	15.65	15.72	4.15
N024	1.0	19.0	3.4
N031	8.9	12.1	2.4
N042	11.03	9.12	3.30
N043	10.4	15.5	2.90
N087	10.5	22.6	3.20
N116		23.9	3.6
N136	17.4	33.9	4.3
N53A	27.3	38.9	10.0
N53B	28.4	38.6	10.0
N90A	13.4	20.0	3.48
N90B			

TOTAL LABS REPORTING	13	13	13
TOTAL LABS USED	12	13	13
MEAN	14.83167	20.64154	6.68692
STD DEV	6.57567	10.10096	8.59529
MEDIAN	12.21500	19.00000	3.48000

TOTAL LABS REPORTING	12	12	12
TOTAL LABS USED	12	10	11
MEAN	15.22833	1.75800	1.03091
STD DEV	6.38245	.70787	1.21666
MEDIAN	15.90000	1.66000	.47000

MEAN *	12.22800	16.89455	6.08455
STD DEV *	2.75446	4.57658	9.27688
MEDIAN *	11.01500	15.72000	3.30000
MEAN *			
STD DEV *			
MEDIAN *			

* results after rejection of lab 53

DATA SUMMARY

14

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

PRINTOUT PREPARED: 85/11/26.

PARAMETERS: PYRENE

NG/ML

PARAMETER: PYRENE

UG/G

SAMPLE RESULTS

SAMPLE RESULTS

A1 A2 A3

S1 S2 S3

LAB
N004 28.0
N010 20.0
N017 30.87
N024 41.0
N031 17.7
N042 21.75
N043 20.0
N087 26.5
N116 23.9
N120 26.0
N136 34.5
N53A 68.4
N53B 70.6
N90A 24.20LAB
N010 18.0
N017 13.0
N024 26.0
N031 14.0
N042 16.43
N043 25.1
N087 24.2
N116 21.0
N120 19.6
N136 19.6
N53A 13.55
N90A 13.13
N90B 12.97
N15B 9.58• 95273
• 87710
• 66000LAB
N010 26.0
N017 19.0
N024 19.36
N031 14.0
N042 20.6
N043 11.82
N087 21.1
N116 18.8
N120 10.0
N136 31.6
N53A 74.2
N90A 76.1
N90B 23.61LAB
N010 18.0
N017 13.0
N024 26.0
N031 14.0
N042 16.43
N043 25.1
N087 24.2
N116 21.0
N120 19.6
N136 19.6
N53A 13.55
N90A 13.13
N90B 12.97
N15B 9.58• 95273
• 87710
• 66000

	A1	A2	A3			
TOTAL LABS REPORTING	15	15	15			
TOTAL LABS USED	14	14	15			
MEAN	30.24429	27.66357	9.75400			
STD DEV	17.59927	21.31839	4.54510			
MEDIAN	25.10000	20.85000	6.90000			

	A1	A2	A3			
TOTAL LABS REPORTING	14	14	14			
TOTAL LABS USED	14	14	13			
MEAN	17.14714	2.87769	• 97000			
STD DEV	6.91908	1.10405	• 83842			
MEDIAN	16.25000	2.57000	• 67500			

	A1	A2	A3			
MEAN *	23.70167	19.74917	7.10077			
STD DEV *	6.24086	7.65613	1.37558			
MEDIAN *	24.05000	19.98000	5.67000			

	A1	A2	A3			
MEAN *	18.42385	2.94583	• 95273			
STD DEV *	5.20980	1.12423	• 87710			
MEDIAN *	18.50000	2.63500	• 66000			

* results after rejection of lab 53

APPENDIX II

Flagging of Ampule and Sediment Results

ANALYSIS OF PAHS IN SEDIMENT AND SOLUTION

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
 LABORATORIES YET TO REPORT = 0
 LABORATORY RESULTS OMITTED ARE NONE

QUALITY ASSURANCE AND METHOD SECTION
 NATIONAL WATER SEARCH INSTITUTE
 BURLINGTON ONTARIO

BASIC ACCEPTABLE ERROR = .50
 CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED LAB NO.	S1 VALUE	RANK	REPORTED LAB NO.	S2 VALUE	RANK	REPORTED LAB NO.	S3 VALUE	RANK	
N024	4	4.3	VH	7.00	2.5	VH	6.00	2.6	VH	6.00
N031	4.6	LH	2.00	<1	1.1	VH	0.00	<1	VH	0.00
N042	13.18	VH	9.00	1.33	5.00	H	5.00	1.74	H	5.00
N043	1.0	VH	3.00	0.82	1.0	VH	3.00	0.10	VH	3.00
N087	10.5	VH	8.00	>1	3.00	VH	0.00	>1	VH	0.00
N116	2.8	VH	6.00	0.9	4.00	VH	-ND	0.09	VH	0.00
N136	1.5	VH	5.00	1.9	4.00	VH	0.00	0.1	VH	0.00
N90A	1.01	VH	4.00	0.09	1.00	VH	0.05	1.05	VH	0.00
N158	.35	VL	1.00	0.00	0.00	VL	0.00	0.00	VL	0.00
MEDIAN CONC.	1.500			.860			.100			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N024	19.00	6.333	3	VHVHVH
N031	12.00	2.000	3	LVHH
N042	19.00	6.333	3	VHH
N043	18.50	2.833	3	VL
N087	13.00	4.333	3	VH
N116	6.00	6.000	1	VH
N136	12.50	4.167	3	VH
N90A	6.00	2.000	1	VL
158	1.00	1.000	1	VL
OVERALL AVERAGE RANK IS	4.143			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N024	1.00	1.000	1	VL	
N90A	6.00	2.000	1	VL	
N031	2.00	2.000	1	VL	
N043	2.00	2.833	3	VL	
N136	12.50	4.167	3	VH	
N087	13.00	4.333	3	VH	
N116	6.00	6.000	1	VH	
N024	19.00	6.333	3	VH	
N042	19.00	6.333	3	VHHVH	
OVERALL AVERAGE RANK IS	4.143				

INSUFFICIENT DATA
 INSUFFICIENT DATA
 INSUFFICIENT DATA
 INSUFFICIENT DATA
 INSUFFICIENT DATA

METHOD CODING

INSUFFICIENT DATA
 INSUFFICIENT DATA
 INSUFFICIENT DATA

METHOD CODING

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
 LABORATORIES YET TO REPORT¹⁰ BASIC ACCEPTABLE ERROR = .50
 LABORATORY RESULTS OMITTED ARE NONE CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED LAB NO.	S1 REPORTED VALUE	RANK	S2 REPORTED VALUE	RANK	S3 REPORTED VALUE	RANK
N010	12.00	4.000		7.2	1.400	1.76	3.00
N024	20.00	6.667	3	VH	10.00	1.21	7.00
N043	29.00	8.667	3	H	10.07	1.21	VL
N067	21.00	7.000		17.00	1.000	2.00	1.73
N116	17.00	8.500		17.00	1.000	1.00	1.00
N136	17.6	11.00		17.6	1.000	1.00	1.00
N72A	7.399	5.000		7.399	1.000	1.570	1.20
N72B	9.400	8.000		9.400	1.000	9.319	11.00
N90A	5.95	3.000		5.95	1.000	6.83	9.00
N90B	5.93	2.000		5.93	1.000	1.83	4.50
1158	MEDIAN	0.00		1158	1.000	1.25	8.00
CONC.	7.600			CONC.	1.000	1.050	3.00

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N010	12.00	4.000	3	VH
N024	20.00	6.667	3	HVLVH
N043	29.00	8.667	3	VL
N067	21.00	7.000		VH
N116	17.00	8.500		H
N72A	7.399	5.667		
N72B	9.400	6.333		
N90A	5.95	3.833		
N90B	5.93	3.833		
1158	11.58	8.000	1	
OVERALL AVERAGE RANK IS	6.030			

OVERALL AVERAGE RANK IS 6.030

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N043	9.00	3.000	3	VL	
N010	12.00	4.000	3		
N90A	14.50	4.833	3		
N90B	14.50	4.833	3		
N72B	19.00	6.333	3	H	
N042	20.00	6.667	3	HVLVH	
N024	20.00	6.667	3	VH	
N087	21.00	7.000	3		
1158	11.58	8.000	1		
N116	17.00	8.500	2		INSUFFICIENT DATA
N136	27.00	9.000	3	VH	
OVERALL AVERAGE RANK IS	6.030			H	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20
 LABORATORIES YET TO REPORT: 0
 ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED LAB NO.	LAB NO. VALUE	RANK	REPORTED S1 LAB NO.	REPORTED S2 LAB NO.	REPORTED S3 LAB NO.
N010	4.5	8.00	1.0	1.65 VH	7.00	.37
N024	6.6	13.00	1.6	1.65 VH	13.00	.44
N031	6.8	14.00	1.5	1.5 VH	12.00	.49
N042	3.8	12.00	2.0	2.12 VH	11.00	.11
N043	6.7	12.00	2.0	1.0 VH	10.00	.30
N067	3.17	4.00	5.6	.9	10.00	.23
N116	5.9	11.00	5.5	.5	6.00	.50
N120	3.0	15.00	3.0	.5 VH	14.00	.3
N136	5.7	10.00	8.0	.8	9.00	.04
N12A	5.077	7.00	0.57	1.00	1.00	.014
N72B	4.400	7.00	0.88	2.00	2.00	.019
N9DA	2.65	VL	2.00	4.00	4.00	.022
N9DB	2.61	VL	1.00	3.00	3.00	.022
115A	4.10	6.00	1.05	1.00	1.00	.035
115B	3.15	L	3.00	.69	6.00	.600
MEDIAN CONC.	4.500		.670	.360		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF RANKED SAMPLES	SUMMARY OF FLAGGING	METHOD CODING
N010	22	2.00	7	VHH	
N024	35	0.00	11	VHH VHH	
N031	35	0.00	11	VHH	
N042	46	0.00	8	VHH	
N043	25	0.00	8	VHH	
N087	15	0.00	5	VHH	
N116	16	0.00	1	H	
N120	41	0.00	13	VHHVHH	
N136	28	0.00	9	VHH	
N72A	14	0.00	3	VHH	
N72B	14	0.00	3	VHH	
N90A	10	0.00	3	VHH	
N90B	4	0.00	2	VHH	
115A	23	0.00	2	VHH	
115B	11	0.00	7	VHH	
OVERALL RANK IS	168	5.667	28	L	
OVERALL AVERAGE		7.390			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N90B	4	0.00	2	VL	
N90A	10	0.00	3	VL	
N72A	11	0.00	3	VL	
N72B	14	0.00	3	VL	
N087	15	0.00	5	VL	
N115B	14	0.00	7	VL	
N115A	22	0.00	7	VL	
N042	16	0.00	8	VL	
N116	16	0.00	8	VL	
N043	25	0.00	8	VL	
N136	13	0.00	9	VL	
N031	11	0.00	11	VL	
N120	13	0.00	13	VL	
OVERALL RANK IS	41	6.667	33	VHHVHH	
OVERALL AVERAGE		13.667			

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00. BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT: 0 ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED LAB NO.	S1 VALUE	RANK	REPORTED LAB NO.	S2 VALUE	RANK	REPORTED LAB NO.	S3 VALUE	RANK
N010	10.00	4.00	1.4	N024	7.00	2.8 H	N031	10.00	4.0
N024	8.1	7.00	1.4	N031	11.00	3.1 H	N042	5.00	5.0
N031	15.2	VH	1	N042	16.00	1.97	N043	2.00	2.0
N042	6.75	VH	1	N043	2.00	1.44 L	N047	1.00	1.7
N043	4.2	VL	1	N047	1.00	1.44	N116	1.00	1.1
N047	3.68	VL	1	N116	1.00	2.2	N72A	8.00	6.0
N116	12.9	VH	1	N72A	8.00	2.166	N72A	10.302	ND
N72A	9.302	VH	8	N72A	9.00	5.004	N72A	10.798	.402
N72A	6.0	VH	5	N72A	5.00	2.066	115A	6.23	.522
115A	5.67	VH	3.00	115A	3.00	1.80	115B	5.67	.35
MEDIAN CONC.	6.750						OVERALL AVERAGE RANK IS	5.710	
OVERALL AVERAGE RANK IS	5.710						OVERALL AVERAGE RANK IS	5.710	

SUMMARY OF
NO. OF SAMPLES
RANKED

METHOD CODING

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N043	5.00	4.667	3	VLL	VLL
N047	5.00	4.667	3	VLL	VLL
N010	10.00	3.333	3	VH	VH
115A	7.00	3.500	2	VH	VH
115A	14.00	4.667	3	VH	VH
N042	20.00	6.667	3	VH	VH
N042	20.00	6.667	3	VH	VH
N042	20.00	6.667	3	VH	VH
N72A	23.00	7.667	3	VH	VH
N72A	25.00	8.333	3	VH	VH
N116	18.00	9.000	3	VH	VH
N031	30.00	10.000	3	VH	VH
OVERALL AVERAGE RANK IS	5.710				
OVERALL AVERAGE RANK IS	5.710				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 ... BASIC ACCEPTABLE ERROR CR = .50 ... CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT: 0
LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED S1	REPORTED S2	REPORTED S3			
LAB NO.	VALUE	RANK	VALUE	RANK	VALUE	RANK
N010	7.1 H	7.00	1.4	5.00	3.50	
N042	7.76 VH	8.00	1.57	6.00	2.50 VH	5.00
N087	3.12 VL	1.00	1.99	1.00	-ND-	0.00
N116	6.32	6.00	1.33	2.00	-ND-	0.00
N136	5.5	5.00	1.9	7.00	.5	3.50
N908	5.2	4.00	1.34	4.00	.47	1.50
1958	5.19	3.00	1.31	3.00	.47	1.50
MEDIAN	4.22	2.00	2.28 VH	8.00	0.00	
CONE*	5.360		1.370		.500	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	15.50	5.167	3	H	
N042	19.00	6.333	3	VHH	
N087	2.00	1.000	2	VL	
N116	6.00	4.000	2		
N136	15.50	5.167	3		
N908	19.50	3.167	3		
1958	7.50	2.500	2		
	10.00	5.000	2	VH	
OVERALL AVERAGE RANK IS	4.143				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N087	2.00	1.000	2	VL	
N908	7.50	2.500	3		
N90A	9.50	3.167	3		
N116	8.00	4.000	3		
1958	10.00	5.000	3	VH	
N136	15.50	5.167	3		
N010	15.50	5.167	3	H	
N042	19.00	6.333	3	VHH	
OVERALL AVERAGE RANK IS	4.143				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT = 0
LABORATORY RESULTS OMITTED ARE NONE

BASIC ACCEPTABLE ERROR = .50

CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED S1 LAB NO.	REPORTED S1 VALUE	RANK	REPORTED S2 LAB NO.	REPORTED S2 VALUE	RANK	REPORTED S3 LAB NO.	REPORTED S3 VALUE	RANK
N010	7.1	VH	10.00	1.6	19.00	1.57	8.00	1.2 H	10.00
N024	16.0	VH	11.00	3.7	VH	13.00	1.2	4.00	4.00
N031	4.7	VL	6.00	1.0	1.5	5.00	.4	.13	1.00
N043	4.45	VL	1.00	1.5	7.1 L	7.00	-ND-	0.00	0.00
N087	1.16	VL	2.00	2.00	2.00	2.00	-ND-	0.00	0.00
N136	6.00	H	9.00	1.7 L	1.7 L	1.7 L	6.00	5.5	7.00
N72A	4.9	VH	8.00	1.4	1.4	1.4	2.00	2.83	2.00
N72B	20.305	VH	13.00	3.523	VH	12.00	1.4	.727	9.00
N90A	18.144	VH	12.00	3.080	VH	14.00	3.00	.46	5.50
N90B	3.77	VH	3.00	1.09	4.00	4.00	1.09	.34	5.50
I15A	4.06	VH	5.00	1.53	1.00	1.00	8.00	3.00	0.00
I15B	4.73	VH	7.00	2.10	1.00	1.00	10.00	0.00	0.00
MEDIAN									
CONC.	4.730			1.500			4.60		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	27.00	9.000	11.333	VH	VH
N024	34.00	11.333	33.333	VH VH VH	VH VH VH
N031	15.00	5.000	3.000	VL	VL
N043	9.00	3.000	3.000	VL	VL
N116	10.00	2.000	2.000	HL	HL
N136	21.00	7.000	3.000	VL	VL
N72A	27.00	9.000	3.000	VH	VH
N72B	32.00	10.667	3.000	VH	VH
N90A	12.50	4.167	3.000	VH	VH
N90B	12.50	4.167	3.000	VH	VH
I15A	12.50	4.167	3.000	VH	VH
I15B	17.00	8.500	3.000	VH	VH
N010	27.00	9.000	3.000	VH	VH
N72A	27.00	9.000	3.000	VH	VH
N72B	32.00	10.667	3.000	VH	VH
N024	34.00	11.333	33.333	VH VH VH	VH VH VH
OVERALL AVERAGE RANK IS	6.583				
OVERALL AVERAGE RANK IS	6.583				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT: 0 ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION
LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED S1	LAB NO.	REPORTED S1 VALUE	RANK	REPORTED S2	LAB NO.	REPORTED S2 VALUE	RANK	REPORTED S3	LAB NO.	REPORTED S3 VALUE	RANK
N010	3.7		7.00		.76		1.00		.22		4.00	
N024	7.00		2.333		2.00		2.00		.2		3.00	
N031	26.00		1.867		9.00		1.77 ^H		10.00		7.00	
N042	16.61	VH	14.00		1.99 VH		11.00		2.59 VH		8.00	
N043	2.88	VH	8.00		1.92		4.00		.25		6.00	
N116	8.5 VH		10.00		1.4		9.00		-ND-		0.00	
N72A	3.194		4.00		1.26		6.00		.135		1.00	
N72B	3.451		5.00		1.249		8.00		.240		5.00	
N115A	3.63		6.00		1.09		5.00		.13		2.00	
N115B	3.13		3.00		1.23		7.00		0.00		0.00	
MEDIAN												
CONC.	3.630				1.126				.230			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N010	12.00	4.000	3	
N024	7.00	2.333	3	
N031	26.00	1.867	3	VHH
N042	10.00	3.333	3	VHVHVH
N043	12.00	6.000	2	VH
N116	19.00	9.500	2	VH
N72A	14.00	3.667	3	
N72B	16.00	6.000	3	
115A	13.00	4.333	3	
115B	10.00	5.000	2	
OVER ALL AVERAGE RANK IS		5.600		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N024	7.00	2.333	3		
N043	10.00	3.333	3		
N72A	11.00	4.000	3		
N041	12.00	4.000	3		
115A	13.00	4.333	3		
115B	10.00	5.000	2		
N087	12.00	4.333	3		
N72B	18.00	6.000	2	VH	
N031	26.00	8.667	2	VHH	
N116	19.00	9.500	2	VH	
N042	30.00	10.000	2	VHVHVH	
OVER ALL AVERAGE RANK IS		5.600			

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00... BASIC ACCEPTABLE ERROR = .50... CONCENTRATION ERROR INCREMENT = .20.
 LABORATORIES YET TO REPORT: 0
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE LAB NO.	REPORTED VALUE	S1 RANK	REPORTED VALUE	S2 RANK	REPORTED VALUE	S3 RANK
N010	6.7	L	1.00	L	1.00	31
N024	44.7	VH	10.00	14. VH	10.00	11
N042	7.51		4.00	2.36	8.00	2.51
N043	8.3		5.00	1.6	4.00	37
N087	10.6		7.00	1.68	5.00	25
N136	12.4	VH	9.00	3.68	6.00	-ND
N136	9.3		6.00	2.3	7.00	0.00
N90A	7.06		3.00	1.55	2.50	5
N90B	6.92		2.00	1.55	2.50	.54
N15B	24.18	VH	9.00	5.75	9.00	.59
MEDIAN						6.00
CONC.	8.800			1.940		0.520

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	4.00	1.333	3	LL	
N024	28.00	9.333	3	VHVHVH	
N042	18.00	6.333	3	VH	
N087	12.00	4.000	3	VH	
N116	13.00	4.333	3	VH	
N136	17.00	5.667	3	VH	
N90A	10.50	3.500	3	VH	
N90B	10.50	3.500	3	VH	
115B	18.00	9.000	2	VHVH	
OVERALL AVERAGE RANK IS	5.214				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	4.00	1.333	3	LL	
N90A	10.50	3.500	3	VH	
N90B	19.50	6.500	3	VH	
N043	12.00	4.000	3	VH	
N087	13.00	4.333	3	VH	
N136	17.00	5.667	3	VH	
N042	19.00	6.333	3	VH	
N116	14.00	7.000	2	VH	
115B	18.00	9.000	2	VH	
N024	28.00	9.333	3	VHVHVH	
OVERALL AVERAGE RANK IS	5.214				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 . . . BASIC ACCEPTABLE ERROR = .50 . . . CONCENTRATION ERROR INCREMENT = .20
 LABORATORIES YET TO REPORT: 0
 ANALYSIS OF PAH'S IN SEDIMENT AND SCLUTION
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED S1			REPORTED S2		
LAB NO.	VALUE	RANK	VALUE	RANK	VALUE	RANK
N024	11.0 VH	10.00	4.0 VH	8.00	-ND-	0.00
N031	-ND-	0.00	-ND-	0.00	.6	5.00
N042	1.80	4.00	4.00	6.00	0.00	0.00
N043	3.6 VH	7.00	1.2	6.00	4.00	4.00
N087	1.54 L	1.00	-ND-	0.00	-ND-	0.00
N116	2.2	5.00	7	4.00	.1	2.00
N72A	5.049 VH	8.00	.766	5.00	.015	1.00
N72B	5.646 VH	3.00	.561	3.00	.272	3.00
N90A	1.49 L	3.00	.33	1.00	0.00	0.00
N90B	1.47 L	2.00	.38	2.00	0.00	0.00
M158	<9.54	0.00	2.48 VH	7.00	-ND-	0.00
MEDIAN	2.350		1.733		•272	
CONC.						

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N024	18.00	9.000	2	VHH
N031	5.000	5.000	1	
N042	6.000	6.000	1	
N043	17.00	5.667	3	VH
N087	1.000	1.000	1	L
N116	1.000	3.667	3	
N72A	14.00	4.667	3	
N72B	15.00	5.000	3	VH
N90A	4.000	2.000	2	L
N90B	4.000	2.000	2	VH
M158	7.00	7.000	1	
OVERALL AVERAGE RANK	4.609			INSUFFICIENT DATA

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N087	1.00	1.000	1	
N90A	4.00	2.000	2	L
N90B	4.00	2.000	2	
N116	1.00	3.667	3	
N042	4.000	4.000	1	
N72A	15.00	4.667	3	VH
N031	5.000	5.000	1	VH
N72B	15.00	5.000	3	VH
N043	17.00	5.667	3	
N116	6.000	6.000	1	
M158	7.00	7.000	1	VH
N024	18.00	9.000	2	VHV
OVERALL AVERAGE RANK	4.609			INSUFFICIENT DATA

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 . . . BASIC ACCEPTABLE ERROR = .050 . . . CONCENTRATION ERROR INCREMENT = .20
 LABORATORIES YET TO REPORT, 0
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED LAB NO.	S1 VALUE	RANK	REPORTED LAB NO.	S2 VALUE	RANK	REPORTED LAB NO.	S3 VALUE	RANK
N010	23	9.00	2	N017	2.6	5.00	N043	.54	14.00
N017	19.6	6.00	3	N024	6.63	VL	N087	.18	VH
N024	29.0	14.00	3	N031	3.6	10.00	N116	.7	3.00
N031	26.4	11.00	3	N042	3.2	7.00	N120	.62	VH
N042	21.81	18.00	3	N043	3.26	8.00	N136	14.00	
N043	45.3	15.00	3	N087	5.8	14.00	N72A	1.24	
N087	16.3	12.00	2	N116	2.01	13.00	N72B	1.24	
N116	26.5	12.50	2	N120	3.9	11.50	N90A	1.3	2.00
N120	26.5	12.50	2	N136	3.9	12.00	N94B	1.	1.00
N136	26.5	12.50	2	N72A	1.00	11.50	N90A	.8	1.00
N72A	14.871	L		N72B	3.988	13.00	N94B	.646	5.00
N72B	18.430	3.00		N90A	3.950	9.00	N90A	.783	7.00
N90A	18.52	5.00		N94B	4.00	4.00	N94B	.71	8.00
N94B	18.44	4.00		N116	2.51	6.00	N116	.75	8.00
N116	21.12	7.00		MEDIAN	2.71	0.00	MEDIAN	0.00	
MEDIAN	21.810			CONC.	3.230		CONC.	.730	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	18.00	6.00	3	VL VH	LL
N017	20.00	6.67	3	VH	
N024	27.00	9.00	3	VH	
N031	24.00	8.00	3	VH	
N042	30.00	10.00	3	VH	
N043	41.00	13.67	3	VH VH	LL
N116	26.00	8.67	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	34.00	11.33	3	VH	HL
N72A	19.00	6.33	3	VH	HL
N72B	21.00	7.00	3	VH	HL
N90A	16.00	5.33	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N72A	19.00	6.33	3	VH	HL
N72B	21.00	7.00	3	VH	HL
N116	27.00	7.67	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	VH	HL
N90B	18.00	6.00	3	VH	HL
N116	26.00	9.00	3	VH	HL
N120	23.00	7.67	3	VH	HL
N136	24.00	8.00	3	VH	HL
N72A	26.00	8.67	3	VH	HL
N90A	10.00	3.00	3	INSUFFICIENT DATA	

OVERALL AVERAGE
RANK IS
7.674

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N087	6.00	2.00	3	LL	
N90A	16.00	5.33	3	VH	
N010	18.00	6.00	3	VH	
N90B	18.00	6.00	3	VH	
N72A	21.00	7.000	3	VH VH	
N72B	21.00	7.000	3	L	
N116	27.00	7.667	3	L	
N120	23.00	7.667	3	L	
N031	23.00	8.000	3	VH	
N24	26.00	8.667	3	VH	
N16	26.00	9.000	3	VH	
N042	0.00	1.000	3	VH	
N36	13.00	4.333	3	VH VH	

INSUFFICIENT DATA

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20
 LABORATORIES YET TO REPORT⁰
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED S1 LAB NO.	REPORTED S1 VALUE	RANK	REPORTED S2 LAB NO.	REPORTED S2 VALUE	RANK	REPORTED S3 LAB NO.	REPORTED S3 VALUE	RANK
N010	4.7	5.00	1	N010	1.00	54	N010	6.00	1
N024	3.5	L	2	N024	6.00	3	N024	1.00	2
N031	5.4	8.00	1	N031	1.6	4	N031	2.00	8
N043	7.2	VH	10	N043	2.1	H	N043	0.00	0
N087	3.12	L	1	N087	1.39	5	N087	ND	0.00
N116	2.6	VH	1	N116	4.00	8	N116	0.00	0
N136	5.7	9.00	1	N136	1.8	6	N136	7.00	1
N90A	4.53	4.00	1	N90A	2.26	3	N90A	5.00	5
N90B	4.90	6.00	1	N90B	1.14	2	N90B	4.00	4
115A	4.49	3.00	1	115A	1.94	9	115A	3.00	3
115B	4.97	7.00	1	115B	2.04	H	115B	0.00	0
MEDIAN CONC.	4.900			1.400			.515		
OVERALL AVERAGE RANK IS	5.600			1.440			.515		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	12.00	4.000	3	L	
N024	19.00	5.667	3	VHH	
N031	29.00	9.667	3	L	
N087	26.00	8.667	3	VHH	
N116	15.00	7.500	2	VH	
N136	14.00	8.000	2		
N90A	12.00	4.000	3		
115A	15.00	5.000	3		
115B	17.00	6.500	2	H	
OVERALL AVERAGE RANK IS	5.600				
OVERALL AVERAGE RANK IS	5.600				

METHOD CODING

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N024	9.00	3.000	3	L
N031	6.00	4.000	3	
N087	12.00	4.000	3	
N90A	12.00	4.000	3	
N116	15.00	5.000	3	
N136	17.00	5.667	3	VH
N15A	15.00	5.000	3	H
N15B	17.00	7.500	3	VHH
N16A	24.00	8.000	3	
N16B	27.00	8.500	3	
N043	29.00	9.667	3	

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LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT: 0

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION

LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED S1 LAB NO.	REPORTED S1 VALUE	RANK	REPORTED S2 LAB NO.	REPORTED S2 VALUE	RANK	REPORTED S3 LAB NO.	REPORTED S3 VALUE	RANK
N042		0.00			0.00		.92 H	5.00	
N087	1.05	1.00	14		1.00		.29	4.00	
N116	1.9 H	5.50	-ND		0.00		-ND	0.00	
N136	1.9 H	5.50	6		4.00		<1	1.00	
N90A	1.16	4.00	24		2.00		.18	3.00	
N90B		3.00			0.00		0.00	0.00	
115A	1.15	2.00			3.00		.16	2.00	
115B	1.10	2.00			0.00		0.00	0.00	
MEDIAN CONC.	2.19 VH	7.00			0.300		.190		
OVERALL RANK IS			3.313						

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N042	5.00	5.00	1	H	INSUFFICIENT DATA
N087	6.00	2.00	3	H	INSUFFICIENT DATA
N116	5.50	5.50	3	H	INSUFFICIENT DATA
N136	10.50	3.50	3	H	INSUFFICIENT DATA
N90A	9.00	3.00	3	H	INSUFFICIENT DATA
N90B	3.00	3.00	1	VH	INSUFFICIENT DATA
115A	7.00	2.33	3		INSUFFICIENT DATA
115B	7.00	2.33	1	VH	INSUFFICIENT DATA
OVERALL AVERAGE RANK IS		3.313			
OVERALL AVERAGE RANK IS		3.313			

 INSUFFICIENT DATA
 INSUFFICIENT DATA
 INSUFFICIENT DATA

 INSUFFICIENT DATA
 INSUFFICIENT DATA
 INSUFFICIENT DATA

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00. BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT; 0 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED S ₁	RANK	REPORTED S ₂	RANK	REPORTED S ₃	RANK
LAB NO.	VALUE		VALUE		VALUE	
N010	9.35 VL	1.00	.89 L	1.00	3.28 VH	12.00
N017	24.35 VH	11.00	3.4 VH	9.00	1.97 VH	10.00
N024	19.0 L	3.00	1.1	2.00	2.3 VH	3.00
N031	12.4 L	3.00	1.72	5.00	2.58 VH	9.00
N043	19.79	9.00	1.6	5.00	4.41	4.00
N047	15.0	5.00	1.6	7.00	5.50	
N116	20.9 H	10.00	1.78	7.00	4.47	5.00
N136	19.7	8.00	1.5	4.00	1.1	1.00
N90A	16.8	6.00	2.4 H	8.00	1.5	7.00
1150	13.4	4.00	1.41	3.00	4.7	5.00
MEDIAN	11.03 VL	2.00		0.00	5.50	
CONC.	16.800		1.600		4.70	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	4.00	1.333	3	VLL	
N017	21.00	10.500	3	VHH	
N024	24.00	8.000	2	VHH	
N031	24.00	8.000	3	VHH	
N043	14.00	4.667	3	VHH	
N116	22.50	7.500	3	H	
N136	21.00	7.000	3	H	
N90A	12.50	4.167	3	H	
1150	2.00	2.000	1	VL	
OVERALL AVERAGE RANK IS	5.533			INSUFFICIENT DATA	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	4.00	1.333	3	VLL	
N017	2.00	2.000	1	VL	
N024	18.00	5.667	3	L	
N031	12.50	4.167	3		
N116	13.00	4.333	3		
N043	14.00	4.667	3		
N136	21.00	7.000	3	H	
N087	22.50	7.500	3	H	
N024	24.00	8.000	3	VHH	
N042	24.00	8.000	2	VH	
N017	21.00	10.500	2	VHVH	
OVERALL AVERAGE RANK IS	5.533			INSUFFICIENT DATA	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT = 0
LABORATORY RESULTS OMITTED ARE NONE

BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED S1 LAB NO.	REPORTED S1 VALUE	RANK	REPORTED S2 LAB NO.	REPORTED S2 VALUE	RANK	REPORTED S3 LAB NO.	REPORTED S3 VALUE	RANK
N010	18.00	6.00	2.7		7.00	4.00		1.52	1.00
N017	13.00 L	3.00			0.00	-ND	1.89 VH	10.00	0.00
N024	26.00 VH	13.00	2.2		4.00	2.00			
N031	18.5	7.00			2.00	1.00			
N042	16.43	5.00			2.57	1.00			
N043	25.41 VH	12.00			3.67 H	1.00	3.25 VH	14.00	
N067	24.2 H	11.00			3.32				
N116	21.0	9.00			3.1				
N120	22.0	10.00			2.0				
N136	19.6	8.00			3.3				
N90A	13.13 L	4.00			2.26				
N90B	12.97 L	2.00			2.14				
1158	9.58 VL	1.00			1.06 VH				
MEDIAN									
CONC.									
	18.500				2.635				
								.660	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	17.00	5.667	3	L	
N017	13.00	6.500	2	VH	
N024	17.00	8.500	2	VH	
N031	12.00	4.000	3	VH	
N042	22.00	7.333	3	VH	
N043	30.00	10.000	3	VH	
N087	23.00	7.667	3	VH	
N116	18.00	6.000	3	H	
N120	20.00	6.667	3		
N136	25.00	8.333	3		
N90A	14.00	4.667	3	L	
N90B	14.00	4.667	3	VH	
1158	13.00	6.500	3	VH	
OVERALL AVERAGE RANK IS	6.528				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N90B	11.00	3.667	3	L	
N031	12.00	4.000	3	L	
N09A	14.00	4.667	3		
N010	14.00	5.667	3		
N116	16.00	6.000	3		
N017	13.00	6.500	3	VH	
N158	13.00	6.500	3	VH	
N120	20.00	6.667	3	VH	
N042	22.00	7.333	3	VH	
N087	23.00	7.667	3	VH	
N136	25.00	8.333	3	VH	
N034	17.00	8.500	3	VH	
N043	30.00	10.000	3	VH	
OVERALL AVERAGE RANK IS	6.528				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT¹⁰
LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1 LAB NO.	REPORTED A1 VALUE	RANK	REPORTED A2 LAB NO.	REPORTED A2 VALUE	RANK	REPORTED A3 LAB NO.	REPORTED A3 VALUE	RANK	
N004	2.6	4.00	1	N024	3.0	3.8 VH	2	N034	4.00	2.50
N031	1.1 VL	6.00	8	N031	1.00	1.00	1	N043	0.00	0.00
N043	1.78	2.00	0	N047	5.00	1.00	2	N116	2.00	2.50
N116	2.42	3.00	1	N136	0.00	1.20	1	N136	0.00	1.46
N136	-ND	0.00	1	N136	8.00	1.21 VH	2	N136	8.00	1.11 H
MEDIAN	3.54 H	7.00	2	N90A	1.81 H	7.00	3	N90A	6.00	1.4
CONC.	2.650	1.150	3				4		5.00	4.00
							5			3.65

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	10.50	3.500	3	VHH	
N024	21.00	7.000	3	VL	
N031	3.00	1.000	3		
N043	12.00	2.000	3		
N067	10.00	3.333	3		
N116	13.00	3.667	3	H	
N136	20.00	6.667	3	VHH	
N90A	17.00	5.667	3	HH	
OVERALL AVERAGE RANK IS	4.500				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N031	3.00	1.000	3	VL	
N043	2.000	2.000	3		
N004	1.000	3.333	3		
N067	10.50	3.500	3		
N116	11.50	3.833	3		
N136	17.00	5.667	3	HH	
N136	13.00	6.500	3	VHH	
N024	21.00	7.000	3	VHH	
OVERALL AVERAGE RANK IS	4.500				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
 LABORATORIES YET TO REPORT: 0
 ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1	REPORTED A2	REPORTED A3
LAB NO.	VALUE	VALUE	VALUE
	RANK	RANK	RANK
N004	4.6	4.00	7.9
N010	4.5	3.00	8.0
N024	4.19	5.00	12.0
N042	4.19	10.50	VH
N043	5.1	6.00	10.50
N047	6.82	VH	5.54
N116	-ND-	8.00	6.00
N136	10.7	9.00	12.9
N72A	2.621	VL	VH
N72B	5.33	6.00	1.472
N90A		7.00	10.51
MEDIAN		8.00	8.00
CONCA.	4.700	8.070	2.190

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N72A	3.00	1.000	1	L	VLVL
N72B	2.00	2.000	2	L	VLVL
N004	1.00	3.667	3	L	VL
N043	1.300	4.333	3	L	VL
N010	14.000	4.667	3	VHL	VHL
N087	15.000	6.333	3	H	H
N042	19.000	6.333	3	H	H
N136	30.000	10.000	3	VHL	VHL
N72A	3.000	1.000	1	VHL	VHL
N72B	2.000	1.000	1	VHL	VHL
N90A	23.000	7.667	3	INSUFFICIENT DATA	INSUFFICIENT DATA
N90B	7.000	7.000	1	INSUFFICIENT DATA	INSUFFICIENT DATA
OVERALL AVERAGE RANK IS		5.742			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N72A	3.00	1.000	1	VLVL	VLVL
N72B	2.00	2.000	2	L	VL
N004	1.00	3.667	3	L	VL
N043	1.300	4.333	3	L	VL
N010	14.000	4.667	3	VHL	VHL
N087	15.000	6.333	3	H	H
N042	19.000	6.333	3	H	H
N136	30.000	10.000	3	VHL	VHL
N90A	23.000	7.667	3	VHL	VHL
N90B	7.000	7.000	1	VHL	VHL
OVERALL AVERAGE RANK IS		5.742			

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT: 0

ANALYSIS OF PAH'S IN SEDIMENT AND SCLUTION

LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1	REPORTED A2	REPORTED A3
LAB NO.	VALUE	VALUE	VALUE
N004	3.9	3.50	4.8
N010	4.6	6.00	4.9
N024	4.1	5.00	5.50
N034	4.8	7.00	11. VH
N042	6.02 H	10.00	26.1 VH
N067	3.71	7.8 VH	10.00
N116	3.9	2.00	1.36 VL
N120	1.5	3.50	4.9
N136	8.8 VH	12.00	5.50
N72A	3.292 L	11.00	2.00
N72B	4.99	1.00	9.3 VH
N90A	8.00	5.06	9.00
MEDIAN CONC.	4.070	4.900	1.750

TOTAL NO. OF SAMPLES SUMMARY OF
LAB NO. RANK RANKED FLAGGING

NO. OF SAMPLES	SUMMARY OF FLAGGING	METHOD CODING
4.000	VHHH	VVL
5.000	VHHH	VVL
5.667	H	V
8.667	VHHH	VVL
10.000	VHHH	VVL
11.000	VHHH	VVL
12.000	VHHH	VVL
13.000	VHHH	VVL
14.000	VHHH	VVL
15.000	VHHH	VVL
16.000	VHHH	VVL
17.000	VHHH	VVL
18.000	VHHH	VVL
19.000	VHHH	VVL
20.000	VHHH	VVL
21.000	VHHH	VVL
22.000	VHHH	VVL
23.000	VHHH	VVL
24.000	VHHH	VVL
25.000	VHHH	VVL
26.000	VHHH	VVL
27.000	VHHH	VVL
28.000	VHHH	VVL
29.000	VHHH	VVL
30.000	VHHH	VVL
31.000	VHHH	VVL
32.000	VHHH	VVL
33.000	VHHH	VVL
34.000	VHHH	VVL
35.000	VHHH	VVL
36.000	VHHH	VVL
37.000	VHHH	VVL
38.000	VHHH	VVL
39.000	VHHH	VVL
40.000	VHHH	VVL
41.000	VHHH	VVL
42.000	VHHH	VVL
43.000	VHHH	VVL
44.000	VHHH	VVL
45.000	VHHH	VVL
46.000	VHHH	VVL
47.000	VHHH	VVL
48.000	VHHH	VVL
49.000	VHHH	VVL
50.000	VHHH	VVL
51.000	VHHH	VVL
52.000	VHHH	VVL
53.000	VHHH	VVL
54.000	VHHH	VVL
55.000	VHHH	VVL
56.000	VHHH	VVL
57.000	VHHH	VVL
58.000	VHHH	VVL
59.000	VHHH	VVL
60.000	VHHH	VVL
61.000	VHHH	VVL
62.000	VHHH	VVL
63.000	VHHH	VVL
64.000	VHHH	VVL
65.000	VHHH	VVL
66.000	VHHH	VVL
67.000	VHHH	VVL
68.000	VHHH	VVL
69.000	VHHH	VVL
70.000	VHHH	VVL
71.000	VHHH	VVL
72.000	VHHH	VVL
73.000	VHHH	VVL
74.000	VHHH	VVL
75.000	VHHH	VVL
76.000	VHHH	VVL
77.000	VHHH	VVL
78.000	VHHH	VVL
79.000	VHHH	VVL
80.000	VHHH	VVL
81.000	VHHH	VVL
82.000	VHHH	VVL
83.000	VHHH	VVL
84.000	VHHH	VVL
85.000	VHHH	VVL
86.000	VHHH	VVL
87.000	VHHH	VVL
88.000	VHHH	VVL
89.000	VHHH	VVL
90.000	VHHH	VVL
91.000	VHHH	VVL
92.000	VHHH	VVL
93.000	VHHH	VVL
94.000	VHHH	VVL
95.000	VHHH	VVL
96.000	VHHH	VVL
97.000	VHHH	VVL
98.000	VHHH	VVL
99.000	VHHH	VVL
100.000	VHHH	VVL

OVERALL AVERAGE RANK IS 6.528

TOTAL NO. OF SAMPLES SUMMARY OF METHOD CODING
RANK RANKED FLAGGING

OVERALL AVERAGE RANK IS 6.528

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT¹⁰ D₁₀
ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION
LABORATORY RESULTS OMITTED ARE NONE

BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED A ₁	REPORTED A ₂	REPORTED A ₃			
LAB NO.	VALUE	Rank	Value	Rank	Value	Rank
N004	8.5	6.00	16. VH	7.00	6.5 VH	8.00
N010	7.8	4.00	6.6 L	4.00	3.5 VL	6.00
N024	9.0	7.00	9.3	5.00	1.4 VL	3.00
N031	11.7	VH	9.00	10.8 VH	8.9 VH	9.00
N042	11.60	VH	8.00	16.34 VH	8.00	9.88 VH
N042	8.4	5.00	5.00	3.00	2.98 VH	10.00
N087	5.53	L	2.00	2.74 VL	1.00	4.56 VL
N116	7.1	3.00	9.6	6.00	4.9 VH	1.00
N728	5.249	VL	1.00	3.452 VL	2.00	1.172 VL
MEDIAN CONC.	8.400		9.300		3.200	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	21.00	7.000	3	VHH	
N010	14.00	4.667	3	L	
N024	15.00	5.000	3	VL	
N031	27.00	9.000	3	VH	
N042	26.00	8.667	3	VHHVHH	
N043	13.00	4.333	3	VL	
N087	4.00	1.333	3	VVL	
N116	18.00	5.333	3	VH	
N728	4.00	4.000	1	VLVLVL	
OVERALL AVERAGE RANK IS	5.179			INSUFFICIENT DATA	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N087	6.00	1.000	3		
N728	5.000	1.000	3	L	
N024	4.000	4.000	3	VLVLVL	
N043	13.00	4.333	3	VL	
N010	14.00	4.667	3	L	
N024	15.00	5.000	3	VL	
N116	16.00	5.333	3	VH	
N004	21.00	7.000	3	VH	
N042	26.00	8.667	3	VHVH	
N031	27.00	9.000	3	VHHVHH	
OVERALL AVERAGE RANK IS	5.179			INSUFFICIENT DATA	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20
 LABORATORIES YET TO REPORT = 0
 ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1 LAB NO.	REPORTED A1 VALUE	RANK	REPORTED A2 LAB NO.	REPORTED A2 VALUE	RANK	REPORTED A3 LAB NO.	REPORTED A3 VALUE	RANK
N004	3.5	L	1	3.00	6.0	2	2.2	2.00	2
N010	4.4		3	3.00	9.7	VH	6.00	3.7	4.00
N042	6.81		4	4.00	4.30	L	2.00	5.59	8.00
N087	4.06	L	2	2.00	5.93	VL	1.00	5.54	VL
N116	-ND-		0	0.80	5.93	VL	3.00	3.54	3.00
N136	8.7	VH	6	9.33	VH		5.00	5.14	7.00
N90A	7.51	H	5	5.00	9.73	VH	7.00	4.85	5.00
N90B	0.00		0	0.00	0.00		0.00	4.94	6.00
MEDIAN CONC.	5.605			6.000			4.275		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	7.00	2.333	3	LVL	
N010	13.00	4.333	3	VH	
N042	14.00	4.667	3	LH	
N087	4.00	1.333	3	LVL	
N116	6.00	3.000	2	VH	
N136	18.00	6.000	3	VHVH	
N90A	17.00	5.667	3	VHVH	
N90B	6.00	6.000	1	VHVH	
OVERALL AVERAGE RANK IS	4.048			INSUFFICIENT DATA	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N007	4.00	1.333	3	VH	
N004	7.00	2.333	3	LVL	
N116	6.00	3.000	2	VH	
N010	13.00	4.333	3	LH	
N042	14.00	4.667	3	HVH	
N136	18.00	6.000	3	VHVH	
N90B	6.00	6.000	1	INSUFFICIENT DATA	
OVERALL AVERAGE RANK IS	4.048			INSUFFICIENT DATA	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT⁰
LABORATORY RESULTS OMITTED ARE NONE

BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED LAB NO.	A1 VALUE	RANK	REPORTED A2 LAB NO.	VALUE	RANK	REPORTED A3 LAB NO.	VALUE	RANK
N004	2.0	VL	3.00	2.4	VL	2.00	6	VL	3.00
N010	4.0	VL	6.00	8.5	VL	5.00	3.9	VH	8.00
N024	6.9	VH	10.00	18.0	VH	8.00	19.0	VH	12.00
N031	3.6	VL	5.00	22.6	VH	9.00	2.8	VH	4.00
N043	2.8	VL	4.00	1.0	VL	1.00	4	VL	2.00
N067	5.9	VL	2.00	7.0	VL	3.00	4.2	VL	1.00
N116	.3	VL	1.00	6.3	L	3.00	4.2	VL	9.00
N136	7.0	VH	9.00	9.7	VH	6.00	5.3	H	11.00
N72A	6.022	VH	8.00	10.7	37 H	7.00	3.752	VH	16.00
N72B	0	VL	0.00	0	VL	0.00	4.327	VH	10.00
N90A	5.08	H	7.00	7.37	VH	4.00	3.78	VH	5.00
N90B	0	VL	0.00	0	VL	0.00	3.84	VH	7.00
MEDIAN				8.500			3.816		
CONC.	3.600								

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N004	18.00	2.667	3	VL VL VL
N010	19.00	6.333	3	VH VH VH
N024	30.00	10.000	3	VH
N031	18.00	6.000	3	VH
N043	7.00	2.333	3	VH
N067	3.00	1.000	3	VH
N116	13.00	4.333	3	VH
N136	26.00	8.667	3	VH
N72A	21.00	7.000	3	VH
N72B	10.00	3.333	3	VH
N90A	16.00	5.333	3	VH
N90B	7.00	2.333	3	H
OVERALL AVERAGE RANK IS	5.742			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N007	3.00	1.500	2	VL VL	
N003	7.00	2.333	3	VL VL	
N004	8.00	2.667	3	VL VL	
N116	13.00	4.333	3	VL VL	
N90A	16.00	5.333	3	VL VL	
N031	18.00	6.000	3	VL VL	
N010	19.00	6.333	3	VL VL	
N72A	21.00	7.000	3	VL VL	
N90B	27.00	8.667	3	VL VL	
N136	26.00	8.667	3	VL VL	
N72B	30.00	10.000	3	VL VL	
OVERALL AVERAGE RANK IS	5.742				

INSUFFICIENT DATA
INSUFFICIENT DATA

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT = 0

ANALYSIS OF PAH'S IN SEDIMENT AND SCLUTION

LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1	REPORTED A2	REPORTED A3
LAB NO.	LAB VALUE	LAB VALUE	LAB VALUE
N004	4.8	5.00	2.7 L
N010	4.9	6.00	4.2
N024	4.4	3.00	5.00
N031	5.1	7.00	7.00
N042	5.17 VH	10.5 VH	2.4
N043	5.5	9.00	9.00
N087	4.45	6.00	4.97 VH
N116	3.2 L	2.00	3.22
N72A	2.463 VL	1.00	8.1 VH
N72B	2.00	0.00	3.37
MEDIAN CONC.	4.800	4.200	2.250

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N004	10.00	3.333	3	L
N010	16.00	5.333	3	VH
N024	17.00	5.667	3	VHH
N031	24.000	8.000	3	VHHV
N042	25.000	8.333	3	VHHVVH
N043	17.00	5.667	3	VL
N087	17.00	5.667	3	VLVH
N116	19.00	6.333	3	VLVH
N72A	8.00	2.667	3	VL
N72B	2.00	2.000	1	VL
OVERALL AVERAGE RANK IS	5.179			INSUFFICIENT DATA

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N72B	2.00	2.000	1	VL	VL
N087	7.00	2.333	3	VL	VLL
N72A	8.00	2.667	3	VH	
N004	10.00	3.333	3	VH	
N010	16.00	5.333	3	VH	
N043	17.00	5.667	3	VH	
N024	17.00	5.667	3	VH	
N116	19.00	6.333	3	VH	
N031	24.00	8.000	3	VH	
N042	25.00	8.333	3	VH	
OVERALL AVERAGE RANK IS	5.179			INSUFFICIENT DATA	METHOD CODING

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20
 LABORATORIES YET TO REPORT¹⁰ TO ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION
 LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED LAB NO.	A1 VALUE	REPORTED LAB NO.	A1 RANK	REPORTED LAB NO.	A2 VALUE	REPORTED LAB NO.	A2 RANK	REPORTED LAB NO.	A3 VALUE	REPORTED LAB NO.	A3 RANK
N004	10.0	4.00	11.0	5.00	3.9	5.00	3.9	5.00	3.9	5.00	3.9	5.00
N010	9.2	2.50	14.9	VL	3.3	VL	2.00	VL	3.3	VL	2.00	VL
N024	16.7	VH	13.0	VL	6.1	VH	9.50	VH	6.1	VH	9.50	VH
N042	10.71	6.00	6.68	VL	2.00	VL	4.00	VL	2.00	VL	4.00	VL
N043	9.2	2.50	8.67	VL	3.4	VL	3.00	VL	3.4	VL	3.00	VL
N087	16.0	VH	7.81	VL	4.00	VL	3.03	VL	4.00	VL	3.03	VL
N116	2.9	VL	1.00	VL	6.00	VL	4.2	VL	6.00	VL	4.2	VL
N136	18.6	VH	9.00	VH	14.8	VH	9.50	VH	14.8	VH	9.50	VH
N90A	10.48	5.00	11.81	VL	7.00	VL	7.00	VL	7.00	VL	7.00	VL
N90B	0.00	0.00	0.00	VL	0.00	VL	4.38	VL	4.38	VL	4.38	VL
MEDIAN CONC.	10.480	11.000	4.050		4.050		4.050		4.050		4.050	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N004	14.00	4.667	3	
N010	5.50	1.833	3	
N024	25.00	8.333	3	VL
N042	12.00	4.000	3	VHV
N043	9.50	3.167	3	VL
N087	11.50	3.833	3	VHL
N116	13.00	4.333	3	VL
N136	27.50	9.167	3	VHV
N90A	19.00	6.333	3	VHVHV
N90B	8.00	8.000	1	
OVERALL AVERAGE RANK IS	5.179			INSUFFICIENT DATA

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N010	5.50	1.833	3	VL	
N024	9.50	3.167	3	VL	
N087	11.50	3.833	3	VHL	
N042	12.00	4.000	3	VL	
N116	13.00	4.333	3	VH	
N136	14.00	4.667	3	VL	
N90A	19.00	6.333	3		INSUFFICIENT DATA
N90B	8.00	8.000	1		VHV
N136	27.50	9.167	3		VHVHV
OVERALL AVERAGE RANK IS	5.179				

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00

LABORATORIES YET TO REPORT¹⁰ BASIC ACCEPTABLE ERROR = .50

ANALYSIS OF PAH'S IN SEDIMENT AND SOLUTION LABORATORY RESULTS OMITTED ARE NONE

CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED A1	REPORTED A2	REPORTED A3
LAB NO.	VALUE	VALUE	VALUE
N004	1.2 VL	1.00	-ND-
N024	7.2 VH	10.00	17.0 VH
N031	2.0	-ND-	6.00
N042	5.28 VH	9.00	0.00
N043	4.0 VH	7.00	5.00
N087	1.30 VL	2.00	3.4
N116	1.5 L	4.00	-ND-
N136	4.3 VH	8.00	2.2
N72A	1.412 L	3.00	1.90
N72B	0.00	0.00	0.00
N90A	3.01	6.00	2.76
N90B	0.00	0.00	0.00
MEDIAN			1.21
CONC.	2.505	2.790	1.260

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	1.00	1.000	1	VL	INSUFFICIENT DATA
N72B	1.00	1.000	1	VH	INSUFFICIENT DATA
N72A	6.00	6.500	2	VH	INSUFFICIENT DATA
N087	2.00	2.000	3	VH	INSUFFICIENT DATA
N116	6.00	6.333	3	VH	INSUFFICIENT DATA
N136	18.00	3.000	1	VH	INSUFFICIENT DATA
N72A	6.00	6.000	3	VH	INSUFFICIENT DATA
N72B	1.00	1.000	3	VH	INSUFFICIENT DATA
N90A	14.00	4.667	1	VH	INSUFFICIENT DATA
N90B	3.00	3.000	1	VH	INSUFFICIENT DATA
OVERALL AVERAGE RANKS		4.840			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	1.00	1.000	1	VL	INSUFFICIENT DATA
N72B	1.00	1.000	1	LL	INSUFFICIENT DATA
N72A	6.00	6.000	2	VL	INSUFFICIENT DATA
N087	2.00	2.000	3	VH	INSUFFICIENT DATA
N116	6.00	6.000	3	VH	INSUFFICIENT DATA
N90A	14.00	4.667	3	VH	INSUFFICIENT DATA
N136	18.00	6.000	3	VH	INSUFFICIENT DATA
N72A	1.00	6.333	3	VH	INSUFFICIENT DATA
N90B	14.00	6.500	1	VH	INSUFFICIENT DATA
N031	13.00	6.500	3	VH	INSUFFICIENT DATA
N042	13.00	6.500	3	VH	INSUFFICIENT DATA
N024	25.00	8.333	3	VH	INSUFFICIENT DATA
OVERALL AVERAGE RANKS		4.840			

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT¹⁰
LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1 LAB NO.	RANK VALUE	REPORTED A2 LAB NO.	RANK VALUE	REPORTED A3 LAB NO.	RANK VALUE
N004	21.0	6.00	22.0	4.00	6.0 L	4.00
N010	20.0	4.50	24.0	7.00	7.1	6.00
N017	20.28	VH	12.0	23.27	5.00	11.00
N024	24.0	9.00	30.0	9.50	8.1	8.00
N031	17.1	3.00	23.4	6.00	7.6	7.00
N043	21.18	7.00	14.6 VL	2.00	5.71 L	3.00
N067	20.0	4.50	47.0 VH	13.00	12.1 VH	15.00
N116	13.8	VL	20.3	3.00	6.56	15.00
N120	22.6	VL	25.4	9.00	9.4	12.00
N136	26.0 H	VL	30.0 H	9.50	10.0	13.00
N72A	34.5 VH	VL	41.6 VH	12.00	11.7 VH	14.00
N72B	7.180 VL	VL	8.79 VL	1.00	2.155 VL	2.00
N90A	24.49	0.00	32.39 VH	11.00	3.265 VL	2.00
N90B	0.00	0.00	0.00	0.00	9.00	10.00
MEDIAN CONC.	21.180		24.000		8.43	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES	SUMMARY OF FLAGGING	METHOD CODING
N004	14.00	4.667	3	L	
N010	17.50	5.833	3	VH	
N017	28.00	9.333	3	H	
N024	26.50	8.833	3		
N031	16.00	5.333	3		
N043	12.00	4.000	3	VLL	
N067	32.50	10.833	3	VHVH	
N116	10.00	3.333	3	VL	
N120	28.00	9.333	3		
N136	33.50	11.167	3	HH	
N72A	3.00	1.000	3	VHVHVH	
N72B	2.00	2.000	1	VLLVVL	
N90A	30.00	10.000	1	VL	
N90B	10.00	10.000	1	VH	
OVERALL AVERAGE RANK IS	7.366			INSUFFICIENT DATA	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES	SUMMARY OF FLAGGING	METHOD CODING
N72A	3.00	1.000	3	VLLVVL	
N72B	2.000	2.000	1	VL	
N087	10.00	3.333	3	VL	
N092	12.000	4.000	3	VLL	
N004	14.000	4.667	3	L	
N031	16.000	5.333	3		
N010	17.500	5.833	3		
N024	26.500	8.833	3	H	
N017	28.000	9.333	3	VH	
N116	32.500	10.833	3	VH	
N90A	30.000	10.333	1	VHVH	
N90B	10.000	10.000	1	VHVH	
N043	5.00	10.833	1	INSUFFICIENT DATA	
N120	11.000	11.667	1	VHVH	
N136	13.000	13.000	1	VHVH	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00 BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

LABORATORIES YET TO REPORT: 0
ANALYSIS OF PAH'S IN SEDIMENT AND SCLUTION
LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1 LAB NO.	REPORTED A1 VALUE	RANK	REPORTED A2 LAB NO.	REPORTED A2 VALUE	RANK	REPORTED A3 LAB NO.	REPORTED A3 VALUE	RANK
N004	2.2	VL	1	3.2	VL	1	-ND-	0	0
N010	3.8		5	5.00	6.0	2	3.7	4	0
N024	3.9		6	6.00	7.5	5	5.00	1	0
N031	3.5		3	3.00	11.5	8	3.4	2	5
N043	4.3		7	7.00	7.0	8	4.2	5	0
N16	2.2	L	2	4.00	-ND-	6	4.00	0	0
N136	3.7		4	6.5	3.00	3	3.6	2	5
N90A	7.3 VH		9	10.4 VH	7.00	7	5.9 VH	8	0
N90B	6.34 VH		8	8.15 VH	6.00	4	4.23	6	0
MEDIAN CONC.	3.800			7.250			4.30	7.00	
							3.950		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	2.00	1.000	2	VLVL	
N010	11.00	3.667	3		
N024	12.00	4.000	3	VH	
N031	13.50	4.500	3	L	
N043	16.00	5.333	3		
N116	9.50	2.000	2		
N136	9.50	3.167	3		
N90A	24.00	8.000	3	VHVHVH	
N90B	7.00	7.000	1	VH	
OVERALL AVERAGE RANK	15.15	4.680		INSUFFICIENT DATA	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	2.00	1.000	2	VL	
N007	2.00	2.000	2	VL	
N010	1.00	3.167	3		
N116	9.50	3.667	3		
N136	11.00	3.667	3		
N024	12.00	4.000	3	VH	
N031	13.50	4.500	3		
N043	16.00	5.333	3		
N90A	20.00	6.667	3	VH	
N90B	7.00	7.000	3	VHVHVH	
N136	24.00	6.000	3		
OVERALL AVERAGE RANK	15.15	4.680		INSUFFICIENT DATA	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00..... BASIC ACCEPTABLE ERROR = .50..... CONCENTRATION ERROR INCREMENTS = .20.....
LABORATORIES YET TO REPORT¹⁰..... LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A1 LAB NO.	REPORTED A1 VALUE	RANK	REPORTED A2 LAB NO.	REPORTED A2 VALUE	RANK	REPORTED A3 LAB NO.	REPORTED A3 VALUE	RANK
N004	3.6 VL	2.00	-	1.2	2.00	-	-ND-	0.00	-
N042	6.23 VL	4.00	-	-	-	-	0.00	0.00	-
N087	3.22 VL	1.00	-	-	-	-	-ND-	0.00	-
N116	-ND-	0.00	-	1.7	3.00	-	-ND-	0.00	-
N136	9.1 VH	5.00	-	1.9	4.00	-	1.3	3.00	-
N90A	6.20 VH	3.00	-	2.36 H	5.00	-	.86	2.00	-
N90B	-	0.00	-	0.00	-	-	.85	-	-
MEDIAN	-	-	-	1.700	-	-	1.00	-	-
CONC.	6.200	-	-	-	.860	-	-	-	-

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N004	4.00	2.00	2	VL	
N042	4.00	4.00	1	VLVL	
N087	2.00	1.00	2		
N116	3.00	3.00	1	VH	
N136	4.00	-	3		
N90A	12.00	3.33	3		
N90B	1.00	1.00	1	H	
OVERALL IS RANK	IS	2.769	-	INSUFFICIENT DATA	
OVERALL AVERAGE RANK	IS	2.769	-	INSUFFICIENT DATA	

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N087	2.00	1.000	2	VL	
N008	1.00	1.000	1	VL	
N004	4.00	2.000	2	VL	
N116	3.00	3.000	1	H	
N90A	1.000	3.333	3	INSUFFICIENT DATA	
N042	4.00	4.000	1	VH	
N136	12.00	4.000	3	INSUFFICIENT DATA	
OVERALL AVERAGE RANK	IS	2.769	-	INSUFFICIENT DATA	

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT: 0
LABORATORY RESULTS OMITTED ARE NONE

SAMPLE	REPORTED A ₁	REPORTED A ₂	REPORTED A ₃
LAB NO.	VALUE	VALUE	VALUE
N004	14.0 H	8.00	20.0 H
N010	10.0	2.00	4.00
N017	15.65 VH	9.00	14.72
N024	11.0	5.00	15.72
N031	18.9	1.00	19.00
N043	10.4	6.00	2.1 VL
N087	10.5	3.00	15.5
N116	-ND-	4.00	22.6 VH
N136	17.4 VH	10.00	13.9 VH
N90A	13.4	7.00	23.9 VH
MEDIAN CONC.	11.015	15.720	3.300

SAMPLE	REPORTED A ₁	REPORTED A ₂	REPORTED A ₃
LAB NO.	VALUE	VALUE	VALUE
N004	20.50	6.833	3
N010	8.00	2.667	HH
N017	25.00	6.333	VH
N024	19.00	6.333	VH
N031	3.000	1.000	VL
N062	14.00	4.667	VL
N083	11.00	3.667	VH
N084	19.00	6.333	VH
N116	12.00	6.000	VL
N136	32.00	10.667	VHVHH
N90A	23.50	7.833	H
OVERALL AVERAGE RANK IS	5.844		

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N004	2	6.833	3	VL
N010	3	2.667	3	VH
N017	4	6.667	3	VL
N024	5	0.000	2	VH
N031	6	1.000	2	VH
N043	7	3.667	3	VH
N062	8	4.667	3	VH
N083	9	3.667	3	VH
N084	10	6.333	3	VH
N116	11	6.000	2	VH
N136	12	10.667	3	VHVHH
N90A	13	7.833	3	H
N90A	14	8.333	3	VH
N017	15	0.000	2	VH
N136	16	10.667	3	VHVHH
OVERALL AVERAGE RANK IS	5.844			

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N004	2	6.833	3	VL
N010	3	2.667	3	VH
N017	4	6.667	3	VL
N024	5	0.000	2	VH
N031	6	1.000	2	VH
N043	7	3.667	3	VH
N062	8	4.667	3	VH
N083	9	3.667	3	VH
N084	10	6.333	3	VH
N116	11	6.000	2	VH
N136	12	10.667	3	VHVHH
N90A	13	7.833	3	H
N90A	14	8.333	3	VH
N017	15	0.000	2	VH
N136	16	10.667	3	VHVHH
OVERALL AVERAGE RANK IS	5.844			

METHOD CODING

LOWER LIMIT FOR USE OF BASIC ACCEPTABLE ERROR = 1.00
LABORATORIES YET TO REPORT: 0
LABORATORY RESULTS OMITTED ARE NONE

BASIC ACCEPTABLE ERROR = .50 CONCENTRATION ERROR INCREMENT = .20

SAMPLE	REPORTED A1 LAB NO.	REPORTED A1 VALUE	RANK	REPORTED A2 LAB NO.	REPORTED A2 VALUE	RANK	REPORTED A3 LAB NO.	REPORTED A3 VALUE	RANK
N004	28.	10.00	26. H	10.00	7.8	11.00			
N010	20.	13.50	19.	5.00	5.6	12.00			
N017	30.87	H	11.00	19.36	6.00	7.33	10.00		
N021	11. VL		11.00	14. L	3.00	6.6	5.00		
N034	17.7 L		2.00	20.6	7.00	6.1	3.00		
N043	21.75		5.00	14.62	VL	2.00	5.46	1.00	
N087	20.0	3.50	21.1	8.00	6.9	8.00			
N116	26.5	9.00	28.1 VH	11.00	6.67	6.50			
N120	23.9	6.00	18.8	4.00	7.0	9.00			
N136	26.	8.00	31.6 VL	1.00	10.	13.00			
N90A	34.5 VH	12.00	31.6 VH	12.00	9.7 VH	12.00			
N90B	24.20	7.00	23.61	9.00	6.48	4.00			
MEDIAN	0.00	0.00	0.00	0.00	6.67	6.50			
CONC.	24.050		19.980		6.670				

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING
N004	31.00	10.333	3	H
N010	10.50	3.500	3	H
N017	27.00	9.000	3	VLL
N024	9.00	3.000	3	VL
N031	12.00	4.000	3	VLL
N043	18.00	2.667	3	VL
N087	19.50	6.500	3	VH
N116	26.50	8.633	3	VH
N120	29.00	6.333	3	VL VH
N136	32.00	7.333	3	VH VH
N90A	36.00	12.000	3	VH VH VH
N90B	20.00	6.667	3	
OVERALL AVERAGE RANK IS	6.676			INSUFFICIENT DATA

LAB NO.	TOTAL RANK	AVERAGE RANK	NO. OF SAMPLES RANKED	SUMMARY OF FLAGGING	METHOD CODING
N042	8.00	2.667	3	VL	
N024	9.00	3.000	3	VLL	
N010	10.50	3.500	3	L	
N031	12.00	4.000	3		
N116	19.00	6.333	3		
N043	19.50	6.500	3		
N90A	20.00	6.667	3		
N120	22.00	7.333	3		
N087	26.50	8.633	3	VL VH	
N017	27.00	9.000	3	H	
N004	31.00	10.333	3	VH	
N136	36.00	12.000	3	VH VH VH	
OVERALL AVERAGE RANK IS	6.676				

APPENDIX III

Flagging

When the true values of constituents in test samples are unknown, individual results can be evaluated in terms of their absolute differences from the interlaboratory medians. Medians are chosen rather than means since they are not influenced by a moderate number of extreme values. By this flagging technique, all results are graded into the following three groups in the order of decreasing accuracy: (1) results with no flags, (2) results with H or L flags, and (3) results with VH or VL flags. Before evaluation is performed, three parameters, namely, Lower Limit for use of Basic Acceptable Error (LLBAE), Basic Acceptable Error (BAE), and Concentration Error Increment (CEI) are to be set. LLBAE is usually set at the lower end of the medians in the test samples. According to our previous interlaboratory studies on PCBs, a 30% error at LLBAE is considered reasonable and thus this is used as BAE. For samples whose medians are at or below LLBAE, the results are evaluated according to the following formulae:

	Absolute difference between sample and median results	\leq	BAE	:	acceptable
BAE <	Absolute difference between sample and median results	\leq	$1.5 \times BAE$:	H or L
	Absolute difference between sample and median results	$>$	$1.5 \times BAE$:	VH or VL

For samples whose medians are above the LLBAE, the allowable BAE is augmented by adding an increment to BAE. This increment is calculated by multiplying the CEI by the difference between the sample median and LLBAE values. In this study, CEI is set at 0.2. Sample results are again evaluated by the above three formulate except that the augmented BAE is used instead of BAE.