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Final Report - Volume II of III

Emissions Testing of Combustion Stack and Pushing Operations at Coke Battery No. 2 at Bethlehem Steel Corporation's Burns Harbor Division in Chesterton, Indiana

Office of Air Quality
Clean Air
OAQPS
Planning and Standards

FINAL REPORT
EMISSIONS TESTING OF COMBUSTION STACK AND PUSHING OPERATIONS AT COKE BATTERY NO. 2 AT BETHLEHEM STEEL CORPORATION'S BURNS HARBOR DIVISION IN CHESTERTON, INDIANA

Volume II
Appendix C

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APPENDIX C

ANALYTICAL DATA

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Narrative

Site: ***Bethlehem Steel***
Prepared for: ***Frank Meadows*** **(PES)**
Prepared by: ***Linh Nguyen***

Description of Procedures for EPA Method 315 and Observations:

****Note: All extractions were done with toluene as opposed to Methylene Chloride**

Filters -

Procedure:

The filters (including any loose particles) were transferred to a tared amber jar. The amber jars were placed into a desiccator overnight in a temperature controlled environment. The following day, the samples were weighed and initial weights were taken. To ensure that all conditions remained the same, the samples were placed back into the desiccator and allowed to sit overnight and the second weighings were taken at the same time the next day. Once constant weight had been attained, 100 mL of toluene was added to each jar. The jars were placed in a sonicator and allowed to sonicate for 3 minutes. After sonication was complete, the samples were taken out of the sonicator. Each sample was filtered through a buchner funnel reinforced with an additional Whatman 934-AH filter to prevent cross contamination on the buchner funnels. Once the solutions were vacuum filtered, the extract was placed into a triple rinsed beaker (methylene chloride solvent). The beaker containing the extract was placed onto a hotplate at low heat and the solvent was allowed to evaporate. Once the samples almost reached dryness, the samples were taken off the hotplate and poured into a tared aluminum pan. The beakers were triple rinsed with toluene and then the solvent was poured into the aluminum pan. The rinse was performed to ensure that no material remained in the beaker. The aluminum weighing pan was heated to complete dryness, placed into a desiccator and allowed to sit in the desiccator overnight. The following day, the samples were weighed and the weights recorded.

Observations:

The filters had a lot of loose, black particles which were also placed into the jars for PM weights. This was seen mostly on the Inlets.

Acetone Front Half Rinse-

Procedure:

The rinses were taken and poured into tared 400 mL beakers. The beakers were triple rinsed with $MeCl_2$. The weights of the beakers including the rinses were taken. This gives an initial and a final weight to which the volumes of the rinses were calculated. A separate sheet is attached explaining how the volumes were calculated. The beakers containing the rinses were allowed to sit overnight in a hood to allow the acetone solvent to evaporate. The next day the beakers, which now contain no solvent, were taken and placed into the dessicator. The beakers were allowed to sit in the dessicator overnight. The next day, initial weighings for the samples were

taken. The samples were then allowed to sit in the dessicator again for 24 hours. The next day at approximately the same time, the samples were weighed again for the second weighings. Once constant weight has been attained, the weights were recorded for the Particulate Mass (PM) portion of the analysis. Next, the beakers were taken and 25 mL of $MeCl_2$ was added to each beaker. Aluminum foil was placed over the tops of the beakers. The beakers were then placed into a sonicator and allowed to sonicated for 3 minutes. This fraction will be combined with the $MeCl_2$ Front Half Rinse.

Observations:
No observations out of the ordinary were noted.

Methylene Chloride Front Half Rinse-

Procedure:
The rinses were taken and poured into tared 400 mL beakers. The beakers were triple rinsed with $MeCl_2$. The weights of the beakers including the rinses were taken. This gives an initial and a final weight to which the volumes of the rinses were calculated. At this point, the extracts from the Acetone Front Half Rinse were combined with this fraction. The combined fractions were placed onto a hotplate and allowed to heat gently at a low temperature setting. Once the solution has almost reached dryness, the solution was poured into a tared aluminum pan. The pan was then was placed back onto the hotplate and taken to complete dryness. The pans were then transferred to the dessicator and allowed to sit overnight. The following day, the samples were weighed and the weights recorded.

Observations:
No observations out of the ordinary were noted.

Impinger, Back Half Water-

Procedure:
Each sample was then poured into a clean, 1000 mL separatory funnel. Once in the separatory funnel, the amber jars containing the original samples were triple rinsed with toluene and then poured into the separatory funnel. The approximate volume of this rinse is 50 mL. The samples were then shaken for 1 minute. After 1 minute, the bottom water layer was drained into a clean, 1000 mL amber jar. After the water was drained, the remaining toluene layer was emptied into a clean 250 mL beaker. An additional 25 mL of toluene was added. The solution was then shaken for another minute and the bottom water layer was drained into the same 1000 mL amber jar. This was repeated once more. Once the third shake was completed, and the remaining toluene layer was drained into the 250 mL beaker, the beaker was placed onto a hotplate and was gently heated to evaporate the solvent. Once the solution was almost to dryness, the solution was transferred to a tared aluminum pan. The pan was then placed back onto the hotplate and heated to complete dryness. Afterwards, the pans were placed into the dessicator to sit overnight. The following day, the pans were weighed and the weights recorded.

Observations:
No observations out of the ordinary were noted.

Acetone, Back Half Rinse-

Procedure:

The exact same procedure was used for the Back Half Rinse as was used for the Front Half Rinse. The only difference was that since PM analysis was not required, when the solvent dried down in the beaker, constant weight was not taken for these samples. After the solvent had evaporated, 25 mL of toluene was added to each beaker and sonicated for 3 minutes each. The rest of the procedure was the same as that of the Acetone Front Half Rinse.

Observations:

No observations out of the ordinary were noted.

Methylene Chloride, Back Half Rinse-

Procedure:

The solution was poured into a tared beaker. After the solution had been poured into the beaker, another weight was taken to calculate the volume. Once the volume had been determined, the samples were placed onto a hotplate to heat the sample to dryness. Once the sample was dried, 25 mL of toluene was added to the beakers. The beakers were sonicated for 3 minutes. Once sonicated, the samples were filtered through the buchner funnel. The extract was placed into a clean, 250 mL beaker. The beaker containing the rinse was placed onto a hotplate and gently heated almost to dryness. Once the rinse was almost dry, the solution was transferred to a tared aluminum pan. The pans were placed back onto the hotplate and the solution heated to complete dryness. Once the pans were dry, the aluminum pans were transferred to a desiccator and allowed to sit overnight. The following day, the pans were weighed and the weights recorded.

Observations:

No observations out of the ordinary were noted.

Field Reagent Blanks-

Procedure:

The samples were poured into tared beakers. Weights were taken after the reagent blank rinses were poured in. These final weights were used to calculated the volumes of the reagent blanks. The reagent blanks were allowed to sit on a hotplate at low heat. After the solvents had evaporated, the final weights of the beakers with any contents remaining were taken. Particulate Mass was calculated. For the filter blank, 100 mL of methylene chloride was added to the beaker and sonicated for 3 minutes. Afterwards, the methylene chloride was filtered and poured into a clean beaker. The beaker containing the solvent was heated down to near dryness. The solvent was then transferred to a tared aluminum pan. The pan was placed onto the hotplate and reduced to dryness. The pan was desiccated and weights recorded the next day.

Observations:

No observations out of the ordinary were noticed.

Laboratory Reagent Blanks-

Procedure:

The same procedures were used for Laboratory Reagent blanks as for the Field Reagent Blanks. Solvents that were used during the extraction process were tested in the reagent blank. A filter from the same lot that was sent to the field was used to go through the extraction process.

Observations:

No observations out of the ordinary were noticed

81003

Matrix = ***FILTERS***

Method = **PM**

Sample ID:	Weight of Petri dish (g)	Filter Pre-weight (g)	Final wt. Of filter+dish (g)	Final weight of filter PM (g)
B-I-M315-1-F (080798-05)	168.7107	0.32825	170.7471	1.7081
B-I-M315-1-F (080798-16)	169.1583	0.32116	170.3306	0.8511
B-I-M315-2-F (080798-04)	162.9469	0.31677	165.0058	1.7421
B-I-M315-2-F (080798-19)	175.7047	0.32332	177.6603	1.6323
B-I-M315-3-F (080798-11)	160.6746	0.32119	162.3930	1.3972
B-I-M315-3-F (080798-15)	163.3534	0.31589	164.9029	1.2336
B-I-M315-FB-F (080798-2)	172.1577	0.32242	172.4818	0.0017
B-O-M315-1-F (080798-06)	172.5921	0.32402	172.9172	0.0011
B-O-M315-2-F (080798-23)	166.2064	0.32027	166.5295	0.0028
B-O-M315-3-F (080798-22)	149.5202	0.31509	149.8357	0.0004
B-O-M315-FB-F (080798-24)	181.8306	0.33064	182.1624	0.0011
B-U-M315-1-F (080798-17)	147.9548	0.31669	148.3507	0.0792
B-U-M315-2-F (080798-12)	166.9930	0.32378	167.4157	0.0989
B-U-M315-3-F (080798-01)	170.3177	0.32254	170.7125	0.0722
B-U-M315-FB-F (080798-07)	168.0875	0.32563	168.4190	0.0058

Method = **MCEM**

Sample ID:		Weight of Alum. pan (g)	Weight after evaporation (g)	Final weight of MCEM (g)
B-I-M315-1-F (080798-05)	10	1.6590	1.6595	0.0005
B-I-M315-1-F (080798-16)	11	1.6590	1.6593	0.0003
B-I-M315-2-F (080798-04)	12	1.6535	1.6535	0.0000
B-I-M315-2-F (080798-19)	13	1.6491	1.6494	0.0003
B-I-M315-3-F (080798-11)	14	1.6367	1.6382	0.0015
B-I-M315-3-F (080798-15)	15	1.6555	1.6560	0.0005
B-I-M315-FB-F (080798-2)	16	1.6450	1.6453	0.0003
B-O-M315-1-F	17	1.6415	1.6418	0.0003
B-O-M315-2-F	18	1.6429	1.6435	0.0006
B-O-M315-3-F	19	1.6427	1.6427	0.0000
B-O-M315-FB-F	20	1.6435	1.6437	0.0002
B-U-M315-1-F	21	1.6332	1.6335	0.0003
B-U-M315-2-F	22	1.6401	1.6402	0.0001
B-U-M315-3-F	23	1.6522	1.6522	0.0000
B-U-M315-FB-F	24	1.6232	1.6232	0.0000

Matrix = ***Acetone FHR***

Method = **PM**

Sample ID:	Volume of liquid (mL)	Weight of beaker (g)	Final weight of rinse (g)	Final weight of filter PM (g)
B-I-M315-1-FH-A	267.4	175.8228	175.9928	0.1700
B-I-M315-2-FH-A	339.2	155.0218	155.3708	0.3489
B-I-M315-3-FH-A	303.2	165.0352	165.1712	0.1360
B-I-M315-FB-FH-A	121.9	178.5494	178.5516	0.0022
B-O-M315-1-FH-A	129.7	179.0007	179.0069	0.0061
B-O-M315-2-FH-A	227.1	166.2611	166.2652	0.0041
B-O-M315-3-FH-A	299.8	179.7362	179.7436	0.0074
B-O-M315-FB-FH-A	149.6	170.3356	170.3371	0.0014
B-U-M315-1-FH-A	229.8	165.7417	165.8741	0.1324
B-U-M315-2-FH-A	236.5	178.6304	178.7571	0.1267
B-U-M315-3-FH-A	201.3	164.5489	164.8105	0.2616
B-U-M315-FB-FH-A	139.0	167.2803	167.2825	0.0022

Matrix = ***Methylene Chloride FHR***

Method = **MCEM**

Sample ID:		Weight of Alum. pan (g)	Weight after evaporation (g)	Final weight of MCEM (g)
B-I-M315-1-FH-M	10	1.6506	1.6528	0.0022
B-I-M315-2-FH-M	11	1.6571	1.6583	0.0012
B-I-M315-3-FH-M	12	1.6543	1.6560	0.0017
B-I-M315-FB-FH-M	13	1.6422	1.6423	0.0001
B-O-M315-1-FH-M	14	1.6212	1.6231	0.0019
B-O-M315-2-FH-M	15	1.6169	1.6178	0.0009
B-O-M315-3-FH-M	16	1.6354	1.6380	0.0026
B-O-M315-FB-FH-M	17	1.6238	1.6247	0.0009
B-U-M315-1-FH-M	18	1.6195	1.6599	0.0404
B-U-M315-2-FH-M	19	1.6472	1.6786	0.0314
B-U-M315-3-FH-M	20	1.6551	1.7924	0.1373
B-U-M315-FB-FH-M	21	1.6451	1.6454	0.0003

Matrix = ***Acetone BHR***

Method = **MCEM**

Sample ID:		Volume of liquid (mL)	Weight of Alum. pan (g)	Weight after evaporation (g)	Final weight of MCEM (g)
B-I-M315-1-BH-A	1	408.0	1.6436	1.6460	0.0024
B-I-M315-2-BH-A	2	349.1	1.5877	1.5893	0.0016
B-I-M315-3-BH-A	3	348.4	1.6713	1.6726	0.0013
B-I-M315-FB-BH-A	4	263.2	1.6485	1.6485	0.0000
B-O-M315-1-BH-A	5	56.0	1.6396	1.6402	0.0006
B-O-M315-2-BH-A	6	177.9	1.6753	1.6766	0.0013
B-O-M315-3-BH-A	7	263.6	1.6550	1.6558	0.0008
B-O-M315-FB-BH-A	8	190.5	1.0260	1.0260	0.0000
B-U-M315-1-BH-A	9	147.8	1.0324	1.0325	0.0001
B-U-M315-2-BH-A	10	202.8	1.0330	1.0335	0.0005
B-U-M315-3-BH-A	11	165.6	1.0305	1.0310	0.0005
B-U-M315-FB-BH-A	12	120.2	1.0244	1.0244	0.0000

Matrix = ***Methylene Chloride BHR***

Method = **MCEM**

Sample ID:		Volume of liquid (mL)	Weight of Alum. pan (g)	Weight after evaporation (g)	Final weight of MCEM (g)
B-I-M315-1-BH-M	1	231.2	0.9950	0.9969	0.0019
B-I-M315-2-BH-M	2	244.9	0.9969	1.0013	0.0044
B-I-M315-3-BH-M	3	228.1	0.9985	0.9991	0.0006
B-I-M315-FB-BH-M	4	204.1	0.9953	0.9954	0.0001
B-O-M315-1-BH-M	5	75.4	1.0178	1.0178	0.0000
B-O-M315-2-BH-M	6	199.6	1.0197	1.0199	0.0002
B-O-M315-3-BH-M	7	132.7	1.0176	1.0202	0.0026
B-O-M315-FB-BH-M	8	250.1	1.0163	1.0163	0.0000
B-U-M315-1-BH-M	9	82.5	1.0160	1.0160	0.0000
B-U-M315-2-BH-M	10	143.8	1.0164	1.0168	0.0004
B-U-M315-3-BH-M	11	132.1	1.0257	1.0258	0.0001
B-U-M315-FB-BH-M	12	136.4	1.0150	1.0150	0.0000

Matrix = ***H20 Impinger rinses***

Method = **MCEM**

Sample ID:		Weight of Alum. pan (g)	Weight after evaporation (g)	Final weight of MCEM (g)
B-I-M315-1-IMP H20	13	1.6011	1.6041	0.0030
B-I-M315-2-IMP H20	14	1.6170	1.6206	0.0036
B-I-M315-3-IMP H20	15	1.6060	1.6090	0.0030
B-I-M315-FB-IMP H20	16	1.6549	1.6565	0.0016
B-O-M315-1-IMP H20	17	1.6460	1.6486	0.0026
B-O-M315-2-IMP H20	18	1.6645	1.6673	0.0028
B-O-M315-3-IMP H20	19	1.6595	1.6599	0.0004
B-O-M315-FB-IMP H20	20	1.6426	1.6427	0.0001
B-U-M315-1-IMP H20	21	1.6232	1.6235	0.0003
B-U-M315-2-IMP H20	22	1.6084	1.6086	0.0002
B-U-M315-3-IMP H20	23	1.6739	1.6742	0.0003
B-U-M315-FB-IMP H20	24	1.6291	1.6291	0.0000

Matrix = ***Blanks***

Method = **PM**

Sample ID:	Weight of Petri dish (g)	Final wt. Of filter+dish (g)	Filter Pre-weight (g)	Final weight of filter PM (g)
B-LB-F	171.0074	171.3363	0.32563	0.0032

Sample ID:	Volume of liquid (mL)	Weight of beaker (g)	Final weight of rinse (g)	Final weight of filter PM (g)
B-LB-Acetone	199.6	177.4500	177.4502	0.0002
B-LB-MeCl2	203.1	176.8191	176.8192	0.0000
B-LB-H20	199.6	175.6222	175.6223	0.0001

Method = **MCEM**

Sample ID:	Weight of Alum. pan (g)	Weight after evaporation (g)	Final weight of MCEM (g)
B-LB-F	1.6526	1.6526	0.0000

ANALYTICAL REQUEST AND CHAIN OF CUSTODY

PLANT: Bethlehem Steel

PROJECT #: 5506.000

RECOVERY PERSON: R Kolb, R Durham

SAMPLE TECHNICIAN: G. Gay, J. Cowters

ANALYTICAL REQUEST

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	SAMPLE NAME	NUMBER OF CONTAINERS	EPA Method 315 for Extractable Organic Matter										COMMENTS (Type of container, special preparation, special handling, etc.)
B-I-315-1	8/11/98		Same	7	X										ERG for
B-I-315-2	8/12/98		Same	7	X										EDM
B-I-315-3	8/13/98		Same	7	X										
B-I-315-FB	8/14/98		Same	6	X										First Analyte
B-O-315-1	8/11/98		Same	6	X										for Metals
B-O-315-2	8/12/98		Same	6	X										analysis
B-O-315-3	8/13/98		Same	6	X										
B-O-315-FB	8/14/98		Same	6	X										
B-U-315-1	8/14/98		Same	6	X										
B-U-315-2	8/14/98		Same	6	X										
Lab Blanks	8/15/98		Same	4	X										

Ronald J. Kolb	8/15/98 / 1100	[signature]	
RELINQUISHER'S NAME	DATE/TIME	RELINQUISHER'S SIGNATURE	SHIPPER'S NAME AND ID NUMBER
ROBERT MARTZ	8/17/98 3pm	Robert F. Martz	
RECEIVER'S NAME	DATE/TIME	RECEIVER'S SIGNATURE	

U.S. EPA - Bethlehem Steel - Chesterton, Indiana - S506.000
Master Sample Log

Sample Run No.	Date/Time	Sample Description	Liquid Level Marked/ Sealed	Being Stored Below 4°C
Baghouse Inlet		EPA Marked 315	✓	N/A
B-I-315-1	8/11/98	Filters 080798-05 080798-16	2 filters per test	
BI-315-1	↓	Front ½ Acetone Rinse		
"		F.H. $MeCl_2$ Rinse		
"		Impinger H_2O/H_2O Rinse		
B-I-315-1	↓	Back ½ Acetone/~~MeCl~~ $MeCl_2$ Rinse	500 ml bottle = Acetone 250 ml bottle = $MeCl_2$	
B-I-315-2	8/12/98	Filters 080798-04 080798-19	2 filters per test	
	↓	F.H. Acetone Rinse		
		FH $MeCl_2$ Rinse		
		B.H. Impinger H_2O/H_2O Rinse		
		B.H. Acetone Rinse		
B-I-315-2	↓	B.H. $MeCl_2$ Rinse		
B-I-315-3	8/13/98	Filters 080798-11 080798-15	2 filters per test	
		F.H. Acetone Rinse		
		F.H. $MeCl_2$ Rinse		
		Impinger H_2O/H_2O Rinse		
		B.H. Acetone Rinse		
B-I-315-3	8/13/98	B.H. $MeCl_2$ Rinse		
B-I-315-FB	8/14/98	Filter 080798-2		
	↓	F.H. Acetone Rinse		
		F.H. $MeCl_2$ Rinse		
	↓	Imp. H_2O/H_2O Rinse		

2 MAF

U.S. EPA - Bethlehem Steel - Chesterton, Indiana - S506.000
Master Sample Log

Sample Run No.	Date/Time	Sample Description	Liquid Level Marked/ Sealed	Being Stored Below 4°C
B-I-315-FB	8/14/98	B.H. Acetone Rinse		N/A
		B.H. $MeCl_2$ Rinse		
Baghouse Outlet		EPA Method 315	✓	N/A
B-O-315-1	8/11/98	Filter 080798-06		
		F.H. Acetone Rinse		
		F.H. $MeCl_2$ Rinse		
		Imp. H_2O/H_2O Rinse		
		BH Acetone Rinse		
		BH $MeCl_2$ Rinse		
B-O-315-2	8/12/98	Filter 080798-23		
		F.H. Acetone Rinse		
		F.H. $MeCl_2$ Rinse		
		Imp. H_2O/H_2O Rinse		
		BH Acetone Rinse		
		BH $MeCl_2$ Rinse		
B-O-315-3	8/13/98	Filter 080798-22		
		F.H. Acetone Rinse		
		F.H. $MeCl_2$ Rinse		
		Imp. H_2O/H_2O Rinse		
		B.H. Acetone Rinse		
		B.H. $MeCl_2$ Rinse		

RJM 3

U.S. EPA - Bethlehem Steel - Chesterton, Indiana - S506.000
Master Sample Log

Sample Run No.	Date/Time	Sample Description	Liquid Level Marked/ Sealed	Being Stored Below 4°C
B-O-315-FB	8/14/98	Filter 080798-24		
		F.H. Acetone Rinse		
		FH $MeCl_2$ Rinse		
		Imp. H_2O / H_2O Rinse		
		BH Acetone Rinse		
		BH $MeCl_2$ Rinse		
Underfire	Stack	Outlet		
B-U-315-1	8/14/98	Filter 080798-17		
		F.H. Acetone Rinse		
		FH $MeCl_2$ Rinse		
		Imp. H_2O / H_2O Rinse		
		BH Acetone Rinse		
		BH $MeCl_2$ Rinse		
B-U-315-2	8/14/98	Filter 080798-12		
		F.H. Acetone Rinse		
		FH $MeCl_2$ Rinse		
		Imp. H_2O / H_2O Rinse		
		BH Acetone Rinse		
		BH $MeCl_2$ Rinse		

4 MEF

U.S. EPA - Bethlehem Steel - Chesterton, Indiana - S506.000
Master Sample Log

Sample Run No.	Date/Time	Sample Description	Liquid Level Marked/ Sealed	Being Stored Below 4°C
Lab Blanks		Filter 080798-07		
		Acetone		
		$MeCl_2$		
		HPLC grade H_2O		

Page 4 of 4

First Analytical Laboratories

ANALYSIS REPORT

Metals Residues

Project # S511.000
Indiana Coke Oven

Prepared for:

Pacific Environmental Services, Inc.
560 Herndon Parkway; Suite 200
Herndon, VA 20170-5240

Reviewed and Approved by:

William H. Wadlin, Ph. D.
Laboratory Manager

October 26, 1998

First Analytical Laboratories

CASE NARRATIVE

Project #: 81003 Report Date: 26-Oct-98
Client: Pacific Environmental Services, Inc.
Client Project ID: S511.000

Samples:

Twelve sets of samples were submitted for determination of various metals. A blank filter was also provided which required the same analyses. Each set consisted of a filter and several aluminum pans in which extracts of the filters had been dried for a gravimetric measurement already performed by another laboratory. The target elements were antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorus, selenium, silver, thallium and zinc. All of the samples were hand delivered in good condition, with no apparent damage.

Preparation:

Since there is no standard method for preparation of such samples, some method development effort was required. In particular, we did not initially know how best to remove the residues from the pans quantitatively, without removing any of the base material of the pan itself.

For the initial trials we selected the set identified as B-1-M315-3, as it had visible material in each pan, including a variety of physical appearances. A few milliliters of water were added to each pan and allowed to stand for ten minutes. This had no visible effect on the residues, neither removing or softening any of the residues. Similar treatment with dilute nitric acid had no useful effect either. The residues were probed with a plastic spatula to determine whether it would now come loose from the pan. Most of the residues seemed to be stiff, tacky tars. Since the materials could be smudged and, to some extent, scraped up with the spatula, we decided to use the corresponding filters themselves to wipe up the residues. This was most effective, since the filters were to be combined with the residues anyway. This also avoided the problem of quantitatively cleaning a tarry spatula, (much like the initial problem of cleaning the tarry pan).

The procedure adopted was to wrap a portion of one of the sample filters around the end of a clean spatula, and use this assembly to swab all of the residue

out of all of the corresponding pans of the sample subset. This cleaning was facilitated by the fortuitous finding that the filters were still damp with solvent which appeared to soften the residues. It was then possible to use another filter portion for a second cleaning, taking up any film of desired residue missed by the first swab.

When the pans were cleaned of residue in this way, and all of the residue was on the filters, the filter portions used and any remaining unused were placed in a beaker for digestion. The samples were then prepared according to EPA Method 3050A, which is a nitric acid digestion.

A remaining issue was that one set of pans had been treated with dilute nitric acid in the method development effort, while the others had not been so treated. Thus we treated a blank pan with dilute nitric acid in the same way and used all of the washings so derived to create a blank for this aspect of B-1-M315-3 only. In the report it is the one called "Blank Pan". In the raw data it is called RB-AP for "reagent blank; Acid-washed Pan". It was gratifying to find after the analysis that this special blank did not show any noteworthy hits for the target elements.

Analysis:

Cadmium, manganese, lead (inlets only), and zinc were determined by Direct Aspiration Flame Atomic Absorption Spectrophotometry (FLAA). Antimony, arsenic, beryllium, lead (O, U, and blanks), nickel, selenium, silver and thallium were determined by Graphite Furnace Atomic Absorption Spectrophotometry (GFAA). Barium, chromium, cobalt, copper and phosphorus were determined by Inductively Coupled Plasma - Optical Emission (ICP).

Results:

The results are reported as total micrograms in the whole combination of original samples for each subset. All of the target elements were detected in all of the inlet samples. Antimony, beryllium, chromium, cobalt, mercury and phosphorus were not found on any of the samples other than the inlets. The highest levels were found for lead and zinc.

Quality Control:

Traces of barium, cadmium, manganese, lead and zinc were found in the blank filter. None of these are unusual. They are commonly found on blank filters at these low levels. In all cases, many of the O and U samples are indistinguishable from these blank levels, meaning that after blank correction, we cannot show the presence of such elements in the corresponding residues.

The spike recoveries were all within the normal range of 70% to 130%. The

duplicates were all within the normal limit of 20% for all cases in which the sample level is more than five times the detection limit. If the sample level is lower than this it is not possible to make a meaningful evaluation of the deviation between the duplicates.

First Analytical Laboratories
1126 Burning Tree Dr. Chapel Hill, NC 27514
Tel. (919) 942-8607
FAX (919) 929-8688

ANALYSIS REPORT

Project #: 81003
Client: Pacific Environmental Services
Client Project ID: S511.000

Report Date: 26-Oct-98
Date Received: 06-Oct-98

Total Micrograms in Combined Sample

µg

Sample	Sb	As	Ba	Be	Cd	Cr
	GFAA	GFAA	ICP	GFAA	FLAA	ICP
B-O-M315-1	< 0.5	< 0.5	1.2	< 0.02	1.8	< 2.5
B-O-M315-2	< 0.5	< 0.5	1.5	< 0.02	1.4	< 2.5
B-O-M315-3	< 0.5	< 0.5	0.8	< 0.02	1.7	< 2.5
B-O-M315-FB	< 0.5	< 0.5	1.1	< 0.02	2.0	< 2.5
B-U-M315-1	< 0.5	4.8	1.2	< 0.02	1.9	< 2.5
B-U-M315-2	< 0.5	4.0	2.6	< 0.02	1.6	< 2.5
B-U-M315-3	< 0.5	5.8	1.3	< 0.02	1.1	< 2.5
B-U-M315-FB	< 0.5	< 0.5	1.4	< 0.02	1.8	< 2.5
B-I-M315-1	4.3	62.9	27.4	0.96	3.0	6.0
B-I-M315-2	3.7	81.8	35.7	1.07	3.8	9.7
B-I-M315-3	3.4	92.3	28.4	1.02	4.3	6.8
B-I-M315-FB	< 0.5	< 0.5	1.6	< 0.02	2.0	< 2.5
BLANK PAN	< 0.5	< 0.5	< 0.2	< 0.02	1.9	< 2.5
BLANK FILTER	< 0.5	< 0.5	0.8	< 0.02	1.7	< 2.5

QC SUMMARY

Spikes						
% Recovery	94%	85%	96%	91%	97%	85%
Duplicates						
%RPD					0.0%	

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ANALYSIS REPORT

Project #: 81003
Client: Pacific Environmental Services
Client Project ID: S511.000

Report Date: 26-Oct-98
Date Received: 06-Oct-98

Total Micrograms in Combined Sample

µg

Sample	Co	Cu	Mn	Hg	Pb	Ni
	ICP	ICP	FLAA	CVAA	FLAA/GFAA	GFAA
B-O-M315-1	< 2	< 2	3	< 0.4	0.8	< 0.5
B-O-M315-2	< 2	2	7	< 0.4	0.5	0.9
B-O-M315-3	< 2	< 2	3	< 0.4	0.5	< 0.5
B-O-M315-FB	< 2	< 2	3	< 0.4	0.5	< 0.5
B-U-M315-1	< 2	< 2	3	< 0.4	4.1	< 0.5
B-U-M315-2	< 2	3	3	< 0.4	3.6	< 0.5
B-U-M315-3	< 2	2	1	< 0.4	2.7	< 0.5
B-U-M315-FB	< 2	< 2	2	< 0.4	0.6	< 0.5
B-I-M315-1	3	14	42	0.50	103	87.0
B-I-M315-2	5	21	46	0.60	153	86.5
B-I-M315-3	3	20	44	0.50	128	61.4
B-I-M315-FB	< 2	< 2	3	< 0.4	0.6	< 0.5
BLANK PAN	2	< 2	3	< 0.4	0.3	< 0.5
BLANK FILTER	< 2	< 2	3	< 0.4	0.7	< 0.5

QC SUMMARY

Spikes						
% Recovery	88%	89%	95%	95%	98%	86%
					98%	
Duplicates						
%RPD			0.0%		2.6%	

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ANALYSIS REPORT

Project #: 81003
Client: Pacific Environmental Services
Client Project ID: S511.000

Report Date: 26-Oct-98
Date Received: 06-Oct-98

Total Micrograms in Combined Sample

µg

Sample	P	Se	Ag	Tl	Zn
	ICP	GFAA	GFAA	GFAA	FLAA
B-O-M315-1	< 10	< 0.3	< 0.2	< 0.3	8.3
B-O-M315-2	< 10	0.5	2.1	< 0.3	11.7
B-O-M315-3	< 10	< 0.3	< 0.2	< 0.3	7.8
B-O-M315-FB	< 10	< 0.3	< 0.2	< 0.3	10.0
B-U-M315-1	< 10	2.3	< 0.2	0.9	12.7
B-U-M315-2	< 10	2.0	< 0.2	< 0.3	11.8
B-U-M315-3	< 10	1.0	< 0.2	1.0	10.1
B-U-M315-FB	< 10	< 0.3	< 0.2	< 0.3	10.3
B-I-M315-1	40	14.4	0.3	3.7	178
B-I-M315-2	45	21.1	0.6	4.9	242
B-I-M315-3	43	19.1	0.4	4.6	228
B-I-M315-FB	< 10	< 0.3	< 0.2	< 0.3	13
BLANK PAN	< 10	< 0.3	< 0.2	< 0.3	10.0
BLANK FILTER	< 10	< 0.3	< 0.2	< 0.3	10.9

QC SUMMARY

Spikes					
% Recovery	83%	103%	106%	88%	104%
Duplicates					
%RPD					9.8%

ANTIMONY

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 5 µg/L
Postdig'n spike conc. 100 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	-2.5	-2.5	100	1			<	0.5
B-O-M315-2	81003.O2	-4.7	-4.7	100	1			<	0.5
B-O-M315-3	81003.O3	3.1	3.1	100	1			<	0.5
B-O-M315-FB	81003.OB	-0.9	-0.9	100	1			<	0.5
B-U-M315-1	81003.U1	-3.5	-3.5	100	1			<	0.5
B-U-M315-2	81003.U2	3.8	3.8	100	1			<	0.5
B-U-M315-3	81003.U3	0.6	0.6	100	1			<	0.5
B-U-M315-FB	81003.UB	-3.5	-3.5	100	1			<	0.5
B-I-M315-1	81003.I1	42.6	42.6	100	1				4.3
B-I-M315-2	81003.I2	37.2	37.2	100	1				3.7
B-I-M315-3	81003.I3	33.7	33.7	100	1				3.4
B-I-M315-FB	81003.IB	-3.7	-3.7	100	1			<	0.5
BLANK PAN	81003.RBAP	-2.4	-2.4	100	1			<	0.5
BLANK FILTER	81003.RBF	-1.2	-1.2	100	1			<	0.5
SPIKE	81003.O1 S	93.9			% REC	93.9%			

ARSENIC

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 5 µg/L
Postdig'n spike conc. 100 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	0.3	0.3	100	1			<	0.5
B-O-M315-2	81003.O2	2.2	2.2	100	1			<	0.5
B-O-M315-3	81003.O3	4.8	4.8	100	1			<	0.5
B-O-M315-FB	81003.OB	1.9	1.9	100	1			<	0.5
B-U-M315-1	81003.U1	47.5	47.5	100	1				4.8
B-U-M315-2	81003.U2	40.3	40.3	100	1				4.0
B-U-M315-3	81003.U3	57.8	57.8	100	1				5.8
B-U-M315-FB	81003.UB	2.1	2.1	100	1			<	0.5
B-I-M315-1	81003.I1	125.7	628.5	100	5				62.9
B-I-M315-2	81003.I2	163.6	818.0	100	5				81.8
B-I-M315-3	81003.I3	184.6	922.8	100	5				92.3
B-I-M315-FB	81003.IB	2.8	2.8	100	1			<	0.5
BLANK PAN	81003.RBAP	1.8	1.8	100	1			<	0.5
BLANK FILTER	81003.RBF	-1.9	-1.9	100	1			<	0.5
SPIKE	81003.O1 S	85.1			% REC	85.1%			

BARIUM

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 2 µg/L
Postdig'n spike conc. 1000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	12	12	100	1				1.2
B-O-M315-2	81003.O2	15	15	100	1				1.5
B-O-M315-3	81003.O3	8	8	100	1				0.8
B-O-M315-FB	81003.OB	11	11	100	1				1.1
B-U-M315-1	81003.U1	12	12	100	1				1.2
B-U-M315-2	81003.U2	26	26	100	1				2.6
B-U-M315-3	81003.U3	13	13	100	1				1.3
B-U-M315-FB	81003.UB	14	14	100	1				1.4
B-I-M315-1	81003.I1	274	274	100	1				27.4
B-I-M315-2	81003.I2	357	357	100	1				35.7
B-I-M315-3	81003.I3	284	284	100	1				28.4
B-I-M315-FB	81003.IB	16	16	100	1				1.6
BLANK PAN	81003.RBAP	-1	-1	100	1			<	0.2
BLANK FILTER	81003.RBF	8	8	100	1				0.8
SPIKE	81003.O1 S	968			% REC	95.6%			

BERYLLIUM

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 0.15 µg/L
Postdig'n spike conc. 5.00 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	0.02	0.02	100	1			<	0.02
B-O-M315-2	81003.O2	0.05	0.05	100	1			<	0.02
B-O-M315-3	81003.O3	0.00	0.00	100	1			<	0.02
B-O-M315-FB	81003.OB	-0.03	-0.03	100	1			<	0.02
B-U-M315-1	81003.U1	0.06	0.06	100	1			<	0.02
B-U-M315-2	81003.U2	0.17	0.17	100	1				0.02
B-U-M315-3	81003.U3	0.12	0.12	100	1			<	0.02
B-U-M315-FB	81003.UB	0.02	0.02	100	1			<	0.02
B-I-M315-1	81003.I1	9.57	9.57	100	1				0.96
B-I-M315-2	81003.I2	10.73	10.73	100	1				1.07
B-I-M315-3	81003.I3	10.17	10.17	100	1				1.02
B-I-M315-FB	81003.IB	0.03	0.03	100	1			<	0.02
BLANK PAN	81003.RBAP	-0.02	-0.02	100	1			<	0.02
BLANK FILTER	81003.RBF	-0.01	-0.01	100	1			<	0.02
SPIKE	81003.O1 S	4.56			% REC	91.2%			

CADMIUM

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 5 µg/L
Postdig'n spike conc. 400 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml	Total µg
B-O-M315-1	81003.O1	18	18	100	1			1.8
B-O-M315-2	81003.O2	14	14	100	1			1.4
B-O-M315-3	81003.O3	17	17	100	1			1.7
B-O-M315-FB	81003.OB	20	20	100	1			2.0
B-U-M315-1	81003.U1	19	19	100	1			1.9
B-U-M315-2	81003.U2	16	16	100	1			1.6
B-U-M315-3	81003.U3	11	11	100	1			1.1
B-U-M315-FB	81003.UB	18	18	100	1			1.8
B-I-M315-1	81003.I1	30	30	100	1			3.0
B-I-M315-2	81003.I2	38	38	100	1			3.8
B-I-M315-3	81003.I3	43	43	100	1			4.3
B-I-M315-FB	81003.IB	20	20	100	1			2.0
BLANK PAN	81003.RBAP	19	19	100	1			1.9
BLANK FILTER	81003.F	17	17	100	1			1.7
SPIKE	81003.I1 S	418			% REC	97.0%		
DUPLICATE	81003.O2 D	14			%RPD	0.0%		

CHROMIUM

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 25 µg/L
Postdig'n spike conc. 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	-17	-17	100	1			<	2.5
B-O-M315-2	81003.O2	-4	-4	100	1			<	2.5
B-O-M315-3	81003.O3	-21	-21	100	1			<	2.5
B-O-M315-FB	81003.OB	-32	-32	100	1			<	2.5
B-U-M315-1	81003.U1	-2	-2	100	1			<	2.5
B-U-M315-2	81003.U2	-5	-5	100	1			<	2.5
B-U-M315-3	81003.U3	4	4	100	1			<	2.5
B-U-M315-FB	81003.UB	-25	-25	100	1			<	2.5
B-I-M315-1	81003.I1	60	60	100	1				6.0
B-I-M315-2	81003.I2	97	97	100	1				9.7
B-I-M315-3	81003.I3	68	68	100	1				6.8
B-I-M315-FB	81003.IB	-26	-26	100	1			<	2.5
BLANK PAN	81003.RBAP	-32	-32	100	1			<	2.5
BLANK FILTER	81003.RBF	-32	-32	100	1			<	2.5
SPIKE	81003.O3 S	1761			% REC	85.1%			

COBALT

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 20 µg/L
Postdig'n spike conc. 1000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	3	3	100	1			<	2.0
B-O-M315-2	81003.O2	5	5	100	1			<	2.0
B-O-M315-3	81003.O3	9	9	100	1			<	2.0
B-O-M315-FB	81003.OB	13	13	100	1			<	2.0
B-U-M315-1	81003.U1	7	7	100	1			<	2.0
B-U-M315-2	81003.U2	8	8	100	1			<	2.0
B-U-M315-3	81003.U3	5	5	100	1			<	2.0
B-U-M315-FB	81003.UB	12	12	100	1			<	2.0
B-I-M315-1	81003.I1	34	34	100	1				3.4
B-I-M315-2	81003.I2	45	45	100	1				4.5
B-I-M315-3	81003.I3	31	31	100	1				3.1
B-I-M315-FB	81003.IB	8	8	100	1			<	2.0
BLANK PAN	81003.RBAP	24	24	100	1				2.4
BLANK FILTER	81003.RBF	4	4	100	1			<	2.0
SPIKE	81003.O3 S	881			% REC	88.1%			

COPPER

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 20 µg/L
Postdig'n spike conc. 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	12	12	100	1			<	2.0
B-O-M315-2	81003.O2	20	20	100	1				2.0
B-O-M315-3	81003.O3	9	9	100	1			<	2.0
B-O-M315-FB	81003.OB	7	7	100	1			<	2.0
B-U-M315-1	81003.U1	19	19	100	1			<	2.0
B-U-M315-2	81003.U2	30	30	100	1				3.0
B-U-M315-3	81003.U3	21	21	100	1				2.1
B-U-M315-FB	81003.UB	10	10	100	1			<	2.0
B-I-M315-1	81003.I1	143	143	100	1				14.3
B-I-M315-2	81003.I2	212	212	100	1				21.2
B-I-M315-3	81003.I3	203	203	100	1				20.3
B-I-M315-FB	81003.IB	11	11	100	1			<	2.0
BLANK PAN	81003.RBAP	2	2	100	1			<	2.0
BLANK FILTER	81003.RBF	11	11	100	1			<	2.0
SPIKE	81003.O3 S	1775			% REC	88.8%			
DUPLICATE	81003.O2 D				%RPD	NA			

MANGANESE

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 10 µg/L
Postdig'n spike conc. 400 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml	Total µg
B-O-M315-1	81003.O1	28	28	100	1			2.8
B-O-M315-2	81003.O2	65	65	100	1			6.5
B-O-M315-3	81003.O3	34	34	100	1			3.4
B-O-M315-FB	81003.OB	26	26	100	1			2.6
B-U-M315-1	81003.U1	29	29	100	1			2.9
B-U-M315-2	81003.U2	31	31	100	1			3.1
B-U-M315-3	81003.U3	14	14	100	1			1.4
B-U-M315-FB	81003.UB	24	24	100	1			2.4
B-I-M315-1	81003.I1	421	421	100	1			42.1
B-I-M315-2	81003.I2	458	458	100	1			45.8
B-I-M315-3	81003.I3	444	444	100	1			44.4
B-I-M315-FB	81003.IB	27	27	100	1			2.7
BLANK PAN	81003.RBAP	27	27	100	1			2.7
BLANK FILTER	81003.RBF	25	25	100	1			2.5
SPIKE	81003.I1 S	800			% REC	94.8%		
DUPLICATE	81003.O2 D	65			%RPD	0.0%		

MERCURY

CVAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 0.20 µg/L
Postdig'n spike conc. 5.00 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	0.02	0.02	100	1	100	5	<	0.4
B-O-M315-2	81003.O2	-0.02	-0.02	100	1	100	5	<	0.4
B-O-M315-3	81003.O3	-0.06	-0.06	100	1	100	5	<	0.4
B-O-M315-FB	81003.OB	-0.01	-0.01	100	1	100	5	<	0.4
B-U-M315-1	81003.U1	0.16	0.16	100	1	100	5	<	0.4
B-U-M315-2	81003.U2	-0.01	-0.01	100	1	100	5	<	0.4
B-U-M315-3	81003.U3	0.17	0.17	100	1	100	5	<	0.4
B-U-M315-FB	81003.UB	-0.01	-0.01	100	1	100	5	<	0.4
B-I-M315-1	81003.I1	0.23	0.23	100	1	100	5		0.5
B-I-M315-2	81003.I2	0.30	0.30	100	1	100	5		0.6
B-I-M315-3	81003.I3	0.25	0.25	100	1	100	5		0.5
B-I-M315-FB	81003.IB	0.00	0.00	100	1	100	5	<	0.4
BLANK PAN	81003.RBAP	-0.04	-0.04	100	1	100	5	<	0.4
BLANK FILTER	81003.RBF	0.02	0.02	100	1	100	5	<	0.4
SPIKE	81003.O3 S	4.75			% REC	95.0%			

LEAD

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 100 µg/L
Postdig'n spike conc. 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1		0	100	1			<	10.0
B-O-M315-2	81003.O2		0	100	1			<	10.0
B-O-M315-3	81003.O3		0	100	1			<	10.0
B-O-M315-FB	81003.OB		0	100	1			<	10.0
B-U-M315-1	81003.U1		0	100	1			<	10.0
B-U-M315-2	81003.U2		0	100	1			<	10.0
B-U-M315-3	81003.U3		0	100	1			<	10.0
B-U-M315-FB	81003.UB		0	100	1			<	10.0
B-I-M315-1	81003.I1	1030	1030	100	1				103.0
B-I-M315-2	81003.I2	1530	1530	100	1				153.0
B-I-M315-3	81003.I3	1280	1280	100	1				128.0
B-I-M315-FB	81003.IB		0	100	1			<	10.0
BLANK PAN	81003.RBAP		0	100	1			<	10.0
BLANK FILTER	81003.F		0	100	1			<	10.0
SPIKE	81003.I1 S	2980			% REC	97.5%			
DUPLICATE	81003.I2 D	1570			%RPD	2.6%			

LEAD

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 3 µg/L
Postdig'n spike conc. 100 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml	Total µg
B-O-M315-1	81003.O1	7.8	7.8	100	1			0.8
B-O-M315-2	81003.O2	5.0	5.0	100	1			0.5
B-O-M315-3	81003.O3	4.6	4.6	100	1			0.5
B-O-M315-FB	81003.OB	4.8	4.8	100	1			0.5
B-U-M315-1	81003.U1	41.4	41.4	100	1			4.1
B-U-M315-2	81003.U2	36.4	36.4	100	1			3.6
B-U-M315-3	81003.U3	27.4	27.4	100	1			2.7
B-U-M315-FB	81003.UB	5.5	5.5	100	1			0.6
B-I-M315-1	81003.I1		0.0	100	1			
B-I-M315-2	81003.I2		0.0	100	1			
B-I-M315-3	81003.I3		0.0	100	1			
B-I-M315-FB	81003.IB	5.7	5.7	100	1			0.6
BLANK PAN	81003.RBAP	3.0	3.0	100	1			0.3
BLANK FILTER	81003.F	7.3	7.3	100	1			0.7
SPIKE	81003.O1 S	105.9			% REC	98.1%		
DUPLICATE	81003.I2 D				%RPD	ERR		

NICKEL

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 5 µg/L
Postdig'n spike conc. 100 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	-13.7	-13.7	100	1			<	0.5
B-O-M315-2	81003.O2	9.2	9.2	100	1				0.9
B-O-M315-3	81003.O3	-7.0	-7.0	100	1			<	0.5
B-O-M315-FB	81003.OB	-2.5	-2.5	100	1			<	0.5
B-U-M315-1	81003.U1	4.9	4.9	100	1			<	0.5
B-U-M315-2	81003.U2	1.3	1.3	100	1			<	0.5
B-U-M315-3	81003.U3	-0.2	-0.2	100	1			<	0.5
B-U-M315-FB	81003.UB	2.7	2.7	100	1			<	0.5
B-I-M315-1	81003.I1	173.9	869.5	100	5				87.0
B-I-M315-2	81003.I2	172.9	864.5	100	5				86.5
B-I-M315-3	81003.I3	122.7	613.5	100	5				61.4
B-I-M315-FB	81003.IB	-2.9	-2.9	100	1			<	0.5
BLANK PAN	81003.RBAP	-3.5	-3.5	100	1			<	0.5
BLANK FILTER	81003.RBF	-1.8	-1.8	100	1			<	0.5
SPIKE	81003.O1 S	86.0			% REC	86.0%			

PHOSPHORUS

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 100 µg/L
Postdig'n spike conc. 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	-21	-21	100	1			<	10.0
B-O-M315-2	81003.O2	8	8	100	1			<	10.0
B-O-M315-3	81003.O3	11	11	100	1			<	10.0
B-O-M315-FB	81003.OB	-8	-8	100	1			<	10.0
B-U-M315-1	81003.U1	87	87	100	1			<	10.0
B-U-M315-2	81003.U2	25	25	100	1			<	10.0
B-U-M315-3	81003.U3	69	69	100	1			<	10.0
B-U-M315-FB	81003.UB	-25	-25	100	1			<	10.0
B-I-M315-1	81003.I1	397	397	100	1				39.7
B-I-M315-2	81003.I2	446	446	100	1				44.6
B-I-M315-3	81003.I3	426	426	100	1				42.6
B-I-M315-FB	81003.IB	8	8	100	1			<	10.0
BLANK PAN	81003.RBAP	-77	-77	100	1			<	10.0
BLANK FILTER	81003.RBF	23	23	100	1			<	10.0
SPIKE	81003.O3 S	1661			% REC	83.1%			

SELENIUM

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 3 µg/L
Postdig'n spike conc. 50 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	0.6	0.6	100	1			<	0.3
B-O-M315-2	81003.O2	4.8	4.8	100	1				0.5
B-O-M315-3	81003.O3	0.6	0.6	100	1			<	0.3
B-O-M315-FB	81003.OB	2.4	2.4	100	1			<	0.3
B-U-M315-1	81003.U1	22.7	22.7	100	1				2.3
B-U-M315-2	81003.U2	19.6	19.6	100	1				2.0
B-U-M315-3	81003.U3	10.3	10.3	100	1				1.0
B-U-M315-FB	81003.UB	-0.2	-0.2	100	1			<	0.3
B-I-M315-1	81003.I1	28.8	144.2	100	5				14.4
B-I-M315-2	81003.I2	42.1	210.7	100	5				21.1
B-I-M315-3	81003.I3	38.3	191.3	100	5				19.1
B-I-M315-FB	81003.IB	0.0	0.0	100	1			<	0.3
BLANK PAN	81003.RBAP	-1.0	-1.0	100	1			<	0.3
BLANK FILTER	81003.RBF	0.4	0.4	100	1			<	0.3
SPIKE	81003.O1 S	51.6			% REC	103.2%			

SILVER

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 2.00 µg/L
Postdig'n spike conc. 10.00 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	1.46	1.46	100	1			<	0.20
B-O-M315-2	81003.O2	20.67	20.67	100	1				2.07
B-O-M315-3	81003.O3	-0.40	-0.40	100	1			<	0.20
B-O-M315-FB	81003.OB	1.49	1.49	100	1			<	0.20
B-U-M315-1	81003.U1	-1.25	-1.25	100	1			<	0.20
B-U-M315-2	81003.U2	-1.59	-1.59	100	1			<	0.20
B-U-M315-3	81003.U3	-1.46	-1.46	100	1			<	0.20
B-U-M315-FB	81003.UB	-0.97	-0.97	100	1			<	0.20
B-I-M315-1	81003.I1	3.08	3.08	100	1				0.31
B-I-M315-2	81003.I2	5.93	5.93	100	1				0.59
B-I-M315-3	81003.I3	4.04	4.04	100	1				0.40
B-I-M315-FB	81003.IB	-1.06	-1.06	100	1			<	0.20
BLANK PAN	81003.RBAP	-1.27	-1.27	100	1			<	0.20
BLANK FILTER	81003.RBF	-1.07	-1.07	100	1			<	0.20
SPIKE	81003.O1 S	10.56			% REC	105.6%			

THALLIUM

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81003
Date: 26-Oct-98

IDL = 3 µg/L
Postdig'n spike conc. 50 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml		Total µg
B-O-M315-1	81003.O1	-2.5	-2.5	100	1			<	0.3
B-O-M315-2	81003.O2	1.9	1.9	100	1			<	0.3
B-O-M315-3	81003.O3	0.9	0.9	100	1			<	0.3
B-O-M315-FB	81003.OB	1.5	1.5	100	1			<	0.3
B-U-M315-1	81003.U1	8.6	8.6	100	1				0.9
B-U-M315-2	81003.U2	2.8	2.8	100	1			<	0.3
B-U-M315-3	81003.U3	10.3	10.3	100	1				1.0
B-U-M315-FB	81003.UB	-0.7	-0.7	100	1			<	0.3
B-I-M315-1	81003.I1	36.5	36.5	100	1				3.7
B-I-M315-2	81003.I2	49.3	49.3	100	1				4.9
B-I-M315-3	81003.I3	46.2	46.2	100	1				4.6
B-I-M315-FB	81003.IB	-0.8	-0.8	100	1			<	0.3
BLANK PAN	81003.RBAP	-0.5	-0.5	100	1			<	0.3
BLANK FILTER	81003.RBF	-2.1	-2.1	100	1			<	0.3
SPIKE	81003.O1 S	44.2			% REC	88.4%			

ZINC

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

IDL = 10 µg/L
Postdig'n spike conc. 400 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Init. Vol. ml	Vol. Dig'd ml	Total µg
B-O-M315-1	81003.O1	83	83	100	1			8.3
B-O-M315-2	81003.O2	117	117	100	1			11.7
B-O-M315-3	81003.O3	78	78	100	1			7.8
B-O-M315-FB	81003.OB	100	100	100	1			10.0
B-U-M315-1	81003.U1	127	127	100	1			12.7
B-U-M315-2	81003.U2	118	118	100	1			11.8
B-U-M315-3	81003.U3	101	101	100	1			10.1
B-U-M315-FB	81003.UB	103	103	100	1			10.3
B-I-M315-1	81003.I1	356	1780	100	5			178.0
B-I-M315-2	81003.I2	483	2415	100	5			241.5
B-I-M315-3	81003.I3	455	2275	100	5			227.5
B-I-M315-FB	81003.IB	128	128	100	1			12.8
BLANK PAN	81003.RBAP	100	100	100	1			10.0
BLANK FILTER	81003.RBF	109	109	100	1			10.9
SPIKE	81003.I1 S	772			% REC	104.0%		
DUPLICATE	81003.O2 D	129			%RPD	9.8%		

ARSENIC

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.028	10.0
Standard 2	0.128	50.0
Standard 3	0.238	100.0
Standard 4	0.441	200.0

Calibration Verifications

ICV = 100	103.1	CCV2 = 100	107.2
ICB = 0	2.1	CCB2 = 0	4.6
CCV1 = 100	110.0	CCV3 = 100	111.2
CCB1 = 0	0.9	CCB3 = 0	2.8

ANTIMONY

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.016	10.0
Standard 2	0.081	50.0
Standard 3	0.153	100.0
Standard 4	0.285	200.0

Calibration Verifications

ICV = 100	97.3	CCV2 = 100	104.1
ICB = 0	3.2	CCB2 = 0	-0.8
CCV1 = 100	97.6	CCV3 = 100	111.0
CCB1 = 0	-3.9	CCB3 = 0	-5.7
		CCV4 = 100	101.0
		CCB4 = 0	-5.9

BARIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81002 and 81006
Date: 26-Oct-98

Calibration Data

	Emiss.	True conc., µg/L
Blank	32	0
Standard 1	54	20
Standard 2	739	500
Standard 3	1397	1000
Standard 4	2754	2000

Calibration Verifications

ICV = 1000	967	CCV2 = 1000	1116
ICB = 0	0	CCB2 = 0	0
CCV1 = 1000	1057		
CCB1 = 0	1		

BERYLLIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.012	0.5
Standard 2	0.043	2.0
Standard 3	0.105	5.0
Standard 4	0.175	10.0

Calibration Verifications

ICV = 5	5.07	CCV2 = 5	5.15
ICB = 0	0.16	CCB2 = 0	0.05
CCV1 = 5	4.83	CCV3 = 5	5.07
CCB1 = 0	-0.01	CCB3 = 0	0.08
		CCV4 = 5	
		CCB4 = 0	

CADMIUM

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEE

Client: PES
Proj. #: 81002
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.017	50
Standard 2	0.032	100
Standard 3	0.064	200
Standard 4	0.151	500
Standard 5	0.295	1000

Calibration Verifications

ICV = 500	522	CCV2 = 500	511
ICB = 0	3	CCB2 = 0	3
CCV1 = 500	495		
CCB1 = 0	1		

CHROMIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81002 and 81006
Date: 26-Oct-98

Calibration Data

	Emiss.	True conc., µg/L
Blank	603	0
Standard 1	758	100
Standard 2	3049	1000
Standard 3	5860	2000
Standard 4	13550	5000

Calibration Verifications

ICV = 2000	1829	CCV2 = 2000	2107
ICB = 0	-14	CCB2 = 0	-14
CCV1 = 2000	2124		
CCB1 = 0	-9		

CHROMIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81002 and 81006
Date: 26-Oct-98

Calibration Data

	Emiss.	True conc., µg/L
Blank	510	0
Standard 1	679	100
Standard 2	2957	1000
Standard 3	5337	2000
Standard 4	12453	5000

Calibration Verifications

ICV = 2000	1981	CCV2 = 2000	2121
ICB = 0	-20	CCB2 = 0	-25
CCV1 = 2000	1842		
CCB1 = 0	-24		

COBALT

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Emiss.	True conc., µg/L
Blank	336	0
Standard 1	375	20
Standard 2	440	50
Standard 3	709	150
Standard 4	1519	500

Calibration Verifications

ICV = 500	500	CCV2 = 500	510
ICB = 0	14	CCB2 = 0	14
CCV1 = 500	493	CCV3 = 500	530
CCB1 = 0	15	CCB3 = 0	10

COPPER

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Emiss.	True conc., µg/L
Blank	1285	0
Standard 1	2949	100
Standard 2	18473	1000
Standard 3	36484	2000
Standard 4	89349	5000

Calibration Verifications

ICV = 2000	1998	CCV2 = 2000	2248
ICB = 0	8	CCB2 = 0	11
CCV1 = 2000	2127	CCV3 = 2000	2106
CCB1 = 0	13	CCB3 = 0	13
		CCV4 = 2000	2017
		CCB4 = 0	11

LEAD

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 81002
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.003	200
Standard 2	0.007	500
Standard 3	0.015	1000
Standard 4	0.029	2000
Standard 5	0.073	5000

Calibration Verifications

ICV = 2000	1950	CCV2 = 2000	1940
ICB = 0	10	CCB2 = 0	-30
CCV1 = 2000	1950	CCV3 = 2000	
CCB1 = 0	-20	CCB3 = 0	

LEAD

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEE

Client: PES
Proj. #: 81002
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.022	10
Standard 2	0.120	50
Standard 3	0.233	100
Standard 4	0.414	200

Calibration Verifications

ICV = 100	101.4	CCV2 = 100	99.4
ICB = 0	1.6	CCB2 = 0	1.1
CCV1 = 100	101.7	CCV3 = 100	107.4
CCB1 = 0	-1.4	CCB3 = 0	5.1

MANGANESE

QUALITY CONTROL DATA

Client: PES
Proj. #: 81002 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.006	50
Standard 2	0.013	100
Standard 3	0.026	200
Standard 4	0.065	500
Standard 5	0.125	1000

Calibration Verifications

ICV = 500	496	CCV2 = 500	497
ICB = 0	0	CCB2 = 0	-7
CCV1 = 500	483		
CCB1 = 0	1		

MERCURY

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.00
Standard 1	0.010	0.50
Standard 2	0.025	1.00
Standard 3	0.042	2.00
Standard 4	0.125	5.00
Standard 5	0.278	10.00

Calibration Verifications

ICV = 5	4.79	CCV2 = 5	4.76
ICB = 0	-0.13	CCB2 = 0	-0.06
CCV1 = 5	4.53	CCV3 = 5	4.42
CCB1 = 0	-0.18	CCB3 = 0	-0.09
		CCV4 = 5	4.95
		CCB4 = 0	-0.09

NICKEL

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.030	20.0
Standard 2	0.082	50.0
Standard 3	0.173	100.0
Standard 4	0.340	200.0

Calibration Verifications

ICV = 100	108.0	CCV2 = 100	89.7
ICB = 0	3.1	CCB2 = 0	-3.3
CCV1 = 100	87.4	CCV3 = 100	88.4
CCB1 = 0	-1.0	CCB3 = 0	-4.2

PHOSPHORUS

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Emiss.	True conc., µg/L
Blank	316	0
Standard 1	369	200
Standard 2	558	1000
Standard 3	518	2000
Standard 4	1567	5000
Standard 5	6099	20000

Calibration Verifications

ICV = 2000	2010	CCV2 = 2000	2043
ICB = 0	21	CCB2 = 0	61
CCV1 = 2000	1934	CCV3 = 2000	2039
CCB1 = 0	99	CCB3 = 0	-56
		CCV4 = 2000	1960
		CCB4 = 0	-43

SELENIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.017	10.0
Standard 2	0.049	25.0
Standard 3	0.097	50.0
Standard 4	0.206	100.0

Calibration Verifications

ICV = 50	50.4	CCV2 = 50	53.3
ICB = 0	-4.3	CCB2 = 0	-0.3
CCV1 = 50	51.7	CCV3 = 50	54.1
CCB1 = 0	2.1	CCB3 = 0	6.4

SELENIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.008	10.0
Standard 2	0.046	25.0
Standard 3	0.086	50.0
Standard 4	0.171	100.0

Calibration Verifications

ICV = 50	50.8	CCV2 = 50
ICB = 0	2.1	CCB2 = 0
CCV1 = 50	50.9	CCV3 = 50
CCB1 = 0	1.7	CCB3 = 0

SILVER

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.096	5.0
Standard 2	0.191	10.0
Standard 3	0.383	20.0
Standard 4	0.544	30.0

Calibration Verifications

ICV = 20	20.2	CCV2 = 20	18.6
ICB = 0	-1.0	CCB2 = 0	-1.1
CCV1 = 20	19.5	CCV3 = 20	18.6
CCB1 = 0	-1.1	CCB3 = 0	-1.3

THALLIUM

QUALITY CONTROL DATA

Client: PES
Proj. #: 81003 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.0
Standard 1	0.017	10.0
Standard 2	0.030	20.0
Standard 3	0.079	50.0
Standard 4	0.149	100.0

Calibration Verifications

ICV = 50	48.9	CCV2 = 50	49.7
ICB = 0	-2.6	CCB2 = 0	-0.5
CCV1 = 50	48.6	CCV3 = 50	46.9
CCB1 = 0	-0.3	CCB3 = 0	-0.3
		CCV4 = 50	54.3
		CCB4 = 0	-2.0

ZINC

QUALITY CONTROL DATA

Client: PES
Proj. #: 81002 and 81006
Date: 26-Oct-98

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.035	50
Standard 2	0.056	100
Standard 3	0.091	200
Standard 4	0.205	500
Standard 5	0.367	1000

Calibration Verifications

ICV = 500	488	CCV2 = 500	478
ICB = 0	3	CCB2 = 0	0
CCV1 = 500	501		
CCB1 = 0	-4		

Method File: SB.SEL | Element: Sb | Wavelength: 217.
Date: 10/15/98 | Time: 10:00 | Slit: 0.7 L
Data File: | ID/Wt File: 81002.IDW | Lamp Current: 0
Technique: HGA | Calib. Type: Linear | Energy: 38

Sb ID: BLANK Seq. No.: 00148 A/S Pos.: 0 Date: 10/15

Replicate 1 Time: 10:02
Peak Area (A-s): 0.010 Peak Height (A): 0.020
Background Pk Area (A-s): 0.127 Background Pk Height (A): 0.082
Blank Corrected Pk Area (A-s): -0.000
Concentration (ug/L): -0.1

Replicate 2 Time: 10:06
Peak Area (A-s): -0.004 Peak Height (A): 0.018
Background Pk Area (A-s): 0.138 Background Pk Height (A): 0.088
Blank Corrected Pk. Area (A-s): -0.014
Concentration (ug/L): -9.1

Mean Conc (ug/L): -4.6 SD: 6.35 RSD(%): 139.

Auto-zero performed.

Sb ID: 10 PPB Seq. No.: 00149 A/S Pos.: 1 Date: 10/15

Replicate 1 Time: 10:09
Peak Area (A-s): 0.024 Peak Height (A): 0.040
Background Pk Area (A-s): 0.123 Background Pk Height (A): 0.083
Blank Corrected Pk Area (A-s): 0.021
Concentration (ug/L): 12.9

Replicate 2 Time: 10:12
Peak Area (A-s): 0.014 Peak Height (A): 0.035
Background Pk Area (A-s): 0.134 Background Pk Height (A): 0.073
Blank Corrected Pk Area (A-s): 0.011
Concentration (ug/L): 7.0

Mean Conc (ug/L): 9.9 SD: 4.20 RSD(%): 42.3

Standard number 1 applied. [10.0]
Correlation coefficient: 1.00000 Slope: 0.0016

Sb ID: 50 PPB Seq. No.: 00150 A/S Pos.: 2 Date: 10/15

Replicate 1 Time: 10:15
Peak Area (A-s): 0.083 Peak Height (A): 0.127
Background Pk Area (A-s): 0.129 Background Pk Height (A): 0.078
Blank Corrected Pk Area (A-s): 0.080
Concentration (ug/L): 50.2

Replicate 2 Time: 10:19
Peak Area (A-s): 0.085 Peak Height (A): 0.130
Background Pk Area (A-s): 0.136 Background Pk Height (A): 0.075
Blank Corrected Pk Area (A-s): 0.081
Concentration (ug/L): 51.2

ean Conc (ug/L): 50.7 SD: 0.73 RSD(%): 1.44

tandard number 2 applied. [50.0]
orrelation coefficient: 0.99999 Slope: 0.0016

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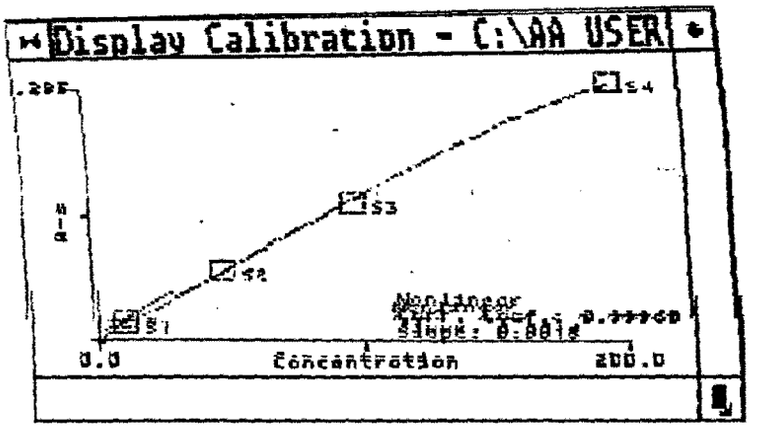
Display Calibration - C:\AA USER
.295
Abs
S1
S2
S3
S4
Nonlinear
Slope: 0.0016
0.0
Concentration
200.0

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Recovery is 97.5%

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Concentration (ug/L): 91.6

Replicate 2 Time: 12:50
Concentration (ug/L): 96.2

Mean Conc (ug/L): 93.9 SD: 3.26 RSD(%): 3.47

Recovery is 96.4%

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Sb ID: CCB Seq. No.: 00193 A/S Pos.: 0 Date: 10/1

Replicate 1 Time: 14:59
Concentration (ug/L): -6.7

Replicate 2 Time: 15:02
Concentration (ug/L): -5.1

Mean Conc (ug/L): -5.9 SD: 1.12 RSD(%): 18.

QC sample is within range -15.49 - 15.49

```
lement File: AS.GEL          Element: As                    Wavelength: 193.7
ate: 10/20/98                Time: 09:30                    Slit: 0.70 L
ata File:                    ID/Wt File: 81002.IDW          Lamp Current: 0
echnique: HGA                Calib. Type: Linear            Energy: 33
```

```
s    ID: BLANK               Seq. No.: 00104    A/S Pos.: 0     Date: 10/20/
```

```
eplicate  1                                  Time: 09:30
eak Area (A-s): 0.007                        Peak Height (A): 0.040
ackground Pk Area (A-s): 0.135               Background Pk Height (A): 0.149
lank Corrected Pk Area (A-s): 0.006
oncentration (ug/L  ): 2.60

eplicate  2                                  Time: 09:33
eak Area (A-s): -0.010                       Peak Height (A): 0.039
ackground Pk Area (A-s): 0.130               Background Pk Height (A): 0.119
lank Corrected Pk Area (A-s): -0.010
oncentration (ug/L  ): -4.07

ean Conc  (ug/L  ):       -0.74              SD: 4.715                RSD(%): 639.0

uto-zero performed.
```

```
s    ID: 10 PPB AS           Seq. No.: 00105    A/S Pos.: 1     Date: 10/20/
```

```
eplicate  1                                  Time: 09:36
eak Area (A-s): 0.026                        Peak Height (A): 0.057
ackground Pk Area (A-s): 0.129               Background Pk Height (A): 0.100
lank Corrected Pk Area (A-s): 0.028
oncentration (ug/L  ): 11.24

eplicate  2                                  Time: 09:40
eak Area (A-s): 0.026                        Peak Height (A): 0.047
ackground Pk Area (A-s): 0.114               Background Pk Height (A): 0.096
lank Corrected Pk Area (A-s): 0.028
oncentration (ug/L  ): 11.26

lean Conc  (ug/L  ):       11.25             SD: 0.012                RSD(%): 0.11

tandard number 1 applied.  [10.00]
orrelation coefficient: 1.00000              Slope: 0.0028
```

```
s    ID: 50 PPB AS           Seq. No.: 00106    A/S Pos.: 2     Date: 10/20/
```

```
eplicate  1                                  Time: 09:43
eak Area (A-s): 0.118                        Peak Height (A): 0.208
ackground Pk Area (A-s): 0.105               Background Pk Height (A): 0.094
lank Corrected Pk Area (A-s): 0.119
oncentration (ug/L  ): 42.59

eplicate  2                                  Time: 09:46
eak Area (A-s): 0.088                        Peak Height (A): 0.175
ackground Pk Area (A-s): 0.119               Background Pk Height (A): 0.112
lank Corrected Pk Area (A-s): 0.090
oncentration (ug/L  ): 32.05
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Mean Conc (ug/L): 37.32 SD: 7.451 RSD(%): 19.9

Standard number 2 applied. [50.00]
Correlation coefficient: 0.99324 Slope: 0.0021

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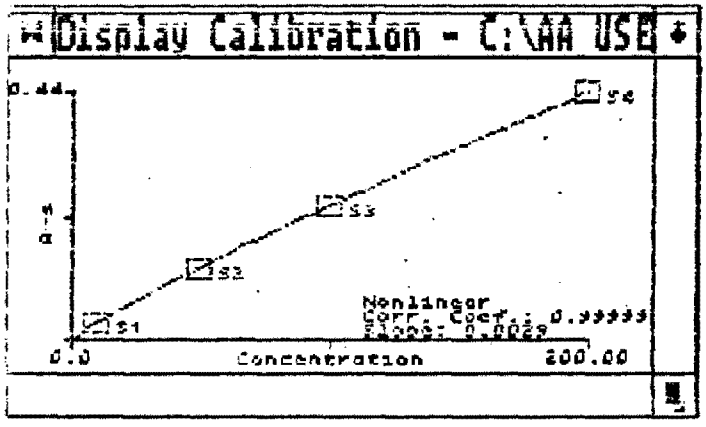
ean Conc (ug/L): 51.95 SD: 6.724 RSD(%): 12.94

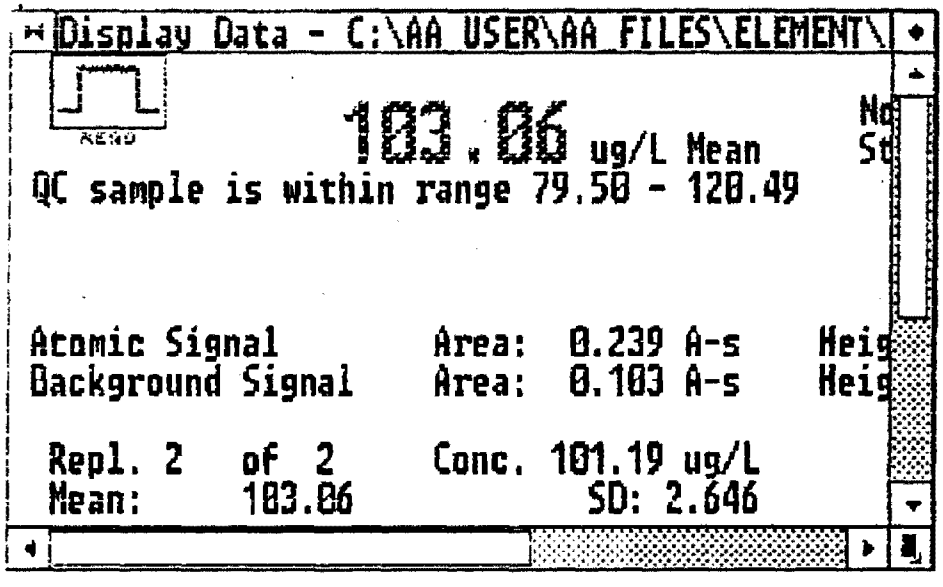
tandard number 2 applied. [50.00]
orrelation coefficient: 0.99999 Slope: 0.0029



[illegible] Seq. No.: [illegible] A/S Pos.: [illegible] Date: 10/20/[illegible]

[illegible] Time: [illegible]
[illegible] 104.97

[illegible] Time: [illegible]



As ID: ICB Seq. No.: 00111 A/S Pos.: 0 Date: 10/2

Replicate 1 Time: 10:26
Concentration (ug/L): 0.98

Replicate 2 Time: 10:29
Concentration (ug/L): 3.21

Mean Conc (ug/L): 2.09 SD: 1.576 RSD(%): 75.

QC sample is within range -5.49 - 5.49

As ID: 81003.RB-AP Seq. No.: 00112 A/S Pos.: 14 Date: 10/2

Replicate 1 Time: 10:32
Concentration (ug/L): 3.39

Replicate 2 Time: 10:35
Concentration (ug/L): 0.24

Mean Conc (ug/L): 1.81 SD: 2.234 RSD(%): 123

As ID: 81003.RB-F Seq. No.: 00113 A/S Pos.: 15 Date: 10/2

Replicate 1 Time: 10:39
Concentration (ug/L): -0.48

Replicate 2 Time: 10:42
Concentration (ug/L): -3.37

Mean Conc (ug/L): -1.93 SD: 2.048 RSD(%): 106

As ID: 81003.OB Seq. No.: 00114 A/S Pos.: 16 Date: 10/2

Replicate 1 Time: 10:45
Concentration (ug/L): 0.75

Replicate 2 Time: 10:48
Concentration (ug/L): 3.06

Mean Conc (ug/L): 1.90 SD: 1.635 RSD(%): 85.

As ID: 81003.UB Seq. No.: 00115 A/S Pos.: 17 Date: 10/2

Replicate 1 Time: 10:51
Concentration (ug/L): 3.46

Replicate 2 Time: 10:54
Concentration (ug/L): 0.78

Mean Conc (ug/L): 2.11 SD: 1.894 RSD(%): 89.

As ID: 81003.IB Seq. No.: 00116 A/S Pos.: 18 Date: 10/20/

Replicate 1 Time: 10:58
Concentration (ug/L): 3.73

Replicate 2 Time: 11:01
Concentration (ug/L): 1.80

Mean Conc (ug/L): 2.76 SD: 1.363 RSD(%): 49.26

As ID: 81003.01 Seq. No.: 00117 A/S Pos.: 19 Date: 10/20/

Replicate 1 Time: 11:04
Concentration (ug/L): -1.40

Replicate 2 Time: 11:07
Concentration (ug/L): 1.92

Mean Conc (ug/L): 0.25 SD: 2.344 RSD(%): 903.4

As ID: 81003.01 Seq. No.: 00118 A/S Pos.: 19 Date: 10/20/

Replicate 1 Time: 11:10
Concentration (ug/L): 83.00

Replicate 2 Time: 11:14
Concentration (ug/L): 87.23

Mean Conc (ug/L): 85.11 SD: 2.991 RSD(%): 3.51

Recovery is 84.9%

As ID: 81003.02 Seq. No.: 00119 A/S Pos.: 20 Date: 10/20/

Replicate 1 Time: 11:17
Concentration (ug/L): 2.85

Replicate 2 Time: 11:20
Concentration (ug/L): 1.63

Mean Conc (ug/L): 2.24 SD: 0.858 RSD(%): 38.32

As ID: 81003.03 Seq. No.: 00120 A/S Pos.: 21 Date: 10/20/

Replicate 1 Time: 11:23
Concentration (ug/L): 5.13

Replicate 2 Time: 11:27
Concentration (ug/L): 4.54

Mean Conc (ug/L): 4.84 SD: 0.419 RSD(%): 8.65

As ID: CCV Seq. No.: 00121 A/S Pos.: 3 Date: 10/20

Replicate 1 Time: 11:30
Concentration (ug/L): 89.55

Replicate 2 Time: 11:33
Concentration (ug/L): 87.92

Mean Conc (ug/L): 88.73 SD: 1.155 RSD(%): 1.30

QC sample is within range 79.50 - 120.49

3 low 8 wb dw drinkee

As ID: CCV Seq. No.: 00122 A/S Pos.: 3 Date: 10/20

Replicate 1 Time: 11:38
Concentration (ug/L): 104.82

Replicate 2 Time: 11:41
Concentration (ug/L): 115.30

Mean Conc (ug/L): 110.04 SD: 7.407 RSD(%): 6.73

QC sample is within range 79.50 - 120.49

As ID: CCB Seq. No.: 00123 A/S Pos.: 0 Date: 10/20

Replicate 1 Time: 11:44
Concentration (ug/L): 1.53

Replicate 2 Time: 11:47
Concentration (ug/L): 0.17

Mean Conc (ug/L): 0.85 SD: 0.961 RSD(%): 113.

QC sample is within range -5.49 - 5.49

As ID: B1003.U1 Seq. No.: 00124 A/S Pos.: 22 Date: 10/20

Replicate 1 Time: 11:51
Concentration (ug/L): 44.63

Replicate 2 Time: 11:54
Concentration (ug/L): 50.43

Mean Conc (ug/L): 47.52 SD: 4.104 RSD(%): 8.63

As ID: B1003.U2 Seq. No.: 00125 A/S Pos.: 23 Date: 10/20

Replicate 1 Time: 11:57

Concentration (ug/L): 39.36

Replicate 2 Time: 12:00
Concentration (ug/L): 41.10

Mean Conc (ug/L): 40.23 SD: 1.232 RSD(%): 3.06

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As ID: 81003.I2 X5 Seq. No.: 00131 A/S Pos.: 26 Date: 10/20

Replicate 1 Time: 12:35
Concentration (ug/L): 138.93

Replicate 2 Time: 12:39
Concentration (ug/L): 188.76

Mean Conc (ug/L): 163.63 SD: 35.236 RSD(%): 21.5

As ID: 81003.I3x5 Seq. No.: 00132 A/S Pos.: 27 Date: 10/20

Replicate 1 Time: 12:42
Concentration (ug/L): ~~122.71~~

Replicate 2 Time: 12:45
Concentration (ug/L): 183.04 ✓

Mean Conc (ug/L): ~~152.82~~ SD: 42.660 RSD(%): 27.9

As ID: 81003.I3x5 Seq. No.: 00133 A/S Pos.: 27 Date: 10/20

Replicate 1 Time: 12:49
Concentration (ug/L): 186.06 ✓

The signal is too large for the range of the electronics.
Replicate 2 Time: 12:52
Concentration (ug/L): --------

Mean Conc (ug/L): ---- SD: ---- RSD(%): ----

As ID: CCV Seq. No.: 00134 A/S Pos.: 3 Date: 10/20

Replicate 1 Time: 13:01
Concentration (ug/L): 103.60

Replicate 2 Time: 13:04
Concentration (ug/L): 110.83

Mean Conc (ug/L): 107.21 SD: 5.116 RSD(%): 4.77

QC sample is within range 79.50 - 120.49

As ID: CCB Seq. No.: 00135 A/S Pos.: 0 Date: 10/20

Replicate 1 Time: 13:07
Concentration (ug/L): 7.84

Replicate 2 Time: 13:11
Concentration (ug/L): 1.49

Mean Conc (ug/L): 4.63 SD: 4.488 RSD(%): 96.1

3MA 400 Analysis Ver. 4.10 Thu 10/15/98 - 11:06:51

ıod File Name: BA Replicates:3 Read Delay: 65
ırks: BA ONLY Data File:

Nt file is 10236

ANDARD #1			REPLICATE	#1				1108	10/15/98
	BA455	EM	49						
ANDARD #1			REPLICATE	#2					
	BA455	EM	53						
ANDARD #1			REPLICATE	#3					
	BA455	EM	60				peak-noisy		
	BA455	AV	54.0	SD	5.6	CV	10.3	CONC	0.0200
ANDARD #2			REPLICATE	#1				1111	10/15/98
	BA455	EM	788						
ANDARD #2			REPLICATE	#2					
	BA455	EM	709						
ANDARD #2			REPLICATE	#3					
	BA455	EM	719						
	BA455	AV	738.7	SD	43.0	CV	5.8	CONC	0.5000
ANDARD #3			REPLICATE	#1				1113	10/15/98
	BA455	EM	1410						
ANDARD #3			REPLICATE	#2					
	BA455	EM	1360						
ANDARD #3			REPLICATE	#3					
	BA455	EM	1420						
	BA455	AV	1396.7	SD	32.1	CV	2.3	CONC	1.0000
ANDARD #4			REPLICATE	#1				1115	10/15/98
	BA455	EM	2707						
ANDARD #4			REPLICATE	#2					
	BA455	EM	2803						
ANDARD #4			REPLICATE	#3					
	BA455	EM	2751						
	BA455	AV	2753.7	SD	48.1	CV	1.7	CONC	2.0000
ANK			REPLICATE	#1				1117	10/15/98
	BA455	EM	36						
ANK			REPLICATE	#2					
	BA455	EM	26						

BA455 EM 34

BA455 AV 32.0 SD 5.3 CV 16.5 CONC 0.0000

BA455 CC 0.9999 SLOPE 1360.5981 INT 37.1389

:V REPLICATE #1 1119 10/15/98
BA455 EM 1358 0.9708 mg/L

:V REPLICATE #2
BA455 EM 1360 0.9723 mg/L

:V REPLICATE #3
BA455 EM 1342 0.9590 mg/L

BA455 AV 1353.3 EM SD 9.9 CV 0.7

BA455 AV 0.9674 mg/L SD 0.0073 CV 0.75

:B REPLICATE #1 1121 10/15/98
BA455 EM 39 0.0014 mg/L peak-noisy

:B REPLICATE #2
BA455 EM 37 -0.0001 mg/L peak-noisy

:B REPLICATE #3
BA455 EM 34 -0.0023 mg/L peak-noisy

BA455 AV 36.7 EM SD 2.5 CV 6.9

BA455 AV -0.0003 mg/L SD 0.0018 CV 532.91

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L002.B-1 REPLICATE #1 1123 10/15/98
BA455 EM 999 0.7069 mg/L

L002.B-1 REPLICATE #2
BA455 EM 1009 0.7143 mg/L

L002.B-1 REPLICATE #3
BA455 EM 1039 0.7363 mg/L

BA455 AV 1015.7 EM SD 20.8 CV 2.0

BA455 AV 0.7192 mg/L SD 0.0153 CV 2.13

-1X2 REPLICATE #1 1125 10/15/98
BA455 EM 572 0.3931 mg/L

-1X2 REPLICATE #2
BA455 EM 596 0.4107 mg/L

-1X2 REPLICATE #3
BA455 EM 584 0.4019 mg/L

BA455 AV 584.0 EM SD 12.0 CV 2.1

BA455 AV 0.4019 mg/L SD 0.0088 CV 2.19

-1X2S REPLICATE #1 1127 10/15/98
BA455 EM 1330 0.9502 mg/L

-1X2S REPLICATE #2

-1X2S REPLICATE #3
BA455 EM 1404 1.0046 mg/L

BA455 AV 1363.7 EM SD 37.4 CV 2.7

BA455 AV 0.9750 mg/L SD 0.0275 CV 2.82

-1X2 REPLICATE #1 1129 10/15/98
BA455 EM 615 0.4247 mg/L

-1X2 REPLICATE #2
BA455 EM 575 0.3953 mg/L

-1X2 REPLICATE #3
BA455 EM 606 0.4181 mg/L

BA455 AV 598.7 EM SD 21.0 CV 3.5

BA455 AV 0.4127 mg/L SD 0.0154 CV 3.74

-1X2D REPLICATE #1 1132 10/15/98
BA455 EM 530 0.3622 mg/L

-1X2D REPLICATE #2
BA455 EM 581 0.3997 mg/L

-1X2D REPLICATE #3
BA455 EM 567 0.3894 mg/L

BA455 AV 559.3 EM SD 26.4 CV 4.7

BA455 AV 0.3838 mg/L SD 0.0194 CV 5.05

)-1X2 REPLICATE #1 1134 10/15/98
BA455 EM 569 0.3909 mg/L

)-1X2 REPLICATE #2
BA455 EM 556 0.3813 mg/L

)-1X2 REPLICATE #3
BA455 EM 567 0.3894 mg/L

BA455 AV 564.0 EM SD 7.0 CV 1.2

BA455 AV 0.3872 mg/L SD 0.0051 CV 1.33

-2A REPLICATE #1 1136 10/15/98
BA455 EM 43 0.0043 mg/L peak-noisy

-2A REPLICATE #2
BA455 EM 37 -0.0001 mg/L peak-noisy

-2A REPLICATE #3
BA455 EM 34 -0.0023 mg/L peak-noisy

BA455 AV 38.0 EM SD 4.6 CV 12.1

BA455 AV 0.0006 mg/L SD 0.0034 CV 532.18

-2A REPLICATE #1 1138 10/15/98
BA455 EM 43 0.0043 mg/L

-2A REPLICATE #2
BA455 EM 39 0.0014 mg/L peak-noisy

BA455 EM 42 0.0036 mg/L peak-noisy

BA455 AV 41.3 EM SD 2.1 CV 5.0

BA455 AV 0.0031 mg/L SD 0.0015 CV 49.63

-2AS REPLICATE #1 1140 10/15/98
BA455 EM 1164 0.8282 mg/L

-2AS REPLICATE #2
BA455 EM 1115 0.7922 mg/L

-2AS REPLICATE #3
BA455 EM 1113 0.7907 mg/L

BA455 AV 1130.7 EM SD 28.9 CV 2.6

BA455 AV 0.8037 mg/L SD 0.0212 CV 2.64

JT REPLICATE #1 1142 10/15/98
BA455 EM 41 0.0028 mg/L peak-noisy

JT REPLICATE #2
BA455 EM 37 -0.0001 mg/L peak-noisy

JT REPLICATE #3
BA455 EM 42 0.0036 mg/L peak-noisy

BA455 AV 40.0 EM SD 2.6 CV 6.6

BA455 AV 0.0021 mg/L SD 0.0019 CV 92.47

CV REPLICATE #1 1144 10/15/98
BA455 EM 1449 1.0377 mg/L

CV REPLICATE #2
BA455 EM 1456 1.0428 mg/L

CV REPLICATE #3
BA455 EM 1521 1.0906 mg/L

BA455 AV 1475.3 EM SD 39.7 CV 2.7

BA455 AV 1.0570 mg/L SD 0.0292 CV 2.76

CB REPLICATE #1 1146 10/15/98
BA455 EM 38 0.0006 mg/L peak-noisy

CB REPLICATE #2
BA455 EM 40 0.0021 mg/L peak-noisy

CB REPLICATE #3
BA455 EM 36 -0.0008 mg/L peak-noisy

BA455 AV 38.0 EM SD 2.0 CV 5.3

BA455 AV 0.0006 mg/L SD 0.0015 CV 232.26

-2A REPLICATE #1 1148 10/15/98
BA455 EM 44 0.0050 mg/L peak-noisy

-2A REPLICATE #2

-2A REPLICATE #3
BA455 EM 40 0.0021 mg/L peak-noisy

BA455 AV 42.3 EM SD 2.1 CV 4.9

BA455 AV 0.0038 mg/L SD 0.0015 CV 40.08

)—2A REPLICATE #1 1150 10/15/98
BA455 EM 36 -0.0008 mg/L peak-noisy

)—2A REPLICATE #2
BA455 EM 38 0.0006 mg/L peak-noisy

)—2A REPLICATE #3
BA455 EM 36 -0.0008 mg/L peak-noisy

BA455 AV 36.7 EM SD 1.2 CV 3.1

BA455 AV -0.0003 mg/L SD 0.0008 CV 244.52

3—AP REPLICATE #1 1152 10/15/98
BA455 EM 33 -0.0030 mg/L peak-noisy

3—AP REPLICATE #2
BA455 EM 38 0.0006 mg/L peak-noisy

3—AP REPLICATE #3
BA455 EM 38 0.0006 mg/L peak-noisy

BA455 AV 36.3 EM SD 2.9 CV 7.9

BA455 AV -0.0006 mg/L SD 0.0021 CV 358.35

3—F REPLICATE #1 1154 10/15/98
BA455 EM 47 0.0072 mg/L peak-noisy

3—F REPLICATE #2
BA455 EM 46 0.0065 mg/L

3—F REPLICATE #3
BA455 EM 49 0.0087 mg/L peak-noisy

BA455 AV 47.3 EM SD 1.5 CV 3.2

BA455 AV 0.0075 mg/L SD 0.0011 CV 14.98

3 REPLICATE #1 1156 10/15/98
BA455 EM 55 0.0131 mg/L peak-noisy

B REPLICATE #2
BA455 EM 53 0.0117 mg/L peak-noisy

B REPLICATE #3
BA455 EM 49 0.0087 mg/L peak-noisy

BA455 AV 52.3 EM SD 3.1 CV 5.8

BA455 AV 0.0112 mg/L SD 0.0022 CV 20.11

B REPLICATE #1 1159 10/15/98
BA455 EM 55 0.0131 mg/L peak-noisy

B REPLICATE #2
BA455 EM 53 0.0117 mg/L peak-noisy

BA455 EM 62 0.0183 mg/L peak-noisy

BA455 AV 56.7 EM SD 4.7 CV 8.3

BA455 AV 0.0144 mg/L SD 0.0035 CV 24.20

REPLICATE #1 1201 10/15/98
BA455 EM 63 0.0190 mg/L peak-noisy

REPLICATE #2
BA455 EM 58 0.0153 mg/L peak-noisy

REPLICATE #3
BA455 EM 56 0.0139 mg/L peak-noisy

BA455 AV 59.0 EM SD 3.6 CV 6.1

BA455 AV 0.0161 mg/L SD 0.0026 CV 16.49

REPLICATE #1 1203 10/15/98
BA455 EM 1516 1.0869 mg/L

REPLICATE #2
BA455 EM 1590 1.1413 mg/L

REPLICATE #3
BA455 EM 1561 1.1200 mg/L

BA455 AV 1555.7 EM SD 37.3 CV 2.4

BA455 AV 1.1161 mg/L SD 0.0274 CV 2.46

REPLICATE #1 1205 10/15/98
BA455 EM 39 0.0014 mg/L peak-noisy

REPLICATE #2
BA455 EM 36 -0.0008 mg/L peak-noisy

REPLICATE #3
BA455 EM 38 0.0006 mg/L peak-noisy

BA455 AV 37.7 EM SD 1.5 CV 4.1

BA455 AV 0.0004 mg/L SD 0.0011 CV 289.44

REPLICATE #1 1207 10/15/98
BA455 EM 53 0.0117 mg/L peak-noisy

REPLICATE #2
BA455 EM 58 0.0153 mg/L peak-noisy

REPLICATE #3
BA455 EM 53 0.0117 mg/L

BA455 AV 54.7 EM SD 2.9 CV 5.3

BA455 AV 0.0129 mg/L SD 0.0021 CV 16.47

REPLICATE #1 1209 10/15/98
BA455 EM 1342 0.9590 mg/L

REPLICATE #2

S REPLICATE #3
BA455 EM 1364 0.9752 mg/L

BA455 AV 1353.7 EM SD 11.1 CV 0.8

BA455 AV 0.9676 mg/L SD 0.0081 CV 0.84

REPLICATE #1 1211 10/15/98
BA455 EM 57 0.0146 mg/L

REPLICATE #2
BA455 EM 52 0.0109 mg/L

REPLICATE #3
BA455 EM 65 0.0205 mg/L peak-noisy

BA455 AV 58.0 EM SD 6.6 CV 11.3

BA455 AV 0.0153 mg/L SD 0.0048 CV 31.43

REPLICATE #1 1213 10/15/98
BA455 EM 47 0.0072 mg/L peak-noisy

REPLICATE #2
BA455 EM 44 0.0050 mg/L peak-noisy

REPLICATE #3
BA455 EM 52 0.0109 mg/L peak-noisy

BA455 AV 47.7 EM SD 4.0 CV 8.5

BA455 AV 0.0077 mg/L SD 0.0030 CV 38.39

REPLICATE #1 1215 10/15/98
BA455 EM 52 0.0109 mg/L

REPLICATE #2
BA455 EM 50 0.0095 mg/L peak-noisy

REPLICATE #3
BA455 EM 57 0.0146 mg/L peak-noisy

BA455 AV 53.0 EM SD 3.6 CV 6.8

BA455 AV 0.0117 mg/L SD 0.0026 CV 22.73

REPLICATE #1 1217 10/15/98
BA455 EM 69 0.0234 mg/L peak-noisy

REPLICATE #2
BA455 EM 70 0.0242 mg/L

REPLICATE #3
BA455 EM 80 0.0315 mg/L peak-noisy

BA455 AV 73.0 EM SD 6.1 CV 8.3

BA455 AV 0.0264 mg/L SD 0.0045 CV 16.96

REPLICATE #1 1219 10/15/98
BA455 EM 56 0.0139 mg/L peak-noisy

REPLICATE #2
BA455 EM 55 0.0131 mg/L peak-noisy

BA455 EM 54 0.0124 mg/L peak-noisy

BA455 AV 55.0 EM SD 1.0 CV 1.8

BA455 AV 0.0131 mg/L SD 0.0007 CV 5.60

REPLICATE #1 1221 10/15/98

BA455 EM 402 0.2682 mg/L

REPLICATE #2

BA455 EM 431 0.2895 mg/L

REPLICATE #3

BA455 EM 398 0.2652 mg/L

BA455 AV 410.3 EM SD 18.0 CV 4.4

BA455 AV 0.2743 mg/L SD 0.0132 CV 4.83

: REPLICATE #1 1223 10/15/98

BA455 EM 523 0.3571 mg/L

: REPLICATE #2

BA455 EM 536 0.3666 mg/L

: REPLICATE #3

BA455 EM 510 0.3475 mg/L

BA455 AV 523.0 EM SD 13.0 CV 2.5

BA455 AV 0.3571 mg/L SD 0.0096 CV 2.68

; REPLICATE #1 1225 10/15/98

BA455 EM 408 0.2726 mg/L

; REPLICATE #2

BA455 EM 455 0.3071 mg/L

; REPLICATE #3

BA455 EM 406 0.2711 mg/L

BA455 AV 423.0 EM SD 27.7 CV 6.6

BA455 AV 0.2836 mg/L SD 0.0204 CV 7.19

:V REPLICATE #1 1227 10/15/98

BA455 EM 1515 1.0862 mg/L

:V REPLICATE #2

BA455 EM 1611 1.1567 mg/L

:V REPLICATE #3

BA455 EM 1498 1.0737 mg/L

BA455 AV 1541.3 EM SD 60.9 CV 4.0

BA455 AV 1.1055 mg/L SD 0.0448 CV 4.05

:B REPLICATE #1 1230 10/15/98

BA455 EM 42 0.0036 mg/L peak-noisy

:B REPLICATE #2

BA455 EM 41 0.0028 mg/L peak-noisy

BA455 AV 40.7 EM SD 1.5 CV 3.8

BA455 AV 0.0026 mg/L SD 0.0011 CV 43.30

006.1 REPLICATE #1 1232 10/15/98
BA455 EM 813 0.5702 mg/L

006.1 REPLICATE #2
BA455 EM 835 0.5864 mg/L

006.1 REPLICATE #3
BA455 EM 824 0.5783 mg/L

BA455 AV 824.0 EM SD 11.0 CV 1.3

BA455 AV 0.5783 mg/L SD 0.0081 CV 1.40

REPLICATE #1 1234 10/15/98
BA455 EM 1841 1.3258 mg/L

REPLICATE #2
BA455 EM 1996 1.4397 mg/L

REPLICATE #3
BA455 EM 1899 1.3684 mg/L

BA455 AV 1912.0 EM SD 78.3 CV 4.1

BA455 AV 1.3780 mg/L SD 0.0576 CV 4.18

REPLICATE #1 1236 10/15/98
BA455 EM 1079 0.7657 mg/L

REPLICATE #2
BA455 EM 1024 0.7253 mg/L

REPLICATE #3
BA455 EM 1160 0.8253 mg/L

BA455 AV 1087.7 EM SD 68.4 CV 6.3

BA455 AV 0.7721 mg/L SD 0.0503 CV 6.51

REPLICATE #1 1238 10/15/98
BA455 EM 1034 0.7327 mg/L

REPLICATE #2
BA455 EM 1058 0.7503 mg/L

REPLICATE #3
BA455 EM 1038 0.7356 mg/L

BA455 AV 1043.3 EM SD 12.9 CV 1.2

BA455 AV 0.7395 mg/L SD 0.0095 CV 1.28

REPLICATE #1 1240 10/15/98
BA455 EM 836 0.5871 mg/L

REPLICATE #2
BA455 EM 853 0.5996 mg/L

REPLICATE #3

BA455 AV 847.3 EM SD 9.8 CV 1.2

BA455 AV 0.5955 mg/L SD 0.0072 CV 1.21

V REPLICATE #1 1242 10/15/98
BA455 EM 1508 1.0810 mg/L

V REPLICATE #2
BA455 EM 1531 1.0979 mg/L

V REPLICATE #3
BA455 EM 1501 1.0759 mg/L

BA455 AV 1513.3 EM SD 15.7 CV 1.0

BA455 AV 1.0850 mg/L SD 0.0115 CV 1.06

B REPLICATE #1 1244 10/15/98
BA455 EM 39 0.0014 mg/L peak-noisy

B REPLICATE #2
BA455 EM 41 0.0028 mg/L peak-noisy

B REPLICATE #3
BA455 EM 35 -0.0016 mg/L peak-noisy

BA455 AV 38.3 EM SD 3.1 CV 8.0

BA455 AV 0.0009 mg/L SD 0.0022 CV 255.78

```
---------------------------------------------------------------------------
lement File: BE.GEL          Element: Be                    Wavelength: 234.9
ate: 10/22/98                Time: 16:30                    Slit: 0.7 L
ata File:                    ID/Wt File: 81013.IDW          Lamp Current: 30
echnique: HGA                Calib. Type: Linear            Energy: 65
---------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
e    ID: BLANK               Seq. No.: 00050    A/S Pos.: 0     Date: 10/22/

eplicate  1                              Time: 16:30
eak Area (A-s): -0.003                   Peak Height (A): 0.003
ackground Pk Area (A-s): 0.550           Background Pk Height (A): 0.195
lank Corrected Pk Area (A-s): -0.006
oncentration (ug/L  ): -0.37

eplicate  2                              Time: 16:33
eak Area (A-s): -0.003                   Peak Height (A): 0.002
ackground Pk Area (A-s): 0.288           Background Pk Height (A): 0.101
lank Corrected Pk Area (A-s): -0.006
oncentration (ug/L  ): -0.36

lean Conc  (ug/L  ):       -0.37         SD: 0.005                RSD(%): 1.39

uto-zero performed.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
le    ID: 0.5 PPB              Seq. No.: 00051    A/S Pos.: 1     Date: 10/22/

eplicate  1                              Time: 16:36
eak Area (A-s): 0.008                    Peak Height (A): 0.023
lackground Pk Area (A-s): 0.180          Background Pk Height (A): 0.122
lank Corrected Pk Area (A-s): 0.011
oncentration (ug/L  ): 0.68

eplicate  2                              Time: 16:40
eak Area (A-s): 0.010                    Peak Height (A): 0.029
ackground Pk Area (A-s): 0.149           Background Pk Height (A): 0.121
lank Corrected Pk Area (A-s): 0.013
oncentration (ug/L  ): 0.79

lean Conc  (ug/L  ):        0.73         SD: 0.079                RSD(%): 10.74

tandard number 1 applied.  [0.50]
orrelation coefficient: 1.00000          Slope: 0.0237

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
e    ID: 2 PPB                Seq. No.: 00052    A/S Pos.: 2     Date: 10/22/

eplicate  1                              Time: 16:43
eak Area (A-s): 0.039                    Peak Height (A): 0.096
ackground Pk Area (A-s): 0.186           Background Pk Height (A): 0.245
lank Corrected Pk Area (A-s): 0.042
oncentration (ug/L  ): 1.76

eplicate  2                              Time: 16:46
eak Area (A-s): 0.041                    Peak Height (A): 0.118
ackground Pk Area (A-s): 0.182           Background Pk Height (A): 0.276
lank Corrected Pk Area (A-s): 0.044
oncentration (ug/L  ): 1.87
```

Mean Conc (ug/L): 1.81 SD: 0.082 RSD(%): 4.5

Standard number 2 applied. [2.00]
Correlation coefficient: 0.99891 Slope: 0.0216

Be ID: 5 PPB Seq. No.: 00053 A/S Pos.: 3 Date: 10/2

Replicate 1 Time: 16:49
Peak Area (A-s): 0.100 Peak Height (A): 0.255
Background Pk Area (A-s): 0.305 Background Pk Height (A): 0.632
Blank Corrected Pk Area (A-s): 0.103
Concentration (ug/L): 4.76

Replicate 2 Time: 16:52
Peak Area (A-s): 0.103 Peak Height (A): 0.250
Background Pk Area (A-s): 0.297 Background Pk Height (A): 0.630
Blank Corrected Pk Area (A-s): 0.106
Concentration (ug/L): 4.88

Mean Conc (ug/L): 4.82 SD: 0.085 RSD(%): 1.7

Standard number 3 applied. [5.00]
Correlation coefficient: 0.99966 Slope: 0.0210

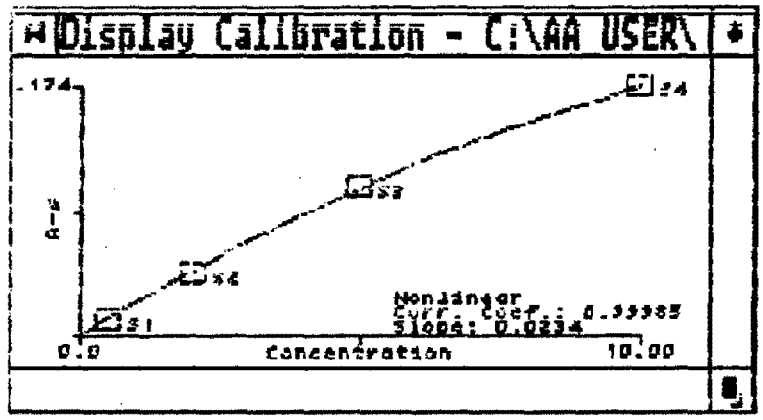
Be ID: 10 PPB Seq. No.: 00054 A/S Pos.: 4 Date: 10/2

Replicate 1 Time: 16:55
Peak Area (A-s): 0.173 Peak Height (A): 0.286
Background Pk Area (A-s): 0.505 Background Pk Height (A): 1.139
Blank Corrected Pk Area (A-s): 0.176
Concentration (ug/L): 8.39

Replicate 2 Time: 16:58
Peak Area (A-s): 0.170 Peak Height (A): 0.268
Background Pk Area (A-s): 0.500 Background Pk Height (A): 1.194
Blank Corrected Pk Area (A-s): 0.173
Concentration (ug/L): 8.23

Mean Conc (ug/L): 8.31 SD: 0.113 RSD(%): 1.36

Standard number 4 applied. [10.00]
Correlation coefficient: 0.99183 Slope: 0.0184



Be ID: ICV Seq. No.: 00055 A/S Pos.: 5 Date: 10/22/

Replicate 1 Time: 17:05
Concentration (ug/L): 5.12

Replicate 2 Time: 17:08
Concentration (ug/L): 5.01

Mean Conc (ug/L): 5.07 SD: 0.077 RSD(%): 1.51

QC sample is within range 3.5 - 6.49

Be ID: ICB Seq. No.: 00056 A/S Pos.: 0 Date: 10/22/

Replicate 1 Time: 17:11
Concentration (ug/L): 0.16

Replicate 2 Time: 17:14
Concentration (ug/L): 0.16

Mean Conc (ug/L): 0.16 SD: 0.002 RSD(%): 1.25

QC sample is within range -1.49 - 1.49

Auto-zero performed.

Be ID: 81003.RB-AP Seq. No.: 00057 A/S Pos.: 14 Date: 10/22/

Replicate 1 Time: 17:17
Concentration (ug/L): -0.01

Replicate 2 Time: 17:20
Concentration (ug/L): -0.02

Mean Conc (ug/L): -0.02 SD: 0.008 RSD(%): 44.56

Be ID: 81003.RB-F Seq. No.: 00058 A/S Pos.: 15 Date: 10/22/

Replicate 1 Time: 17:24

Concentration (ug/L): 0.01

Replicate 2 Time: 17:27
Concentration (ug/L): -0.03

Mean Conc (ug/L): -0.01 SD: 0.027 RSD(%): 232

Be ID: B1003.0B Seq. No.: 00059 A/S Pos.: 16 Date: 10/2

Replicate 1 Time: 17:30
Concentration (ug/L): -0.01

Replicate 2 Time: 17:33
Concentration (ug/L): -0.04

Mean Conc (ug/L): -0.03 SD: 0.020 RSD(%): 74.

Be ID: B1003.UB Seq. No.: 00060 A/S Pos.: 17 Date: 10/2

Replicate 1 Time: 17:36
Concentration (ug/L): 0.02

Replicate 2 Time: 17:39
Concentration (ug/L): 0.02

Mean Conc (ug/L): 0.02 SD: 0.002 RSD(%): 8.01

Be ID: B1003.IB Seq. No.: 00061 A/S Pos.: 18 Date: 10/2

Replicate 1 Time: 17:43
Concentration (ug/L): 0.02

Replicate 2 Time: 17:46
Concentration (ug/L): 0.03

Mean Conc (ug/L): 0.03 SD: 0.006 RSD(%): 21.1

Be ID: B1003.01 Seq. No.: 00062 A/S Pos.: 19 Date: 10/22

Replicate 1 Time: 17:49
Concentration (ug/L): 0.04

Replicate 2 Time: 17:52
Concentration (ug/L): -0.00

Mean Conc (ug/L): 0.02 SD: 0.028 RSD(%): 163.

Be ID: B1003.01 Seq. No.: 00063 A/S Pos.: 19 Date: 10/22

Replicate 1 Time: 17:55
Concentration (ug/L): 4.51

Replicate 2 Time: 17:59
Concentration (ug/L): 4.61

Mean Conc (ug/L): 4.56 SD: 0.073 RSD(%): 1.60

Recovery is 90.8%

Be ID: 81003.02 Seq. No.: 00064 A/S Pos.: 20 Date: 10/22

Replicate 1 Time: 18:02
Concentration (ug/L): 0.04

Replicate 2 Time: 18:05
Concentration (ug/L): 0.05

Mean Conc (ug/L): 0.05 SD: 0.006 RSD(%): 12.9

Be ID: 81003.03 Seq. No.: 00065 A/S Pos.: 21 Date: 10/22

Replicate 1 Time: 18:08
Concentration (ug/L): 0.01

Replicate 2 Time: 18:11
Concentration (ug/L): -0.02

Mean Conc (ug/L): -0.00 SD: 0.019 RSD(%): 961.

Be ID: CCV Seq. No.: 00066 A/S Pos.: 3 Date: 10/22

Replicate 1 Time: 18:15
Concentration (ug/L): 4.81

Replicate 2 Time: 18:18
Concentration (ug/L): 4.85

Mean Conc (ug/L): 4.83 SD: 0.028 RSD(%): 0.57

QC sample is within range 3.5 - 6.49

Be ID: CCB Seq. No.: 00067 A/S Pos.: 0 Date: 10/22

Replicate 1 Time: 18:21
Concentration (ug/L): -0.01

Replicate 2 Time: 18:24
Concentration (ug/L): -0.02

Mean Conc (ug/L): -0.01 SD: 0.008 RSD(%): 55.9

QC sample is within range -1.49 - 1.49

Be ID: 81003.U1 Seq. No.: 00068 A/S Pos.: 22 Date: 10/22

Replicate 1 Time: 18:27
Concentration (ug/L): 0.04

Replicate 2 Time: 18:30

Concentration (ug/L): 0.08

Mean Conc (ug/L): 0.06 SD: 0.022 RSD(%): 35.

Be ID: 81003.U2 Seq. No.: 00069 A/S Pos.: 23 Date: 10/2

Replicate 1 Time: 18:33
Concentration (ug/L): 0.09

Replicate 2 Time: 18:36
Concentration (ug/L): 0.25

Mean Conc (ug/L): 0.17 SD: 0.109 RSD(%): 63.

Be ID: 81003.U3 Seq. No.: 00070 A/S Pos.: 24 Date: 10/2

Replicate 1 Time: 18:39
Concentration (ug/L): 0.12

Replicate 2 Time: 18:42
Concentration (ug/L): 0.12

Mean Conc (ug/L): 0.12 SD: 0.005 RSD(%): 3.83

Be ID: 81003.I1 Seq. No.: 00071 A/S Pos.: 25 Date: 10/22

Replicate 1 Time: 18:46
Concentration (ug/L): 9.48

Replicate 2 Time: 18:49
Concentration (ug/L): 9.66

Mean Conc (ug/L): 9.57 SD: 0.124 RSD(%): 1.30

Be ID: 81003.I2 Seq. No.: 00072 A/S Pos.: 26 Date: 10/22

Replicate 1 Time: 18:52
Concentration (ug/L): 10.79

Replicate 2 Time: 18:55
Concentration (ug/L): 10.67

Mean Conc (ug/L): 10.73 SD: 0.084 RSD(%): 0.79

Be ID: 81003.I3 Seq. No.: 00073 A/S Pos.: 27 Date: 10/22

Replicate 1 Time: 18:58
Concentration (ug/L): 10.24

Replicate 2 Time: 19:01
Concentration (ug/L): 10.10

Mean Conc (ug/L): 10.17 SD: 0.101 RSD(%): 0.99

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MAIN: 0.001	AA HO 0.001		MAIN: 0.000	AA HO-0.000	
CD	MEAN: 0.000	SD: 0.000	RSD: 80.4	AUTOZERO	0.000

MAIN: 0.017	AA HO 0.017		MAIN: 0.016	AA HO 0.016	
CD	MEAN: 0.016	SD: 0.000	RSD: 2.6	1.STANDARD	0.050 MG/L

MAIN: 0.097 MG/L	AA HO 0.032		MAIN: 0.098 MG/L	AA HO 0.032	
CD	MEAN: 0.098 MG/L	SD: 0.001	RSD: 1.0	2.STANDARD	0.100 MG/L

MAIN: 0.197 MG/L	AA HO 0.063		MAIN: 0.199 MG/L	AA HO 0.064	
CD	MEAN: 0.198 MG/L	SD: 0.002	RSD: 0.8	3.STANDARD	0.200 MG/L

MAIN: 0.477 MG/L	AA HO 0.152		MAIN: 0.471 MG/L	AA HO 0.150	
CD	MEAN: 0.474 MG/L	SD: 0.005	RSD: 1.0	4.STANDARD	0.495 MG/L

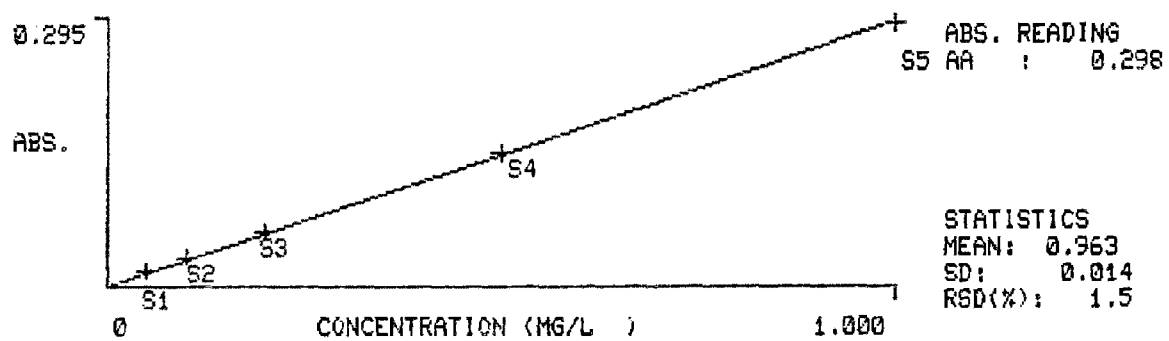
MAIN: 0.953 MG/L	AA HO 0.291		MAIN: 0.974 MG/L	AA HO 0.298	
CD	MEAN: 0.963 MG/L	SD: 0.014	RSD: 1.5	5.STANDARD	0.991 MG/L

FLAME DISPLAY CALIBRATION MODE
ELEMENT: CD

REPL. 0 OF 2

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

0.991



C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN: 0.008 MG/L	AA HO 0.000		MAIN: 0.008 MG/L	AA HO 0.000	
CD	MEAN: 0.008 MG/L	SD: 0.000	RSD: 1.5	AUTOZERO	0.000

	AA		AA
MAIN: 0.520 MG/L	HO 0.155	MAIN: 0.524 MG/L	HO 0.156

CD ICV MEAN: 0.522 MG/L SD: 0.002 RSD: 0.5

	AA		AA
MAIN: 0.003 MG/L	HO 0.001	MAIN: 0.003 MG/L	HO 0.001

CD ICB MEAN: 0.003 MG/L SD: 0.001 RSD: 22.1

	AA		AA
MAIN: 0.004 MG/L	HO 0.001	MAIN: 0.003 MG/L	HO 0.001

CD Set Ø MEAN: 0.004 MG/L SD: 0.001 RSD: 18.5 AUTOZERO 0.000

	AA		AA
MAIN: 0.020 MG/L	HO 0.006	MAIN: 0.019 MG/L	HO 0.006

100 CD B-1 MEAN: 0.020 MG/L SD: 0.001 RSD: 3.6

	AA		AA
MAIN: 0.012 MG/L	HO 0.004	MAIN: 0.013 MG/L	HO 0.004

CD 8-1 MEAN: 0.013 MG/L SD: 0.001 RSD: 6.0

	AA		AA
MAIN: 0.414 MG/L	HO 0.123	MAIN: 0.418 MG/L	HO 0.124

CD 8-1S MEAN: 0.416 MG/L SD: 0.003 RSD: 0.6

	AA		AA
MAIN: 0.017 MG/L	HO 0.005	MAIN: 0.018 MG/L	HO 0.005

CD 9-1 MEAN: 0.017 MG/L SD: 0.000 RSD: 2.8

	AA		AA
MAIN: 0.018 MG/L	HO 0.005	MAIN: 0.017 MG/L	HO 0.005

CD 9-1D MEAN: 0.017 MG/L SD: 0.000 RSD: 2.6

	AA		AA
MAIN: 0.021 MG/L	HO 0.006	MAIN: 0.021 MG/L	HO 0.006

CD 10-1 MEAN: 0.021 MG/L SD: 0.000 RSD: 2.3

	AA		AA
MAIN: 0.024 MG/L	HO 0.007	MAIN: 0.026 MG/L	HO 0.008

CD B-2A MEAN: 0.025 MG/L SD: 0.001 RSD: 3.9

MAIN:	0.029 MG/L	AA HO 0.009	MAIN:	0.029 MG/L	AA HO 0.009

CD 8-2A MEAN: 0.029 MG/L SD: 0.000 RSD: 1.4

MAIN:	0.387 MG/L	AA HO 0.115	MAIN:	0.389 MG/L	AA HO 0.116

CD 8-2AS MEAN: 0.388 MG/L SD: 0.001 RSD: 0.3

MAIN:	0.502 MG/L	AA HO 0.149	MAIN:	0.488 MG/L	AA HO 0.145

CD CCV ~~9-2A~~ MEAN: 0.495 MG/L SD: 0.009 RSD: 1.9

MAIN:	0.002 MG/L	AA HO 0.001	MAIN:	0.001 MG/L	AA HO 0.000

CD CCB MEAN: 0.001 MG/L SD: 0.000 RSD: 29.9

MAIN:	0.029 MG/L	AA HO 0.009	MAIN:	0.031 MG/L	AA HO 0.009

CD 9-2A MEAN: 0.030 MG/L SD: 0.002 RSD: 5.4

MAIN:	0.026 MG/L	AA HO 0.008	MAIN:	0.030 MG/L	AA HO 0.009

CD 9-2AD MEAN: 0.028 MG/L SD: 0.003 RSD: 10.2

MAIN:	0.027 MG/L	AA HO 0.008	MAIN:	0.029 MG/L	AA HO 0.009

CD 10-2A MEAN: 0.028 MG/L SD: 0.001 RSD: 3.2

MAIN:	0.020 MG/L	AA HO 0.006	MAIN:	0.018 MG/L	AA HO 0.005

1003 CD RB-AP MEAN: 0.019 MG/L SD: 0.002 RSD: 10.0

MAIN:	0.017 MG/L	AA HO 0.005	MAIN:	0.017 MG/L	AA HO 0.005

CD RB-1 MEAN: 0.017 MG/L SD: 0.000 RSD: 2.1

MAIN:	0.020 MG/L	AA HO 0.006	MAIN:	0.019 MG/L	AA HO 0.006

CD OB MEAN: 0.020 MG/L SD: 0.001 RSD: 3.8

MAIN: 0.018 MG/L	HO 0.005 AA		MAIN: 0.017 MG/L	HO 0.005 AA	
CD uB	MEAN: 0.018 MG/L	SD: 0.001	RSD: 3.0		
MAIN: 0.022 MG/L	HO 0.006 AA		MAIN: 0.019 MG/L	HO 0.006 AA	
CD IB	MEAN: 0.020 MG/L	SD: 0.002	RSD: 9.6		
MAIN: 0.503 MG/L	HO 0.149 AA		MAIN: 0.519 MG/L	HO 0.154 AA	
CD ccV	MEAN: 0.511 MG/L	SD: 0.011	RSD: 2.2		
MAIN: 0.003 MG/L	HO 0.001 AA		MAIN: 0.003 MG/L	HO 0.001 AA	
CD ccB	MEAN: 0.003 MG/L	SD: 0.000	RSD: 3.6		
MAIN: 0.003 MG/L	HO 0.001 AA		MAIN: 0.001 MG/L	HO 0.000 AA	
CD sto	MEAN: 0.002 MG/L	SD: 0.002	RSD: 97.5	AUTOZERO	0.000
MAIN: 0.016 MG/L	HO 0.005 AA		MAIN: 0.019 MG/L	HO 0.006 AA	
CD 01	MEAN: 0.018 MG/L	SD: 0.003	RSD: 15.3		
MAIN: 0.013 MG/L	HO 0.004 AA		MAIN: 0.014 MG/L	HO 0.004 AA	
CD 02	MEAN: 0.014 MG/L	SD: 0.001	RSD: 4.9		
MAIN: 0.014 MG/L	HO 0.004 AA		MAIN: 0.013 MG/L	HO 0.004 AA	
CD 02D	MEAN: 0.014 MG/L	SD: 0.000	RSD: 2.0		
MAIN: 0.017 MG/L	HO 0.005 AA		MAIN: 0.017 MG/L	HO 0.005 AA	
CD 03	MEAN: 0.017 MG/L	SD: 0.000	RSD: 1.1		
MAIN: 0.020 MG/L	HO 0.006 AA		MAIN: 0.019 MG/L	HO 0.006 AA	
CD 41	MEAN: 0.019 MG/L	SD: 0.001	RSD: 5.8		

MAIN:	0.016 MG/L	AA HO 0.005	MAIN:	0.017 MG/L	AA HO 0.005
CD U2	MEAN: 0.016 MG/L	SD: 0.001 RSD: 7.0			
MAIN:	0.011 MG/L	AA HO 0.003	MAIN:	0.012 MG/L	AA HO 0.003
CD U3	MEAN: 0.011 MG/L	SD: 0.001 RSD: 5.9			
MAIN:	0.499 MG/L	AA HO 0.148	MAIN:	0.500 MG/L	AA HO 0.149
CD CCV	MEAN: 0.500 MG/L	SD: 0.001 RSD: 0.2			
MAIN:	0.001 MG/L	AA HO 0.000	MAIN:	0.002 MG/L	AA HO 0.001
CD CCB	MEAN: 0.002 MG/L	SD: 0.001 RSD: 35.5			
MAIN:	0.030 MG/L	AA HO 0.009	MAIN:	0.030 MG/L	AA HO 0.009
CD I1	MEAN: 0.030 MG/L	SD: 0.000 RSD: 0.6			
MAIN:	0.415 MG/L	AA HO 0.123	MAIN:	0.421 MG/L	AA HO 0.125
CD ILS	MEAN: 0.418 MG/L	SD: 0.004 RSD: 0.9			
MAIN:	0.038 MG/L	AA HO 0.011	MAIN:	0.038 MG/L	AA HO 0.011
CD I2	MEAN: 0.038 MG/L	SD: 0.000 RSD: 0.9			
MAIN:	0.041 MG/L	AA HO 0.012	MAIN:	0.044 MG/L	AA HO 0.013
CD I3	MEAN: 0.043 MG/L	SD: 0.002 RSD: 5.3			
MAIN:	0.024 MG/L	AA HO 0.007	MAIN:	0.026 MG/L	AA HO 0.008
CD 1	MEAN: 0.025 MG/L	SD: 0.001 RSD: 5.8			
MAIN:	0.412 MG/L	AA HO 0.122	MAIN:	0.406 MG/L	AA HO 0.121
CD IS	MEAN: 0.409 MG/L	SD: 0.005 RSD: 1.1			

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MAIN:	0.020 MG/L	AA HO 0.006	MAIN:	0.020 MG/L	AA HO 0.006

CD 2 MEAN: 0.020 MG/L SD: 0.000 RSD: 0.1

MAIN:	0.018 MG/L	AA HO 0.005	MAIN:	0.018 MG/L	AA HO 0.005

CD 2D MEAN: 0.018 MG/L SD: 0.000 RSD: 0.8

MAIN:	0.025 MG/L	AA HO 0.007	MAIN:	0.025 MG/L	AA HO 0.007

CD 3 MEAN: 0.025 MG/L SD: 0.000 RSD: 0.1

MAIN:	0.511 MG/L	AA HO 0.152	MAIN:	0.514 MG/L	AA HO 0.153

CD CCV MEAN: 0.513 MG/L SD: 0.002 RSD: 0.5

MAIN:	0.005 MG/L	AA HO 0.002	MAIN:	0.005 MG/L	AA HO 0.001

CD CCB MEAN: 0.005 MG/L SD: 0.000 RSD: 7.0

SMA 400 Analysis Ver. 4.10 Fri 10/16/98 - 15:05:10

hod File Name: CR Replicates:4 Read Delay: 65
arks: CR ONLY Data File:

Wt file is 10236

ΓANDARD #1			REPLICATE #1					1506 10/16/98	
	cr267	EM	683						
ΓANDARD #1			REPLICATE #2						
	cr267	EM	667						
ΓANDARD #1			REPLICATE #3						
	cr267	EM	679						
ΓANDARD #1			REPLICATE #4						
	cr267	EM	685						
	cr267	AV	678.5	SD	8.1	CV	1.2	CONC	0.1000
ΓANDARD #2			REPLICATE #1					1508 10/16/98	
	cr267	EM	2848						
ΓANDARD #2			REPLICATE #2						
	cr267	EM	2825						
ΓANDARD #2			REPLICATE #3						
	cr267	EM	3371						
ΓANDARD #2			REPLICATE #4						
	cr267	EM	2785						
	cr267	AV	2957.3	SD	277.1	CV	9.4	CONC	1.0000
ΓANDARD #3			REPLICATE #1					1510 10/16/98	
	cr267	EM	5289						
ΓANDARD #3			REPLICATE #2						
	cr267	EM	5592						
ΓANDARD #3			REPLICATE #3						
	cr267	EM	5139						
ΓANDARD #3			REPLICATE #4						
	cr267	EM	5327						
	cr267	AV	5336.8	SD	188.5	CV	3.5	CONC	2.0000
ΓANDARD #4			REPLICATE #1					1512 10/16/98	
	cr267	EM	12473						
ΓANDARD #4			REPLICATE #2						
	cr267	EM	12358						
ΓANDARD #4			REPLICATE #3						
	cr267	EM	[illegible]						

ANDARD #4 REPLICATE #4
cr267 EM 12446

cr267 AV 12453.0 SD 73.5 CV 0.6 CONC 5.0000

ANK REPLICATE #1 1514 10/16/98
cr267 EM 514

ANK REPLICATE #2
cr267 EM 506

ANK REPLICATE #3
cr267 EM 489

ANK REPLICATE #4
cr267 EM 529

cr267 AV 509.5 SD 16.7 CV 3.3 CONC 0.0000

cr267 CC 0.9999 SLOPE 2393.9426 INT 508.8128

V REPLICATE #1 1516 10/16/98
cr267 EM 5005 1.8782 mg/L

V REPLICATE #2
cr267 EM 5164 1.9446 mg/L

V REPLICATE #3
cr267 EM 5113 1.9233 mg/L

V REPLICATE #4
cr267 EM 5724 2.1785 mg/L

cr267 AV 5251.5 EM SD 321.9 CV 6.1

cr267 AV 1.9811 mg/L SD 0.1345 CV 6.79

B REPLICATE #1 1518 10/16/98
cr267 EM 477 -0.0133 mg/L peak-noisy

B REPLICATE #2
cr267 EM 437 -0.0300 mg/L window-edge

B REPLICATE #3
cr267 EM 434 -0.0313 mg/L window-edge

B REPLICATE #4
cr267 EM 496 -0.0054 mg/L window-edge

cr267 AV 461.0 EM SD 30.5 CV 6.6

cr267 AV -0.0200 mg/L SD 0.0127 CV 63.74

1002.B-1 REPLICATE #1 1520 10/16/98
cr267 EM 446 -0.0262 mg/L peak-noisy

1002.B-1 REPLICATE #2
cr267 EM 490 -0.0079 mg/L

1002.B-1 REPLICATE #3
cr267 EM 475 -0.0141 mg/L

1002.B-1 REPLICATE #4
cr267 EM 464 -0.0187 mg/L peak-noisy

cr267 AV -0.0167 mg/L SD 0.0077 CV 46.27

-1 REPLICATE #1 1522 10/16/98
cr267 EM 4119 1.5081 mg/L

-1 REPLICATE #2
cr267 EM 3947 1.4362 mg/L

-1 REPLICATE #3
cr267 EM 4154 1.5227 mg/L

-1 REPLICATE #4
cr267 EM 4042 1.4759 mg/L

cr267 AV 4065.5 EM SD 91.8 CV 2.3

cr267 AV 1.4857 mg/L SD 0.0384 CV 2.58

-1 REPLICATE #1 1524 10/16/98
cr267 EM 3568 1.2779 mg/L

-1 REPLICATE #2
cr267 EM 3640 1.3080 mg/L

-1 REPLICATE #3
cr267 EM 3540 1.2662 mg/L

-1 REPLICATE #4
cr267 EM 3524 1.2595 mg/L

cr267 AV 3568.0 EM SD 51.3 CV 1.4

cr267 AV 1.2779 mg/L SD 0.0214 CV 1.68

-1D REPLICATE #1 1526 10/16/98
cr267 EM 3476 1.2395 mg/L

-1D REPLICATE #2
cr267 EM 3637 1.3067 mg/L

-1D REPLICATE #3
cr267 EM 3613 1.2967 mg/L

-1D REPLICATE #4
cr267 EM 3455 1.2307 mg/L

cr267 AV 3545.3 EM SD 93.0 CV 2.6

cr267 AV 1.2684 mg/L SD 0.0388 CV 3.06

)—1 REPLICATE #1 1528 10/16/98
cr267 EM 3937 1.4320 mg/L

)—1 REPLICATE #2
cr267 EM 3902 1.4174 mg/L

)—1 REPLICATE #3
cr267 EM 3938 1.4324 mg/L

)—1 REPLICATE #4
cr267 EM 4404 1.6271 mg/L

cr267 AV 4045.3 EM SD 239.8 CV 5.9

cr267 AV 1.4772 mg/L

>—1S REPLICATE #1 1530 10/16/98
cr267 EM 7274 2.8260 mg/L

>—1S REPLICATE #2
cr267 EM 7597 2.9609 mg/L

>—1S REPLICATE #3
cr267 EM 7233 2.8088 mg/L

>—1S REPLICATE #4
cr267 EM 7530 2.9329 mg/L

cr267 AV 7408.5 EM SD 181.8 CV 2.5

cr267 AV 2.8821 mg/L SD 0.0760 CV 2.64

-2A REPLICATE #1 1531 10/16/98
cr267 EM 442 -0.0279 mg/L peak-noisy

-2A REPLICATE #2
cr267 EM 427 -0.0342 mg/L

-2A REPLICATE #3
cr267 EM 443 -0.0275 mg/L window-edge

-2A REPLICATE #4
cr267 EM 429 -0.0333 mg/L window-edge

cr267 AV 435.3 EM SD 8.4 CV 1.9

cr267 AV -0.0307 mg/L SD 0.0035 CV 11.45

-2A REPLICATE #1 1533 10/16/98
cr267 EM 686 0.0740 mg/L

-2A REPLICATE #2
cr267 EM 716 0.0865 mg/L peak-noisy

-2A REPLICATE #3
cr267 EM 703 0.0811 mg/L

-2A REPLICATE #4
cr267 EM 724 0.0899 mg/L

cr267 AV 707.3 EM SD 16.6 CV 2.3

cr267 AV 0.0829 mg/L SD 0.0069 CV 8.37

-2A REPLICATE #1 1535 10/16/98
cr267 EM 538 0.0122 mg/L peak-noisy

-2A REPLICATE #2
cr267 EM 533 0.0101 mg/L

-2A REPLICATE #3
cr267 EM 557 0.0201 mg/L peak-noisy

-2A REPLICATE #4
cr267 EM 567 0.0243 mg/L peak-noisy

cr267 AV 548.8 EM SD 16.0 CV 2.9

JT REPLICATE #1 1537 10/16/98
cr267 EM 488 -0.0087 mg/L

JT REPLICATE #2
cr267 EM 456 -0.0221 mg/L peak-noisy

JT REPLICATE #3
cr267 EM 449 -0.0250 mg/L peak-noisy

JT REPLICATE #4
cr267 EM 446 -0.0262 mg/L peak-noisy

cr267 AV 459.8 EM SD 19.3 CV 4.2

cr267 AV -0.0205 mg/L SD 0.0081 CV 39.32

:V REPLICATE #1 1539 10/16/98
cr267 EM 4703 1.7520 mg/L

:V REPLICATE #2
cr267 EM 5274 1.9905 mg/L

:V REPLICATE #3
cr267 EM 4799 1.7921 mg/L

:V REPLICATE #4
cr267 EM 4899 1.8339 mg/L

cr267 AV 4918.8 EM SD 250.0 CV 5.1

cr267 AV 1.8421 mg/L SD 0.1044 CV 5.67

:B REPLICATE #1 1541 10/16/98
cr267 EM 453 -0.0233 mg/L peak-noisy

:B REPLICATE #2
cr267 EM 460 -0.0204 mg/L peak-noisy

:B REPLICATE #3
cr267 EM 441 -0.0283 mg/L peak-noisy

:B REPLICATE #4
cr267 EM 455 -0.0225 mg/L peak-noisy

cr267 AV 452.3 EM SD 8.1 CV 1.8

cr267 AV -0.0236 mg/L SD 0.0034 CV 14.24

)—2A REPLICATE #1 1543 10/16/98
cr267 EM 413 -0.0400 mg/L peak-noisy

)—2A REPLICATE #2
cr267 EM 437 -0.0300 mg/L peak-noisy

)—2A REPLICATE #3
cr267 EM 424 -0.0354 mg/L peak-noisy

)—2A REPLICATE #4
cr267 EM 415 -0.0392 mg/L window-edge

cr267 AV 422.3 EM SD 10.9 CV 2.6

cr267 AV -0.0362 mg/L SD 0.0046 CV 12.63

)—2AS REPLICATE #1 1545 10/16/98
cr267 EM 3832 1.3882 mg/L

)—2AS REPLICATE #2
cr267 EM 3978 1.4492 mg/L

)—2AS REPLICATE #3
cr267 EM 4248 1.5619 mg/L

)—2AS REPLICATE #4
cr267 EM 4013 1.4638 mg/L

cr267 AV 4017.8 EM SD 172.4 CV 4.3

cr267 AV 1.4658 mg/L SD 0.0720 CV 4.91

3—AP REPLICATE #1 1547 10/16/98
cr267 EM 415 -0.0392 mg/L peak-noisy

3—AP REPLICATE #2
cr267 EM 447 -0.0258 mg/L peak-noisy

3—AP REPLICATE #3
cr267 EM 432 -0.0321 mg/L peak-noisy

3—AP REPLICATE #4
cr267 EM 434 -0.0313 mg/L window-edge

cr267 AV 432.0 EM SD 13.1 CV 3.0

cr267 AV -0.0321 mg/L SD 0.0055 CV 17.11

3—F REPLICATE #1 1549 10/16/98
cr267 EM 413 -0.0400 mg/L peak-noisy

3—F REPLICATE #2
cr267 EM 468 -0.0170 mg/L peak-noisy

3—F REPLICATE #3
cr267 EM 455 -0.0225 mg/L peak-noisy

3—F REPLICATE #4
cr267 EM 439 -0.0292 mg/L

cr267 AV 443.8 EM SD 23.7 CV 5.3

3 REPLICATE #1 1551 10/16/98
cr267 EM 419 -0.0375 mg/L window-edge

3 REPLICATE #2
cr267 EM 419 -0.0375 mg/L peak-noisy

3 REPLICATE #3
cr267 EM 433 -0.0317 mg/L peak-noisy

3 REPLICATE #4
cr267 EM 461 -0.0200 mg/L peak-noisy

cr267 AV 433.0 EM SD 19.8 CV 4.6

cr267 AV -0.0317 mg/L SD 0.0083 CV 26.12

3 REPLICATE #1 1553 10/16/98
cr267 EM 446 -0.0262 mg/L peak-noisy

3 REPLICATE #2
cr267 EM 452 -0.0237 mg/L

3 REPLICATE #3
cr267 EM 453 -0.0233 mg/L peak-noisy

3 REPLICATE #4
cr267 EM 444 -0.0271 mg/L peak-noisy

cr267 AV 448.8 EM SD 4.4 CV 1.0

cr267 AV -0.0251 mg/L SD 0.0018 CV 7.37

3 REPLICATE #1 1555 10/16/98
cr267 EM 443 -0.0275 mg/L

3 REPLICATE #2
cr267 EM 444 -0.0271 mg/L peak-noisy

3 REPLICATE #3
cr267 EM 452 -0.0237 mg/L peak-noisy

3 REPLICATE #4
cr267 EM 444 -0.0271 mg/L peak-noisy

cr267 AV 445.8 EM SD 4.2 CV 0.9

cr267 AV -0.0263 mg/L SD 0.0018 CV 6.65

CV REPLICATE #1 1556 10/16/98
cr267 EM 5520 2.0933 mg/L

CV REPLICATE #2
cr267 EM 5588 2.1217 mg/L

CV REPLICATE #3
cr267 EM 5657 2.1505 mg/L

CV REPLICATE #4
cr267 EM 5580 2.1183 mg/L

cr267 AV 5586.3 EM SD 56.1 CV 1.0

cr267 AV 2.1210 mg/L SD 0.0234 CV 1.10

CB REPLICATE #1 1558 10/16/98

:B REPLICATE #2
cr267 EM 471 -0.0158 mg/L peak-noisy

:B REPLICATE #3
cr267 EM 437 -0.0300 mg/L

:B REPLICATE #4
cr267 EM 437 -0.0300 mg/L

cr267 AV 448.0 EM SD 16.0 CV 3.6

cr267 AV -0.0254 mg/L SD 0.0067 CV 26.38

L REPLICATE #1 1600 10/16/98
cr267 EM 432 -0.0321 mg/L peak-noisy

L REPLICATE #2
cr267 EM 443 -0.0275 mg/L peak-noisy

L REPLICATE #3
cr267 EM 436 -0.0304 mg/L peak-noisy

L REPLICATE #4
cr267 EM 439 -0.0292 mg/L peak-noisy

cr267 AV 437.5 EM SD 4.7 CV 1.1

cr267 AV -0.0298 mg/L SD 0.0019 CV 6.53

1A 400 Analysis Ver. 4.10 Mon 10/19/98 - 14:34:28

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od File Name: CR Replicates:4 Read Delay: 65
rks: CR ONLY Data File:

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ANDARD #1 REPLICATE #1 1437 10/19/98
cr267 EM 819

ANDARD #1 REPLICATE #2
cr267 EM 733

ANDARD #1 REPLICATE #3
cr267 EM 738

ANDARD #1 REPLICATE #4
cr267 EM 742 peak-noisy

cr267 AV 758.0 SD 40.8 CV 5.4 CONC 0.1000

ANDARD #2 REPLICATE #1 1439 10/19/98
cr267 EM 3063

ANDARD #2 REPLICATE #2
cr267 EM 3043

ANDARD #2 REPLICATE #3
cr267 EM 2965

ANDARD #2 REPLICATE #4
cr267 EM 3123

cr267 AV 3048.5 SD 65.2 CV 2.1 CONC 1.0000

ANDARD #3 REPLICATE #1 1441 10/19/98
cr267 EM 6422

ANDARD #3 REPLICATE #2
cr267 EM 5739

ANDARD #3 REPLICATE #3
cr267 EM 5782

ANDARD #3 REPLICATE #4
cr267 EM 5498

cr267 AV 5860.3 SD 394.8 CV 6.7 CONC 2.0000

ANDARD #4 REPLICATE #1 1443 10/19/98
cr267 EM 13437

ANDARD #4 REPLICATE #2
cr267 EM 13568

ANDARD #4 REPLICATE #3

ANDARD #4 REPLICATE #4
cr267 EM 13968

cr267 AV 13549.8 SD 312.4 CV 2.3 CONC 5.0000

ANK REPLICATE #1 1445 10/19/98
cr267 EM 587

ANK REPLICATE #2
cr267 EM 694

ANK REPLICATE #3
cr267 EM 580

ANK REPLICATE #4
cr267 EM 552

cr267 AV 603.3 SD 62.4 CV 10.3 CONC 0.0000

cr267 CC 0.9999 SLOPE 2605.7290 INT 542.6687

V REPLICATE #1 1447 10/19/98
cr267 EM 5227 1.7977 mg/L

V REPLICATE #2
cr267 EM 5265 1.8123 mg/L

V REPLICATE #3
cr267 EM 5353 1.8461 mg/L

V REPLICATE #4
cr267 EM 5384 1.8580 mg/L

cr267 AV 5307.3 EM SD 73.5 CV 1.4

cr267 AV 1.8285 mg/L SD 0.0282 CV 1.54

B REPLICATE #1 1449 10/19/98
cr267 EM 493 -0.0191 mg/L peak-noisy

B REPLICATE #2
cr267 EM 493 -0.0191 mg/L peak-noisy

B REPLICATE #3
cr267 EM 482 -0.0233 mg/L peak-noisy

B REPLICATE #4
cr267 EM 560 0.0067 mg/L peak-noisy

cr267 AV 507.0 EM SD 35.7 CV 7.0

cr267 AV -0.0137 mg/L SD 0.0137 CV 100.12

003.01 REPLICATE #1 1451 10/19/98
cr267 EM 479 -0.0244 mg/L peak-noisy

003.01 REPLICATE #2
cr267 EM 497 -0.0175 mg/L peak-noisy

003.01 REPLICATE #3
cr267 EM 521 -0.0083 mg/L

003.01 REPLICATE #4

cr267 AV 498.8 EM SD 17.2 CV 3.5

cr267 AV -0.0169 mg/L SD 0.0066 CV 39.19

S REPLICATE #1 1453 10/19/98
cr267 EM 514 -0.0110 mg/L peak-noisy

S REPLICATE #2
cr267 EM 530 -0.0049 mg/L

02

S REPLICATE #3
cr267 EM 546 0.0013 mg/L

S REPLICATE #4
cr267 EM 542 -0.0003 mg/L peak-noisy

cr267 AV 533.0 EM SD 14.4 CV 2.7

cr267 AV -0.0037 mg/L SD 0.0055 CV 148.68

REPLICATE #1 1455 10/19/98
cr267 EM 493 -0.0191 mg/L peak-noisy

REPLICATE #2
cr267 EM 487 -0.0214 mg/L peak-noisy

03

REPLICATE #3
cr267 EM 496 -0.0179 mg/L peak-noisy

REPLICATE #4
cr267 EM 474 -0.0264 mg/L window-edge

cr267 AV 487.5 EM SD 9.7 CV 2.0

cr267 AV -0.0212 mg/L SD 0.0037 CV 17.67

REPLICATE #1 1457 10/19/98
cr267 EM 5726 1.9892 mg/L

03 SPK

REPLICATE #2
cr267 EM 4687 1.5905 mg/L

REPLICATE #3
cr267 EM 4787 1.6288 mg/L

REPLICATE #4
cr267 EM 5325 1.8353 mg/L

cr267 AV 5131.3 EM SD 485.5 CV 9.5

cr267 AV 1.7610 mg/L SD 0.1863 CV 10.58

REPLICATE #1 1459 10/19/98
cr267 EM 517 -0.0099 mg/L peak-noisy

REPLICATE #2
cr267 EM 541 -0.0006 mg/L

REPLICATE #3
cr267 EM 554 0.0043 mg/L peak-noisy

REPLICATE #4
cr267 EM 534 -0.0033 mg/L peak-noisy

cr267 AV -0.0024 mg/L SD 0.0059 CV 249.91

REPLICATE #1 1500 10/19/98

cr267	EM	501	-0.0160 mg/L	peak-noisy

REPLICATE #2

cr267	EM	550	0.0028 mg/L	peak-noisy

REPLICATE #3

cr267	EM	544	0.0005 mg/L	peak-noisy

REPLICATE #4

cr267	EM	523	-0.0075 mg/L	peak-noisy

cr267 AV 529.5 EM SD 22.2 CV 4.2

cr267 AV -0.0051 mg/L SD 0.0085 CV 168.95

REPLICATE #1 1502 10/19/98

cr267	EM	535	-0.0029 mg/L

REPLICATE #2

cr267	EM	578	0.0136 mg/L	peak-noisy

REPLICATE #3

cr267	EM	561	0.0070 mg/L	peak-noisy

REPLICATE #4

cr267	EM	533	-0.0037 mg/L	peak-noisy

cr267 AV 551.8 EM SD 21.7 CV 3.9

cr267 AV 0.0035 mg/L SD 0.0083 CV 238.45

REPLICATE #1 1504 10/19/98

cr267	EM	706	0.0627 mg/L

REPLICATE #2

cr267	EM	700	0.0604 mg/L

REPLICATE #3

cr267	EM	679	0.0523 mg/L

REPLICATE #4

cr267	EM	715	0.0661 mg/L

cr267 AV 700.0 EM SD 15.3 CV 2.2

cr267 AV 0.0604 mg/L SD 0.0059 CV 9.72

REPLICATE #1 1506 10/19/98

cr267	EM	799	0.0984 mg/L

REPLICATE #2

cr267	EM	769	0.0869 mg/L

REPLICATE #3

cr267	EM	828	0.1095 mg/L

REPLICATE #4

cr267	EM	784	0.0926 mg/L

cr267 AV 795.0 EM SD 25.2 CV 3.2

REPLICATE #1 1508 10/19/98
cr267 EM 692 0.0573 mg/L

REPLICATE #2
cr267 EM 724 0.0696 mg/L

REPLICATE #3
cr267 EM 687 0.0554 mg/L

REPLICATE #4
cr267 EM 780 0.0911 mg/L

cr267 AV 720.8 EM SD 42.8 CV 5.9

cr267 AV 0.0683 mg/L SD 0.0164 CV 24.01

V REPLICATE #1 1510 10/19/98
cr267 EM 6026 2.1043 mg/L

V REPLICATE #2
cr267 EM 6188 2.1665 mg/L

V REPLICATE #3
cr267 EM 6083 2.1262 mg/L

V REPLICATE #4
cr267 EM 6012 2.0990 mg/L

cr267 AV 6077.3 EM SD 80.0 CV 1.3

cr267 AV 2.1240 mg/L SD 0.0307 CV 1.44

B REPLICATE #1 1512 10/19/98
cr267 EM 546 0.0013 mg/L

B REPLICATE #2
cr267 EM 516 -0.0102 mg/L

B REPLICATE #3
cr267 EM 516 -0.0102 mg/L peak-noisy

B REPLICATE #4
cr267 EM 495 -0.0183 mg/L peak-noisy

cr267 AV 518.3 EM SD 21.0 CV 4.0

cr267 AV -0.0094 mg/L SD 0.0081 CV 85.93

006.1 REPLICATE #1 1514 10/19/98
cr267 EM 1414 0.3344 mg/L

006.1 REPLICATE #2
cr267 EM 1402 0.3298 mg/L

006.1 REPLICATE #3
cr267 EM 1396 0.3275 mg/L

006.1 REPLICATE #4
cr267 EM 1508 0.3705 mg/L

cr267 AV 1430.0 EM SD 52.5 CV 3.7

Jt file is 10236

˜ANDARD #1			REPLICATE	#1				1615	10/22/98
	CO228	EM	378						
˜ANDARD #1			REPLICATE	#2					
	CO228	EM	379			peak-noisy			
˜ANDARD #1			REPLICATE	#3					
	CO228	EM	369			peak-noisy			
	CO228	AV	375.3	SD	5.5	CV	1.5	CONC	0.0200
˜ANDARD #2			REPLICATE	#1				1617	10/22/98
	CO228	EM	444						
˜ANDARD #2			REPLICATE	#2					
	CO228	EM	430						
˜ANDARD #2			REPLICATE	#3					
	CO228	EM	446						
	CO228	AV	440.0	SD	8.7	CV	2.0	CONC	0.0500
˜ANDARD #3			REPLICATE	#1				1618	10/22/98
	CO228	EM	683						
˜ANDARD #3			REPLICATE	#2					
	CO228	EM	739						
˜ANDARD #3			REPLICATE	#3					
	CO228	EM	705						
	CO228	AV	709.0	SD	28.2	CV	4.0	CONC	0.1500
ΓANDARD #4			REPLICATE	#1				1620	10/22/98
	CO228	EM	1538						
ΓANDARD #4			REPLICATE	#2					
	CO228	EM	1482						
ΓANDARD #4			REPLICATE	#3					
	CO228	EM	1537						
	CO228	AV	1519.0	SD	32.0	CV	2.1	CONC	0.5000
_ANK			REPLICATE	#1				1622	10/22/98
	CO228	EM	328						
_ANK			REPLICATE	#2					
	CO228	EM	344						
_ANK			REPLICATE	#3					
	CO228	EM	337						
	CO228	AV	336.3	SD	8.0	CV	2.4	CONC	0.0000

CO228 CC 0.9997 SLOPE 2379.9478 INT 333.2209

⊃V			REPLICATE	#1	1624 10/22/98
CO228	EM	1481	0.4823 mg/L		

CO228 EM 1536 0.5054 mg/L

:V REPLICATE #3
CO228 EM 1552 0.5121 mg/L

CO228 AV 1523.0 EM SD 37.2 CV 2.4

CO228 AV 0.4999 mg/L SD 0.0156 CV 3.13

:B REPLICATE #1 1625 10/22/98
CO228 EM 356 0.0096 mg/L peak-noisy

:B REPLICATE #2
CO228 EM 373 0.0167 mg/L peak-noisy

:B REPLICATE #3
CO228 EM 368 0.0146 mg/L peak-noisy

CO228 AV 365.7 EM SD 8.7 CV 2.4

CO228 AV 0.0136 mg/L SD 0.0037 CV 26.93

L002.B-1 REPLICATE #1 1627 10/22/98
CO228 EM 375 0.0176 mg/L peak-noisy

L002.B-1 REPLICATE #2
CO228 EM 404 0.0297 mg/L

L002.B-1 REPLICATE #3
CO228 EM 387 0.0226 mg/L window-edge

CO228 AV 388.7 EM SD 14.6 CV 3.7

CO228 AV 0.0233 mg/L SD 0.0061 CV 26.28

-1 REPLICATE #1 1629 10/22/98
CO228 EM 395 0.0260 mg/L peak-noisy

-1 REPLICATE #2
CO228 EM 397 0.0268 mg/L peak-noisy

-1 REPLICATE #3
CO228 EM 379 0.0192 mg/L peak-noisy

CO228 AV 390.3 EM SD 9.9 CV 2.5

CO228 AV 0.0240 mg/L SD 0.0041 CV 17.27

-1 REPLICATE #1 1631 10/22/98
CO228 EM 386 0.0222 mg/L

-1 REPLICATE #2
CO228 EM 406 0.0306 mg/L peak-noisy

-1 REPLICATE #3
CO228 EM 385 0.0218 mg/L peak-noisy

CO228 AV 392.3 EM SD 11.8 CV 3.0

CO228 AV 0.0248 mg/L SD 0.0050 CV 20.04

-1D REPLICATE #1 1632 10/22/98
CO228 EM 392 0.0247 mg/L peak-noisy

-1D REPLICATE #2

·1D REPLICATE #3
C0228 EM 406 0.0306 mg/L peak-noisy

C0228 AV 401.3 EM SD 8.1 CV 2.0

C0228 AV 0.0286 mg/L SD 0.0034 CV 11.87

›—1 REPLICATE #1 1634 10/22/98
C0228 EM 402 0.0289 mg/L peak-noisy

›—1 REPLICATE #2
C0228 EM 382 0.0205 mg/L window-edge

›—1 REPLICATE #3
C0228 EM 385 0.0218 mg/L peak-noisy

C0228 AV 389.7 EM SD 10.8 CV 2.8

C0228 AV 0.0237 mg/L SD 0.0045 CV 19.11

›—1S REPLICATE #1 1636 10/22/98
C0228 EM 2719 1.0025 mg/L

›—1S REPLICATE #2
C0228 EM 2657 0.9764 mg/L

›—1S REPLICATE #3
C0228 EM 2574 0.9415 mg/L

C0228 AV 2650.0 EM SD 72.8 CV 2.7

C0228 AV 0.9735 mg/L SD 0.0306 CV 3.14

-2A REPLICATE #1 1638 10/22/98
C0228 EM 347 0.0058 mg/L peak-noisy

-2A REPLICATE #2
C0228 EM 359 0.0108 mg/L

-2A REPLICATE #3
C0228 EM 397 0.0268 mg/L peak-noisy

C0228 AV 367.7 EM SD 26.1 CV 7.1

C0228 AV 0.0145 mg/L SD 0.0110 CV 75.78

-2A REPLICATE #1 1640 10/22/98
C0228 EM 358 0.0104 mg/L peak-noisy

-2A REPLICATE #2
C0228 EM 381 0.0201 mg/L

-2A REPLICATE #3
C0228 EM 344 0.0045 mg/L peak-noisy

C0228 AV 361.0 EM SD 18.7 CV 5.2

C0228 AV 0.0117 mg/L SD 0.0078 CV 67.25

-2A REPLICATE #1 1641 10/22/98
C0228 EM 340 0.0028 mg/L window-edge

-2A REPLICATE #2

-2A REPLICATE #3
CO228 EM 336 0.0012 mg/L peak-noisy

CO228 AV 342.7 EM SD 8.3 CV 2.4

CO228 AV 0.0040 mg/L SD 0.0035 CV 88.15

JT REPLICATE #1 1643 10/22/98
CO228 EM 370 0.0155 mg/L

JT REPLICATE #2
CO228 EM 404 0.0297 mg/L peak-noisy

JT REPLICATE #3
CO228 EM 378 0.0188 mg/L peak-noisy

CO228 AV 384.0 EM SD 17.8 CV 4.6

CO228 AV 0.0213 mg/L SD 0.0075 CV 35.01

CV REPLICATE #1 1645 10/22/98
CO228 EM 1518 0.4978 mg/L

CV REPLICATE #2
CO228 EM 1484 0.4835 mg/L

CV REPLICATE #3
CO228 EM 1516 0.4970 mg/L

CO228 AV 1506.0 EM SD 19.1 CV 1.3

CO228 AV 0.4928 mg/L SD 0.0080 CV 1.63

CB REPLICATE #1 1646 10/22/98
CO228 EM 377 0.0184 mg/L peak-noisy

CB REPLICATE #2
CO228 EM 367 0.0142 mg/L window-edge

CB REPLICATE #3
CO228 EM 361 0.0117 mg/L peak-noisy

CO228 AV 368.3 EM SD 8.1 CV 2.2

CO228 AV 0.0148 mg/L SD 0.0034 CV 23.02

O-2A REPLICATE #1 1648 10/22/98
CO228 EM 328 -0.0022 mg/L peak-noisy

O-2A REPLICATE #2
CO228 EM 333 -0.0001 mg/L peak-noisy

O-2A REPLICATE #3
CO228 EM 338 0.0020 mg/L peak-noisy

CO228 AV 333.0 EM SD 5.0 CV 1.5

CO228 AV -0.0001 mg/L SD 0.0021 CV 2263.92

O-2AS REPLICATE #1 1650 10/22/98
CO228 EM 3107 0.7152 mg/L

1—2AS REPLICATE #2
CO228 EM 2131 0.7554 mg/L

1—2AS REPLICATE #3
CO228 EM 2069 0.7293 mg/L

CO228 AV 2102.3 EM SD 31.3 CV 1.5

CO228 AV 0.7433 mg/L SD 0.0131 CV 1.77

1—AP REPLICATE #1 1652 10/22/98
CO228 EM 371 0.0159 mg/L window-edge

1—AP REPLICATE #2
CO228 EM 433 0.0419 mg/L peak-noisy

1—AP REPLICATE #3
CO228 EM 368 0.0146 mg/L peak-noisy

CO228 AV 390.7 EM SD 36.7 CV 9.4

CO228 AV 0.0241 mg/L SD 0.0154 CV 63.87

3—F REPLICATE #1 1653 10/22/98
CO228 EM 343 0.0041 mg/L window-edge

3—F REPLICATE #2
CO228 EM 327 -0.0026 mg/L window-edge

3—F REPLICATE #3
CO228 EM 356 0.0096 mg/L peak-noisy

CO228 AV 342.0 EM SD 14.5 CV 4.2

CO228 AV 0.0037 mg/L SD 0.0061 CV 165.46

3 REPLICATE #1 1655 10/22/98
CO228 EM 353 0.0083 mg/L peak-noisy

3 REPLICATE #2
CO228 EM 353 0.0083 mg/L window-edge

3 REPLICATE #3
CO228 EM 386 0.0222 mg/L peak-noisy

CO228 AV 364.0 EM SD 19.1 CV 5.2

CO228 AV 0.0129 mg/L SD 0.0080 CV 61.90

3 REPLICATE #1 1657 10/22/98
CO228 EM 347 0.0058 mg/L peak-noisy

3 REPLICATE #2
CO228 EM 381 0.0201 mg/L window-edge

3 REPLICATE #3
CO228 EM 358 0.0104 mg/L peak-noisy

CO228 AV 362.0 EM SD 17.3 CV 4.8

CO228 AV 0.0121 mg/L SD 0.0073 CV 60.28

3 REPLICATE #1 1659 10/22/98
CO228 EM 350 0.0071 mg/L peak-noisy

CO228 EM 358 0.0104 mg/L peak-noisy

3 REPLICATE #3
CO228 EM 350 0.0071 mg/L peak-noisy

CO228 AV 352.7 EM SD 4.6 CV 1.3

CO228 AV 0.0082 mg/L SD 0.0019 CV 23.75

:V REPLICATE #1 1701 10/22/98
CO228 EM 1527 0.5016 mg/L

:V REPLICATE #2
CO228 EM 1526 0.5012 mg/L

:V REPLICATE #3
CO228 EM 1587 0.5268 mg/L

CO228 AV 1546.7 EM SD 34.9 CV 2.3

CO228 AV 0.5099 mg/L SD 0.0147 CV 2.88

:B REPLICATE #1 1702 10/22/98
CO228 EM 362 0.0121 mg/L peak-noisy

:B REPLICATE #2
CO228 EM 365 0.0134 mg/L peak-noisy

:B REPLICATE #3
CO228 EM 374 0.0171 mg/L window-edge

CO228 AV 367.0 EM SD 6.2 CV 1.7

CO228 AV 0.0142 mg/L SD 0.0026 CV 18.49

L REPLICATE #1 1704 10/22/98
CO228 EM 336 0.0012 mg/L window-edge

L REPLICATE #2
CO228 EM 347 0.0058 mg/L peak-noisy

L REPLICATE #3
CO228 EM 338 0.0020 mg/L peak-noisy

CO228 AV 340.3 EM SD 5.9 CV 1.7

CO228 AV 0.0030 mg/L SD 0.0025 CV 82.38

2 REPLICATE #1 1706 10/22/98
CO228 EM 347 0.0058 mg/L peak-noisy

2 REPLICATE #2
CO228 EM 346 0.0054 mg/L peak-noisy

2 REPLICATE #3
CO228 EM 343 0.0041 mg/L peak-noisy

CO228 AV 345.3 EM SD 2.1 CV 0.6

CO228 AV 0.0051 mg/L SD 0.0009 CV 17.19

3 REPLICATE #1 1708 10/22/98
CO228 EM 353 0.0083 mg/L peak-noisy

REPLICATE #3
CO228 EM 354 0.0087 mg/L peak-noisy

CO228 AV 354.7 EM SD 2.1 CV 0.6

CO228 AV 0.0090 mg/L SD 0.0009 CV 9.71

S REPLICATE #1 1709 10/22/98
CO228 EM 2414 0.8743 mg/L

S REPLICATE #2
CO228 EM 2464 0.8953 mg/L

S REPLICATE #3
CO228 EM 2412 0.8735 mg/L

CO228 AV 2430.0 EM SD 29.5 CV 1.2

CO228 AV 0.8810 mg/L SD 0.0124 CV 1.41

REPLICATE #1 1711 10/22/98
CO228 EM 338 0.0020 mg/L peak-noisy

REPLICATE #2
CO228 EM 356 0.0096 mg/L peak-noisy

REPLICATE #3
CO228 EM 355 0.0092 mg/L peak-noisy

CO228 AV 349.7 EM SD 10.1 CV 2.9

CO228 AV 0.0069 mg/L SD 0.0043 CV 61.51

2 REPLICATE #1 1713 10/22/98
CO228 EM 354 0.0087 mg/L window-edge

2 REPLICATE #2
CO228 EM 352 0.0079 mg/L window-edge

2 REPLICATE #3
CO228 EM 347 0.0058 mg/L peak-noisy

CO228 AV 351.0 EM SD 3.6 CV 1.0

CO228 AV 0.0075 mg/L SD 0.0015 CV 20.28

3 REPLICATE #1 1714 10/22/98
CO228 EM 339 0.0024 mg/L peak-noisy

3 REPLICATE #2
CO228 EM 340 0.0028 mg/L peak-noisy

3 REPLICATE #3
CO228 EM 354 0.0087 mg/L window-edge

CO228 AV 344.3 EM SD 8.4 CV 2.4

CO228 AV 0.0047 mg/L SD 0.0035 CV 75.47

L REPLICATE #1 1716 10/22/98
CO228 EM 409 0.0318 mg/L peak-noisy

L REPLICATE #2

CO228 EM 412 0.0331 mg/L peak-noisy

CO228 AV 414.7 EM SD 7.4 CV 1.8

CO228 AV 0.0342 mg/L SD 0.0031 CV 9.05

2 REPLICATE #1 1718 10/22/98
CO228 EM 448 0.0482 mg/L peak-noisy

2 REPLICATE #2
CO228 EM 413 0.0335 mg/L

2 REPLICATE #3
CO228 EM 462 0.0541 mg/L peak-noisy

CO228 AV 441.0 EM SD 25.2 CV 5.7

CO228 AV 0.0453 mg/L SD 0.0106 CV 23.42

3 REPLICATE #1 1720 10/22/98
CO228 EM 416 0.0348 mg/L peak-noisy

3 REPLICATE #2
CO228 EM 396 0.0264 mg/L peak-noisy

3 REPLICATE #3
CO228 EM 410 0.0323 mg/L peak-noisy

CO228 AV 407.3 EM SD 10.3 CV 2.5

CO228 AV 0.0311 mg/L SD 0.0043 CV 13.85

CV REPLICATE #1 1721 10/22/98
CO228 EM 1564 0.5171 mg/L

CV REPLICATE #2
CO228 EM 1570 0.5197 mg/L

CV REPLICATE #3
CO228 EM 1646 0.5516 mg/L

CO228 AV 1593.3 EM SD 45.7 CV 2.9

CO228 AV 0.5295 mg/L SD 0.0192 CV 3.63

CB REPLICATE #1 1723 10/22/98
CO228 EM 352 0.0079 mg/L

CB REPLICATE #2
CO228 EM 366 0.0138 mg/L window-edge

CB REPLICATE #3
CO228 EM 350 0.0071 mg/L peak-noisy

CO228 AV 356.0 EM SD 8.7 CV 2.4

CO228 AV 0.0096 mg/L SD 0.0037 CV 38.27

MA 400 Analysis Ver. 4.10 Thu 10/15/98 - 14:52:14

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od File Name: CU Replicates:3 Read Delay: 60
rks: CU ONLY Data File:

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t file is 10236

ANDARD #1			REPLICATE #1					1455	10/15/98
	CU324	EM	2893						
ANDARD #1			REPLICATE #2						
	CU324	EM	2922						
ANDARD #1			REPLICATE #3						
	CU324	EM	3032						
	CU324	AV	2949.0	SD	73.3	CV	2.5	CONC	0.1000
ANDARD #2			REPLICATE #1					1457	10/15/98
	CU324	EM	18716						
ANDARD #2			REPLICATE #2						
	CU324	EM	18102						
ANDARD #2			REPLICATE #3						
	CU324	EM	18600						
	CU324	AV	18472.7	SD	326.2	CV	1.8	CONC	1.0000
ANDARD #3			REPLICATE #1					1459	10/15/98
	CU324	EM	36619						
ANDARD #3			REPLICATE #2						
	CU324	EM	36754						
ANDARD #3			REPLICATE #3						
	CU324	EM	36078						
	CU324	AV	36483.7	SD	357.7	CV	1.0	CONC	2.0000
ANDARD #4			REPLICATE #1					1501	10/15/98
	CU324	EM	87901						
ANDARD #4			REPLICATE #2						
	CU324	EM	89983						
ANDARD #4			REPLICATE #3						
	CU324	EM	90163						
	CU324	AV	89349.0	SD	1257.2	CV	1.4	CONC	5.0000
ANK			REPLICATE #1					1502	10/15/98
	CU324	EM	1381						
ANK			REPLICATE #2						
	CU324	EM	1310						

CU324 EM 1164

CU324 AV 1285.0 SD 110.6 CV 8.6 CONC 0.0000

CU324 CC 1.0000 SLOPE 17636.554 INT 1136.6479

✓ REPLICATE #1 1504 10/15/98
CU324 EM 36059 1.9801 mg/L

✓ REPLICATE #2
CU324 EM 36151 1.9853 mg/L

✓ REPLICATE #3
CU324 EM 36900 2.0278 mg/L

CU324 AV 36370.0 EM SD 461.3 CV 1.3

CU324 AV 1.9977 mg/L SD 0.0262 CV 1.31

B REPLICATE #1 1506 10/15/98
CU324 EM 1289 0.0086 mg/L peak-noisy

B REPLICATE #2
CU324 EM 1294 0.0089 mg/L peak-noisy

B REPLICATE #3
CU324 EM 1229 0.0052 mg/L peak-noisy

CU324 AV 1270.7 EM SD 36.2 CV 2.8

CU324 AV 0.0076 mg/L SD 0.0021 CV 26.99

002.B-1 REPLICATE #1 1508 10/15/98
CU324 EM 1792 0.0372 mg/L

002.B-1 REPLICATE #2
CU324 EM 1852 0.0406 mg/L

002.B-1 REPLICATE #3
CU324 EM 1842 0.0400 mg/L

CU324 AV 1828.7 EM SD 32.1 CV 1.8

CU324 AV 0.0392 mg/L SD 0.0018 CV 4.65

1 REPLICATE #1 1509 10/15/98
CU324 EM 3593 0.1393 mg/L

1 REPLICATE #2
CU324 EM 3780 0.1499 mg/L

1 REPLICATE #3
CU324 EM 3746 0.1480 mg/L

CU324 AV 3706.3 EM SD 99.6 CV 2.7

CU324 AV 0.1457 mg/L SD 0.0056 CV 3.88

1 REPLICATE #1 1511 10/15/98
CU324 EM 3459 0.1317 mg/L

1 REPLICATE #2
CU324 EM 3534 0.1359 mg/L

1 REPLICATE #3
CU324 EM 3570 0.1380 mg/L

CU324 AV 3521.0 EM SD 56.6 CV 1.6

CU324 AV 0.1352 mg/L SD 0.0032 CV 2.38

1D REPLICATE #1 1513 10/15/98
CU324 EM 3456 0.1315 mg/L

1D REPLICATE #2
CU324 EM 3471 0.1324 mg/L

1D REPLICATE #3
CU324 EM 3445 0.1309 mg/L

CU324 AV 3457.3 EM SD 13.1 CV 0.4

CU324 AV 0.1316 mg/L SD 0.0007 CV 0.56

—1 REPLICATE #1 1515 10/15/98
CU324 EM 3627 0.1412 mg/L

—1 REPLICATE #2
CU324 EM 3410 0.1289 mg/L

—1 REPLICATE #3
CU324 EM 3373 0.1268 mg/L

CU324 AV 3470.0 EM SD 137.2 CV 4.0

CU324 AV 0.1323 mg/L SD 0.0078 CV 5.88

—1S REPLICATE #1 1517 10/15/98
CU324 EM 36048 1.9795 mg/L

—1S REPLICATE #2
CU324 EM 36402 1.9996 mg/L

—1S REPLICATE #3
CU324 EM 36139 1.9846 mg/L

CU324 AV 36196.3 EM SD 183.8 CV 0.5

CU324 AV 1.9879 mg/L SD 0.0104 CV 0.52

-2A REPLICATE #1 1518 10/15/98
CU324 EM 1197 0.0034 mg/L peak-noisy

-2A REPLICATE #2
CU324 EM 1191 0.0031 mg/L

-2A REPLICATE #3
CU324 EM 1194 0.0033 mg/L peak-noisy

CU324 AV 1194.0 EM SD 3.0 CV 0.3

CU324 AV 0.0033 mg/L SD 0.0002 CV 5.23

-2A REPLICATE #1 1520 10/15/98
CU324 EM 1416 0.0158 mg/L

2A REPLICATE #3
CU324 EM 1379 0.0137 mg/L

CU324 AV 1404.0 EM SD 21.7 CV 1.5

CU324 AV 0.0152 mg/L SD 0.0012 CV 8.10

2A REPLICATE #1 1522 10/15/98
CU324 EM 1361 0.0127 mg/L

2A REPLICATE #2
CU324 EM 1280 0.0081 mg/L

2A REPLICATE #3
CU324 EM 1334 0.0112 mg/L

CU324 AV 1325.0 EM SD 41.2 CV 3.1

CU324 AV 0.0107 mg/L SD 0.0023 CV 21.90

T REPLICATE #1 1523 10/15/98
CU324 EM 1243 0.0060 mg/L

T REPLICATE #2
CU324 EM 1235 0.0056 mg/L window-edge

T REPLICATE #3
CU324 EM 1283 0.0083 mg/L peak-noisy

CU324 AV 1253.7 EM SD 25.7 CV 2.1

CU324 AV 0.0066 mg/L SD 0.0015 CV 21.98

V REPLICATE #1 1525 10/15/98
CU324 EM 38542 2.1209 mg/L

V REPLICATE #2
CU324 EM 38326 2.1087 mg/L

V REPLICATE #3
CU324 EM 39057 2.1501 mg/L

CU324 AV 38641.7 EM SD 375.6 CV 1.0

CU324 AV 2.1266 mg/L SD 0.0213 CV 1.00

B REPLICATE #1 1527 10/15/98
CU324 EM 1367 0.0131 mg/L peak-noisy

B REPLICATE #2
CU324 EM 1356 0.0124 mg/L peak-noisy

B REPLICATE #3
CU324 EM 1380 0.0138 mg/L

CU324 AV 1367.7 EM SD 12.0 CV 0.9

CU324 AV 0.0131 mg/L SD 0.0007 CV 5.20

—2A REPLICATE #1 1529 10/15/98
CU324 EM 1376 0.0136 mg/L

CU324 EM 1376 0.0136 mg/L peak-noisy

—2A REPLICATE #3
CU324 EM 1410 0.0155 mg/L

CU324 AV 1387.3 EM SD 19.6 CV 1.4

CU324 AV 0.0142 mg/L SD 0.0011 CV 7.83

—2AS REPLICATE #1 1531 10/15/98
CU324 EM 30235 1.6499 mg/L

—2AS REPLICATE #2
CU324 EM 29750 1.6224 mg/L

—2AS REPLICATE #3
CU324 EM 31039 1.6955 mg/L

CU324 AV 30341.3 EM SD 651.0 CV 2.1

CU324 AV 1.6559 mg/L SD 0.0369 CV 2.23

—AP REPLICATE #1 1532 10/15/98
CU324 EM 1178 0.0023 mg/L peak-noisy

—AP REPLICATE #2
CU324 EM 1181 0.0025 mg/L peak-noisy

—AP REPLICATE #3
CU324 EM 1170 0.0019 mg/L peak-noisy

CU324 AV 1176.3 EM SD 5.7 CV 0.5

CU324 AV 0.0023 mg/L SD 0.0003 CV 14.33

—F REPLICATE #1 1534 10/15/98
CU324 EM 1340 0.0115 mg/L

—F REPLICATE #2
CU324 EM 1317 0.0102 mg/L

—F REPLICATE #3
CU324 EM 1329 0.0109 mg/L

CU324 AV 1328.7 EM SD 11.5 CV 0.9

CU324 AV 0.0109 mg/L SD 0.0007 CV 5.99

REPLICATE #1 1536 10/15/98
CU324 EM 1260 0.0070 mg/L

REPLICATE #2
CU324 EM 1234 0.0055 mg/L

REPLICATE #3
CU324 EM 1273 0.0077 mg/L

CU324 AV 1255.7 EM SD 19.9 CV 1.6

CU324 AV 0.0067 mg/L SD 0.0011 CV 16.68

REPLICATE #1 1538 10/15/98
CU324 EM 1288 0.0086 mg/L

REPLICATE #2

REPLICATE #3

CU324	EM	1318	0.0103 mg/L	peak-noisy

CU324	AV	1304.7 EM	SD	15.3	CV	1.2
CU324	AV	0.0095 mg/L	SD	0.0009	CV	9.09

REPLICATE #1 1539 10/15/98

CU324	EM	1304	0.0095 mg/L

REPLICATE #2

CU324	EM	1334	0.0112 mg/L

REPLICATE #3

CU324	EM	1332	0.0111 mg/L

CU324	AV	1323.3 EM	SD	16.8	CV	1.3
CU324	AV	0.0106 mg/L	SD	0.0010	CV	8.98

V REPLICATE #1 1541 10/15/98

CU324	EM	41066	2.2640 mg/L

V REPLICATE #2

CU324	EM	40184	2.2140 mg/L

V REPLICATE #3

CU324	EM	41089	2.2653 mg/L

CU324	AV	40779.7 EM	SD	516.0	CV	1.3
CU324	AV	2.2478 mg/L	SD	0.0293	CV	1.30

B REPLICATE #1 1543 10/15/98

CU324	EM	1273	0.0077 mg/L	peak-noisy

B REPLICATE #2

CU324	EM	1426	0.0164 mg/L	peak-noisy

B REPLICATE #3

CU324	EM	1272	0.0077 mg/L

CU324	AV	1323.7 EM	SD	88.6	CV	6.7
CU324	AV	0.0106 mg/L	SD	0.0050	CV	47.39

REPLICATE #1 1545 10/15/98

CU324	EM	1327	0.0108 mg/L

REPLICATE #2

CU324	EM	1366	0.0130 mg/L

REPLICATE #3

CU324	EM	1331	0.0110 mg/L

CU324	AV	1341.3 EM	SD	21.5	CV	1.6
CU324	AV	0.0116 mg/L	SD	0.0012	CV	10.48

REPLICATE #1 1547 10/15/98

CU324	EM	1465	0.0186 mg/L

REPLICATE #2

CU324	EM	1497	0.0190 mg/L

REPLICATE #3
CU324 EM 1519 0.0217 mg/L

CU324 AV 1490.3 EM SD 27.2 CV 1.8

CU324 AV 0.0201 mg/L SD 0.0015 CV 7.68

REPLICATE #1 1548 10/15/98
CU324 EM 1304 0.0095 mg/L

REPLICATE #2
CU324 EM 1299 0.0092 mg/L

REPLICATE #3
CU324 EM 1295 0.0090 mg/L

CU324 AV 1299.3 EM SD 4.5 CV 0.3

CU324 AV 0.0092 mg/L SD 0.0003 CV 2.77

S REPLICATE #1 1550 10/15/98
CU324 EM 32616 1.7849 mg/L

S REPLICATE #2
CU324 EM 32426 1.7741 mg/L

S REPLICATE #3
CU324 EM 32303 1.7671 mg/L

CU324 AV 32448.3 EM SD 157.7 CV 0.5

CU324 AV 1.7754 mg/L SD 0.0089 CV 0.50

REPLICATE #1 1552 10/15/98
CU324 EM 1459 0.0183 mg/L

REPLICATE #2
CU324 EM 1442 0.0173 mg/L

REPLICATE #3
CU324 EM 1493 0.0202 mg/L

CU324 AV 1464.7 EM SD 26.0 CV 1.8

CU324 AV 0.0186 mg/L SD 0.0015 CV 7.92

REPLICATE #1 1553 10/15/98
CU324 EM 1647 0.0289 mg/L

REPLICATE #2
CU324 EM 1674 0.0305 mg/L

REPLICATE #3
CU324 EM 1697 0.0318 mg/L peak-noisy

CU324 AV 1672.7 EM SD 25.0 CV 1.5

CU324 AV 0.0304 mg/L SD 0.0014 CV 4.67

REPLICATE #1 1555 10/15/98
CU324 EM 1529 0.0222 mg/L

REPLICATE #2
CU324 EM 1531 0.0224 mg/L peak-noisy

CU324 EM 1470 0.0189 mg/L

CU324 AV 1510.0 EM SD 34.7 CV 2.3

CU324 AV 0.0212 mg/L SD 0.0020 CV 9.28

REPLICATE #1 1557 10/15/98

CU324 EM 3679 0.1442 mg/L

REPLICATE #2

CU324 EM 3654 0.1427 mg/L

REPLICATE #3

CU324 EM 3624 0.1410 mg/L

CU324 AV 3652.3 EM SD 27.5 CV 0.8

CU324 AV 0.1426 mg/L SD 0.0016 CV 1.09

REPLICATE #1 1559 10/15/98

CU324 EM 4844 0.2102 mg/L

REPLICATE #2

CU324 EM 4875 0.2120 mg/L

REPLICATE #3

CU324 EM 4907 0.2138 mg/L

CU324 AV 4875.3 EM SD 31.5 CV 0.6

CU324 AV 0.2120 mg/L SD 0.0018 CV 0.84

REPLICATE #1 1601 10/15/98

CU324 EM 4641 0.1987 mg/L

REPLICATE #2

CU324 EM 4695 0.2018 mg/L

REPLICATE #3

CU324 EM 4789 0.2071 mg/L

CU324 AV 4708.3 EM SD 74.9 CV 1.6

CU324 AV 0.2025 mg/L SD 0.0042 CV 2.10

:V REPLICATE #1 1602 10/15/98

CU324 EM 37874 2.0830 mg/L

:V REPLICATE #2

CU324 EM 38366 2.1109 mg/L

:V REPLICATE #3

CU324 EM 38573 2.1227 mg/L

CU324 AV 38271.0 EM SD 359.1 CV 0.9

CU324 AV 2.1055 mg/L SD 0.0204 CV 0.97

:B REPLICATE #1 1604 10/15/98

CU324 EM 1442 0.0173 mg/L

:B REPLICATE #2

CU324 EM 1333 0.0111 mg/L

CU324 EM 1318 0.0102 mg/L peak noisy

CU324 AV 1363.7 EM SD 68.4 CV 5.0

CU324 AV 0.0129 mg/L SD 0.0039 CV 30.12

006.1 REPLICATE #1 1606 10/15/98
CU324 EM 5058 0.2223 mg/L

006.1 REPLICATE #2
CU324 EM 4994 0.2187 mg/L

006.1 REPLICATE #3
CU324 EM 5053 0.2221 mg/L

CU324 AV 5035.0 EM SD 35.6 CV 0.7

CU324 AV 0.2210 mg/L SD 0.0020 CV 0.91

REPLICATE #1 1608 10/15/98
CU324 EM 4587 0.1956 mg/L

REPLICATE #2
CU324 EM 4592 0.1959 mg/L

REPLICATE #3
CU324 EM 4651 0.1993 mg/L

CU324 AV 4610.0 EM SD 35.6 CV 0.8

CU324 AV 0.1969 mg/L SD 0.0020 CV 1.02

REPLICATE #1 1609 10/15/98
CU324 EM 4625 0.1978 mg/L

REPLICATE #2
CU324 EM 4659 0.1997 mg/L

REPLICATE #3
CU324 EM 4633 0.1982 mg/L

CU324 AV 4639.0 EM SD 17.8 CV 0.4

CU324 AV 0.1986 mg/L SD 0.0010 CV 0.51

REPLICATE #1 1611 10/15/98
CU324 EM 4718 0.2031 mg/L

REPLICATE #2
CU324 EM 4626 0.1978 mg/L

REPLICATE #3
CU324 EM 4785 0.2069 mg/L

CU324 AV 4709.7 EM SD 79.8 CV 1.7

CU324 AV 0.2026 mg/L SD 0.0045 CV 2.23

REPLICATE #1 1613 10/15/98
CU324 EM 34111 1.8697 mg/L

REPLICATE #2
CU324 EM 35403 1.9429 mg/L

REPLICATE #3

CU324 AV 34303.3 EM SD 1017.2 CV 3.0

CU324 AV 1.8806 mg/L SD 0.0577 CV 3.07

V REPLICATE #1 1615 10/15/98
CU324 EM 35849 1.9682 mg/L

V REPLICATE #2
CU324 EM 37568 2.0657 mg/L

V REPLICATE #3
CU324 EM 36700 2.0165 mg/L

CU324 AV 36705.7 EM SD 859.5 CV 2.3

CU324 AV 2.0168 mg/L SD 0.0487 CV 2.42

B REPLICATE #1 1616 10/15/98
CU324 EM 1441 0.0173 mg/L peak-noisy

B REPLICATE #2
CU324 EM 1263 0.0072 mg/L peak-noisy

B REPLICATE #3
CU324 EM 1276 0.0079 mg/L

CU324 AV 1326.7 EM SD 99.2 CV 7.5

CU324 AV 0.0108 mg/L SD 0.0056 CV 52.22

MPLE #43 REPLICATE #1 1618 10/15/98
CU324 EM 1369 0.0132 mg/L

MPLE #43 REPLICATE #2
CU324 EM 1337 0.0114 mg/L

```
Element File: PB.GEL          Element: Pb                    Wavelength: 283.3
Date: 10/14/98                Time: 15:32                    Slit: 0.7 L
Data File:                    ID/Wt File: 81002.IDW          Lamp Current: 10
Technique: HGA                Calib. Type: Nonlinear         Energy: 46
-----------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Pb    ID: BLANK               Seq. No.: 00094    A/S Pos.: 0     Date: 10/14/

Replicate  1                                  Time: 15:32
Peak Area (A-s): -0.001                       Peak Height (A): 0.011
Background Pk Area (A-s): 0.030               Background Pk Height (A): 0.046
Blank Corrected Pk Area (A-s): -0.002
Concentration (ug/L  ): -0.6

Replicate  2                                  Time: 15:35
Peak Area (A-s): -0.001                       Peak Height (A): 0.014
Background Pk Area (A-s): 0.025               Background Pk Height (A): 0.041
Blank Corrected Pk Area (A-s): -0.002
Concentration (ug/L  ): -0.5

Mean Conc  (ug/L  ):        -0.6              SD: 0.02                RSD(%): 4.31

Auto-zero performed.

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Pb    ID: 10 PPB PB           Seq. No.: 00095    A/S Pos.: 1     Date: 10/14/

Replicate  1                                  Time: 15:39
Peak Area (A-s): 0.020                        Peak Height (A): 0.056
Background Pk Area (A-s): 0.033               Background Pk Height (A): 0.049
Blank Corrected Pk Area (A-s): 0.021
Concentration (ug/L  ): 5.6

Replicate  2                                  Time: 15:42
Peak Area (A-s): 0.023                        Peak Height (A): 0.053
Background Pk Area (A-s): 0.034               Background Pk Height (A): 0.044
Blank Corrected Pk Area (A-s): 0.023
Concentration (ug/L  ): 6.3

Mean Conc  (ug/L  ):        6.0               SD: 0.47                RSD(%): 7.93

Standard number 1 applied.  [10.0]
Correlation coefficient: 1.00000              Slope: 0.0022

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Pb    ID: 50 PPB PB           Seq. No.: 00096    A/S Pos.: 2     Date: 10/14/

Replicate  1                                  Time: 15:45
Peak Area (A-s): 0.117                        Peak Height (A): 0.248
Background Pk Area (A-s): 0.051               Background Pk Height (A): 0.056
Blank Corrected Pk Area (A-s): 0.118
Concentration (ug/L  ): 53.2

Replicate  2                                  Time: 15:49
Peak Area (A-s): 0.120                        Peak Height (A): 0.253
Background Pk Area (A-s): 0.053               Background Pk Height (A): 0.055
Blank Corrected Pk Area (A-s): 0.121
Concentration (ug/L  ): 54.6
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lean Conc (uo/L): 53.9 SD: 0.97 RSD(%): 1.80

Standard number 2 applied. [50.0]
Correlation coefficient: 1.00000 Slope: 0.0022

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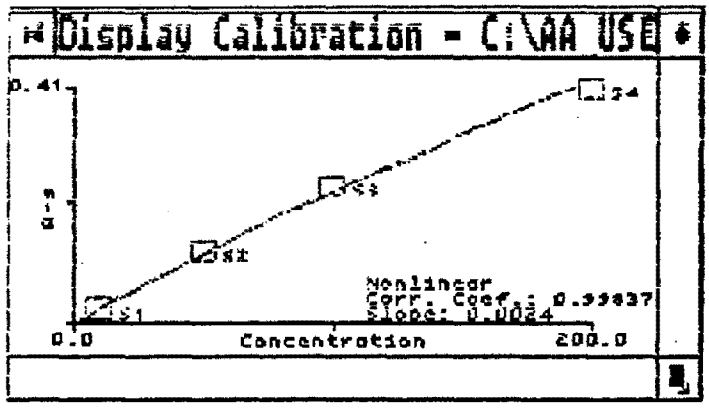
Display Calibration - C:\AA USE
0.41
0.0
Concentration
200.0
S1
S2
S3
S4
Nonlinear
Corr. Coef.: 0.99837
Slope: 0.0024

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eplicate 2 Time: 16:30
oncentration (ug/L): 22.5

ean Conc (ug/L): 23.5 SD: 1.39 RSD(%): 5.91

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h ID: 81002.8-1 Seq. No.: 00103 A/S Pos.: 7 Date: 10/14

eplicate 1 Time: 16:33
oncentration (ug/L): 114.4

eplicate 2 Time: 16:36
oncentration (ug/L): 114.1

ean Conc (ug/L): 114.3 SD: 0.21 RSD(%): 0.18

ecovery is 90.8%

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h ID: 81002.9-1 Seq. No.: 00104 A/S Pos.: 8 Date: 10/14

eplicate 1 Time: 16:40
oncentration (ug/L): 22.5

eplicate 2 Time: 16:43
oncentration (ug/L): 19.1

ean Conc (ug/L): 20.8 SD: 2.40 RSD(%): 11.5

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h ID: 81002.10-1 Seq. No.: 00105 A/S Pos.: 9 Date: 10/14

eplicate 1 Time: 16:46
oncentration (ug/L): 26.4

eplicate 2 Time: 16:49
oncentration (ug/L): 25.4

ean Conc (ug/L): 25.9 SD: 0.73 RSD(%): 2.81

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h ID: 81002.8-2A Seq. No.: 00106 A/S Pos.: 10 Date: 10/14

eplicate 1 Time: 16:53
oncentration (ug/L): 2.9

eplicate 2 Time: 16:56
oncentration (ug/L): 5.1

ean Conc (ug/L): 4.0 SD: 1.51 RSD(%): 37.8

---

h ID: 81002.1-2A Seq. No.: 00107 A/S Pos.: 11 Date: 10/14

eplicate 1 Time: 16:59
oncentration (ug/L): 18.4

eplicate 2 Time: 17:02
oncentration (ug/L): 18.5

ean Conc (ug/L): 18.5 SD: 0.05 RSD(%): 0.29

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ean Conc (ug/L): -0.5 SD: 1.24 RSD(%): 237.

C sample is within range -5.49 - 5.49

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ecovery is 80.0%

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ean Conc (ug/L): 11.0 SD: 0.11 RSD(%): 1.01

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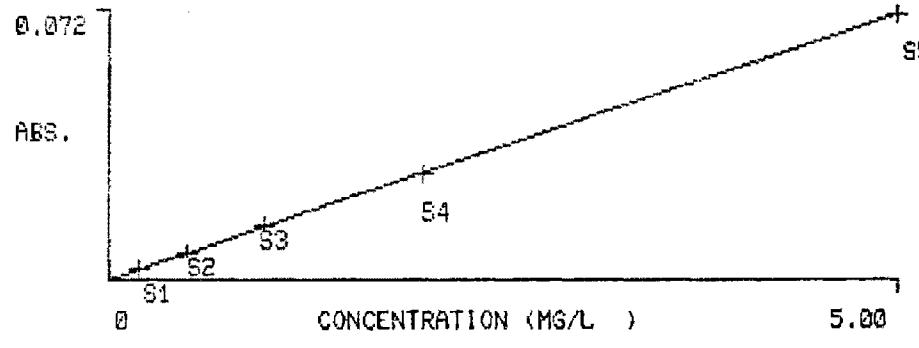
MAIN:	-0.000	AA HO	-0.000	MAIN:	-0.000	AA HO	0.000
PB	MEAN:	-0.000	SD: 0.000	RSD:	99.9	AUTOZERO	0.000
MAIN:	0.003	AA HO	0.003	MAIN:	0.003	AA HO	0.003
PB	MEAN:	0.003	SD: 0.000	RSD:	2.2	1.STANDARD	0.20 MG/L
MAIN:	0.48 MG/L	AA HO	0.007	MAIN:	0.48 MG/L	AA HO	0.007
PB	MEAN:	0.48 MG/L	SD: 0.001	RSD:	0.3	2.STANDARD	0.50 MG/L
MAIN:	0.98 MG/L	AA HO	0.014	MAIN:	1.00 MG/L	AA HO	0.015
PB	MEAN:	0.99 MG/L	SD: 0.017	RSD:	1.7	3.STANDARD	1.00 MG/L
MAIN:	1.97 MG/L	AA HO	0.029	MAIN:	1.95 MG/L	AA HO	0.029
PB	MEAN:	1.96 MG/L	SD: 0.015	RSD:	0.8	4.STANDARD	1.99 MG/L
MAIN:	5.00 MG/L	AA HO	0.072	MAIN:	5.01 MG/L	AA HO	0.073
PB	MEAN:	5.00 MG/L	SD: 0.007	RSD:	0.1	5.STANDARD	5.00 MG/L

FLAME DISPLAY CALIBRATION MODE
ELEMENT: PB

REPL. 0 OF 2

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

5.00



ABS. READING
S5 AA : 0.073

STATISTICS
MEAN: 5.00
SD: 0.007
RSD(%): 0.1

C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN:	-0.01 MG/L	AA HO	-0.000	MAIN:	0.02 MG/L	AA HO	0.000
PB	MEAN:	0.01 MG/L	SD: 0.026	RSD:	99.9	AUTOZERO	0.00

	MAIN: 1.98 MG/L	HO 0.029 AA		MAIN: 1.92 MG/L	HO 0.028 AA
PB IV	MEAN: 1.95 MG/L	SD: 0.039 RSD: 2.0			
	MAIN: 0.01 MG/L	HO 0.000 AA		MAIN: 0.00 MG/L	HO 0.000 AA
PB ICB	MEAN: 0.01 MG/L	SD: 0.007 RSD: 99.9			
	MAIN: 1.02 MG/L	HO 0.015 AA		MAIN: 1.04 MG/L	HO 0.015 AA
1003 PB I1	MEAN: 1.03 MG/L	SD: 0.018 RSD: 1.7			
	MAIN: 3.00 MG/L	HO 0.044 AA		MAIN: 2.95 MG/L	HO 0.043 AA
PB I1S	MEAN: 2.98 MG/L	SD: 0.036 RSD: 1.2			
	MAIN: 1.54 MG/L	HO 0.022 AA		MAIN: 1.53 MG/L	HO 0.022 AA
PB I2	MEAN: 1.53 MG/L	SD: 0.010 RSD: 0.6			
	MAIN: 1.55 MG/L	HO 0.022 AA		MAIN: 1.60 MG/L	HO 0.023 AA
PB I2D	MEAN: 1.57 MG/L	SD: 0.038 RSD: 2.4			
	MAIN: 1.28 MG/L	HO 0.019 AA		MAIN: 1.28 MG/L	HO 0.019 AA
PB I3	MEAN: 1.28 MG/L	SD: 0.001 RSD: 0.1			
	MAIN: 1.96 MG/L	HO 0.029 AA		MAIN: 1.93 MG/L	HO 0.028 AA
PB CCV	MEAN: 1.95 MG/L	SD: 0.039 RSD: 2.0			
	MAIN: -0.02 MG/L	HO-0.000 AA		MAIN: -0.01 MG/L	HO-0.000 AA
PB CCB	MEAN: -0.02 MG/L	SD: 0.009 RSD: 55.4			
1006	MAIN: 0.46 MG/L	HO 0.007 AA		MAIN: 0.41 MG/L	HO 0.006 AA
PB 1	MEAN: 0.43 MG/L	SD: 0.036 RSD: 8.2			

MAIN:	2.41 MG/L	HO	AA 0.035	MAIN:	2.36 MG/L	HO	AA 0.034

PB 1S MEAN: 2.38 MG/L SD: 0.034 RSD: 1.4

MAIN:	0.33 MG/L	HO	AA 0.005	MAIN:	0.36 MG/L	HO	AA 0.005

PB 2 MEAN: 0.34 MG/L SD: 0.021 RSD: 6.1

MAIN:	0.35 MG/L	HO	AA 0.005	MAIN:	0.30 MG/L	HO	AA 0.004

PB 2D MEAN: 0.32 MG/L SD: 0.037 RSD: 11.4

MAIN:	0.33 MG/L	HO	AA 0.005	MAIN:	0.38 MG/L	HO	AA 0.005

PB 3 MEAN: 0.35 MG/L SD: 0.036 RSD: 10.1

MAIN:	1.94 MG/L	HO	AA 0.028	MAIN:	1.94 MG/L	HO	AA 0.028

PB CCV MEAN: 1.94 MG/L SD: 0.005 RSD: 0.3

MAIN:	-0.02 MG/L	HO	AA -0.000	MAIN:	-0.05 MG/L	HO	AA -0.001

PB CCB MEAN: -0.03 MG/L SD: 0.023 RSD: 69.5

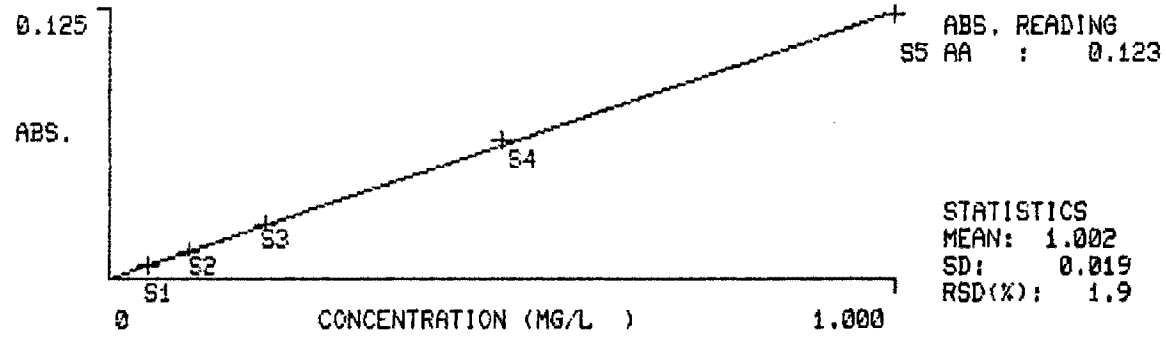
MAIN:	-0.000	AA HO	-0.000	MAIN:	-0.000	AA HO	0.000
MN	MEAN:	-0.000	SD:	0.000	RSD: 52.8	AUTOZERO	0.000
MAIN:	0.006	AA HO	0.006	MAIN:	0.006	AA HO	0.006
MN	MEAN:	0.006	SD:	0.000	RSD: 1.1	1.STANDARD	0.050 MG/L
MAIN:	0.101 MG/L	AA HO	0.013	MAIN:	0.102 MG/L	AA HO	0.013
MN	MEAN:	0.101 MG/L	SD:	0.000	RSD: 0.3	2.STANDARD	0.100 MG/L
MAIN:	0.194 MG/L	AA HO	0.025	MAIN:	0.200 MG/L	AA HO	0.026
MN	MEAN:	0.197 MG/L	SD:	0.005	RSD: 2.3	3.STANDARD	0.199 MG/L
MAIN:	0.516 MG/L	AA HO	0.065	MAIN:	0.514 MG/L	AA HO	0.065
MN	MEAN:	0.515 MG/L	SD:	0.002	RSD: 0.3	4.STANDARD	0.503 MG/L
MAIN:	0.943 MG/L	AA HO	0.122	MAIN:	0.950 MG/L	AA HO	0.123
MN	MEAN:	0.947 MG/L	SD:	0.005	RSD: 0.6	5.STANDARD	0.987 MG/L
MAIN:	1.015 MG/L	AA HO	0.126	MAIN:	0.988 MG/L	AA HO	0.123
MN	MEAN:	1.002 MG/L	SD:	0.019	RSD: 1.9	5.STANDARD	0.990 MG/L

FLAME DISPLAY CALIBRATION MODE
ELEMENT: MN

REPL. 0 OF 2

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

0.990



C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

	AA		AA
MAIN: 0.005 MG/L	HO-0.000	MAIN: 0.004 MG/L	HO-0.000

MN MEAN: 0.005 MG/L SD: 0.001 RSD: 18.9 AUTOZERO 0.000

	AA		AA
MAIN: 0.494 MG/L	HO 0.062	MAIN: 0.499 MG/L	HO 0.063

MN ICV MEAN: 0.496 MG/L SD: 0.004 RSD: 0.7

	AA		AA
MAIN: 0.001 MG/L	HO 0.000	MAIN: -0.001 MG/L	HO-0.000

MN ICB MEAN: -0.000 MG/L SD: 0.002 RSD: 99.9

	AA		AA
MAIN: 0.050 MG/L	HO 0.006	MAIN: 0.057 MG/L	HO 0.007

002 MN 8-1 MEAN: 0.053 MG/L SD: 0.005 RSD: 9.9

	AA
MAIN: 4.074 MG/L	HO 0.513

E61 Sample concentration greater than highest standard

	AA
MAIN: 4.113 MG/L	HO 0.518

E61 Sample concentration greater than highest standard

MN 8-1 MEAN: 4.094 MG/L SD: 0.027 RSD: 0.7

	AA		AA
MAIN: 0.004 MG/L	HO 0.001	MAIN: 0.005 MG/L	HO 0.000

MN set Ø MEAN: 0.005 MG/L SD: 0.001 RSD: 19.8 AUTOZERO 0.000

	AA		AA
MAIN: 0.352 MG/L	HO 0.044	MAIN: 0.360 MG/L	HO 0.045

MN 8-1x10 MEAN: 0.356 MG/L SD: 0.006 RSD: 1.6

	AA		AA
MAIN: 0.848 MG/L	HO 0.107	MAIN: 0.845 MG/L	HO 0.106

MN 8-1S (400) MEAN: 0.847 MG/L SD: 0.002 RSD: 0.3

	AA		AA
MAIN: 0.680 MG/L	HO 0.086	MAIN: 0.687 MG/L	HO 0.087

MN 8-1x5 MEAN: 0.684 MG/L SD: 0.005 RSD: 0.8

		AA			AA
MAIN:	0.684 MG/L	HO 0.086	MAIN:	0.685 MG/L	HO 0.086

102 MN 8-4x5D MEAN: 0.684 MG/L SD: 0.001 RSD: 0.1

		AA			AA
MAIN:	0.186 MG/L	HO 0.023	MAIN:	0.195 MG/L	HO 0.024

MN 10-1x20 MEAN: 0.190 MG/L SD: 0.006 RSD: 3.1

		AA			AA
MAIN:	0.058 MG/L	HO 0.007	MAIN:	0.063 MG/L	HO 0.008

MN 8-2A MEAN: 0.061 MG/L SD: 0.003 RSD: 5.0

		AA			AA
MAIN:	0.061 MG/L	HO 0.008	MAIN:	0.061 MG/L	HO 0.008

MN 8-2A MEAN: 0.061 MG/L SD: 0.000 RSD: 0.2

		AA			AA
MAIN:	0.428 MG/L	HO 0.054	MAIN:	0.445 MG/L	HO 0.056

MN 8-2AS MEAN: 0.436 MG/L SD: 0.012 RSD: 2.7

		AA			AA
MAIN:	0.480 MG/L	HO 0.060	MAIN:	0.486 MG/L	HO 0.061

MN CCV MEAN: 0.483 MG/L SD: 0.004 RSD: 0.9

		AA			AA
MAIN:	0.001 MG/L	HO 0.000	MAIN:	0.001 MG/L	HO 0.000

MN CCB MEAN: 0.001 MG/L SD: 0.000 RSD: 32.8

		AA			AA
MAIN:	0.167 MG/L	HO 0.021	MAIN:	0.166 MG/L	HO 0.021

MN 9-4 MEAN: 0.167 MG/L SD: 0.001 RSD: 0.5

		AA			AA
MAIN:	0.168 MG/L	HO 0.021	MAIN:	0.148 MG/L	HO 0.019

MN 9-4D MEAN: 0.158 MG/L SD: 0.015 RSD: 9.2

		AA			AA
MAIN:	0.067 MG/L	HO 0.008	MAIN:	0.065 MG/L	HO 0.008

MN 10-4 MEAN: 0.066 MG/L SD: 0.001 RSD: 1.8

MAIN:	0.028 MG/L	AA HO 0.004	MAIN:	0.026 MG/L	AA HO 0.003

.03 MN RB-P MEAN: 0.027 MG/L SD: 0.001 RSD: 4.9

MAIN:	0.026 MG/L	AA HO 0.003	MAIN:	0.024 MG/L	AA HO 0.003

MN RB-F MEAN: 0.025 MG/L SD: 0.002 RSD: 7.4

MAIN:	0.025 MG/L	AA HO 0.003	MAIN:	0.027 MG/L	AA HO 0.003

MN MEAN: 0.026 MG/L SD: 0.001 RSD: 5.2

MAIN:	-0.015 MG/L	AA HO-0.002	MAIN:	-0.014 MG/L	AA HO 0.000

MN OB MEAN: -0.014 MG/L SD: 0.001 RSD: 3.6 AUTOZERO 0.000

MAIN:	0.025 MG/L	AA HO 0.003	MAIN:	0.022 MG/L	AA HO 0.003

MN UB MEAN: 0.024 MG/L SD: 0.002 RSD: 7.7

MAIN:	0.029 MG/L	AA HO 0.004	MAIN:	0.025 MG/L	AA HO 0.003

MN IB MEAN: 0.027 MG/L SD: 0.003 RSD: 11.0

MAIN:	0.497 MG/L	AA HO 0.063	MAIN:	0.497 MG/L	AA HO 0.063

MN rcV MEAN: 0.497 MG/L SD: 0.000 RSD: 0.1

MAIN:	-0.006 MG/L	AA HO-0.001	MAIN:	-0.008 MG/L	AA HO-0.001

MN rcB MEAN: -0.007 MG/L SD: 0.001 RSD: 12.5

MAIN:	-0.006 MG/L	AA HO-0.001	MAIN:	-0.009 MG/L	AA HO-0.001

MN Set φ MEAN: -0.007 MG/L SD: 0.002 RSD: 26.1 AUTOZERO 0.000

MAIN:	0.029 MG/L	AA HO 0.004	MAIN:	0.028 MG/L	AA HO 0.004

MN G1 MEAN: 0.028 MG/L SD: 0.001 RSD: 2.4

MAIN: 0.064 MG/L	HO 0.008 AA		MAIN: 0.067 MG/L	HO 0.008 AA	
MN 02	MEAN: 0.065 MG/L	SD: 0.003	RSD: 3.9		
MAIN: 0.062 MG/L	HO 0.008 AA		MAIN: 0.067 MG/L	HO 0.008 AA	
MN 02D	MEAN: 0.065 MG/L	SD: 0.004	RSD: 6.2		
MAIN: 0.033 MG/L	HO 0.004 AA		MAIN: 0.034 MG/L	HO 0.004 AA	
MN 03	MEAN: 0.034 MG/L	SD: 0.000	RSD: 1.4		
MAIN: 0.027 MG/L	HO 0.003 AA		MAIN: 0.031 MG/L	HO 0.004 AA	
MN 41	MEAN: 0.029 MG/L	SD: 0.003	RSD: 10.8		
MAIN: 0.032 MG/L	HO 0.004 AA		MAIN: 0.029 MG/L	HO 0.004 AA	
MN 42	MEAN: 0.031 MG/L	SD: 0.002	RSD: 5.6		
MAIN: 0.014 MG/L	HO 0.002 AA		MAIN: 0.013 MG/L	HO 0.002 AA	
MN 43	MEAN: 0.014 MG/L	SD: 0.001	RSD: 6.5		
MAIN: 0.489 MG/L	HO 0.062 AA		MAIN: 0.480 MG/L	HO 0.060 AA	
MN CCV	MEAN: 0.484 MG/L	SD: 0.007	RSD: 1.4		
MAIN: -0.007 MG/L	HO-0.001 AA		MAIN: -0.008 MG/L	HO-0.001 AA	
MN CCB	MEAN:-0.008 MG/L	SD: 0.000	RSD: 5.1		
MAIN: 0.416 MG/L	HO 0.052 AA		MAIN: 0.427 MG/L	HO 0.054 AA	
MN I1	MEAN: 0.421 MG/L	SD: 0.008	RSD: 1.9		
MAIN: 0.800 MG/L	HO 0.101 AA		MAIN: 0.799 MG/L	HO 0.101 AA	
MN IIS	MEAN: 0.800 MG/L	SD: 0.001	RSD: 0.1		

MAIN:	0.451 MG/L	AA HO 0.057	MAIN:	0.465 MG/L	AA HO 0.059

MN I2 MEAN: 0.458 MG/L SD: 0.010 RSD: 2.2

MAIN:	0.446 MG/L	AA HO 0.056	MAIN:	0.442 MG/L	AA HO 0.056

MN I3 MEAN: 0.444 MG/L SD: 0.003 RSD: 0.6

MAIN:	0.494 MG/L	AA HO 0.062	MAIN:	0.516 MG/L	AA HO 0.065

066

MN 1 MEAN: 0.505 MG/L SD: 0.016 RSD: 3.1

MAIN:	0.879 MG/L	AA HO 0.111	MAIN:	0.885 MG/L	AA HO 0.111

MN 1S MEAN: 0.882 MG/L SD: 0.004 RSD: 0.5

MAIN:	0.345 MG/L	AA HO 0.043	MAIN:	0.322 MG/L	AA HO 0.041

MN 2 MEAN: 0.334 MG/L SD: 0.017 RSD: 5.0

MAIN:	0.333 MG/L	AA HO 0.042	MAIN:	0.336 MG/L	AA HO 0.042

MN 2D MEAN: 0.334 MG/L SD: 0.002 RSD: 0.6

MAIN:	0.359 MG/L	AA HO 0.045	MAIN:	0.356 MG/L	AA HO 0.045

MN 3 MEAN: 0.358 MG/L SD: 0.003 RSD: 0.7

MAIN:	0.473 MG/L	AA HO 0.060	MAIN:	0.475 MG/L	AA HO 0.060

MN CCV MEAN: 0.474 MG/L SD: 0.001 RSD: 0.2

MAIN:	-0.016 MG/L	AA HO-0.002	MAIN:	-0.020 MG/L	AA HO-0.003

MN CCB MEAN: 0.018 MG/L SD: 0.003 RSD: 17.7

81003 ALL(-I3)
81006
81011(-43)

```
HG                          AA-BG    BG
MAIN:   0.001          PA 0.030   0.005
                       PH 0.001   0.000
```

0.000 AUTOZERO

```
HG                          AA-BG    BG
MAIN:   0.010          PA 0.141   0.018
                       PH 0.010   0.000
```

0.50 1.STANDARD

```
HG                          AA-BG    BG
MAIN:    1.21 UG/L     PA 0.428  -0.040
                       PH 0.025  -0.001
```

E61 Sample concentration greater than highest standard

1.03 2.STANDARD

```
HG                          AA-BG    BG
MAIN:    1.70 UG/L     PA 0.657  -0.025
                       PH 0.042  -0.001
```

E61 Sample concentration greater than highest standard

1.91 3.STANDARD

```
HG                          AA-BG    BG
MAIN:    5.75 UG/L     PA 2.020   0.024
                       PH 0.125   0.002
```

E61 Sample concentration greater than highest standard

5.10 4.STANDARD

```
HG                          AA-BG    BG
MAIN:   11.31 UG/L     PA 4.198   0.021
                       PH 0.278   0.003
```

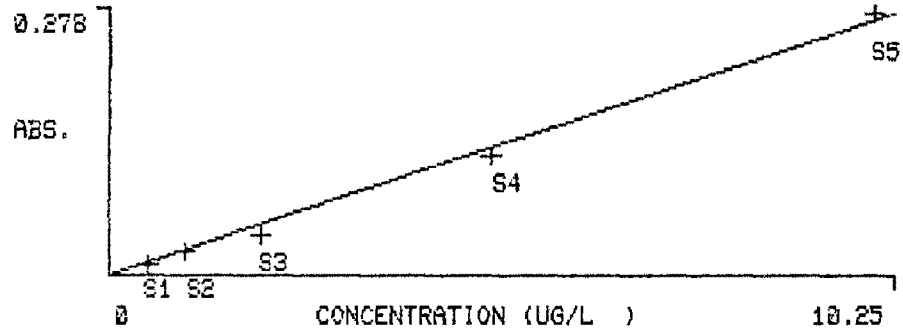
E61 Sample concentration greater than highest standard

10.25 5.STANDARD

HGA DISPLAY CALIBRATION MODE
ELEMENT: HG - PEAK HEIGHT

PRINTER: ON
BG CORR: ON
UNITS : UG/L
CH.MASS:

10.25



READ
PEAK AREA (A-S)
AA-BG: 4.198
BG: 0.021

PEAK HEIGHT (A)
AA-BG: 0.278
BG: 0.003

HG ICV		AA-BG	BG	HG ICB		AA-BG	BG
MAIN:	4.79 UG/L	PA 2.088	0.011	MAIN:	-0.13 UG/L	PA-0.098	-0.000
		PH 0.130	0.001			PH-0.004	-0.000
HG RB AP		AA-BG	BG	HG		AA-BG	BG
MAIN:	-0.07 UG/L	PA-0.033	-0.021	MAIN:	-0.01 UG/L	PA-0.004	-0.024
		PH-0.002	-0.002			PH-0.000	-0.001
HG RB-F		AA-BG	BG	HG		AA-BG	BG
MAIN:	0.00 UG/L	PA-0.005	-0.041	MAIN:	0.03 UG/L	PA-0.019	-0.040
		PH 0.000	-0.002			PH 0.001	-0.001
HG 0B		AA-BG	BG	HG		AA-BG	BG
MAIN:	-0.04 UG/L	PA-0.026	-0.044	MAIN:	0.03 UG/L	PA-0.019	-0.018
		PH-0.001	-0.002			PH 0.001	-0.001
HG 4B		AA-BG	BG	HG		AA-BG	BG
MAIN:	-0.03 UG/L	PA-0.014	-0.011	MAIN:	0.01 UG/L	PA-0.029	-0.015
		PH-0.001	0.000			PH 0.000	-0.002
HG IB		AA-BG	BG	HG		AA-BG	BG
MAIN:	0.04 UG/L	PA 0.014	-0.007	MAIN:	-0.04 UG/L	PA-0.011	-0.029
		PH 0.001	-0.001			PH-0.001	-0.002
HG 01		AA-BG	BG	HG		AA-BG	BG
MAIN:	0.01 UG/L	PA 0.017	-0.017	MAIN:	0.03 UG/L	PA 0.007	-0.016
		PH 0.000	0.000			PH 0.001	-0.000
HG 01S		AA-BG	BG	HG		AA-BG	BG
MAIN:	4.43 UG/L	PA 1.985	-0.011	MAIN:	5.04 UG/L	PA 2.323	0.008
		PH 0.120	-0.000			PH 0.136	0.000
HG ~~02~~ CCV ✓		AA-BG	BG	HG CCB		AA-BG	BG
MAIN:	4.53 UG/L	PA 2.022	-0.010	MAIN:	-0.18 UG/L	PA-0.104	-0.012
		PH 0.123	0.000			PH-0.005	-0.001
HG 02		AA-BG	BG	HG		AA-BG	BG
MAIN:	-0.03 UG/L	PA-0.031	-0.020	MAIN:	-0.01 UG/L	PA-0.032	-0.020
		PH-0.001	-0.001			PH-0.000	0.000

3 ml
5 ml

HG	03		AA-BG	BG	HG			AA-BG	BG
MAIN:	-0.06 UG/L	PA	-0.008	-0.029	MAIN:	-0.06 UG/L	PA	-0.022	-0.003
		PH	-0.002	-0.000			PH	-0.002	0.001
HG	u1		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.19 UG/L	PA	0.023	-0.012	MAIN:	0.12 UG/L	PA	0.048	0.000
		PH	0.005	-0.000			PH	0.003	0.000
HG	u2		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.00 UG/L	PA	0.005	-0.010	MAIN:	-0.01 UG/L	PA	-0.006	-0.010
		PH	0.000	0.001			PH	-0.000	-0.001
HG	u3		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.19 UG/L	PA	0.101	-0.004	MAIN:	0.15 UG/L	PA	0.080	0.006
		PH	0.005	0.002			PH	0.004	0.000
HG	I1		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.22 UG/L	PA	0.089	-0.013	MAIN:	0.24 UG/L	PA	0.121	-0.007
		PH	0.006	-0.001			PH	0.006	0.000
HG	I2		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.27 UG/L	PA	0.124	0.020	MAIN:	0.32 UG/L	PA	0.128	-0.002
		PH	0.007	0.002			PH	0.009	-0.001
HG	CCV		AA-BG	BG	HG	CCB		AA-BG	BG
MAIN:	4.76 UG/L	PA	2.145	0.012	MAIN:	-0.06 UG/L	PA	-0.052	-0.008
		PH	0.129	0.001			PH	-0.002	0.001
HG	1		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.03 UG/L	PA	0.003	-0.002	MAIN:	0.09 UG/L	PA	0.026	0.005
		PH	0.001	-0.001			PH	0.002	-0.000
HG	2		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.01 UG/L	PA	0.024	-0.003	MAIN:	0.12 UG/L	PA	0.026	-0.016
		PH	0.000	0.001			PH	0.003	-0.000
HG	3		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.09 UG/L	PA	0.039	-0.012	MAIN:	-0.01 UG/L	PA	-0.004	0.010
		PH	0.002	-0.000			PH	-0.000	0.000
HG	B-2B		AA-BG	BG	HG			AA-BG	BG
MAIN:	-0.04 UG/L	PA	-0.019	0.018	MAIN:	0.07 UG/L	PA	-0.016	0.004
		PH	-0.001	0.000			PH	0.002	-0.000
HG	11-2B		AA-BG	BG	HG			AA-BG	BG
MAIN:	3.01 UG/L	PA	1.295	0.049	MAIN:	3.13 UG/L	PA	1.365	-0.006
		PH	0.082	0.003			PH	0.085	-0.000
HG	11-2BS		AA-BG	BG	HG			AA-BG	BG
MAIN:	7.39 UG/L	PA	3.307	0.008	MAIN:	7.34 UG/L	PA	3.355	0.050
		PH	0.200	0.001			PH	0.199	0.002
HG	12-2B		AA-BG	BG	HG			AA-BG	BG
MAIN:	2.19 UG/L	PA	0.935	0.021	MAIN:	2.29 UG/L	PA	0.951	0.011
		PH	0.059	0.002			PH	0.062	0.002
HG	CCV		AA-BG	BG	HG	CCB		AA-BG	BG
MAIN:	4.42 UG/L	PA	2.141	0.007	MAIN:	-0.09 UG/L	PA	-0.066	-0.009
		PH	0.120	0.002			PH	-0.002	-0.001

HG 13-2B			AA-BG	BG	HG			AA-BG	BG
MAIN:	2.38	UG/L	PA 1.083	0.007	MAIN:	2.17	UG/L	PA 0.993	0.026
			PH 0.064	0.000				PH 0.059	0.004
HG 21-2B			AA-BG	BG	HG			AA-BG	BG
MAIN:	1.27	UG/L	PA 0.542	-0.012	MAIN:	1.37	UG/L	PA 0.579	0.024
			PH 0.034	0.000				PH 0.037	0.002
HG 22-2B			AA-BG	BG	HG			AA-BG	BG
MAIN:	1.30	UG/L	PA 0.603	0.009	MAIN:	1.24	UG/L	PA 0.575	0.020
			PH 0.035	0.000				PH 0.034	0.002
HG 23-2B			AA-BG	BG	HG			AA-BG	BG
MAIN:	1.08	UG/L	PA 0.493	-0.015	MAIN:	1.24	UG/L	PA 0.538	0.002
			PH 0.029	0.000				PH 0.034	-0.000
HG CCV			AA-BG	BG	HG CCB			AA-BG	BG
MAIN:	4.95	UG/L	PA 2.283	0.000	MAIN:	-0.09	UG/L	PA-0.085	-0.016
			PH 0.134	0.000				PH-0.002	-0.001

```
lement File: NI.GEL          Element: Ni                    Wavelength: 232.0
ate: 10/19/98                Time: 10:09                    Slit: 0.20 L
ata File:                    ID/Wt File: 81002.IDW          Lamp Current: 25
echnique: HGA                Calib. Type: Linear            Energy: 47
-----------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
li    ID: BLANK              Seq. No.: 00001    A/S Pos.: 0     Date: 10/19/

eplicate  1                                Time: 10:09
eak Area (A-s): 0.041                      Peak Height (A): 0.048
lackoround Pk Area (A-s): 0.096            Background Pk Height (A): 0.045
lank Corrected Pk Area (A-s): 0.041

eplicate  2                                Time: 10:12
eak Area (A-s): 0.019                      Peak Height (A): 0.026
lackoround Pk Area (A-s): 0.069            Backoround Pk Height (A): 0.029
lank Corrected Pk Area (A-s): 0.019

lean Pk Area (A-s):       0.030            SD: 0.0160                RSD(%): 53.40

uto-zero performed.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
li    ID: BLANK              Seq. No.: 00002    A/S Pos.: 0     Date: 10/19/

eplicate  1                                Time: 10:15
eak Area (A-s): 0.016                      Peak Height (A): 0.020
lackoround Pk Area (A-s): 0.063            Backoround Pk Height (A): 0.026
lank Corrected Pk Area (A-s): -0.014

eplicate  2                                Time: 10:19
eak Area (A-s): 0.020                      Peak Height (A): 0.022
lackoround Pk Area (A-s): 0.060            Backoround Pk Height (A): 0.027
lank Corrected Pk Area (A-s): -0.009

lean Pk Area (A-s):      -0.012            SD: 0.0030                RSD(%): 25.81

uto-zero performed.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
li    ID: 20 PPB NI          Seq. No.: 00003    A/S Pos.: 1     Date: 10/19/

eplicate  1                                Time: 10:22
eak Area (A-s): 0.047                      Peak Height (A): 0.032
lackoround Pk Area (A-s): 0.074            Backoround Pk Height (A): 0.030
lank Corrected Pk Area (A-s): 0.028

eplicate  2                                Time: 10:25
eak Area (A-s): 0.050                      Peak Height (A): 0.037
lackoround Pk Area (A-s): 0.078            Backoround Pk Height (A): 0.035
lank Corrected Pk Area (A-s): 0.032

lean Pk Area (A-s):       0.030            SD: 0.0026                RSD(%): 8.71

tandard number 1 applied.  [20.0]
orrelation coefficient: 1.00000            Slope: 0.0015
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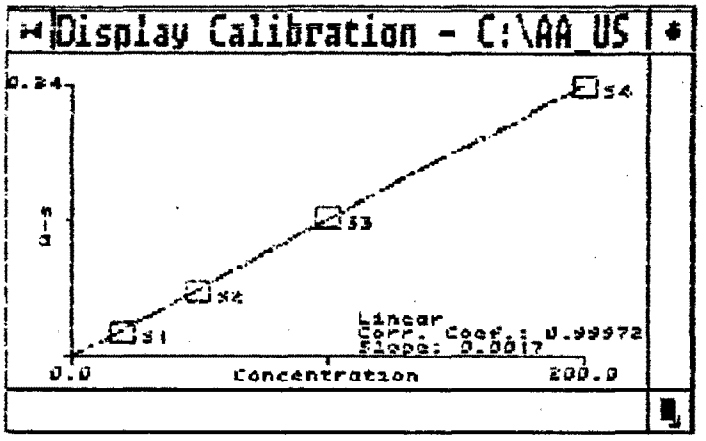
Display Calibration - C:\AA_US
0.24
S4
S3
S2
S1
Linear
Corr. Coef.: 0.99972
Slope: 0.0017
0.0
Concentration
200.0

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Replicate 2 Time: 11:14
Concentration (ug/L): -3.1

Mean Conc (ug/L): -1.5 SD: 1.86 RSD(%): 102.

[illegible] ID: [illegible] Seq. No.: 00011 A/S Pos.: 16 Date: 10/19

Replicate 1 Time: 11:17
Concentration (ug/L): -2.4

Replicate 2 Time: 11:20
Concentration (ug/L): -2.7

Mean Conc (ug/L): -2.5 SD: 0.24 RSD(%): 9.34

Ni ID: 81003.UB Seq. No.: 00012 A/S Pos.: 17 Date: 10/19

Replicate 1 Time: 11:23
Concentration (ug/L): -1.1

Replicate 2 Time: 11:27
Concentration (ug/L): 6.4

Mean Conc (ug/L): 2.7 SD: 5.27 RSD(%): 197.

Ni ID: 81003.IB Seq. No.: 00013 A/S Pos.: 18 Date: 10/19

Replicate 1 Time: 11:30
Concentration (ug/L): 17.0

Replicate 2 Time: 11:33
Concentration (ug/L): 24.9

Mean Conc (ug/L): 20.9 SD: 5.61 RSD(%): 26.7

Ni ID: 81003.IB Seq. No.: 00014 A/S Pos.: 18 Date: 10/19

Replicate 1 Time: 11:37
Concentration (ug/L): -1.2

Replicate 2 Time: 11:40
Concentration (ug/L): -4.6

Mean Conc (ug/L): -2.9 SD: 2.36 RSD(%): 80.9

Ni ID: 81003.01 Seq. No.: 00015 A/S Pos.: 19 Date: 10/19

Replicate 1 Time: 11:43
Concentration (ug/L): -11.0

Replicate 2 Time: 11:47
Concentration (ug/L): -16.5

Mean Conc (ug/L): -13.7 SD: 3.91 RSD(%): 28.4

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3MA 400 Analysis Ver. 4.10 Thu 10/22/98 - 13:23:27

hod File Name: P Replicates:3 Read Delay: 65
arks: Data File:

Wt file is 10236

ΓANDARD #1			REPLICATE	#1				1327	10/22/98
	P214	EM	368			peak-noisy			
ΓANDARD #1			REPLICATE	#2					
	P214	EM	369			peak-noisy			
ΓANDARD #1			REPLICATE	#3					
	P214	EM	370			peak-noisy			
	P214	AV	369.0	SD	1.0	CV	0.3	CONC	0.2000
ΓANDARD #2			REPLICATE	#1				1329	10/22/98
	P214	EM	550						
ΓANDARD #2			REPLICATE	#2					
	P214	EM	563						
ΓANDARD #2			REPLICATE	#3					
	P214	EM	562						
	P214	AV	558.3	SD	7.2	CV	1.3	CONC	1.0000
ΓANDARD #3			REPLICATE	#1				1331	10/22/98
	P214	EM	798						
ΓANDARD #3			REPLICATE	#2					
	P214	EM	816						
ΓANDARD #3			REPLICATE	#3					
	P214	EM	838						
	P214	AV	817.3	SD	20.0	CV	2.5	CONC	2.0000
ΓANDARD #4			REPLICATE	#1				1333	10/22/98
	P214	EM	1550						
ΓANDARD #4			REPLICATE	#2					
	P214	EM	1570						
ΓANDARD #4			REPLICATE	#3					
	P214	EM	1581						
	P214	AV	1567.0	SD	15.7	CV	1.0	CONC	5.0000
_ANK			REPLICATE	#1				1335	10/22/98
	P214	EM	323						
_ANK			REPLICATE	#2					
	P214	EM	312						

P214 EM 312

P214 AV 315.7 SD 6.4 CV 2.0 CONC 0.0000

P214 CC 1.0000 SLOPE 250.2997 INT 314.9751

:V REPLICATE #1 1337 10/22/98
P214 EM 787 1.8858 mg/L

:V REPLICATE #2
P214 EM 851 2.1415 mg/L

:V REPLICATE #3
P214 EM 816 2.0017 mg/L

P214 AV 818.0 EM SD 32.0 CV 3.9

P214 AV 2.0097 mg/L SD 0.1280 CV 6.37

:B REPLICATE #1 1339 10/22/98
P214 EM 318 0.0121 mg/L peak-noisy

:B REPLICATE #2
P214 EM 316 0.0041 mg/L peak-noisy

:B REPLICATE #3
P214 EM 327 0.0480 mg/L peak-noisy

P214 AV 320.3 EM SD 5.9 CV 1.8

P214 AV 0.0214 mg/L SD 0.0234 CV 109.35

1002.B-1 REPLICATE #1 1341 10/22/98
P214 EM 478 0.6513 mg/L

1002.B-1 REPLICATE #2
P214 EM 498 0.7312 mg/L

1002.B-1 REPLICATE #3
P214 EM 494 0.7152 mg/L

P214 AV 490.0 EM SD 10.6 CV 2.2

P214 AV 0.6993 mg/L SD 0.0423 CV 6.05

-1 REPLICATE #1 1343 10/22/98
P214 EM 5019 18.7936 mg/L

-1 REPLICATE #2
P214 EM 5017 18.7856 mg/L

-1 REPLICATE #3
P214 EM 5349 20.1120 mg/L

P214 AV 5128.3 EM SD 191.1 CV 3.7

P214 AV 19.2304 mg/L SD 0.7635 CV 3.97

-1 REPLICATE #1 1345 10/22/98
P214 EM 4266 15.7852 mg/L

-1 REPLICATE #2
P214 EM 4548 16.9118 mg/L

-1 REPLICATE #3

P214 AV 4368.7 EM SD 155.9 CV 3.6

P214 AV 16.1953 mg/L SD 0.6227 CV 3.84

·1D REPLICATE #1 1347 10/22/98
P214 EM 4297 15.9090 mg/L

·1D REPLICATE #2
P214 EM 4272 15.8091 mg/L

·1D REPLICATE #3
P214 EM 4396 16.3046 mg/L

P214 AV 4321.7 EM SD 65.6 CV 1.5

P214 AV 16.0076 mg/L SD 0.2620 CV 1.64

›—1 REPLICATE #1 1349 10/22/98
P214 EM 4895 18.2982 mg/L

›—1 REPLICATE #2
P214 EM 4854 18.1344 mg/L

›—1 REPLICATE #3
P214 EM 4920 18.3980 mg/L

P214 AV 4889.7 EM SD 33.3 CV 0.7

P214 AV 18.2769 mg/L SD 0.1331 CV 0.73

›—1S REPLICATE #1 1351 10/22/98
P214 EM 5287 19.8643 mg/L

›—1S REPLICATE #2
P214 EM 5298 19.9082 mg/L

›—1S REPLICATE #3
P214 EM 5314 19.9722 mg/L

P214 AV 5299.7 EM SD 13.6 CV 0.3

P214 AV 19.9149 mg/L SD 0.0542 CV 0.27

-2A REPLICATE #1 1353 10/22/98
P214 EM 336 0.0840 mg/L peak-noisy

-2A REPLICATE #2
P214 EM 330 0.0600 mg/L peak-noisy

-2A REPLICATE #3
P214 EM 330 0.0600 mg/L peak-noisy

P214 AV 332.0 EM SD 3.5 CV 1.0

P214 AV 0.0680 mg/L SD 0.0138 CV 20.35

-2A REPLICATE #1 1355 10/22/98
P214 EM 343 0.1120 mg/L peak-noisy

-2A REPLICATE #2
P214 EM 333 0.0720 mg/L

-2A REPLICATE #3

P214 AV 340.3 EM SD 6.4 CV 1.9

P214 AV 0.1013 mg/L SD 0.0257 CV 25.35

-2A REPLICATE #1 1357 10/22/98
P214 EM 343 0.1120 mg/L peak-noisy

-2A REPLICATE #2
P214 EM 343 0.1120 mg/L

-2A REPLICATE #3
P214 EM 339 0.0960 mg/L peak-noisy

P214 AV 341.7 EM SD 2.3 CV 0.7

P214 AV 0.1066 mg/L SD 0.0092 CV 8.65

NT REPLICATE #1 1359 10/22/98
P214 EM 323 0.0321 mg/L window-edge

NT REPLICATE #2
P214 EM 328 0.0520 mg/L peak-noisy

NT REPLICATE #3
P214 EM 311 -0.0159 mg/L peak-noisy

P214 AV 320.7 EM SD 8.7 CV 2.7

P214 AV 0.0227 mg/L SD 0.0349 CV 153.51

CV REPLICATE #1 1401 10/22/98
P214 EM 804 1.9538 mg/L

CV REPLICATE #2
P214 EM 790 1.8978 mg/L

CV REPLICATE #3
P214 EM 803 1.9498 mg/L

P214 AV 799.0 EM SD 7.8 CV 1.0

P214 AV 1.9338 mg/L SD 0.0312 CV 1.61

CB REPLICATE #1 1403 10/22/98
P214 EM 330 0.0600 mg/L window-edge

CB REPLICATE #2
P214 EM 320 0.0201 mg/L peak-noisy

CB REPLICATE #3
P214 EM 369 0.2158 mg/L

P214 AV 339.7 EM SD 25.9 CV 7.6

P214 AV 0.0986 mg/L SD 0.1034 CV 104.86

O-2A REPLICATE #1 1405 10/22/98
P214 EM 324 0.0361 mg/L

O-2A REPLICATE #2
P214 EM 321 0.0510 mg/L peak-noisy

1—2A REPLICATE #3
P214 EM 323 0.0321 mg/L peak-noisy

P214 AV 326.0 EM SD 4.4 CV 1.3

P214 AV 0.0440 mg/L SD 0.0174 CV 39.54

1—2AS REPLICATE #1 1407 10/22/98
P214 EM 698 1.5303 mg/L

1—2AS REPLICATE #2
P214 EM 718 1.6102 mg/L

1—2AS REPLICATE #3
P214 EM 735 1.6781 mg/L

P214 AV 717.0 EM SD 18.5 CV 2.6

P214 AV 1.6062 mg/L SD 0.0740 CV 4.61

~~3—AP~~ P=10 std REPLICATE #1 1409 10/22/98
P214 EM 6135 23.2522 mg/L

3—AP REPLICATE #2
P214 EM 6025 22.8127 mg/L

3—AP REPLICATE #3
P214 EM 6138 23.2642 mg/L

P214 AV 6099.3 EM SD 64.4 CV 1.1

P214 AV 23.1097 mg/L SD 0.2573 CV 1.11

3—F REPLICATE #1 1411 10/22/98
P214 EM 315 0.0001 mg/L peak-noisy

3—F REPLICATE #2
P214 EM 344 0.1160 mg/L peak-noisy

3—F REPLICATE #3
P214 EM 303 -0.0478 mg/L

P214 AV 320.7 EM SD 21.1 CV 6.6

P214 AV 0.0227 mg/L SD 0.0842 CV 370.36

3 REPLICATE #1 1413 10/22/98
P214 EM 313 -0.0079 mg/L window-edge

3 REPLICATE #2
P214 EM 333 0.0720 mg/L window-edge

3 REPLICATE #3
P214 EM 313 -0.0079 mg/L peak-noisy

P214 AV 319.7 EM SD 11.5 CV 3.6

P214 AV 0.0187 mg/L SD 0.0461 CV 246.12

3 REPLICATE #1 1415 10/22/98
P214 EM 304 -0.0438 mg/L peak-noisy

P214 EM 314 [illegible] mg/L window-edge

3 REPLICATE #3
P214 EM 308 -0.0279 mg/L peak-noisy

P214 AV 308.7 EM SD 5.0 CV 1.6

P214 AV -0.0252 mg/L SD 0.0201 CV 79.79

3 REPLICATE #1 1417 10/22/98
P214 EM 313 -0.0079 mg/L window-edge

3 REPLICATE #2
P214 EM 322 0.0281 mg/L peak-noisy

3 REPLICATE #3
P214 EM 316 0.0041 mg/L peak-noisy

P214 AV 317.0 EM SD 4.6 CV 1.4

P214 AV 0.0081 mg/L SD 0.0183 CV 226.31

CV REPLICATE #1 1419 10/22/98
P214 EM 822 2.0257 mg/L

CV REPLICATE #2
P214 EM 833 2.0696 mg/L

CV REPLICATE #3
P214 EM 824 2.0337 mg/L

P214 AV 826.3 EM SD 5.9 CV 0.7

P214 AV 2.0430 mg/L SD 0.0234 CV 1.15

CB REPLICATE #1 1421 10/22/98
P214 EM 345 0.1200 mg/L

CB REPLICATE #2
P214 EM 303 -0.0478 mg/L

CB REPLICATE #3
P214 EM 343 0.1120 mg/L peak-noisy

P214 AV 330.3 EM SD 23.7 CV 7.2

P214 AV 0.0614 mg/L SD 0.0947 CV 154.27

1 REPLICATE #1 1423 10/22/98
P214 EM 300 -0.0598 mg/L peak-noisy

1 REPLICATE #2
P214 EM 311 -0.0159 mg/L peak-noisy

1 REPLICATE #3
P214 EM 318 0.0121 mg/L peak-noisy

P214 AV 309.7 EM SD 9.1 CV 2.9

P214 AV -0.0212 mg/L SD 0.0363 CV 170.93

2 REPLICATE #1 1425 10/22/98
P214 EM 322 0.0281 mg/L peak-noisy

2 REPLICATE #2
P214 EM [illegible] [illegible] mg/L [illegible]

: REPLICATE #3
P214 EM 320 0.0201 mg/L peak-noisy

P214 AV 317.0 EM SD 7.0 CV 2.2

P214 AV 0.0081 mg/L SD 0.0280 CV 345.70

: REPLICATE #1 1427 10/22/98
P214 EM 305 -0.0399 mg/L peak-noisy

: REPLICATE #2
P214 EM 345 0.1200 mg/L peak-noisy

: REPLICATE #3
P214 EM 303 -0.0478 mg/L peak-noisy

P214 AV 317.7 EM SD 23.7 CV 7.5

P214 AV 0.0108 mg/L SD 0.0947 CV 880.25

:S REPLICATE #1 1429 10/22/98
P214 EM 734 1.6741 mg/L

:S REPLICATE #2
P214 EM 729 1.6541 mg/L

:S REPLICATE #3
P214 EM 729 1.6541 mg/L

P214 AV 730.7 EM SD 2.9 CV 0.4

P214 AV 1.6608 mg/L SD 0.0115 CV 0.69

L REPLICATE #1 1431 10/22/98
P214 EM 353 0.1519 mg/L peak-noisy

L REPLICATE #2
P214 EM 330 0.0600 mg/L peak-noisy

L REPLICATE #3
P214 EM 327 0.0480 mg/L peak-noisy

P214 AV 336.7 EM SD 14.2 CV 4.2

P214 AV 0.0867 mg/L SD 0.0568 CV 65.58

Z REPLICATE #1 1433 10/22/98
P214 EM 319 0.0161 mg/L peak-noisy

Z REPLICATE #2
P214 EM 323 0.0321 mg/L

Z REPLICATE #3
P214 EM 322 0.0281 mg/L peak-noisy

P214 AV 321.3 EM SD 2.1 CV 0.6

P214 AV 0.0254 mg/L SD 0.0083 CV 32.74

3 REPLICATE #1 1435 10/22/98
P214 EM 331 0.0640 mg/L peak-noisy

3 REPLICATE #2
P214 EM 334 0.0760 mg/L peak-noisy

REPLICATE #3

P214 EM 332 0.0680 mg/L peak-noisy

P214 AV 332.3 EM SD 1.5 CV 0.5

P214 AV 0.0693 mg/L SD 0.0061 CV 8.80

REPLICATE #1 1437 10/22/98

P214 EM 438 0.4915 mg/L peak-noisy

REPLICATE #2

P214 EM 404 0.3557 mg/L

REPLICATE #3

P214 EM 401 0.3437 mg/L peak-noisy

P214 AV 414.3 EM SD 20.6 CV 5.0

P214 AV 0.3970 mg/L SD 0.0821 CV 20.68

REPLICATE #1 1439 10/22/98

P214 EM 432 0.4675 mg/L

REPLICATE #2

P214 EM 435 0.4795 mg/L

REPLICATE #3

P214 EM 413 0.3916 mg/L

P214 AV 426.7 EM SD 11.9 CV 2.8

P214 AV 0.4462 mg/L SD 0.0477 CV 10.68

REPLICATE #1 1441 10/22/98

P214 EM 423 0.4316 mg/L

REPLICATE #2

P214 EM 433 0.4715 mg/L

REPLICATE #3

P214 EM 409 0.3756 mg/L

P214 AV 421.7 EM SD 12.1 CV 2.9

P214 AV 0.4263 mg/L SD 0.0482 CV 11.30

REPLICATE #1 1443 10/22/98

P214 EM 834 2.0736 mg/L

REPLICATE #2

P214 EM 824 2.0337 mg/L

REPLICATE #3

P214 EM 818 2.0097 mg/L

P214 AV 825.3 EM SD 8.1 CV 1.0

P214 AV 2.0390 mg/L SD 0.0323 CV 1.58

REPLICATE #1 1445 10/22/98

P214 EM 296 -0.0758 mg/L window-edge

REPLICATE #2

P214 EM 297 -0.0718 mg/L peak-noisy

REPLICATE #3

P214 AV 301.0 EM SD 7.8 CV 2.6

P214 AV -0.0558 mg/L SD 0.0312 CV 55.89

L006.1 REPLICATE #1 1447 10/22/98
P214 EM 521 0.8231 mg/L

L006.1 REPLICATE #2
P214 EM 518 0.8111 mg/L

L006.1 REPLICATE #3
P214 EM 518 0.8111 mg/L

P214 AV 519.0 EM SD 1.7 CV 0.3

P214 AV 0.8151 mg/L SD 0.0069 CV 0.85

REPLICATE #1 1449 10/22/98
P214 EM 543 0.9110 mg/L peak-noisy

REPLICATE #2
P214 EM 528 0.8511 mg/L

REPLICATE #3
P214 EM 519 0.8151 mg/L

P214 AV 530.0 EM SD 12.1 CV 2.3

P214 AV 0.8591 mg/L SD 0.0484 CV 5.64

REPLICATE #1 1451 10/22/98
P214 EM 514 0.7951 mg/L

REPLICATE #2
P214 EM 526 0.8431 mg/L

REPLICATE #3
P214 EM 578 1.0508 mg/L

P214 AV 539.3 EM SD 34.0 CV 6.3

P214 AV 0.8964 mg/L SD 0.1359 CV 15.16

REPLICATE #1 1453 10/22/98
P214 EM 499 0.7352 mg/L

REPLICATE #2
P214 EM 506 0.7632 mg/L

REPLICATE #3
P214 EM 525 0.8391 mg/L

P214 AV 510.0 EM SD 13.5 CV 2.6

P214 AV 0.7792 mg/L SD 0.0538 CV 6.90

REPLICATE #1 1455 10/22/98
P214 EM 914 2.3932 mg/L

REPLICATE #2
P214 EM 918 2.4092 mg/L

REPLICATE #3

P214 AV 914.3 EM SD 3.5 CV 0.4

P214 AV 2.3946 mg/L SD 0.0140 CV 0.59

:V REPLICATE #1 1457 10/22/98
P214 EM 821 2.0217 mg/L

:V REPLICATE #2
P214 EM 791 1.9018 mg/L

:V REPLICATE #3
P214 EM 805 1.9578 mg/L

P214 AV 805.7 EM SD 15.0 CV 1.9

P214 AV 1.9604 mg/L SD 0.0600 CV 3.06

:B REPLICATE #1 1459 10/22/98
P214 EM 301 -0.0558 mg/L window-edge

:B REPLICATE #2
P214 EM 293 -0.0878 mg/L peak-noisy

:B REPLICATE #3
P214 EM 319 0.0161 mg/L peak-noisy

P214 AV 304.3 EM SD 13.3 CV 4.4

P214 AV -0.0425 mg/L SD 0.0532 CV 125.14

AMPLE #~~43~~ RS-AP REPLICATE #1 1501 10/22/98
P214 EM 288 -0.1078 mg/L window-edge

AMPLE #~~43~~ REPLICATE #2
P214 EM 302 -0.0518 mg/L

AMPLE #~~43~~ REPLICATE #3
P214 EM 297 -0.0718 mg/L peak-noisy

P214 AV 295.7 EM SD 7.1 CV 2.4

P214 AV -0.0771 mg/L SD 0.0283 CV 36.74

AMPLE #44 REPLICATE #1 1503 10/22/98
P214 EM 313 -0.0079 mg/L peak-noisy

AMPLE #44 REPLICATE #2
P214 EM 312 -0.0119 mg/L

AMPLE #44 REPLICATE #3
P214 EM 319 0.0161 mg/L peak-noisy

P214 AV 314.7 EM SD 3.8 CV 1.2

P214 AV -0.0012 mg/L SD 0.0151 CV 1227.44

AMPLE #45 REPLICATE #1 1505 10/22/98
P214 EM 314 -0.0039 mg/L peak-noisy

AMPLE #45 REPLICATE #2
P214 EM 309 -0.0239 mg/L peak-noisy

AMPLE #45 REPLICATE #3
P214 EM 308 -0.0279 mg/L peak-noisy

Element File: SE.GEL Element: Se Wavelength: 196
Date: 10/16/98 Time: 12:42 Slit: 2.00 L
Data File: ID/Wt File: 81002.IDW Lamp Current: 0
Technique: HGA Calib. Type: Linear Energy: 38

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Se ID: 0 PPB Seq. No.: 00237 A/S Pos.: 0 Date: 10/1

Replicate 1 Time: 12:42
Peak Area (A-s): 0.006 Peak Height (A): 0.037
Background Pk Area (A-s): 0.183 Background Pk Height (A): 0.084
Blank Corrected Pk Area (A-s): 0.010
Concentration (ug/L): 5.34

Replicate 2 Time: 12:45
Peak Area (A-s): 0.011 Peak Height (A): 0.028
Background Pk Area (A-s): 0.192 Background Pk Height (A): 0.082
Blank Corrected Pk Area (A-s): 0.015
Concentration (ug/L): 8.28

Mean Conc (ug/L): 6.81 SD: 2.081 RSD(%): 30.

Auto-zero performed.

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Se ID: 10 PPB Seq. No.: 00238 A/S Pos.: 1 Date: 10/1

Replicate 1 Time: 12:49
Peak Area (A-s): 0.024 Peak Height (A): 0.046
Background Pk Area (A-s): 0.184 Background Pk Height (A): 0.072
Blank Corrected Pk Area (A-s): 0.015
Concentration (ug/L): 8.27

Replicate 2 Time: 12:52
Peak Area (A-s): 0.028 Peak Height (A): 0.050
Background Pk Area (A-s): 0.181 Background Pk Height (A): 0.072
Blank Corrected Pk Area (A-s): 0.019
Concentration (ug/L): 10.35

Mean Conc (ug/L): 9.31 SD: 1.469 RSD(%): 15.7

Standard number 1 applied. [10.00]
Correlation coefficient: 1.00000 Slope: 0.0017

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Se ID: 25 PPB Seq. No.: 00239 A/S Pos.: 2 Date: 10/16

Replicate 1 Time: 12:55
Peak Area (A-s): 0.059 Peak Height (A): 0.087
Background Pk Area (A-s): 0.183 Background Pk Height (A): 0.087
Blank Corrected Pk Area (A-s): 0.050
Concentration (ug/L): 29.03

Replicate 2 Time: 12:59
Peak Area (A-s): 0.056 Peak Height (A): 0.099
Background Pk Area (A-s): 0.173 Background Pk Height (A): 0.080
Blank Corrected Pk Area (A-s): 0.048
Concentration (ug/L): 27.69
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Mean Conc (ug/L): 28.36 SD: 0.950 RSD(%): 3.35

Standard number 2 applied. [25.00]
Correlation coefficient: 0.99443 Slope: 0.0019

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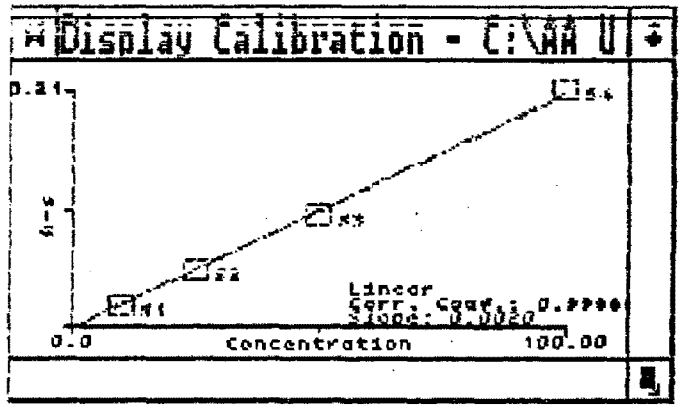
Display Calibration - C:\AA U
0.21
0.0
Concentration
100.00
Linear
Corr. Coef.: 0.9990

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Replicate 2 Time: 14:22
Concentration (ug/L): 0.48

Mean Conc (ug/L): -0.48 SD: 1.354 RSD(%): 284.

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Replicate 2 Time: 14:55
Concentration (ug/L): 0.95

Mean Conc (ug/L): 1.52 SD: 0.796 RSD(%): 52.4

QC sample is within range

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Mean Conc (ug/L): 0.02 SD: 1.477 RSD(%): 6404

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QC sample is within range

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Sample abs. is greater than that of the largest standard.
Mean Conc (ug/L): 125.74 SD: 5.114 RSD(%): 4.07

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Element File: SE.GEL | Element: Se | Wavelength: 196.
Date: 10/19/98 | Time: 15:35 | Slit: 2.00 L
Data File: | ID/Wt File: 81002.IDW | Lamp Current: 0
Technique: HGA | Calib. Type: Linear | Energy: 36

Se ID: 0 PPB Seq. No.: 00044 A/S Pos.: 0 Date: 10/19

Replicate 1 Time: 15:35
Peak Area (A-s): -0.003 Peak Height (A): 0.030
Background Pk Area (A-s): 0.159 Background Pk Height (A): 0.082
Blank Corrected Pk Area (A-s): -0.002
Concentration (ug/L): -1.22

Replicate 2 Time: 15:38
Peak Area (A-s): 0.008 Peak Height (A): 0.028
Background Pk Area (A-s): 0.134 Background Pk Height (A): 0.072
Blank Corrected Pk Area (A-s): 0.008
Concentration (ug/L): 4.03

Mean Conc (ug/L): 1.40 SD: 3.716 RSD(%): 264.

Auto-zero performed.

Se ID: 10 PPB Seq. No.: 00045 A/S Pos.: 1 Date: 10/19

Replicate 1 Time: 15:42
Peak Area (A-s): 0.010 Peak Height (A): 0.040
Background Pk Area (A-s): 0.148 Background Pk Height (A): 0.090
Blank Corrected Pk Area (A-s): 0.007
Concentration (ug/L): 3.60

Replicate 2 Time: 15:45
Peak Area (A-s): 0.012 Peak Height (A): 0.047
Background Pk Area (A-s): 0.132 Background Pk Height (A): 0.074
Blank Corrected Pk Area (A-s): 0.009
Concentration (ug/L): 4.55

Mean Conc (ug/L): 4.08 SD: 0.671 RSD(%): 16.4

Expansion >100 is not allowed. No calibration has occurred.

Se ID: 25 PPB Seq. No.: 00046 A/S Pos.: 2 Date: 10/19

Replicate 1 Time: 15:48
Peak Area (A-s): 0.036 Peak Height (A): 0.080
Background Pk Area (A-s): 0.133 Background Pk Height (A): 0.078
Blank Corrected Pk Area (A-s): 0.034

Replicate 2 Time: 15:52
Peak Area (A-s): 0.048 Peak Height (A): 0.076
Background Pk Area (A-s): 0.116 Background Pk Height (A): 0.065
Blank Corrected Pk Area (A-s): 0.046

Mean Pk Area (A-s): 0.040 SD: 0.0086 RSD(%): 21.63

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Correlation coefficient: 0.99950 Slope: 0.0017

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Concentration (ug/L): -5.38

Mean Conc (ug/L): -6.66 SD: 1.815 RSD(%): 27.2

QC sample is within range

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Replicate 1 Time: 17:27
Concentration (ug/L): 44.82 Corrected Conc (ug/L): 224.1

Replicate 2 Time: 17:31
Concentration (ug/L): 39.44 Corrected Conc (ug/L): 197.2

Mean Conc (ug/L): 42.13 SD: 3.803 RSD(%): 9.0
Corrected Conc (ug/L): 210.6

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Element File: AG.GEL | Element: Ag | Wavelength: 328.
Date: 10/15/98 | Time: 16:02 | Slit: 0.7 L
Data File: | ID/Wt File: 81002.IDW | Lamp Current: 10
Technique: HGA | Calib. Type: Linear | Energy: 55

Ag ID: BLANK Seq. No.: 00195 A/S Pos.: 0 Date: 10/15/

Replicate 1 Time: 16:02
Peak Area (A-s): 0.102 Peak Height (A): 0.158
Background Pk Area (A-s): 0.150 Background Pk Height (A): 0.062
Blank Corrected Pk Area (A-s): 0.007
Concentration (ug/L): 0.10

Replicate 2 Time: 16:05
Peak Area (A-s): 0.088 Peak Height (A): 0.139
Background Pk Area (A-s): 0.133 Background Pk Height (A): 0.061
Blank Corrected Pk Area (A-s): -0.007
Concentration (ug/L): -0.71

Mean Conc (ug/L): -0.30 SD: 0.568 RSD(%): 186.8

Auto-zero performed.

Ag ID: 5 PPB AG Seq. No.: 00196 A/S Pos.: 1 Date: 10/15/

Replicate 1 Time: 16:08
Peak Area (A-s): 0.194 Peak Height (A): 0.290
Background Pk Area (A-s): 0.136 Background Pk Height (A): 0.060
Blank Corrected Pk Area (A-s): 0.099
Concentration (ug/L): 5.37

Replicate 2 Time: 16:12
Peak Area (A-s): 0.187 Peak Height (A): 0.283
Background Pk Area (A-s): 0.129 Background Pk Height (A): 0.057
Blank Corrected Pk Area (A-s): 0.092
Concentration (ug/L): 5.01

Mean Conc (ug/L): 5.19 SD: 0.254 RSD(%): 4.90

Standard number 1 applied. [5.00]
Correlation coefficient: 1.00000 Slope: 0.0191 Int: 0.000

Ag ID: 10 PPB AG Seq. No.: 00197 A/S Pos.: 2 Date: 10/15/

Replicate 1 Time: 16:15
Peak Area (A-s): 0.282 Peak Height (A): 0.428
Background Pk Area (A-s): 0.143 Background Pk Height (A): 0.062
Blank Corrected Pk Area (A-s): 0.187
Concentration (ug/L): 9.79

Replicate 2 Time: 16:18
Peak Area (A-s): 0.288 Peak Height (A): 0.435
Background Pk Area (A-s): 0.148 Background Pk Height (A): 0.065
Blank Corrected Pk Area (A-s): 0.194
Concentration (ug/L): 10.13

Mean Conc (ug/L): 9.96 SD: 0.244 RSD(%): 2.4

Standard number 2 applied. [10.00]
Correlation coefficient: 1.00000 Slope: 0.0190 Int: 0.000

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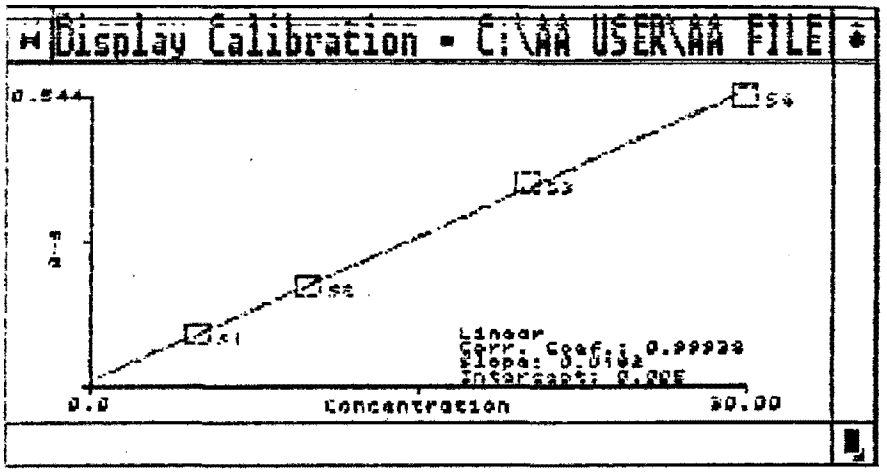
Display Calibration - C:\AA USER\AA FILE
0.544
S1
S2
S3
S4
Linear
Corr. Coef.: 0.99998
Slope: 0.0182
Intercept: 0.006
0.0
Concentration
30.00

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Replicate 2 Time: 17:34
Concentration (ug/L): -0.88

Mean Conc (ug/L): -0.99 SD: 0.163 RSD(%): 16.4

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'eplicate 2 Time: 18:06
:oncentration (ug/L): -1.05

lean Conc (ug/L): -1.09 SD: 0.058 RSD(%): 5.36

IC sample is within range -5.49 - 5.49

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Mean Conc (ug/L): -1.06 SD: 0.025 RSD(%): 2.38

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An ID: CCV Seq. No.: 00224 A/S Pos.: 3 Date: 10/15/

Replicate 1 Time: 19:12
Concentration (ug/L): 19.12

Replicate 2 Time: 19:15
Concentration (ug/L): 18.08

Mean Conc (ug/L): 18.60 SD: 0.738 RSD(%): 3.97

QC sample is within range 15.5 - 24.49

An ID: CCB Seq. No.: 00225 A/S Pos.: 0 Date: 10/15/

Replicate 1 Time: 19:18
Concentration (ug/L): -1.13

Replicate 2 Time: 19:21
Concentration (ug/L): -1.06

Mean Conc (ug/L): -1.10 SD: 0.046 RSD(%): 4.23

QC sample is within range -5.49 - 5.49

An ID: 81003.U2 Seq. No.: 00226 A/S Pos.: 23 Date: 10/15/

Replicate 1 Time: 19:24
Concentration (ug/L): -1.63

Replicate 2 Time: 19:28
Concentration (ug/L): -1.54

Mean Conc (ug/L): -1.59 SD: 0.064 RSD(%): 4.04

An ID: 81003.U3 Seq. No.: 00227 A/S Pos.: 24 Date: 10/15/

Replicate 1 Time: 19:31
Concentration (ug/L): -1.53

Replicate 2 Time: 19:34
Concentration (ug/L): -1.38

Mean Conc (ug/L): -1.46 SD: 0.100 RSD(%): 6.88

An ID: 81003.I1 Seq. No.: 00228 A/S Pos.: 25 Date: 10/15/

Replicate 1 Time: 19:38
Concentration (ug/L): 3.11

Replicate 2 Time: 19:41
Concentration (ug/L): 3.04

Mean Conc (ug/L): 3.08 SD: 0.049 RSD(%): 1.59

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Element File: TL.GEL          Element: Tl                    Wavelength: 276.
Date: 10/19/98                Time: 18:11                    Slit: 2.00 H
Data File:                    ID/Wt File: 81002.IDW          Lamp Current: 7
Technique: HGA                Calib. Type: Nonlinear         Energy: 45
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Tl    ID: BLANK               Seq. No.: 00061    A/S Pos.: 0     Date: 10/19

Replicate  1                                     Time: 18:11
Peak Area (A-s): 0.003                           Peak Height (A): 0.015
Background Pk Area (A-s): 0.013                  Background Pk Height (A): 0.012
Blank Corrected Pk Area (A-s): 0.003

Replicate  2                                     Time: 18:14
Peak Area (A-s): -0.000                          Peak Height (A): 0.016
Background Pk Area (A-s): 0.022                  Background Pk Height (A): 0.015
Blank Corrected Pk Area (A-s): -0.000

Mean Pk Area (A-s):       0.002                  SD: 0.0022                RSD(%): 142.

Auto-zero performed.

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Tl    ID: 10 PPB TL           Seq. No.: 00062    A/S Pos.: 1     Date: 10/19

Replicate  1                                     Time: 18:17
Peak Area (A-s): 0.016                           Peak Height (A): 0.026
Background Pk Area (A-s): 0.039                  Background Pk Height (A): 0.021
Blank Corrected Pk Area (A-s): 0.015

Characteristic Mass = 29.8 pg/0.0044 A-s

Replicate  2                                     Time: 18:21
Peak Area (A-s): 0.021                           Peak Height (A): 0.027
Background Pk Area (A-s): 0.037                  Background Pk Height (A): 0.023
Blank Corrected Pk Area (A-s): 0.019

Mean Pk Area (A-s):       0.017                  SD: 0.0033                RSD(%): 19.4

Standard number 1 applied.  [10.00]
Correlation coefficient: 1.00000                 Slope: 0.0017

Characteristic Mass = 22.6 pg/0.0044 A-s

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Tl    ID: 20 PPB TL           Seq. No.: 00063    A/S Pos.: 2     Date: 10/19

Replicate  1                                     Time: 18:24
Peak Area (A-s): 0.033                           Peak Height (A): 0.034
Background Pk Area (A-s): 0.055                  Background Pk Height (A): 0.031
Blank Corrected Pk Area (A-s): 0.031
Concentration (ug/L  ): 18.34

Replicate  2                                     Time: 18:27
Peak Area (A-s): 0.030                           Peak Height (A): 0.040
Background Pk Area (A-s): 0.059                  Background Pk Height (A): 0.032
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Blank Corrected Pk Area (A-s): 0.028
Concentration (ug/L): 16.61

Mean Conc (ug/L): 17.47 SD: 1.226 RSD(%): 7.02

Standard number 2 applied. [20.00]
Correlation coefficient: 1.00000 Slope: 0.0020

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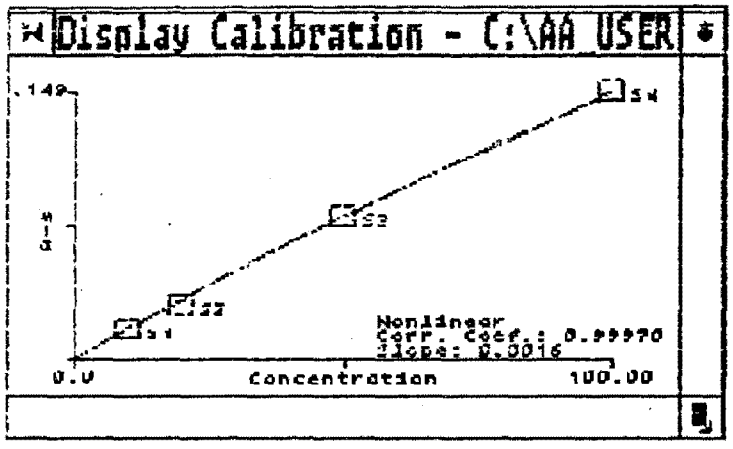
Display Calibration - C:\AA USER
.149
S4
S3
S2
S1
Nonlinear
Corr. Coef.: 0.99970
Slope: 0.0016
0.0
Concentration
100.00

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Replicate 2 Time: 19:06
Concentration (ug/L): -1.71

Mean Conc (ug/L): -2.09 SD: 0.543 RSD(%): 25.9

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Recovery is 93.4%

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Mean Conc (ug/L): 8.62 SD: 5.441 RSD(%): 62.9

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Concentration (ug/L): 3.90 Corrected Conc (ug/L): 19.5

Mean Conc (ug/L): 3.54 SD: 0.513 RSD(%): 14.5
Corrected Conc (ug/L): 17.7

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T1 ID: CCB Seq. No.: 00094 A/S Pos.: 0 Date: 10/20

Replicate 1 Time: 08:07
Concentration (ug/L): -0.00

Replicate 2 Time: 08:10
Concentration (ug/L): -0.49

Mean Conc (ug/L): -0.25 SD: 0.344 RSD(%): 139.

QC sample is within range

T1 ID: 81003.I1 Seq. No.: 00095 A/S Pos.: 25 Date: 10/20

Replicate 1 Time: 08:14
Concentration (ug/L): 35.62

Replicate 2 Time: 08:17
Concentration (ug/L): 37.38

Mean Conc (ug/L): 36.50 SD: 1.249 RSD(%): 3.42

T1 ID: 81003.I2 Seq. No.: 00096 A/S Pos.: 26 Date: 10/20

Replicate 1 Time: 08:20
Concentration (ug/L): 49.66

Replicate 2 Time: 08:24
Concentration (ug/L): 48.86

Mean Conc (ug/L): 49.26 SD: 0.566 RSD(%): 1.15

T1 ID: 81003.I3 Seq. No.: 00097 A/S Pos.: 27 Date: 10/20

Replicate 1 Time: 08:27
Concentration (ug/L): 46.14

Replicate 2 Time: 08:30
Concentration (ug/L): 46.23

Mean Conc (ug/L): 46.18 SD: 0.065 RSD(%): 0.14

T1 ID: 81006.1 Seq. No.: 00098 A/S Pos.: 28 Date: 10/20

Replicate 1 Time: 08:33
Concentration (ug/L): 16.97

Replicate 2 Time: 08:37
Concentration (ug/L): 18.19

Mean Conc (ug/L): 17.58 SD: 0.861 RSD(%): 4.90

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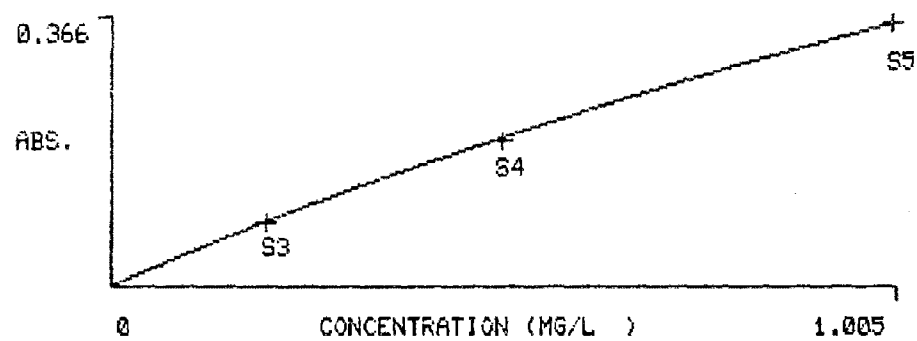
MAIN: 0.003 MG/L	HO 0.001 (AA)		MAIN: 0.002 MG/L	HO 0.001 (AA)	
ZN	MEAN: 0.002 MG/L	SD: 0.001	RSD: 21.8	AUTOZERO	0.000
MAIN: 0.098 MG/L	HO 0.039 (AA)		MAIN: 0.082 MG/L	HO 0.032 (AA)	
ZN	MEAN: 0.090 MG/L	SD: 0.012	RSD: 12.8	1.STANDARD	0.090 MG/L
MAIN: 0.145 MG/L	HO 0.057 (AA)		MAIN: 0.137 MG/L	HO 0.054 (AA)	
ZN	MEAN: 0.141 MG/L	SD: 0.006	RSD: 4.1	2.STANDARD	0.140 MG/L
MAIN: 0.220 MG/L	HO 0.088 (AA)		MAIN: 0.235 MG/L	HO 0.093 (AA)	
ZN	MEAN: 0.228 MG/L	SD: 0.010	RSD: 4.6	3.STANDARD	0.227 MG/L
MAIN: 0.516 MG/L	HO 0.206 (AA)		MAIN: 0.512 MG/L	HO 0.204 (AA)	
ZN	MEAN: 0.514 MG/L	SD: 0.003	RSD: 0.6	4.STANDARD	0.513 MG/L
MAIN: 0.919 MG/L	HO 0.368 (AA)		MAIN: 0.910 MG/L	HO 0.365 (AA)	
ZN	MEAN: 0.915 MG/L	SD: 0.006	RSD: 0.7	5.STANDARD	0.959 MG/L

FLAME DISPLAY CALIBRATION MODE
ELEMENT: ZN

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

REPL. 0 OF 2

0.959
READ



ABS. READING
AA : 0.365

STATISTICS
MEAN: 0.915
SD: 0.006
RSD(%): 0.7

C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN: 0.001 MG/L	HO 0.001 (AA)		MAIN: -0.001 MG/L	HO-0.000 (AA)	
ZN	MEAN: 0.000 MG/L	SD: 0.001	RSD: 99.9	AUTOZERO	0.000

MAIN: 0.500 MG/L	HO 0.207 (AA)		MAIN: 0.475 MG/L	HO 0.198 (AA)	
ZN ICV	MEAN: 0.488 MG/L	SD: 0.018	RSD: 3.6		
MAIN: 0.005 MG/L	HO 0.002 (AA)		MAIN: 0.001 MG/L	HO 0.001 (AA)	
ZN ICB	MEAN: 0.003 MG/L	SD: 0.002	RSD: 86.6		
MAIN: 0.380 MG/L	HO 0.163 (AA)		MAIN: 0.400 MG/L	HO 0.170 (AA)	
02 ZN B-1	MEAN: 0.390 MG/L	SD: 0.014	RSD: 3.6		
MAIN: 0.272 MG/L	HO 0.120 (AA)		MAIN: 0.263 MG/L	HO 0.116 (AA)	
ZN 8-1	MEAN: 0.267 MG/L	SD: 0.006	RSD: 2.4		
MAIN: 0.654 MG/L	HO 0.260 (AA)		MAIN: 0.679 MG/L	HO 0.268 (AA)	
ZN 8-1S	MEAN: 0.666 MG/L	SD: 0.018	RSD: 2.7		
MAIN: 0.358 MG/L	HO 0.154 (AA)		MAIN: 0.384 MG/L	HO 0.164 (AA)	
ZN 9-1	MEAN: 0.371 MG/L	SD: 0.018	RSD: 4.9		
MAIN: 0.360 MG/L	HO 0.155 (AA)		MAIN: 0.353 MG/L	HO 0.152 (AA)	
ZN 9-1D	MEAN: 0.356 MG/L	SD: 0.006	RSD: 1.6		
MAIN: 0.426 MG/L	HO 0.180 (AA)		MAIN: 0.439 MG/L	HO 0.135 (AA)	
ZN 10-1	MEAN: 0.433 MG/L	SD: 0.009	RSD: 2.2		
MAIN: 0.013 MG/L	HO 0.006 (AA)		MAIN: 0.014 MG/L	HO 0.007 (AA)	
ZN [illegible]	MEAN: 0.013 MG/L	SD: 0.000	RSD: 2.3	AUTOZERO	0.000
MAIN: 0.115 MG/L	HO 0.053 (AA)		MAIN: 0.114 MG/L	HO 0.053 (AA)	
ZN B-2A	MEAN: 0.115 MG/L	SD: 0.001	RSD: 0.6		

MAIN:	0.170 MG/L	AA HO 0.077	MAIN:	0.170 MG/L	AA HO 0.077

ZN 8-2A MEAN: 0.170 MG/L SD: 0.000 RSD: 0.1

MAIN:	0.519 MG/L	AA HO 0.214	MAIN:	0.557 MG/L	AA HO 0.227

ZN 8-2AS MEAN: 0.538 MG/L SD: 0.026 RSD: 4.9

MAIN:	0.489 MG/L	AA HO 0.203	MAIN:	0.513 MG/L	AA HO 0.212

CCV

ZN [redacted] MEAN: 0.501 MG/L SD: 0.016 RSD: 3.3

MAIN:	-0.004 MG/L	AA HO-0.002	MAIN:	-0.005 MG/L	AA HO-0.002

ZN CCB MEAN: -0.004 MG/L SD: 0.001 RSD: 16.8

MAIN:	0.180 MG/L	AA HO 0.082	MAIN:	0.172 MG/L	AA HO 0.078

ZN 9-2A MEAN: 0.176 MG/L SD: 0.006 RSD: 3.3

MAIN:	0.164 MG/L	AA HO 0.074	MAIN:	0.170 MG/L	AA HO 0.077

ZN 9-2AP MEAN: 0.167 MG/L SD: 0.004 RSD: 2.6

MAIN:	0.220 MG/L	AA HO 0.098	MAIN:	0.218 MG/L	AA HO 0.098

ZN 10-2A MEAN: 0.219 MG/L SD: 0.001 RSD: 0.5

1003 MAIN:	0.106 MG/L	AA HO 0.049	MAIN:	0.093 MG/L	AA HO 0.043

ZN RB-A MEAN: 0.100 MG/L SD: 0.009 RSD: 9.4

MAIN:	0.108 MG/L	AA HO 0.050	MAIN:	0.111 MG/L	AA HO 0.051

ZN RB-F MEAN: 0.109 MG/L SD: 0.002 RSD: 2.2

MAIN:	0.107 MG/L	AA HO 0.049	MAIN:	0.094 MG/L	AA HO 0.044

ZN OB MEAN: 0.100 MG/L SD: 0.009 RSD: 8.8

MAIN:	0.092 MG/L	AA HO 0.043	MAIN:	0.114 MG/L	AA HO 0.053

ZN uB MEAN: 0.103 MG/L SD: 0.015 RSD: 14.8

MAIN:	0.135 MG/L	AA HO 0.062	MAIN:	0.121 MG/L	AA HO 0.056

ZN tB MEAN: 0.128 MG/L SD: 0.009 RSD: 7.3

MAIN:	0.467 MG/L	AA HO 0.195	MAIN:	0.489 MG/L	AA HO 0.203

ZN ccv MEAN: 0.478 MG/L SD: 0.015 RSD: 3.2

MAIN:	0.005 MG/L	AA HO 0.003	MAIN:	-0.005 MG/L	AA HO-0.002

ZN αB MEAN: 0.000 MG/L SD: 0.007 RSD: 99.9

MAIN:	0.085 MG/L	AA HO 0.040	MAIN:	0.081 MG/L	AA HO 0.038

ZN 01 MEAN: 0.083 MG/L SD: 0.003 RSD: 4.0

MAIN:	0.124 MG/L	AA HO 0.057	MAIN:	0.111 MG/L	AA HO 0.052

ZN 02 MEAN: 0.117 MG/L SD: 0.009 RSD: 7.2

MAIN:	0.079 MG/L	AA HO 0.037	MAIN:	0.077 MG/L	AA HO 0.036

ZN 03 MEAN: 0.078 MG/L SD: 0.001 RSD: 1.8

MAIN:	0.130 MG/L	AA HO 0.060	MAIN:	0.129 MG/L	AA HO 0.059

ZN 02D MEAN: 0.129 MG/L SD: 0.001 RSD: 0.7

MAIN:	0.122 MG/L	AA HO 0.056	MAIN:	0.133 MG/L	AA HO 0.061

ZN 41 MEAN: 0.127 MG/L SD: 0.008 RSD: 6.0

MAIN:	0.131 MG/L	AA HO 0.060	MAIN:	0.105 MG/L	AA HO 0.049

ZN 42 MEAN: 0.118 MG/L SD: 0.018 RSD: 15.6

MAIN:	0.104 MG/L	AA HO 0.048	MAIN:	0.099 MG/L	AA HO 0.046
ZN 43	MEAN: 0.101 MG/L	SD: 0.003 RSD: 3.2			
MAIN:	0.480 MG/L	AA HO 0.200	MAIN:	0.477 MG/L	AA HO 0.199
ZN CCV	MEAN: 0.479 MG/L	SD: 0.002 RSD: 0.5			
MAIN:	0.000 MG/L	AA HO 0.000	MAIN:	-0.001 MG/L	AA HO-0.000
ZN CCB	MEAN:-0.000 MG/L	SD: 0.001 RSD: 99.9			
MAIN:	0.357 MG/L	AA HO 0.154	MAIN:	0.356 MG/L	AA HO 0.153
ZN I1x5	MEAN: 0.356 MG/L	SD: 0.001 RSD: 0.2			
MAIN:	0.774 MG/L	AA HO 0.299	MAIN:	0.770 MG/L	AA HO 0.297
ZN I1x5S	MEAN: 0.772 MG/L	SD: 0.003 RSD: 0.4			
MAIN:	0.490 MG/L	AA HO 0.204	MAIN:	0.476 MG/L	AA HO 0.198
ZN I2x5	MEAN: 0.483 MG/L	SD: 0.010 RSD: 2.1			
MAIN:	0.455 MG/L	AA HO 0.191	MAIN:	0.454 MG/L	AA HO 0.191
ZN I3x5	MEAN: 0.455 MG/L	SD: 0.000 RSD: 0.1			
MAIN:	0.209 MG/L	AA HO 0.094	MAIN:	0.209 MG/L	AA HO 0.094
006 ZN 1x5	MEAN: 0.209 MG/L	SD: 0.000 RSD: 0.0			
MAIN:	0.593 MG/L	AA HO 0.240	MAIN:	0.607 MG/L	AA HO 0.244
ZN 15x5	MEAN: 0.600 MG/L	SD: 0.010 RSD: 1.7			
MAIN:	0.139 MG/L	AA HO 0.064	MAIN:	0.138 MG/L	AA HO 0.063
ZN 2x5	MEAN: 0.138 MG/L	SD: 0.001 RSD: 0.6			

MAIN:	0.139 MG/L	HO AA 0.064	MAIN:	0.136 MG/L	HO AA 0.062

ZN 2x5D MEAN: 0.137 MG/L SD: 0.002 RSD: 1.5

MAIN:	0.153 MG/L	HO AA 0.070	MAIN:	0.146 MG/L	HO AA 0.067

ZN 3x5 MEAN: 0.149 MG/L SD: 0.005 RSD: 3.1

MAIN:	0.507 MG/L	HO AA 0.210	MAIN:	0.515 MG/L	HO AA 0.212

ZN CCV MEAN: 0.511 MG/L SD: 0.005 RSD: 1.0

MAIN:	-0.004 MG/L	HO AA -0.002	MAIN:	-0.003 MG/L	HO AA -0.002

ZN CCB MEAN: -0.003 MG/L SD: 0.000 RSD: 7.9

EASTERN RESEARCH GROUP, INC.

Eastern Research Group
Sample Chain of Custody

Matrix = **Filters**

Contents in Amber jars represent samples taken from filters

B-I-M315-1-F (080798-05)
B-I-M315-1-F (080798-16)
B-I-M315-2-F (080798-04)
B-I-M315-2-F (080798-19)
B-I-M315-3-F (080798-11)
B-I-M315-3-F (080798-15)
B-I-M315-FB-F (080798-2)
B-O-M315-1-F
B-O-M315-2-F
B-O-M315-3-F
B-O-M315-FB-F
B-U-M315-1-F
B-U-M315-2-F
B-U-M315-3-F
B-U-M315-FB-F

Contents in Aluminum Pans for "FILTERS" represent MCEM from the filter Matrix

Sample ID	Aluminum Pan #
B-I-M315-1-F (080798-05)	10
B-I-M315-1-F (080798-16)	11
B-I-M315-2-F (080798-04)	12
B-I-M315-2-F (080798-19)	13
B-I-M315-3-F (080798-11)	14
B-I-M315-3-F (080798-15)	15
B-I-M315-FB-F (080798-2)	16
B-O-M315-1-F	17
B-O-M315-2-F	18
B-O-M315-3-F	19
B-O-M315-FB-F	20
B-U-M315-1-F	21
B-U-M315-2-F	22
B-U-M315-3-F	23
B-U-M315-FB-F	24

Contents in Aluminum Pans for MeCl2 FHR represent MCEM from the MeCl2 Matrix

Matrix = **Methylene Chloride FHR**

Sample ID	Aluminum Pan #
B-I-M315-1-FH-M	10
B-I-M315-2-FH-M	11
B-I-M315-3-FH-M	12
B-I-M315-FB-FH-M	13
B-O-M315-1-FH-M	14
B-O-M315-2-FH-M	15
B-O-M315-3-FH-M	16
B-O-M315-FB-FH-M	17
B-U-M315-1-FH-M	18
B-U-M315-2-FH-M	19
B-U-M315-3-FH-M	20
B-U-M315-FB-FH-M	21

Contents in Aluminum Pans for H2O Imp Rinses represent MCEM from the H20 Imp Rinse Matrix

Matrix = **H2O Impinger Rinses**

Sample ID	Aluminum Pan #
B-I-M315-1-IMP H20	13
B-I-M315-2-IMP H20	14
B-I-M315-3-IMP H20	15
B-I-M315-FB-IMP H20	16
B-O-M315-1-IMP H20	17
B-O-M315-2-IMP H20	18
B-O-M315-3-IMP H20	19
B-O-M315-FB-IMP H20	20
B-U-M315-1-IMP H20	21
B-U-M315-2-IMP H20	22
B-U-M315-3-IMP H20	23
B-U-M315-FB-IMP H20	24

Relinquished by: 10/6/98

Received for FAL. 10/6/98

Relinquished by: Date: 10/5/98
Received by: Date: 10/5/98

ERG
EASTERN RESEARCH GROUP, INC.

Eastern Research Group
Sample Chain of Custody

Contents in Aluminum Pans for "Acetone BHR" represent MCEM from the Acetone BHR Matrix

Matrix = **Acetone BHR**

Sample ID	***Aluminum Pan #***
B-I-M315-1-BH-A	1
B-I-M315-2-BH-A	2
B-I-M315-3-BH-A	3
B-I-M315-FB-BH-A	4
B-O-M315-1-BH-A	5
B-O-M315-2-BH-A	6
B-O-M315-3-BH-A	7
B-O-M315-FB-BH-A	8
B-U-M315-1-BH-A	9
B-U-M315-2-BH-A	10
B-U-M315-3-BH-A	11
B-U-M315-FB-BH-A	12

Contents in Aluminum Pans for MeCl2 BHR represent MCEM from the MeCl2 BHR Matrix

Matrix = **Methylene Chloride BHR**

Sample ID	***Aluminum Pan #***
B-I-M315-1-BH-M	1
B-I-M315-2-BH-M	2
B-I-M315-3-BH-M	3
B-I-M315-FB-BH-M	4
B-O-M315-1-BH-M	5
B-O-M315-2-BH-M	6
B-O-M315-3-BH-M	7
B-O-M315-FB-BH-M	8
B-U-M315-1-BH-M	9
B-U-M315-2-BH-M	10
B-U-M315-3-BH-M	11
B-U-M315-FB-BH-M	12

Relinquished by: Franklin Meadow 10/6/98

Received for FAL 10/6/98 WAWhalen

Relinquished by: [signature] Date: 10/5/98
Received by: [signature] Date: 10/5/98

Quanterra Environmental Services

Quanterra Incorporated
880 Riverside Parkway
West Sacramento, California 95605

916 373-5600 Telephone
916 372-1059 Fax

September 17, 1998
QUANTERRA INCORPORATED PROJECT NUMBER: **301036**
PO/CONTRACT: **CLC-950302**

Ron Kolde
Pacific Environmental Services
4700 Duke Drive
Suite 150
Mason, OH 45040

Dear Mr. Kolde:

This report contains the analytical results for the thirteen samples which were received under chain of custody by Quanterra Incorporated on 18 August 1998. This sample set is associated with your "S506.000" project.

The case narrative is an integral part of this report.

If you have any questions, please feel free to call.

Sincerely,

Patrick Rainey
Project Manager
Advanced Technology

PR/rr

Quanterra
Environmental Services

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QUANTERRA INCORPORATED PROJECT NUMBER 301036

Case Narrative

Quanterra's Quality Assurance Program

Sample Description Information

Chain of Custody Documentation

Polynuclear Aromatic Hydrocarbons - Method HRGC/HRMS
Includes Sample(s): 1 through 13
- Method Blank Sheets
- Sample Data Sheets
- Laboratory Control Sample

Quanterra
Environmental Services

CASE NARRATIVE

QUANTERRA INCORPORATED PROJECT NUMBER 301036

One cooler containing 1-L AGB's was received at 9 degrees. Sample B-8-M429-1 container 6 had some volume lost due to leaking in transit. Sample B-I-M429-3 had water leak into the ziploc and the petri dish containing the filter.

Sample trains were prepared and analyzed by a modified CARB 429 procedure. All fractions of each train were combined for a single extract which was analyzed by HRGC/HRMS.

Detection limits for PAHs are reported on a sample specific basis and all results are recovery corrected per the isotope dilution technique. For an analyte reported as 'Not Detected' the associated detection limit represents its maximum possible concentration.

Results above the reporting limits for Naphthalene, 2-Methylnaphthalene, and Phenanthrene were detected in the laboratory method blank associated with your samples. These analytes are common artifacts of XAD-2 resin and ubiquitous ambient levels. As the observed concentrations may be due to laboratory artifact, these results should be reviewed for significance. Positive concentrations detected for these analytes in your samples are qualified with a "B" footnote on the data sheets.

All reported results for samples "B-I-429-1", "B-I-429-2", and "B-I-429-3"are from analysis of extracts diluted 10X due to high analyte levels and/or matrix interferences observed in the analysis of the undiluted extract. The concentrations reported for Naphthalene and 2-Methylnaphthalene in samples "B-U-429-2" and "B-U-429-3" are from analysis of extracts diluted 10X due to concentrations in excess of the method calibration range for these analytes. All other results are reported from analysis of undiluted extracts. There are some analytes in all samples that exceed the upper method calibration range, however, in most cases the concentration of these analytes are within the linear response range of the detector, and data quality is not adversely affected. The affected analytes are qualified with an "E" footnote on the data sheets.

QUANTERRA INCORPORATED QUALITY CONTROL PROGRAM

Quanterra has implemented an extensive Quality Control (QC) program to ensure the production of scientifically sound, legally defensible data of known documentable quality. This QC program is based upon requirements in "Test Methods for Evaluating Solid Waste", USEPA SW-846, Third Edition. It applies whenever SW-846 analytical methods are used. It also applies in whole or in part whenever project requirements fail to specify some aspect of QC practices described here. It does not apply when other well defined QC programs (e.g. CLP or CLP-like) are specified. This is Quanterra's base QC program for environmental analysis.

Definitions:

Quality Control Batch. The quality control (QC) batch is a set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots.

Surrogate. A surrogate (or internal standard) is an organic compound similar in chemical behavior to the target analyte, but not normally found in environmental samples. Surrogates (or IS) are added to all samples in a batch to monitor the effects of both the matrix and the analytical process on accuracy.

Method Blank. A method blank (MB) is a control sample prepared using the same reagents used for the samples. As part of the QC batch, it accompanies the samples through all steps of the sample extraction and cleanup procedure. The method blank is used to monitor the level of contamination introduced to a batch of samples as a result of processing in the laboratory.

Laboratory Control Sample. A laboratory control sample (LCS) is prepared using a well characterized matrix (e.g., reagent water or Ottawa sand) that is spiked with known amounts of representative analytes. Alternate matrices (e.g., glass beads) may be used for soil analyses when Ottawa sand is not appropriate. As part of a QC batch, it accompanies the samples through all steps of the sample extraction and cleanup process. The LCS is used to monitor the accuracy of the analytical process independent of possible interference effects due to sample matrix.

Duplicate Control Sample. A duplicate laboratory control sample (DCS) consists of a pair of LCSs analyzed within the same QC batch to monitor precision and accuracy independent of sample matrix effects.

Quanterra
Environmental Services

SAMPLE DESCRIPTION INFORMATION
for
Pacific Environmental Services

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
301036-0001-SA	B-I-429-1	AIRTRAIN	11 AUG 98		18 AUG 98
301036-0001-MB	Method Blank	AIRTRAIN	11 AUG 98		18 AUG 98
301036-0002-SA	B-I-429-2	AIRTRAIN	12 AUG 98		18 AUG 98
301036-0003-SA	B-I-429-3	AIRTRAIN	13 AUG 98		18 AUG 98
301036-0004-SA	B-O-429-1	AIRTRAIN	11 AUG 98		18 AUG 98
301036-0005-SA	B-O-429-2	AIRTRAIN	12 AUG 98		18 AUG 98
301036-0006-SA	B-O-429-3	AIRTRAIN	13 AUG 98		18 AUG 98
301036-0007-SA	B-U-429-1	AIRTRAIN	14 AUG 98		18 AUG 98
301036-0008-SA	B-U-429-2	AIRTRAIN	14 AUG 98		18 AUG 98
301036-0009-SA	B-U-429-3	AIRTRAIN	15 AUG 98		18 AUG 98
301036-0010-SA	B-I-429-FB	AIRTRAIN	14 AUG 98		18 AUG 98
301036-0011-SA	B-O-429-FB	AIRTRAIN	14 AUG 98		18 AUG 98
301036-0012-SA	B-U-429-FB	AIRTRAIN	15 AUG 98		18 AUG 98
301036-0013-SA	B-BLANKS-LAB	AIRTRAIN	15 AUG 98		18 AUG 98

ANALYTICAL REQUEST AND CHAIN OF CUSTODY

PLANT: Bethlehem Steel EPA Coke

PROJECT #: 5506.000

RECOVERY PERSON: R Kolb, R Durham

SAMPLE TECHNICIAN: D. Holzschuch, S. Blaine, T. Abernathy

ANALYTICAL REQUEST: CARB Method 429 for PAHs

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	SAMPLE NAME	NUMBER OF CONTAINERS	CARB Method 429 for PAHs	COMMENTS (Type of container, special preparation, special handling, etc.)
(*) B-I-429-1	8/11/98		Same	8/18 NN 9 10	X	Baghouse Inlet
B-I-429-2	8/12/98		Same	10	X	" "
(*) B-I-429-3	8/13/98		Same	7	X	" "
B-O-429-1	8/11/98		Same	7	X	Baghouse Outlet
B-O-429-2	8/12/98		Same	7	X	" "
B-O-429-3	8/13/98		Same	7	X	" "
B-U-429-1	8/14/98		Same	7	X	Underfire Stack
B-U-429-2	8/14/98		Same	7	X	" "
B-U-429-3	8/15/98		Same	7	X	" "
B-I-429-FB	8/14/98		Same	8/18 NN 7	X	Inlet Field Blank
B-O-429-FB	8/14/98		Same	7	X	Outlet Field Blank
B-U-429-FB	8/15/98		Same	7	X	Underfire Field Blank
B-Blanks-Lab	8/15/98		Same	7	X	Lab Blanks

RELINQUISHER'S NAME	DATE/TIME	RELINQUISHER'S SIGNATURE	SHIPPER'S NAME AND ID NUMBER
Ronald J. Kolb	8/15/98 - 2000	[signature]	NN 10:15 am 8/25/98 Relinquisher's Signature; Marsha E. Garcia OES Westco 081898
RECEIVER'S NAME	DATE/TIME	RECEIVER'S SIGNATURE	Receiver's Signature

(*) Container No. 4 had a reduced volume. It leaked in the cooler. [redacted] the filter had melted [redacted] which [redacted] through the [redacted]

ottle Order and hain of Custody

Quanterra Incorporated
1721 South Grand Avenue
Santa Ana, California 92705
714 258-8610 Direct
714 258-0921 Fax

Quanterra Incorporated
880 Riverside Parkway
West Sacramento, California 95605
916 375-5600 Direct
916 372-1059 Fax

Quanterra Environm Services

-3021-A

To: ATT: Ron Kolde
PES
4700 Duke dr, Suite 150
MASON OH 45040
phone Number (513) 398-2556

Requested By: Pat Rainey — Date: 7.29.9
"Must Arrive By" Date: 8.7.98 — Shipped By: B. Thompson — Date: 8.6.9
Ship By: ☐ Lab Courier ☒ Fed-Ex ☐ UPS ☐ Client Pick-up
Cooler ID Number(s):

In: ☒ Ice Chest ☐ Box
Include: ☒ Blue Ice ☒ Chain of Custody ☐ Seals

Container/Preservative	Bottle Lot Numbers	No. of Containers Requested	Analysis
ml VOA			
ml VOA/HCl			
ml Amber Glass Bottle			
ml Amber Glass/H2S04			
ml Amber Glass/HNO3			
ml Amber Glass/NaOH			
Amber Glass Bottle			
Amber Glass/H2SO4			
ml Poly			
ml Poly/HNO3			
ml Poly			
ml P/HN03			
ml P/NaOH			
ml P/ZnAc/NaOH			
Poly			
P/HN03			
z Glass Jar			
z Glass Jar			
oz Glass Jar			
Blank			
cti Bottle/Sterile			
lipore H20			
er Traps (XAD)		20	HR. PAH

ments: Traps ID# = PES080698-1-20

Relinquished By (Signature)	Received By (Signature)	Date	Time
[signature]	FED EX	8/6/98	

STRIBUTION: WHITE - Client; CANARY - Bottle Prep; PINK - Client Folder

Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: Method Blank
Lab ID: 301036-0001-MB
Matrix: AIRTRAIN Sampled: NA Received: NA
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	520	ng/sample	--	E
2-Methylnaphthalene	14	ng/sample	--	
Acenaphthylene	ND	ng/sample	0.46	
Acenaphthene	ND	ng/sample	7.6	
Fluorene	ND	ng/sample	6.5	
Phenanthrene	24	ng/sample	--	
Anthracene	ND	ng/sample	1.4	
Fluoranthene	ND	ng/sample	6.4	
Pyrene	ND	ng/sample	3.1	
Benzo(a)anthracene	ND	ng/sample	0.17	
Chrysene	ND	ng/sample	0.53	
Benzo(b)fluoranthene	ND	ng/sample	0.30	
Benzo(k)fluoranthene	ND	ng/sample	0.14	
Benzo(e)pyrene	ND	ng/sample	0.19	
Benzo(a)pyrene	ND	ng/sample	0.12	
Perylene	ND	ng/sample	0.079	
Indeno(1,2,3-cd)pyrene	ND	ng/sample	0.31	
Dibenz(a,h)anthracene	ND	ng/sample	0.13	
Benzo(g,h,i)perylene	ND	ng/sample	0.37	

Surrogate	Recovery	
13C-Fluorene	80	%
Naphthalene-d8	80	%
Acenaphthylene-d8	76	%
Acenaphthene-d10	81	%
Fluorene-d10	74	%
Phenanthrene-d10	80	%
Fluoranthene-d10	82	%
Pyrene-d10	82	%
Benzo(a)anthracene-d12	91	%
Perylene-d12	90	%
Indeno(123-cd)pyrene-d12	92	%
Chrysene-d12	93	%
Benzo(b)fluoranthene-d12	94	%
Benzo(k)fluoranthene-d12	90	%
Benzo(a)pyrene-d12	85	%
Dibenz(a,h)anthracene-d14	88	%
Benzo(g,h,i)perylene-d12	91	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Clark Pickell Approved By: Mike Flournoy

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: Method Blank
Lab ID: 301036-0001-MB
Matrix: AIRTRAIN Sampled: NA Received: NA
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note E : Concentration exceeds calibration range. Value is estimated.

ND = Not detected
NA = Not applicable

Reported By: Clark Pickell Approved By: Mike Flournoy

The cover letter is an integral part of this report.
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Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-1
Lab ID: 301036-0001-SA
Matrix: AIRTRAIN Sampled: 11 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	27000	ng/sample	--	BE
2-Methylnaphthalene	7900	ng/sample	--	BE
Acenaphthylene	5500	ng/sample	--	E
Acenaphthene	690	ng/sample	--	
Fluorene	2200	ng/sample	--	
Phenanthrene	20000	ng/sample	--	BE
Anthracene	730	ng/sample	--	
Fluoranthene	14000	ng/sample	--	E
Pyrene	2200	ng/sample	--	
Benzo(a)anthracene	910	ng/sample	--	
Chrysene	5500	ng/sample	--	E
Benzo(b)fluoranthene	7500	ng/sample	--	E
Benzo(k)fluoranthene	3000	ng/sample	--	
Benzo(e)pyrene	2000	ng/sample	--	
Benzo(a)pyrene	620	ng/sample	--	
Perylene	100	ng/sample	--	
Indeno(1,2,3-cd)pyrene	2700	ng/sample	--	
Dibenz(a,h)anthracene	1100	ng/sample	--	
Benzo(g,h,i)perylene	2200	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	87	%
Naphthalene-d8	90	%
Acenaphthylene-d8	69	%
Acenaphthene-d10	85	%
Fluorene-d10	84	%
Phenanthrene-d10	96	%
Fluoranthene-d10	109	%
Pyrene-d10	107	%
Benzo(a)anthracene-d12	105	%
Perylene-d12	90	%
Indeno(123-cd)pyrene-d12	93	%
Chrysene-d12	101	%
Benzo(b)fluoranthene-d12	104	%
Benzo(k)fluoranthene-d12	99	%
Benzo(a)pyrene-d12	90	%
Dibenz(a,h)anthracene-d14	90	%
Benzo(g,h,i)perylene-d12	91	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Clark Pickell Approved By: Mike Flournoy

The cover letter is an integral part of this report.
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Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-1
Lab ID: 301036-0001-SA
Matrix: AIRTRAIN Sampled: 11 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

ND = Not detected
NA = Not applicable

Reported By: Clark Pickell Approved By: Mike Flournoy

The cover letter is an integral part of this report.
Rev 230787

Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-2
Lab ID: 301036-0002-SA
Matrix: AIRTRAIN Sampled: 12 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	35000	ng/sample	--	BE
2-Methylnaphthalene	6800	ng/sample	--	BE
Acenaphthylene	5900	ng/sample	--	E
Acenaphthene	470	ng/sample	--	
Fluorene	1800	ng/sample	--	
Phenanthrene	25000	ng/sample	--	BE
Anthracene	690	ng/sample	--	
Fluoranthene	18000	ng/sample	--	E
Pyrene	2500	ng/sample	--	
Benzo(a)anthracene	770	ng/sample	--	
Chrysene	6000	ng/sample	--	E
Benzo(b)fluoranthene	8200	ng/sample	--	E
Benzo(k)fluoranthene	3100	ng/sample	--	
Benzo(e)pyrene	1900	ng/sample	--	
Benzo(a)pyrene	430	ng/sample	--	
Perylene	ND	ng/sample	60	
Indeno(1,2,3-cd)pyrene	2700	ng/sample	--	
Dibenz(a,h)anthracene	1100	ng/sample	--	
Benzo(g,h,i)perylene	2200	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	90	%
Naphthalene-d8	69	%
Acenaphthylene-d8	57	%
Acenaphthene-d10	72	%
Fluorene-d10	67	%
Phenanthrene-d10	87	%
Fluoranthene-d10	93	%
Pyrene-d10	90	%
Benzo(a)anthracene-d12	98	%
Perylene-d12	81	%
Indeno(123-cd)pyrene-d12	82	%
Chrysene-d12	92	%
Benzo(b)fluoranthene-d12	100	%
Benzo(k)fluoranthene-d12	87	%
Benzo(a)pyrene-d12	82	%
Dibenz(a,h)anthracene-d14	81	%
Benzo(g,h,i)perylene-d12	83	%

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ND = Not detected
NA = Not applicable

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Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-2
Lab ID: 301036-0002-SA
Matrix: AIRTRAIN Sampled: 12 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

ND = Not detected
NA = Not applicable

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Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-3
Lab ID: 301036-0003-SA
Matrix: AIRTRAIN Sampled: 13 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	29000	ng/sample	--	BE
2-Methylnaphthalene	3000	ng/sample	--	B
Acenaphthylene	2600	ng/sample	--	
Acenaphthene	530	ng/sample	--	
Fluorene	1300	ng/sample	--	
Phenanthrene	20000	ng/sample	--	BE
Anthracene	640	ng/sample	--	
Fluoranthene	6600	ng/sample	--	E
Pyrene	380	ng/sample	--	
Benzo(a)anthracene	130	ng/sample	--	
Chrysene	1900	ng/sample	--	
Benzo(b)fluoranthene	2900	ng/sample	--	
Benzo(k)fluoranthene	830	ng/sample	--	
Benzo(e)pyrene	390	ng/sample	--	
Benzo(a)pyrene	130	ng/sample	--	
Perylene	ND	ng/sample	22	
Indeno(1,2,3-cd)pyrene	450	ng/sample	--	
Dibenz(a,h)anthracene	240	ng/sample	--	
Benzo(g,h,i)perylene	320	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	82	%
Naphthalene-d8	82	%
Acenaphthylene-d8	63	%
Acenaphthene-d10	76	%
Fluorene-d10	76	%
Phenanthrene-d10	91	%
Fluoranthene-d10	94	%
Pyrene-d10	93	%
Benzo(a)anthracene-d12	105	%
Perylene-d12	88	%
Indeno(123-cd)pyrene-d12	94	%
Chrysene-d12	110	%
Benzo(b)fluoranthene-d12	98	%
Benzo(k)fluoranthene-d12	96	%
Benzo(a)pyrene-d12	87	%
Dibenz(a,h)anthracene-d14	92	%
Benzo(g,h,i)perylene-d12	96	%

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Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-3
Lab ID: 301036-0003-SA
Matrix: AIRTRAIN Sampled: 13 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-1
Lab ID: 301036-0004-SA
Matrix: AIRTRAIN Sampled: 11 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	7800	ng/sample	--	BE
2-Methylnaphthalene	1600	ng/sample	--	BE
Acenaphthylene	300	ng/sample	--	
Acenaphthene	140	ng/sample	--	
Fluorene	300	ng/sample	--	
Phenanthrene	1200	ng/sample	--	BE
Anthracene	84	ng/sample	--	
Fluoranthene	480	ng/sample	--	
Pyrene	280	ng/sample	--	
Benzo(a)anthracene	55	ng/sample	--	
Chrysene	110	ng/sample	--	
Benzo(b)fluoranthene	73	ng/sample	--	
Benzo(k)fluoranthene	68	ng/sample	--	
Benzo(e)pyrene	48	ng/sample	--	
Benzo(a)pyrene	48	ng/sample	--	
Perylene	11	ng/sample	--	
Indeno(1,2,3-cd)pyrene	63	ng/sample	--	
Dibenz(a,h)anthracene	14	ng/sample	--	
Benzo(g,h,i)perylene	140	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	83	%
Naphthalene-d8	67	%
Acenaphthylene-d8	73	%
Acenaphthene-d10	79	%
Fluorene-d10	70	%
Phenanthrene-d10	78	%
Fluoranthene-d10	81	%
Pyrene-d10	81	%
Benzo(a)anthracene-d12	87	%
Perylene-d12	85	%
Indeno(123-cd)pyrene-d12	99	%
Chrysene-d12	74	%
Benzo(b)fluoranthene-d12	107	%
Benzo(k)fluoranthene-d12	84	%
Benzo(a)pyrene-d12	93	%
Dibenz(a,h)anthracene-d14	103	%
Benzo(g,h,i)perylene-d12	91	%

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-1
Lab ID: 301036-0004-SA
Matrix: AIRTRAIN Sampled: 11 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-2
Lab ID: 301036-0005-SA
Matrix: AIRTRAIN Sampled: 12 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	9300	ng/sample	--	BE
2-Methylnaphthalene	2500	ng/sample	--	BE
Acenaphthylene	280	ng/sample	--	
Acenaphthene	120	ng/sample	--	
Fluorene	270	ng/sample	--	
Phenanthrene	970	ng/sample	--	BE
Anthracene	38	ng/sample	--	
Fluoranthene	240	ng/sample	--	
Pyrene	180	ng/sample	--	
Benzo(a)anthracene	43	ng/sample	--	
Chrysene	140	ng/sample	--	
Benzo(b)fluoranthene	63	ng/sample	--	
Benzo(k)fluoranthene	32	ng/sample	--	
Benzo(e)pyrene	33	ng/sample	--	
Benzo(a)pyrene	27	ng/sample	--	
Perylene	13	ng/sample	--	
Indeno(1,2,3-cd)pyrene	30	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	7.5	
Benzo(g,h,i)perylene	45	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	81	%
Naphthalene-d8	65	%
Acenaphthylene-d8	73	%
Acenaphthene-d10	76	%
Fluorene-d10	79	%
Phenanthrene-d10	84	%
Fluoranthene-d10	85	%
Pyrene-d10	86	%
Benzo(a)anthracene-d12	93	%
Perylene-d12	86	%
Indeno(123-cd)pyrene-d12	103	%
Chrysene-d12	79	%
Benzo(b)fluoranthene-d12	104	%
Benzo(k)fluoranthene-d12	91	%
Benzo(a)pyrene-d12	97	%
Dibenz(a,h)anthracene-d14	104	%
Benzo(g,h,i)perylene-d12	93	%

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-2
Lab ID: 301036-0005-SA
Matrix: AIRTRAIN Sampled: 12 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-3
Lab ID: 301036-0006-SA
Matrix: AIRTRAIN Sampled: 13 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	9700	ng/sample	--	BE
2-Methylnaphthalene	1700	ng/sample	--	BE
Acenaphthylene	340	ng/sample	--	
Acenaphthene	97	ng/sample	--	
Fluorene	200	ng/sample	--	
Phenanthrene	630	ng/sample	--	BE
Anthracene	20	ng/sample	--	
Fluoranthene	150	ng/sample	--	
Pyrene	96	ng/sample	--	
Benzo(a)anthracene	23	ng/sample	--	
Chrysene	63	ng/sample	--	
Benzo(b)fluoranthene	38	ng/sample	--	
Benzo(k)fluoranthene	25	ng/sample	--	
Benzo(e)pyrene	24	ng/sample	--	
Benzo(a)pyrene	20	ng/sample	--	
Perylene	ND	ng/sample	6.5	
Indeno(1,2,3-cd)pyrene	25	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	5.1	
Benzo(g,h,i)perylene	64	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	80	%
Naphthalene-d8	58	%
Acenaphthylene-d8	76	%
Acenaphthene-d10	83	%
Fluorene-d10	78	%
Phenanthrene-d10	86	%
Fluoranthene-d10	82	%
Pyrene-d10	83	%
Benzo(a)anthracene-d12	99	%
Perylene-d12	84	%
Indeno(123-cd)pyrene-d12	104	%
Chrysene-d12	89	%
Benzo(b)fluoranthene-d12	111	%
Benzo(k)fluoranthene-d12	93	%
Benzo(a)pyrene-d12	96	%
Dibenz(a,h)anthracene-d14	105	%
Benzo(g,h,i)perylene-d12	95	%

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-3
Lab ID: 301036-0006-SA
Matrix: AIRTRAIN Sampled: 13 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

ND = Not detected
NA = Not applicable

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-1
Lab ID: 301036-0007-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	11000	ng/sample	--	BE
2-Methylnaphthalene	5800	ng/sample	--	BE
Acenaphthylene	950	ng/sample	--	E
Acenaphthene	190	ng/sample	--	
Fluorene	810	ng/sample	--	E
Phenanthrene	1600	ng/sample	--	BE
Anthracene	51	ng/sample	--	
Fluoranthene	430	ng/sample	--	
Pyrene	170	ng/sample	--	
Benzo(a)anthracene	45	ng/sample	--	
Chrysene	120	ng/sample	--	
Benzo(b)fluoranthene	76	ng/sample	--	
Benzo(k)fluoranthene	50	ng/sample	--	
Benzo(e)pyrene	42	ng/sample	--	
Benzo(a)pyrene	47	ng/sample	--	
Perylene	12	ng/sample	--	
Indeno(1,2,3-cd)pyrene	44	ng/sample	--	
Dibenz(a,h)anthracene	12	ng/sample	--	
Benzo(g,h,i)perylene	81	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	105	%
Naphthalene-d8	64	%
Acenaphthylene-d8	68	%
Acenaphthene-d10	77	%
Fluorene-d10	70	%
Phenanthrene-d10	75	%
Fluoranthene-d10	72	%
Pyrene-d10	68	%
Benzo(a)anthracene-d12	78	%
Perylene-d12	68	%
Indeno(123-cd)pyrene-d12	77	%
Chrysene-d12	71	%
Benzo(b)fluoranthene-d12	88	%
Benzo(k)fluoranthene-d12	86	%
Benzo(a)pyrene-d12	73	%
Dibenz(a,h)anthracene-d14	80	%
Benzo(g,h,i)perylene-d12	70	%

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Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-1
Lab ID: 301036-0007-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

ND = Not detected
NA = Not applicable

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Quanterra Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-2
Lab ID: 301036-0008-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	31000	ng/sample	--	BED
2-Methylnaphthalene	2000	ng/sample	--	BD
Acenaphthylene	290	ng/sample	--	
Acenaphthene	110	ng/sample	--	
Fluorene	230	ng/sample	--	
Phenanthrene	730	ng/sample	--	BE
Anthracene	20	ng/sample	--	
Fluoranthene	220	ng/sample	--	
Pyrene	80	ng/sample	--	
Benzo(a)anthracene	25	ng/sample	--	
Chrysene	59	ng/sample	--	
Benzo(b)fluoranthene	45	ng/sample	--	
Benzo(k)fluoranthene	31	ng/sample	--	
Benzo(e)pyrene	32	ng/sample	--	
Benzo(a)pyrene	24	ng/sample	--	
Perylene	ND	ng/sample	7.1	
Indeno(1,2,3-cd)pyrene	32	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	7.2	
Benzo(g,h,i)perylene	78	ng/sample	--	

Surrogate	Recovery		
13C-Fluorene	96	%	
Naphthalene-d8	94	%	D
Acenaphthylene-d8	57	%	
Acenaphthene-d10	60	%	
Fluorene-d10	75	%	
Phenanthrene-d10	85	%	
Fluoranthene-d10	84	%	
Pyrene-d10	75	%	
Benzo(a)anthracene-d12	75	%	
Perylene-d12	58	%	
Indeno(123-cd)pyrene-d12	81	%	
Chrysene-d12	78	%	
Benzo(b)fluoranthene-d12	92	%	
Benzo(k)fluoranthene-d12	94	%	
Benzo(a)pyrene-d12	67	%	
Dibenz(a,h)anthracene-d14	88	%	
Benzo(g,h,i)perylene-d12	76	%	

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Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-2
Lab ID: 301036-0008-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

Note D : Compound quantitated using a secondary dilution.

ND = Not detected
NA = Not applicable

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Quanterra Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-3
Lab ID: 301036-0009-SA
Matrix: AIRTRAIN Sampled: 15 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	180000	ng/sample	--	BED
2-Methylnaphthalene	8200	ng/sample	--	BED
Acenaphthylene	2600	ng/sample	--	E
Acenaphthene	450	ng/sample	--	E
Fluorene	1300	ng/sample	--	E
Phenanthrene	1700	ng/sample	--	BE
Anthracene	86	ng/sample	--	
Fluoranthene	620	ng/sample	--	E
Pyrene	220	ng/sample	--	
Benzo(a)anthracene	72	ng/sample	--	
Chrysene	160	ng/sample	--	
Benzo(b)fluoranthene	64	ng/sample	--	
Benzo(k)fluoranthene	39	ng/sample	--	
Benzo(e)pyrene	34	ng/sample	--	
Benzo(a)pyrene	32	ng/sample	--	
Perylene	ND	ng/sample	9.7	
Indeno(1,2,3-cd)pyrene	35	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	8.6	
Benzo(g,h,i)perylene	63	ng/sample	--	

Surrogate	Recovery		
13C-Fluorene	93	%	
Naphthalene-d8	121	%	D
Acenaphthylene-d8	60	%	
Acenaphthene-d10	44	%	
Fluorene-d10	74	%	
Phenanthrene-d10	83	%	
Fluoranthene-d10	85	%	
Pyrene-d10	78	%	
Benzo(a)anthracene-d12	82	%	
Perylene-d12	64	%	
Indeno(123-cd)pyrene-d12	79	%	
Chrysene-d12	76	%	
Benzo(b)fluoranthene-d12	95	%	
Benzo(k)fluoranthene-d12	91	%	
Benzo(a)pyrene-d12	75	%	
Dibenz(a,h)anthracene-d14	88	%	
Benzo(g,h,i)perylene-d12	74	%	

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Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-3
Lab ID: 301036-0009-SA
Matrix: AIRTRAIN Sampled: 15 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

Note D : Compound quantitated using a secondary dilution.

ND = Not detected
NA = Not applicable

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Quanterra Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-FB
Lab ID: 301036-0010-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	1100	ng/sample	--	BE
2-Methylnaphthalene	89	ng/sample	--	B
Acenaphthylene	27	ng/sample	--	
Acenaphthene	14	ng/sample	--	
Fluorene	22	ng/sample	--	
Phenanthrene	160	ng/sample	--	BE
Anthracene	ND	ng/sample	10	
Fluoranthene	78	ng/sample	--	
Pyrene	29	ng/sample	--	
Benzo(a)anthracene	13	ng/sample	--	
Chrysene	23	ng/sample	--	
Benzo(b)fluoranthene	18	ng/sample	--	
Benzo(k)fluoranthene	15	ng/sample	--	
Benzo(e)pyrene	13	ng/sample	--	
Benzo(a)pyrene	14	ng/sample	--	
Perylene	ND	ng/sample	3.6	
Indeno(1,2,3-cd)pyrene	15	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	3.0	
Benzo(g,h,i)perylene	41	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	94	%
Naphthalene-d8	85	%
Acenaphthylene-d8	65	%
Acenaphthene-d10	74	%
Fluorene-d10	72	%
Phenanthrene-d10	81	%
Fluoranthene-d10	95	%
Pyrene-d10	97	%
Benzo(a)anthracene-d12	99	%
Perylene-d12	86	%
Indeno(123-cd)pyrene-d12	92	%
Chrysene-d12	99	%
Benzo(b)fluoranthene-d12	104	%
Benzo(k)fluoranthene-d12	94	%
Benzo(a)pyrene-d12	81	%
Dibenz(a,h)anthracene-d14	99	%
Benzo(g,h,i)perylene-d12	89	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Clark Pickell Approved By: Mike Flournoy

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Quanterra
Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-I-429-FB
Lab ID: 301036-0010-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Note B : Compound is also detected in the blank.

Note E : Concentration exceeds calibration range. Value is estimated.

ND = Not detected
NA = Not applicable

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Quanterra Environmental Services

POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-FB
Lab ID: 301036-0011-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	620	ng/sample	--	BE
2-Methylnaphthalene	76	ng/sample	--	B
Acenaphthylene	ND	ng/sample	9.2	
Acenaphthene	41	ng/sample	--	
Fluorene	22	ng/sample	--	
Phenanthrene	130	ng/sample	--	B
Anthracene	ND	ng/sample	7.9	
Fluoranthene	44	ng/sample	--	
Pyrene	54	ng/sample	--	
Benzo(a)anthracene	11	ng/sample	--	
Chrysene	17	ng/sample	--	
Benzo(b)fluoranthene	15	ng/sample	--	
Benzo(k)fluoranthene	12	ng/sample	--	
Benzo(e)pyrene	11	ng/sample	--	
Benzo(a)pyrene	12	ng/sample	--	
Perylene	ND	ng/sample	2.8	
Indeno(1,2,3-cd)pyrene	12	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	2.5	
Benzo(g,h,i)perylene	37	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	94	%
Naphthalene-d8	83	%
Acenaphthylene-d8	66	%
Acenaphthene-d10	73	%
Fluorene-d10	75	%
Phenanthrene-d10	81	%
Fluoranthene-d10	92	%
Pyrene-d10	93	%
Benzo(a)anthracene-d12	90	%
Perylene-d12	86	%
Indeno(123-cd)pyrene-d12	96	%
Chrysene-d12	89	%
Benzo(b)fluoranthene-d12	96	%
Benzo(k)fluoranthene-d12	99	%
Benzo(a)pyrene-d12	84	%
Dibenz(a,h)anthracene-d14	102	%
Benzo(g,h,i)perylene-d12	93	%

(continued on following page)

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-0-429-FB
Lab ID: 301036-0011-SA
Matrix: AIRTRAIN Sampled: 14 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-FB
Lab ID: 301036-0012-SA
Matrix: AIRTRAIN Sampled: 15 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	2900	ng/sample	--	BE
2-Methylnaphthalene	840	ng/sample	--	BE
Acenaphthylene	280	ng/sample	--	
Acenaphthene	97	ng/sample	--	
Fluorene	140	ng/sample	--	
Phenanthrene	370	ng/sample	--	BE
Anthracene	25	ng/sample	--	
Fluoranthene	97	ng/sample	--	
Pyrene	58	ng/sample	--	
Benzo(a)anthracene	18	ng/sample	--	
Chrysene	30	ng/sample	--	
Benzo(b)fluoranthene	21	ng/sample	--	
Benzo(k)fluoranthene	15	ng/sample	--	
Benzo(e)pyrene	12	ng/sample	--	
Benzo(a)pyrene	13	ng/sample	--	
Perylene	ND	ng/sample	2.6	
Indeno(1,2,3-cd)pyrene	13	ng/sample	--	
Dibenz(a,h)anthracene	ND	ng/sample	2.9	
Benzo(g,h,i)perylene	32	ng/sample	--	

Surrogate	Recovery	
13C-Fluorene	93	%
Naphthalene-d8	74	%
Acenaphthylene-d8	69	%
Acenaphthene-d10	74	%
Fluorene-d10	74	%
Phenanthrene-d10	83	%
Fluoranthene-d10	96	%
Pyrene-d10	97	%
Benzo(a)anthracene-d12	93	%
Perylene-d12	87	%
Indeno(123-cd)pyrene-d12	91	%
Chrysene-d12	92	%
Benzo(b)fluoranthene-d12	93	%
Benzo(k)fluoranthene-d12	101	%
Benzo(a)pyrene-d12	83	%
Dibenz(a,h)anthracene-d14	91	%
Benzo(g,h,i)perylene-d12	86	%

(continued on following page)

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-U-429-FB
Lab ID: 301036-0012-SA
Matrix: AIRTRAIN Sampled: 15 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

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Note E : Concentration exceeds calibration range. Value is estimated.

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-BLANKS-LAB
Lab ID: 301036-0013-SA
Matrix: AIRTRAIN Sampled: 15 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

Parameter	Result	Units	Reporting Limit	
Naphthalene	650	ng/sample	--	BE
2-Methylnaphthalene	230	ng/sample	--	B
Acenaphthylene	ND	ng/sample	9.2	
Acenaphthene	79	ng/sample	--	
Fluorene	73	ng/sample	--	
Phenanthrene	380	ng/sample	--	B
Anthracene	21	ng/sample	--	
Fluoranthene	44	ng/sample	--	
Pyrene	21	ng/sample	--	
Benzo(a)anthracene	ND	ng/sample	1.4	
Chrysene	ND	ng/sample	4.3	
Benzo(b)fluoranthene	ND	ng/sample	2.8	
Benzo(k)fluoranthene	ND	ng/sample	1.8	
Benzo(e)pyrene	ND	ng/sample	1.6	
Benzo(a)pyrene	ND	ng/sample	1.2	
Perylene	ND	ng/sample	0.26	
Indeno(1,2,3-cd)pyrene	ND	ng/sample	1.3	
Dibenz(a,h)anthracene	ND	ng/sample	0.26	
Benzo(g,h,i)perylene	ND	ng/sample	2.5	

Surrogate	Recovery	
13C-Fluorene	108	%
Naphthalene-d8	59	%
Acenaphthylene-d8	57	%
Acenaphthene-d10	64	%
Fluorene-d10	60	%
Phenanthrene-d10	64	%
Fluoranthene-d10	65	%
Pyrene-d10	67	%
Benzo(a)anthracene-d12	66	%
Perylene-d12	66	%
Indeno(123-cd)pyrene-d12	67	%
Chrysene-d12	68	%
Benzo(b)fluoranthene-d12	69	%
Benzo(k)fluoranthene-d12	74	%
Benzo(a)pyrene-d12	66	%
Dibenz(a,h)anthracene-d14	68	%
Benzo(g,h,i)perylene-d12	64	%

(continued on following page)

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POLYNUCLEAR AROMATIC HYDROCARBONS
HIGH RESOLUTION GC/MS (CONT.)
Method HRGC/HRMS

Client Name: Pacific Environmental Services
Client ID: B-BLANKS-LAB
Lab ID: 301036-0013-SA
Matrix: AIRTRAIN Sampled: 15 AUG 98 Received: 18 AUG 98
Authorized: 18 AUG 98 Prepared: 19 AUG 98 Analyzed: 26 AUG 98

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Note E : Concentration exceeds calibration range. Value is estimated.

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ABORATORY CONTROL SAMPLE REPORT
dvanced Technology Group - High Resolution
roject: 301036

ategory: PAH-HR-AIR PAH by HRGC/HRMS
est: PAH-HR-AIR
atrix: AIR
C Lot: 19 AUG 98-B QC Run: 26 AUG 98-A
oncentration Units: ng/sample

nalyte	Concentration Spiked	Concentration Measured	Accuracy(%) LCS	Accuracy(%) Limits
aphthalene	100	110	107	50-150
-Methylnaphthalene	100	100	102	50-150
cenaphthylene	100	110	114	50-150
cenaphthene	100	110	112	50-150
luorene	100	120	117	50-150
henanthrene	100	110	110	50-150
nthracene	100	110	113	50-150
luoranthene	100	110	115	50-150
yrene	100	110	113	50-150
enzo(a)anthracene	100	100	103	50-150
hrysene	100	100	102	50-150
enzo(b)fluoranthene	100	110	108	50-150
enzo(k)fluoranthene	100	110	111	50-150
enzo(e)pyrene	100	120	124	50-150
enzo(a)pyrene	100	100	104	50-150
erylene	100	87	87	50-150
ndeno(1,2,3-cd)pyrene	100	99	99	50-150
ibenz(a,h)anthracene	100	110	111	50-150
enzo(g,h,i)perylene	100	100	104	50-150
aphthalene-d8	50	33	67	50-150
cenaphthylene-d8	50	31	61	50-150
cenaphthene-d10	50	33	66	50-150
luorene-d10	50	31	62	50-150
henanthrene-d10	50	33	65	50-150
luoranthene-d10	50	38	76	50-150
yrene-d10	50	39	79	50-150
enzo(a)anthracene-d12	50	46	92	50-150
hrysene-d12	50	51	102	50-150
enzo(b)fluoranthene-d12	50	48	95	50-150
enzo(k)fluoranthene-d12	50	45	91	50-150
enzo(a)pyrene-d12	50	42	83	50-150
erylene-d12	50	41	83	50-150
ndeno(123-cd)pyrene-d12	50	48	96	50-150
ibenz(a,h)anthracene-d14	50	45	91	50-150
enzo(g,h,i)perylene-d12	50	49	97	50-150

alculations are performed before rounding to avoid round-off errors in calculated results.

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Account No. 34419005
Report Date: 08/31/98

KOLDE
IFIC ENVIRONMENTAL SERVICES
SCHEFFEL
0 DUKE DRIVE SUITE 150
ON, OH 45040

Final Report

e Received: 08/24/98
ple Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
1 B-I-5506-1 Samp Date: 08/11/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	

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Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		1.88 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	1.88 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	-- --
2 B-I-5506-2 Samp Date: 08/12/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	

Ans

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)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		6.01 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	6.01 ug	-- --
	Panthr-Front		3.15 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	3.15 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	-- --
3 B-I-5506-3 Samp Date: 08/13/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --

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Final Report

Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --

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)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	< 1.0 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	-- --
4 B-O-5506-1 Samp Date: 08/11/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	

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Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	

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Account No. 34419005
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KOLDE
[FIC ENVIRONMENTAL SERVICES
SCHEFFEL
) DUKE DRIVE SUITE 150
)N, OH 45040

Final Report

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e Received: 08/24/98
ple Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	< 1.0 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	** ug/M3
5 B-O-5506-2 Samp Date: 08/12/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	

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) DUKE DRIVE SUITE 150
)N, OH 45040

Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
)ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	

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Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	< 1.0 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	** ug/M3
B-O-5506-3 Samp Date: 08/13/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --

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)N, OH 45040

Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	< 1.0 ug	-- --

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)N, OH 45040

Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	** ug/M3
7 B-V-5506-1 Samp Date: 08/14/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	

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Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	< 1.0 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	-- --

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e Received: 08/24/98
ple Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
3 B-V-5506-2 Samp Date: 08/14/98	XAD-2			
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	

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SCHEFFEL
DUKE DRIVE SUITE 150
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Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	< 5.0 ug	-- --
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	< 1.0 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	-- --
9 B-V-5506-3 Samp Date: 08/15/98 XAD-2				
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	NVG	< 5.0 ug	-- --

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	NVG	< 5.0 ug	-- --
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	NVG	< 1.0 ug	-- --
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	NVG	< 1.0 ug	-- --
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	NVG	< 1.0 ug	-- --
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	NVG	< 1.0 ug	-- --
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	NVG	< 1.0 ug	-- --
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	NVG	< 1.0 ug	-- --
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	NVG	< 1.0 ug	-- --
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	NVG	< 1.0 ug	-- --

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	NVG	< 5.0 ug	-- --
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	NVG	< 5.0 ug	-- --
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	NVG	< 1.0 ug	-- --
	Napth-Front		6.70 ug	
	Napth-Rear		ND	
	Napth-Total	NVG	6.70 ug	-- --
	Panthr-Front		3.27 ug	
	Panthr-Rear		ND	
	Panthr-Total	NVG	3.27 ug	-- --
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	NVG	< 1.0 ug	-- --
0 B-V-5506-FB Samp Date: 08/15/98 FB		XAD-2		
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	0	< 5.0 ug	--
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	0	< 5.0 ug	--
	Anthr-Front		< 1.0 ug	

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: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ıect: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Anthr-Rear		ND	
	Anthr-Total	0	< 1.0 ug	--
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	0	< 1.0 ug	--
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	0	< 1.0 ug	--
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	0	< 1.0 ug	--
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	0	< 1.0 ug	--
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	0	< 1.0 ug	--
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	0	< 1.0 ug	--
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	0	< 1.0 ug	--
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	0	< 5.0 ug	--
	Fluorene-Front		< 5.0 ug	

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
)ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Fluorene-Rear		ND	
	Fluorene-Total	0	< 5.0 ug	--
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	0	< 1.0 ug	--
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	0	< 5.0 ug	--
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	0	< 1.0 ug	--
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	0	< 1.0 ug	--
11 LAB BLANK BLANK	XAD-2			
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	0	< 5.0 ug	--
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	0	< 5.0 ug	--
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	0	< 1.0 ug	--
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	

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Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bz(a)ant-Total	0	< 1.0 ug	--
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	0	< 1.0 ug	--
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	0	< 1.0 ug	--
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	0	< 1.0 ug	--
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	0	< 1.0 ug	--
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	0	< 1.0 ug	--
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	0	< 1.0 ug	--
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	0	< 5.0 ug	--
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	0	< 5.0 ug	--
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	

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Richmond, Virginia 23260
Telephone: 800-888-8061

Group No. C236091
Account No. 34419005
Report Date: 08/31/98

KOLDE
:FIC ENVIRONMENTAL SERVICES
SCHEFFEL
) DUKE DRIVE SUITE 150
)N, OH 45040

Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Indpyene-Total	0	< 1.0 ug	--
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	0	< 5.0 ug	--
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	0	< 1.0 ug	--
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	0	< 1.0 ug	--
12 LAB BLANK BLANK	XAD-2			
	Acnapth-Front		< 5.0 ug	
	Acnapth-Rear		ND	
	Acnapht-Total	0	< 5.0 ug	--
	Acnthy-Front		< 5.0 ug	
	Acnthy-Rear		ND	
	Acnthy-Total	0	< 5.0 ug	--
	Anthr-Front		< 1.0 ug	
	Anthr-Rear		ND	
	Anthr-Total	0	< 1.0 ug	--
	Bz(a)ant-Front		< 1.0 ug	
	Bz(a)ant-Rear		ND	
	Bz(a)ant-Total	0	< 1.0 ug	--
	Bz(a)pyr-Front		< 1.0 ug	
	Bz(a)pyr-Rear		ND	
	Bz(a)pyr-Total	0	< 1.0 ug	--

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bz(b)fnt-Front		< 1.0 ug	
	Bz(b)fnt-Rear		ND	
	Bz(b)fnt-Total	0	< 1.0 ug	--
	Bzpery-Front		< 1.0 ug	
	Bzpery-Rear		ND	
	Bzpery-Total	0	< 1.0 ug	--
	Bz(k)fnt-Front		< 1.0 ug	
	Bz(k)fnt-Rear		ND	
	Bz(k)fnt-Total	0	< 1.0 ug	--
	Chy-Front		< 1.0 ug	
	Chy-Rear		ND	
	Chy-Total	0	< 1.0 ug	--
	Dbzanthr-Front		< 1.0 ug	
	Dbzanthr-Rear		ND	
	Dbzanthr-Total	0	< 1.0 ug	--
	Flanthr-Front		< 5.0 ug	
	Flanthr-Rear		ND	
	Flanthr-Total	0	< 5.0 ug	--
	Fluorene-Front		< 5.0 ug	
	Fluorene-Rear		ND	
	Fluorene-Total	0	< 5.0 ug	--
	Indpyene-Front		< 1.0 ug	
	Indpyene-Rear		ND	
	Indpyene-Total	0	< 1.0 ug	--
	Napth-Front		< 5.0 ug	
	Napth-Rear		ND	
	Napth-Total	0	< 5.0 ug	--

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Group No. C236091
Account No. 34419005
Report Date: 08/31/98

KOLDE
:FIC ENVIRONMENTAL SERVICES
SCHEFFEL
DUKE DRIVE SUITE 150
N, OH 45040

Final Report

Received: 08/24/98
le Type: 14 - Air Sample(s)
ect: EPA COKE-BTHLHM ST PO Number: 103-99-322

ytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Panthr-Front		< 1.0 ug	
	Panthr-Rear		ND	
	Panthr-Total	0	< 1.0 ug	--
	Pyrene-Front		< 1.0 ug	
	Pyrene-Rear		ND	
	Pyrene-Total	0	< 1.0 ug	--
13 SPIKE XAD-2				
	Acnapth-Front		6.14 ug	
	Acnapht-Total	0	6.14 ug	--
iking level - 10 ug				
	Acnthy-Front		7.95 ug	
	Acnthy-Total	0	7.95 ug	--
iking level - 10 ug				
	Anthr-Front		0.466 ug	
	Anthr-Total	0	0.466 ug	--
iking level - 0.5 ug				
	Bz(a)ant-Front		0.65 ug	
	Bz(a)ant-Total	0	0.65 ug	--
iking level - 1.0 ug				
	Bz(a)pyr-Front		0.256 ug	
	Bz(a)pyr-Total	0	0.256 ug	--
iking level - 0.5 ug				
	Bz(b)fnt-Front		0.381 ug	
	Bz(b)fnt-Total	0	0.381 ug	--
iking level - 0.5 ug				
	Bzpery-Front		0.263 ug	

A23

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) DUKE DRIVE SUITE 150
)N, OH 45040

Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Bzpery-Total	0	0.263 ug	--
iking level - 0.5 ug				
	Bz(k)fnt-Front		0.514 ug	
	Bz(k)fnt-Total	0	0.514 ug	--
iking level - 0.5 ug				
	Chy-Front		0.398 ug	
	Chy-Total	0	0.398 ug	--
iking level - 0.5 ug				
	Dbzanthr-Front		0.398 ug	
	Dbzanthr-Total	0	0.398 ug	--
iking level - 0.5 ug				
	Flanthr-Front		5.01 ug	
	Flanthr-Total	0	5.01 ug	--
iking level - 5.0 ug				
	Fluorene-Front		6.67 ug	
	Fluorene-Total	0	6.67 ug	--
iking level - 10 ug				
	Indpyene-Front		0.366 ug	
	Indpyene-Total	0	0.366 ug	--
iking level - 0.5 ug				
	Napth-Front		6.23 ug	
	Napth-Total	0	6.23 ug	--
iking level - 10 ug				
	Panthr-Front		0.477 ug	
	Panthr-Total	0	0.477 ug	--
iking level - 0.5 ug				
	Pyrene-Front		0.473 ug	

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

lytical Results

Client ID	Parameter	Volume	Amount	Concentration
	Pyrene-Total	0	0.473 ug	--
iking level - 0.5 ug				
14 DESORPTION XAD-2				
	Acnapth-Front		9.38 ug	
	Acnapht-Total	0	9.38 ug	--
iking level - 10 ug				
	Acnthy-Front		12.2 ug	
	Acnthy-Total	0	12.2 ug	--
iking level - 10 ug				
	Anthr-Front		0.540 ug	
	Anthr-Total	0	0.540 ug	--
iking level - 0.5 ug				
	Bz(a)ant-Front		0.780 ug	
	Bz(a)ant-Total	0	0.780 ug	--
iking level - 1.0 ug				
	Bz(a)pyr-Front		0.324 ug	
	Bz(a)pyr-Total	0	0.324 ug	--
iking level - 0.5				
	Bz(b)fnt-Front		0.519 ug	
	Bz(b)fnt-Total	0	0.519 ug	--
iking level - 0.5 ug				
	Bzpery-Front		0.306 ug	
	Bzpery-Total	0	0.306 ug	--
iking level - 0.5 ug				
	Bz(k)fnt-Front		0.645 ug	
	Bz(k)fnt-Total	0	0.645 ug	--

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) DUKE DRIVE SUITE 150
)N, OH 45040

Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Results

Client ID	Parameter	Volume	Amount	Concentration
iking level - 1.0 ug				
	Chy-Front		0.474 ug	
	Chy-Total	0	0.474 ug	--
iking level - 0.5 ug				
	Dbzanthr-Front		0.431 ug	
	Dbzanthr-Total	0	0.431 ug	--
iking level - 0.5 ug				
	Flanthr-Front		6.49 ug	
	Flanthr-Total	0	6.49 ug	--
iking level 5.0 ug				
	Fluorene-Front		8.43 ug	
	Fluorene-Total	0	8.43 ug	--
iking level - 10 ug				
	Indpyene-Front		0.573 ug	
	Indpyene-Total	0	0.573 ug	--
iking level - 1.0 ug				
	Napth-Front		8.01 ug	
	Napth-Total	0	8.01 ug	--
iking level - 10 ug				
	Panthr-Front		0.542 ug	
	Panthr-Total	0	0.542 ug	--
iking level - 0.5 ug				
	Pyrene-Front		0.522 ug	
	Pyrene-Total	0	0.522 ug	--
iking level - 0.5 ug				

reviations: ug = micrograms, mg = milligrams, mg/M3 = milligrams per
bic meter of air, g = grams, ug/M3 = micrograms per cubic meter of air,
= liters, w/w = percent weight basis, all Volumes given in liters,
m = parts per million, ppb = parts per billion, Areas given in square
et; ND = Not Detected.

mary of Analytical Methods

pound Name	Analytical Method	Abbreviation
naphthene	NIOSH 5506	Acnapht

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Final Report

: Received: 08/24/98
)le Type: 14 - Air Sample(s)
ject: EPA COKE-BTHLHM ST PO Number: 103-99-322

.ytical Method - continued

ıaphthylene	NIOSH 5506	Acnthy
ıracene	NIOSH 5506	Anthr
:(a)anthracene	NIOSH 5506	Bz(a)ant
:o(a)pyrene	NIOSH 5506	Bz(a)pyr
:o(b)fluoranthene	NIOSH 5506	Bz(b)fnt
:o(ghi)perylene	NIOSH 5506	Bzpery
:o(k)fluoranthene	NIOSH 5506	Bz(k)fnt
/sene	NIOSH 5506	Chy
ɜnz(a,h)anthracene	NIOSH 5506	Dbzanthr
)ranthene	NIOSH 5506	Flanthr
)rene	NIOSH 5506	----
ɜno(1,2,3-cd)pyrene	NIOSH 5506	Indpyene
ıthalene	NIOSH 5506	Napth
ıanthrene	NIOSH 5506	Panthr
ɜne	NIOSH 5506	----

ɜs

Attached are the results we obtained on the analysis of your samples. Any Chains-of-Custody associated with this sample group are also enclosed. Air concentrations are calculated as a convenience to the client and the overall accuracy of this result depends on both the accuracy of the air volume and the amount found by analysis. Theoretical Air Volumes for passive monitors are calculated using the sampling time submitted and the manufacturer's listed sampling rate for each compound.

We appreciate your confidence in allowing Analytics to be your testing laboratory. Any questions regarding this report can be addressed by calling our client services department (800-888-8061).

A. Sue E. Salpin, CIH for
James A. Calpin, CIH
Laboratory Director

ANALYTICAL REQUEST AND CHAIN OF CUSTODY

EPA Cole Ovens

PLANT: Bethlehem Steel - Chesterton, Ind

PROJECT #: 5506.000

RECOVERY PERSON: R Kolde / D. Schettel

SAMPLE TECHNICIAN: J. Centers, T. Abernathy

SAMPLE IDENTIFICATION	COLLECTION DATE	COLLECTION TIME	SAMPLE NAME	NUMBER OF CONTAINERS	ANALYTICAL REQUEST: NIOSH Method 5506 for PAH's										COMMENTS (Type of container, special preparation, special handling, etc.)
B-I-5506-1	8/11/98		Same	3	X										Please fax
B-I-5506-2	8/12/98		Same	3	X										results to
B-I-5506-3	8/13/98		Same	3	X										Dan Schettel or
B-O-5506-1	8/11/98		Same	3	X										Ron Kolde
B-O-5506-2	8/12/98		Same	3	X										
B-O-5506-3	8/13/98		Same	3	X										HPLC analysis -
B-U-5506-1	8/14/98		Same	3	X										Fluorescence / UV
B-U-5506-2	8/14/98		Same	3	X										detection
B-U-5506-3	8/15/98		Same	3	X										17 PAH's
B-U-5506-FB	8/15/98		Same	3	X										per analysis
Lab Blanks			Same	4	X										
* spare tubes also included for spiking - desorption efficiencies. (2)															

RELINQUISHER'S NAME	DATE/TIME	RELINQUISHER'S SIGNATURE	SHIPPER'S NAME AND ID NUMBER
Ronald J. Kolde	8/17/98	Ronald J. Kolde	Fed-Ex

RECEIVER'S NAME	DATE/TIME	RECEIVER'S SIGNATURE
P Chicklo	8/24/98 10:00 Am	P Chicklo

First Analytical Laboratories

ANALYSIS REPORT

Metals in Dust

Project # S506.000

Prepared for:

Pacific Environmental Services, Inc.
7209 E. Kemper Road
Cincinnati, OH 45249

Reviewed and Approved by:

William H. Wadlin, Ph. D.
Laboratory Manager

October 5, 1998

First Analytical Laboratories

CASE NARRATIVE

Project #: 80915 Report Date: 05-Oct-98
Client: Pacific Environmental Services, Inc.
Client Project ID: S506.000

Samples:

Three samples of dust were submitted. The target elements were antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, phosphorus, selenium, silver, thallium and zinc. All of the samples were received in good condition, with no apparent leakage or damage.

Preparation:

The samples were prepared according to EPA Method 3050A, which is a nitric acid digestion.

Analysis:

Cadmium, lead and zinc were determined by Direct Aspiration Flame Atomic Absorption Spectrophotometry (FLAA). Antimony, arsenic, beryllium, selenium, silver and thallium were determined by Graphite Furnace Atomic Absorption Spectrophotometry (GFAA). Barium, chromium, copper, nickel and phosphorus were determined by Inductively Coupled Plasma - Optical Emission (ICP).

Results:

The results are reported as concentration in the original sample, in micrograms of element per gram of sample (μg/g), which is equivalent to parts per million by weight (ppm). All of the target elements were detected in all of the samples, except for silver in sample #2. The highest levels were found for manganese, phosphorus and zinc. These three elements were in the range of about 40 ppm, 50 ppm, and 70 ppm respectively.

Quality Control:

Traces of cadmium and zinc were found in the blanks. The cadmium blank is about half of the sample levels, so these results should be blank corrected. The zinc blank is only about ten percent of the sample values. The spike recoveries were

all within the normal range of 70% to 130%. The duplicates were all within the normal limit of 20% for all cases in which the sample level is more than five times the detection limit.

First Analytical Laboratories
1126 Burning Tree Dr. Chapel Hill, NC 27514
Tel. (919) 942-8607
FAX (919) 929-8688

ANALYSIS REPORT

Project #: 80915
Client: Pacific Environmental
Client Project ID: # S506.000

Report Date: 05-Oct-98
Date Received: 21-Sep-98

Parts per million in original sample
µg/g

Element	BD-BS-1 µg/g	BD-BS-2 µg/g	BD-BS-3 µg/g	QUALITY CONTROL DATA Lab Blank	Spike %Recovery	Duplicate %Diff.
Antimony	0.33	0.52	0.36	< 0.25	74%	NA
Arsenic	10.7	10.5	11.0	< 0.25	82%	2.2%
Barium	9.21	9.32	8.62	< 0.20		2.9%
Beryllium	0.42	0.33	0.29	< 0.005	93%	15.9%
Cadmium	1.64	1.50	1.80	0.75	94%	18.7%
Chromium	7.42	8.33	6.39	< 1.25	104%	1.9%
Copper	7.7	8.1	6.5	< 1.5	108%	
Lead	35.8	36.4	38.9	< 5.0	101%	4.5%
Manganese	67.5	70.2	66.2	< 2.0	97%	1.9%
Mercury	0.20	0.15	0.18	< 0.07	105%	NA
Nickel	7.0	7.8	6.7	< 2.5	96%	NA
Phosphorus	44.7	50.4	43.5	< 1.0		6.8%
Selenium	3.8	3.5	3.2	< 0.2	76%	13.0%
Silver	0.05	< 0.02	0.06	< 0.03	87%	NA
Thallium	0.77	0.88	0.72	< 0.15	100%	13.7%
Zinc	37.5	36.1	39.7	4.7		4.8%

ANTIMONY

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 5 µg/L
Spike Conc. = 100 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	6.6	6.6	100	1	2.0084		0.33
BD-BS-1	80915.2	10.5	10.5	100	1	2.0053		0.52
BD-BS-1	80915.3	7.3	7.3	100	1	2.0040		0.36
Lab Blank	80915.LB	0.0	0.0	100	1	2.0000	<	0.25
Duplicate	80915.2D	4.5	4.5	100	1	1.9956	<	0.25
							% Difference =	NA
Spike	80915.1S	80.6				1.9929	%Recovery =	74.0%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.020	10
Standard 2	0.088	50
Standard 3	0.175	100
Standard 4	0.310	200

Calibration Verifications, µg/L

ICV = 100	99.6	CCV2 = 100	87.9
ICB = 0	0.5	CCB2 = 0	0.4
CCV1 = 100	95.4	CCV3 = 100	88.5
CCB1 = 0	2.2	CCB3 = 0	1.6

ARSENIC

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 5 µg/L
Spike Conc. = 100 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	21.7	216.5	100	10	2.0084		10.78
BD-BS-1	80915.2	105.6	211.2	100	2	2.0053		10.53
BD-BS-1	80915.3	110.5	221.0	100	2	2.0040		11.03
Lab Blank	80915.LB	2.4	2.4	100	1	2.0000	<	0.25
Duplicate	80915.2D	102.8	205.6	100	2	1.9956		10.30
							% Difference =	2.2%
Post-spike	80915.1	111.7			10		%Recovery =	90.1%
Pre-spike	80915.1S	206.81			5	1.9929	%Recovery =	81.8%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.039	10
Standard 2	0.148	50
Standard 3	0.305	100
Standard 4	0.620	200

Calibration Verifications, µg/L

ICV = 100	104.8	CCV2 = 100	95.9
ICB = 0	5.4	CCB2 = 0	2.7
CCV1 = 100	99.4	CCV3 = 100	97.8
CCB1 = 0	7.0	CCB3 = 0	5.2
		CCV4 = 100	95.8
		CCB4 = 0	1.5

BARIUM

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES — IDL = 4 µg/L
Proj. #: 80915 — Spike Conc. = 100 µg/L
Date: 05-Oct-98

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	184.9	184.9	100	1	2.0084		9.21
BD-BS-1	80915.2	186.8	186.8	100	1	2.0053		9.32
BD-BS-1	80915.3	172.8	172.8	100	1	2.0040		8.62
Lab Blank	80915.LB	2.0	2.0	100	1	2.0000	<	0.20
Duplicate	80915.2D	180.6	180.6	100	1	1.9956		9.05
							% Difference =	2.9%

QUALITY CONTROL DATA

Calibration Data

	Emissio	True conc., µg/L
Blank	76	0
Standard 1	171	100
Standard 2	517	500
Standard 3	949	1000
Standard 4	1788	2000

Calibration Verifications, µg/L

ICV = 1000	1010	CCV2 = 1000
ICB = 0	1	CCB2 = 0
CCV1 = 100	1018	CCV3 = 1000
CCB1 = 0	0	CCB3 = 0

BERYLLIUM

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 0.10 µg/L
Spike Conc. = 5.00 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	0.84	8.40	100	10	2.0084		0.418
BD-BS-1	80915.2	0.66	6.60	100	10	2.0053		0.329
BD-BS-1	80915.3	0.59	5.90	100	10	2.0040		0.294
Lab Blank	80915.LB	-0.05	-0.05	100	1	2.0000	<	0.005
Duplicate	80915.2D	0.56	5.60	100	10	1.9956		0.281
							% Difference =	15.9%
Post-spike	80915.1	5.51			10		%Recovery =	93.4%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.00
Standard 1	0.011	0.10
Standard 2	0.042	2.00
Standard 3	0.098	5.00
Standard 4	0.169	10.00

Calibration Verifications, µg/L

ICV = 5	5.25	CCV2 = 5	4.84
ICB = 0	0.04	CCB2 = 0	-0.01
CCV1 = 5	5.26	CCV3 = 5	4.94
CCB1 = 0	0.07	CCB3 = 0	0.02

CADMIUM

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 5 µg/L
Spike Conc. = 400 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	33	33	100	1	2.0084		1.643
BD-BS-1	80915.2	30	30	100	1	2.0053		1.496
BD-BS-1	80915.3	36	36	100	1	2.0040		1.796
Lab Blank	80915.LB	15	15	100	1	2.0000		0.750
Duplicate	80915.2D	36	36	100	1	1.9956		1.804
							% Difference =	18.7%
Pre-spike	80915.1S	408.00			1	1.9929	%Recovery =	93.8%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.021	50
Standard 2	0.040	100
Standard 3	0.080	200
Standard 4	0.193	500
Standard 5	0.360	1000

Calibration Verifications, µg/L

ICV = 500	476	CCV2 = 500	498
ICB = 0	2	CCB2 = 0	0
CCV1 = 50	489	CCV3 = 500	503
CCB1 = 0	1	CCB3 = 0	1

CHROMIUM

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 25 µg/L
Spike Conc. = 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	149	149	100	1	2.0084		7.419
BD-BS-1	80915.2	167	167	100	1	2.0053		8.328
BD-BS-1	80915.3	128	128	100	1	2.0040		6.387
Lab Blank	80915.LB	7	7	100	1	2.0000	<	1.250
Duplicate	80915.2D	163	163	100	1	1.9956		8.168
							% Difference =	1.9%
Pre-spike	80915.1S	2220			1	1.9929	%Recovery =	103.6%

QUALITY CONTROL DATA

Calibration Data

	Emissio	True conc., µg/L
Blank	488	0
Standard 1	580	100
Standard 2	1146	500
Standard 3	1752	1000
Standard 4	3108	2000

Calibration Verifications, µg/L

ICV = 1000	1025	CCV2 = 1000	1017
ICB = 0	7	CCB2 = 0	17
CCV1 = 1000	1051	CCV3 = 1000	
CCB1 = 0	-1	CCB3 = 0	

COPPER

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 30 µg/L
Spike Conc. = 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	156	156	100	1	2.0084		7.767
BD-BS-1	80915.2	163	163	100	1	2.0053		8.128
BD-BS-1	80915.3	130	130	100	1	2.0040		6.487
Lab Blank	80915.LB	19	19	100	1	2.0000	<	1.500
Pre-spike	80915.1S	2319			1	1.9929	%Recovery =	108.2%

QUALITY CONTROL DATA

Calibration Data

	Emissio	True conc., µg/L
Blank	1712	0
Standard 1	2222	100
Standard 2	6842	500
Standard 3	12301	1000
Standard 4	24207	2000

Calibration Verifications, µg/L

ICV = 1000	1019	CCV2 = 1000	1166
ICB = 0	20	CCB2 = 0	27
CCV1 = 10	1094	CCV3 = 1000	
CCB1 = 0	23	CCB3 = 0	

LEAD

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 100 µg/L
Spike Conc. = 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	720	720	100	1	2.0084		35.849
BD-BS-1	80915.2	730	730	100	1	2.0053		36.404
BD-BS-1	80915.3	780	780	100	1	2.0040		38.922
Lab Blank	80915.LB	70	70	100	1	2.0000	<	5.000
Duplicate	80915.2D	760	760	100	1	1.9956		38.084
							% Difference =	4.5%
Pre-spike	80915.1S	2740			1	1.9929	%Recovery =	101.0%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.004	200
Standard 2	0.009	500
Standard 3	0.017	1000
Standard 4	0.032	2000
Standard 5	0.080	5000
Standard 6	0.159	10000

Calibration Verifications, µg/L

ICV = 5000	4940	CCV2 = 5000	4870
ICB = 0	20	CCB2 = 0	10
CCV1 = 500	4930	CCV3 = 5000	5130
CCB1 = 0	-10	CCB3 = 0	-10

MANGANESE

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 40 µg/L
Spike Conc. = 400 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	1355	1355	100	1	2.0084		67.467
BD-BS-1	80915.2	1407	1407	100	1	2.0053		70.164
BD-BS-1	80915.3	1326	1326	100	1	2.0040		66.168
Lab Blank	80915.LB	32	32	100	1	2.0000	<	2.000
Duplicate	80915.2D	1374	1374	100	1	1.9956		68.851
							% Difference =	1.9%
Pre-spike	80915.1S	1744			1	1.9929	%Recovery =	97.3%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.030	200
Standard 2	0.075	500
Standard 3	0.142	1000
Standard 4	0.271	2000

Calibration Verifications, µg/L

ICV = 500	980	CCV2 = 500
ICB = 0	6	CCB2 = 0
CCV1 = 500	1025	CCV3 = 500
CCB1 = 0	31	CCB3 = 0

MERCURY

CVAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 0.20 µg/L
Spike Conc. = 5.00 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	0.55	0.55	100	1	0.2981		0.185
	80915.1	0.65	0.65	100	1	0.2996		0.217
							Avg. =	0.201
BD-BS-2	80915.2	0.30	0.30	100	1	0.3004		0.100
	80915.2	0.61	0.61	100	1	0.3034		0.201
							Avg. =	0.150
BD-BS-3	80915.3	0.50	0.50	100	1	0.2955		0.169
	80915.3	0.56	0.56	100	1	0.3013		0.186
							Avg. =	0.178
Pre-spike	80915.1S	5.79			1	0.3010	%Recovery =	104.8%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0.00
Standard 1	0.010	0.50
Standard 2	0.026	1.00
Standard 3	0.044	2.00
Standard 4	0.119	5.00
Standard 5	0.242	10.00

Calibration Verifications, µg/L

ICV = 5	5.08	CCV3 = 5	4.83
ICB = 0	0.02	CCB3 = 0	-0.03
CCV1 = 5	4.91	CCV4 = 5	4.51
CCB1 = 0	-0.10	CCB4 = 0	-0.03
CCV2 = 5	4.90	CCV5 = 5	
CCB2 = 0	0.00	CCB5 = 0	

NICKEL

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 50 µg/L
Spike Conc. = 2000 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	140	140	100	1	2.0084		6.971
BD-BS-2	80915.2	157	157	100	1	2.0053		7.829
BD-BS-3	80915.3	134	134	100	1	2.0040		6.687
Lab Blank	80915.LB	8	8	100	1	2.0000	<	2.500
Duplicate	80915.2D	120	120	100	1	1.9956		6.013
							% Difference =	26.2%
Pre-spike	80915.1S	2064			1	1.9929	%Recovery =	96.2%

QUALITY CONTROL DATA

Calibration Data

	Emissio	True conc., µg/L
Blank	615	0
Standard 1	692	100
Standard 2	1228	500
Standard 3	1857	1000
Standard 4	3229	2000

Calibration Verifications, µg/L

ICV = 1000	956	CCV2 = 1000	1021
ICB = 0	16	CCB2 = 0	23
CCV1 = 100	1195	CCV3 = 1000	
CCB1 = 0	40	CCB3 = 0	

PHOSPHORUS

ICP ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES IDL = 20 µg/L
Proj. #: 80915
Date: 05-Oct-98

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	898	898	100	1	2.0084		44.712
BD-BS-2	80915.2	1011	1011	100	1	2.0053		50.416
BD-BS-3	80915.3	871	871	100	1	2.0040		43.463
Lab Blank	80915.LB	8	8	100	1	2.0000	<	1.000
Duplicate	80915.2D	940	940	100	1	1.9956		47.104
							% Difference	6.8%

QUALITY CONTROL DATA

Calibration Data

	Emissio	True conc., µg/L
Blank	414	0
Standard 1	444	200
Standard 2	626	1000
Standard 3	859	2000
Standard 4	1590	5000

Calibration Verifications, µg/L

ICV = 2000	2109	CCV2 = 2000
ICB = 0	-2	CCB2 = 0
CCV1 = 200	2342	CCV3 = 2000
CCB1 = 0	18	CCB3 = 0

SELENIUM

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES — IDL = 3 µg/L
Proj. #: 80915 — Spike Conc. = 50 µg/L
Date: 05-Oct-98

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	75.7	75.7	100	1	2.0084		3.77
BD-BS-1	80915.2	69.2	69.2	100	1	2.0053		3.45
BD-BS-1	80915.3	65.0	65.0	100	1	2.0040		3.24
Lab Blank	80915.LB	1.8	1.8	100	1	2.0000	<	0.15
Duplicate	80915.2D	60.4	60.4	100	1	1.9956		3.03
							% Difference =	13.1%
Post-spike	80915.1	113.6			1		%Recovery =	75.7%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.022	10
Standard 2	0.049	25
Standard 3	0.098	50
Standard 4	0.182	100

Calibration Verifications, µg/L

ICV = 50	48.7	CCV2 = 50	
ICB = 0	2.9	CCB2 = 0	
CCV1 = 50	48.4	CCV3 = 50	
CCB1 = 0	1.8	CCB3 = 0	

SILVER

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 0.5 µg/L
Spike Conc. = 10.0 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	1.0	1.0	100	1	2.0084		0.05
BD-BS-1	80915.2	0.2	0.2	100	1	2.0053	<	0.02
BD-BS-1	80915.3	1.1	1.1	100	1	2.0040		0.06
Lab Blank	80915.LB	-0.4	-0.4	100	1	2.0000	<	0.03
Duplicate	80915.2D	1.0	1.0	100	1	1.9956		0.05
							% Difference =	NA
Post-spike	80915.1	9.7			1		%Recovery =	86.9%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.094	5
Standard 2	0.185	10
Standard 3	0.356	20
Standard 4	0.526	30

Calibration Verifications, µg/L

ICV = 20	20.7	CCV2 = 20	
ICB = 0	0.0	CCB2 = 0	
CCV1 = 20	20.8	CCV3 = 20	
CCB1 = 0	-0.1	CCB3 = 0	

THALLIUM

GFAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 3 µg/L
Spike Conc. = 50 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g		Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	15.4	15.4	100	1	2.0084		0.77
BD-BS-2	80915.2	17.6	17.6	100	1	2.0053		0.88
BD-BS-3	80915.3	14.4	14.4	100	1	2.0040		0.72
Lab Blank	80915.LB	0.8	0.8	100	1	2.0000	<	0.15
Duplicate	80915.2D	15.3	15.3	100	1	1.9956		0.77
							% Difference =	13.7%
Post-spike	80915.1	65.3			1		%Recovery =	99.9%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.019	10
Standard 2	0.042	20
Standard 3	0.099	50
Standard 4	0.188	100

Calibration Verifications, µg/L

ICV = 50	50.5	CCV2 = 50	
ICB = 0	1.8	CCB2 = 0	
CCV1 = 50	49.3	CCV3 = 50	
CCB1 = 0	0.0	CCB3 = 0	

ZINC

FLAA ANALYSIS RUN SUMMARY AND CALCULATION WORKSHEET

Client: PES
Proj. #: 80915
Date: 05-Oct-98

IDL = 20 µg/L
Spike Conc. = 400 µg/L

Sample ID Client	FAL	Test Sol'n µg/L	Dig'te Conc µg/L	FV ml	Dil'n Factor	Sample Weight g	Conc. in original Sample µg/g (ppm)
BD-BS-1	80915.1	753	753	100	1	2.0084	37.493
BD-BS-2	80915.2	724	724	100	1	2.0053	36.104
BD-BS-3	80915.3	796	796	100	1	2.0040	39.721
Lab Blank	80915.LB	94	94	100	1	2.0000	4.700
Duplicate	80915.2D	756	756	100	1	1.9956	37.883
						% Difference =	4.8%

QUALITY CONTROL DATA

Calibration Data

	Abs.	True conc., µg/L
Blank	0.000	0
Standard 1	0.019	50
Standard 2	0.041	100
Standard 3	0.085	200
Standard 4	0.204	500
Standard 5	0.397	1000

Calibration Verifications, µg/L

ICV = 500	507	CCV2 = 500	527
ICB = 0	0	CCB2 = 0	17
CCV1 = 50	496	CCV3 = 500	507
CCB1 = 0	-2	CCB3 = 0	-8

PACIFIC ENVIRONMENTAL SERVICES, INC.
Mason, OH 45040
(513) 398-2556
FAX: (513) 398-3342

Chain of Custody Record

Project Number: 5506.000
Project Name: EPA Coke - Bethlehem Steel Chesterton, Indiana
Samplers: D. Scheffel
Purchase Order No.: 103-99-345

PES Field Sample ID	Date	Time	Sample Description	Number of Containers	Analysis Requested: Metals by ICAP				Comments
BD-BS-1	8/11/98		Baghouse Dust - Run 1	1	x				If greater sensitivity is required, GFAAS will be used for the following metals: antimony, arsenic, beryllium, cadmium, chromium lead and selenium Mercury will be by CVAAS
BD-BS-2	8/12/98		Baghouse Dust - Run 2	1	x				
BD-BS-3	8/13/98		Baghouse Dust - Run 3	1	x				
			Analyze for the following metals: antimony, arsenic, barium, beryllium, cadmium, chromium, copper lead, manganese, mercury, nickel, phosphorus, selenium, silver, thallium + zinc (16 metals total)						

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[signature]	9/14/98 1400				

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☐ Dry Ice Dry Ice, 9, UN 1845 _____ x _____ kg.

☐ Cargo Aircraft Only

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lement File: SB.GEL          Element: Sb                    Wavelength: 217.
ate: 09/30/98                Time: 10:02                    Slit: 0.7 L
ata File:                    ID/Wt File: 80911.IDW          Lamp Current: 0
echnique: HGA                Calib. Type: Nonlinear         Energy: 39
-----------------------------------------------------------------------------
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b    ID: BLANK                Seq. No.: 00002    A/S Pos.: 0     Date: 09/30

eplicate  1                                  Time: 10:05
eak Area (A-s): -0.005                       Peak Height (A): 0.020
ackground Pk Area (A-s): 0.161               Background Pk Height (A): 0.079
lank Corrected Pk Area (A-s): -0.006
oncentration (ug/L  ): -2.8

eplicate  2                                  Time: 10:08
eak Area (A-s): -0.000                       Peak Height (A): 0.021
ackground Pk Area (A-s): 0.161               Background Pk Height (A): 0.078
lank Corrected Pk Area (A-s): -0.001
oncentration (ug/L  ): -0.4

lean Conc  (ug/L  ):        -1.6             SD: 1.70                RSD(%): 102.

uto-zero performed.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
b    ID: 10 PPB               Seq. No.: 00003    A/S Pos.: 1     Date: 09/30

eplicate  1                                  Time: 10:11
eak Area (A-s): 0.021                        Peak Height (A): 0.041
ackground Pk Area (A-s): 0.183               Background Pk Height (A): 0.086
lank Corrected Pk Area (A-s): 0.024
oncentration (ug/L  ): 12.5

eplicate  2                                  Time: 10:15
eak Area (A-s): 0.014                        Peak Height (A): 0.036
ackground Pk Area (A-s): 0.182               Background Pk Height (A): 0.080
lank Corrected Pk Area (A-s): 0.016
oncentration (ug/L  ): 8.4

lean Conc  (ug/L  ):        10.5             SD: 2.85                RSD(%): 27.25

tandard number 1 applied.  [10.0]
orrelation coefficient: 1.00000              Slope: 0.0020

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b    ID: 50 PPB               Seq. No.: 00004    A/S Pos.: 2     Date: 09/30

eplicate  1                                  Time: 10:18
eak Area (A-s): 0.085                        Peak Height (A): 0.127
ackground Pk Area (A-s): 0.184               Background Pk Height (A): 0.082
lank Corrected Pk Area (A-s): 0.088
oncentration (ug/L  ): 43.7

eplicate  2                                  Time: 10:21
eak Area (A-s): 0.085                        Peak Height (A): 0.126
ackground Pk Area (A-s): 0.184               Background Pk Height (A): 0.078
lank Corrected Pk Area (A-s): 0.087
oncentration (ug/L  ): 43.4
```

ean Conc (ug/L): 43.5 SD: 0.19 RSD(%): 0.44

tandard number 2 applied. [50.0]
orrelation coefficient: 1.00000 Slope: 0.0021

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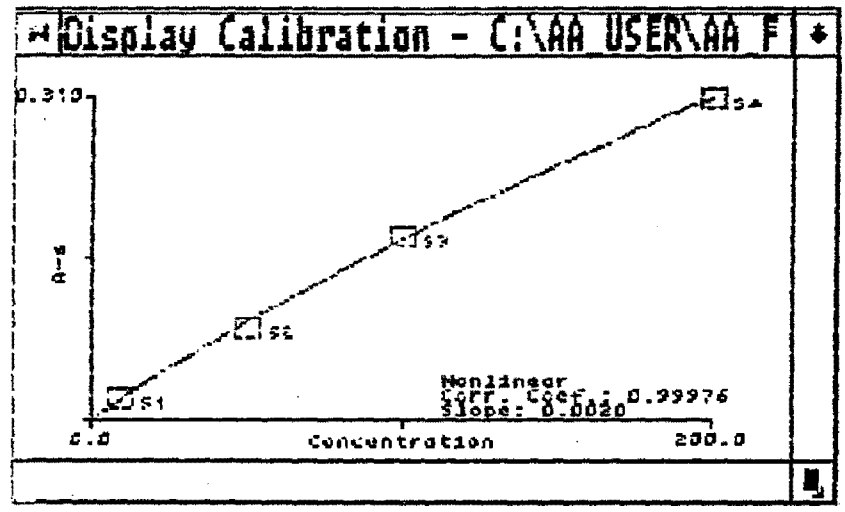
Display Calibration - C:\AA USER\AA F
0.310
Abs
S1
S2
S3
S4
Nonlinear
Corr. Coef.: 0.99976
Slope: 0.0020
0.0
Concentration
200.0

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Sb ID: 80911.I1-2Ax20 Seq. No.: 00031 A/S Pos.: 19 Date: 09/30/

Replicate 1 Time: 13:52
Concentration (ug/L): 12.9 Corrected Conc (ug/L): 258.

Replicate 2 Time: 13:55
Concentration (ug/L): 7.7 Corrected Conc (ug/L): 153.

Mean Conc (ug/L): 10.3 SD: 3.71 RSD(%): 36.09
Corrected Conc (ug/L): 205.

Sb ID: 80911.I2-2Ax20 Seq. No.: 00032 A/S Pos.: 20 Date: 09/30/

Replicate 1 Time: 13:58
Concentration (ug/L): 34.6 Corrected Conc (ug/L): 693.

Replicate 2 Time: 14:02
Concentration (ug/L): 39.1 Corrected Conc (ug/L): 781.

Mean Conc (ug/L): 36.8 SD: 3.13 RSD(%): 8.48
Corrected Conc (ug/L): 737.

Sb ID: 80911.I3-2Ax20 Seq. No.: 00033 A/S Pos.: 21 Date: 09/30/

Replicate 1 Time: 14:05
Concentration (ug/L): 19.5 Corrected Conc (ug/L): 391.

Replicate 2 Time: 14:08
Concentration (ug/L): 20.6 Corrected Conc (ug/L): 412.

Mean Conc (ug/L): 20.1 SD: 0.73 RSD(%): 3.66
Corrected Conc (ug/L): 401.

Sb ID: CCV Seq. No.: 00034 A/S Pos.: 3 Date: 09/30/

Replicate 1 Time: 14:11
Concentration (ug/L): 88.7

Replicate 2 Time: 14:14
Concentration (ug/L): 87.2

Mean Conc (ug/L): 87.9 SD: 1.02 RSD(%): 1.17

QC sample is within range 79.5 - 120.49

Sb ID: CCB Seq. No.: 00035 A/S Pos.: 0 Date: 09/30/

Replicate 1 Time: 14:18
Concentration (ug/L): -1.3

Replicate 2 Time: 14:21
Concentration (ug/L): 2.2

Mean Conc (ug/L): 0.4 SD: 2.48 RSD(%): 609.0

BC sample is within range -15.49 - 15.49

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Element File: AS.GEL | Element: As | Wavelength: 193.
Date: 09/29/98 | Time: 10:20 | Slit: 0.70 L
Data File: 80911CUN.DAT | ID/Wt File: 80911.IDW | Lamp Current: 0
Technique: HGA | Calib. Type: Nonlinear | Energy: 34

As ID: BLANK Seq. No.: 00071 A/S Pos.: 0 Date: 09/29

Replicate 1 Time: 10:20
Peak Area (A-s): 0.010 Peak Height (A): 0.034
Background Pk Area (A-s): 0.133 Background Pk Height (A): 0.101
Blank Corrected Pk Area (A-s): 0.014
Concentration (ug/L): 5.46

Replicate 2 Time: 10:23
Peak Area (A-s): 0.019 Peak Height (A): 0.030
Background Pk Area (A-s): 0.123 Background Pk Height (A): 0.088
Blank Corrected Pk Area (A-s): 0.022
Concentration (ug/L): 8.81

Mean Conc (ug/L): 7.14 SD: 2.368 RSD(%): 33.1

Auto-zero performed.

As ID: BLANK Seq. No.: 00070 A/S Pos.: 0 Date: 09/29

Replicate 1 Time: 10:26
Peak Area (A-s): 0.007 Peak Height (A): 0.028
Background Pk Area (A-s): 0.133 Background Pk Height (A): 0.088
Blank Corrected Pk Area (A-s): -0.007
Concentration (ug/L): -3.01

Replicate 2 Time: 10:29
Peak Area (A-s): -0.006 Peak Height (A): 0.027
Background Pk Area (A-s): 0.148 Background Pk Height (A): 0.096
Blank Corrected Pk Area (A-s): -0.021
Concentration (ug/L): -8.39

Mean Conc (ug/L): -5.70 SD: 3.805 RSD(%): 66.7

Auto-zero performed.

As ID: 10 PPB AS Seq. No.: 00071 A/S Pos.: 1 Date: 09/29

Replicate 1 Time: 10:33
Peak Area (A-s): 0.036 Peak Height (A): 0.070
Background Pk Area (A-s): 0.137 Background Pk Height (A): 0.094
Blank Corrected Pk Area (A-s): 0.035
Concentration (ug/L): 14.27

Replicate 2 Time: 10:36
Peak Area (A-s): 0.043 Peak Height (A): 0.077
Background Pk Area (A-s): 0.136 Background Pk Height (A): 0.088
Blank Corrected Pk Area (A-s): 0.042
Concentration (ug/L): 17.00

Mean Conc (ug/L): 15.63 SD: 1.930 RSD(%): 12.35

Standard number 1 applied. [10.00]
Correlation coefficient: 1.00000 Slope: 0.0039

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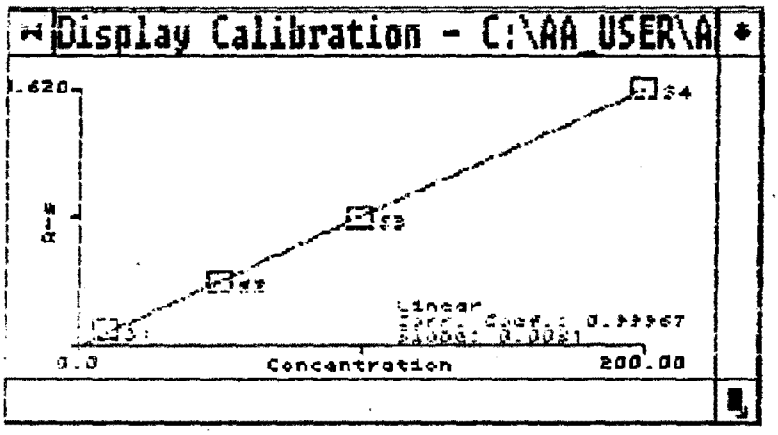
Peak Area (A-s): 0.609 Peak Height (A): 0.811
Background Pk Area (A-s): 0.170 Background Pk Height (A): 0.094
Blank Corrected Pk Area (A-s): 0.609
Concentration (ug/L): 314.84

Mean Conc (ug/L): 326.46 SD: 16.732 RSD(%): 5.12

S-shaped calibration curve detected. 2-coef. equation used.
Standard number 4 applied. [200.00]
Correlation coefficient: 0.99417 Slope: 0.0036

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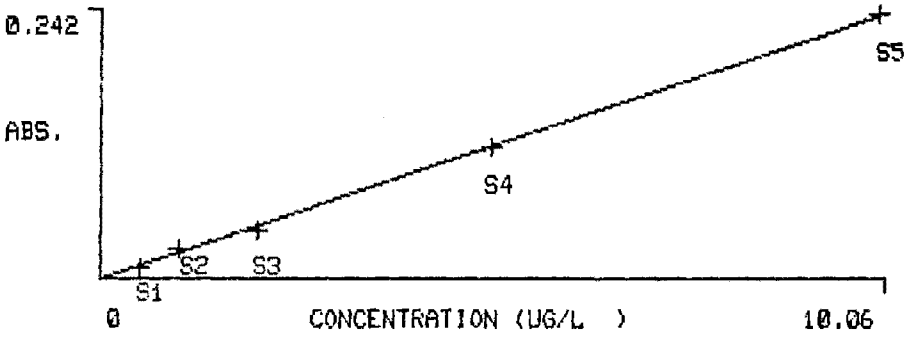
HGA DISPLAY CALIBRATION MODE
ELEMENT: HG - PEAK HEIGHT

PRINTER: ON
BG CORR: ON
UNITS : UG/L
CH.MASS:

10.06



PEAK AREA (A-S)
AA-BG: 3.965
BG: 0.008

PEAK HEIGHT (A)
AA-BG: 0.242
BG: -0.001

HG ICV		AA-BG	BG	HG ICB		AA-BG	BG
MAIN:	5.08 UG/L	PA 1.877	-0.014	MAIN:	0.02 UG/L	PA-0.070	-0.035
		PH 0.122	-0.002			PH 0.000	-0.004
HG RB-2B		AA-BG	BG	HG		AA-BG	BG
MAIN:	-0.10 UG/L	PA-0.031	0.008	MAIN:	-0.07 UG/L	PA-0.009	-0.017
		PH-0.002	-0.002			PH-0.002	-0.001
HG FB-2B		AA-BG	BG	HG		AA-BG	BG
MAIN:	0.07 UG/L	PA 0.020	0.022	MAIN:	0.03 UG/L	PA 0.012	-0.034
		PH 0.002	-0.000			PH 0.001	-0.003
HG ~~01-2B~~ error		AA-BG	BG	HG 01-2B		AA-BG	BG
MAIN:	~~0.00~~ UG/L	PA 0.010	0.008	MAIN:	4.98 UG/L	PA 1.900	-0.000
		PH 0.000	-0.002			PH 0.120	0.001
HG 01-2B		AA-BG	BG	HG 01-2BS		AA-BG	BG
MAIN:	4.71 UG/L	PA 1.755	-0.005	MAIN:	9.91 UG/L	PA 3.814	0.012
		PH 0.114	-0.004			PH 0.239	-0.002
HG 02-2B		AA-BG	BG				
MAIN:	11.47 UG/L	PA 4.268	-0.011				
		PH 0.276	-0.002				

E61 Sample concentration greater than highest standard

HG 02-2B		AA-BG	BG
MAIN:	11.02 UG/L	PA 4.104	-0.007
		PH 0.266	-0.002

E61 Sample concentration greater than highest standard

HG 03-2B		AA-BG	BG	HG		AA-BG	BG
MAIN:	5.21 UG/L	PA 1.906	0.018	MAIN:	4.98 UG/L	PA 1.789	0.011
		PH 0.126	-0.002			PH 0.120	-0.002

HG	O3-3B		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.00 UG/L	PA	0.001	-0.010	MAIN:	0.05 UG/L	PA	0.046	0.004
		PH	0.000	-0.002			PH	0.001	-0.001
HG	I1-3B		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.96 UG/L	PA	0.420	-0.001	MAIN:	0.80 UG/L	PA	0.390	-0.039
		PH	0.023	-0.003			PH	0.019	-0.002
HG	I2-3B		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.13 UG/L	PA	0.060	0.004	MAIN:	0.13 UG/L	PA	0.073	-0.008
		PH	0.003	-0.001			PH	0.003	-0.001
HG	I3-3B		AA-BG	BG	HG	CCV		AA-BG	BG
MAIN:	0.02 UG/L	PA	0.045	0.002	MAIN:	4.83 UG/L	PA	2.081	0.012
		PH	0.000	-0.002			PH	0.116	-0.001
HG	CCB		AA-BG	BG	HG	I3-3B		AA-BG	BG
MAIN:	-0.03 UG/L	PA	-0.039	0.004	MAIN:	0.08 UG/L	PA	0.029	-0.006
		PH	-0.001	-0.001			PH	0.002	-0.002
HG	FB-3B		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.03 UG/L	PA	-0.000	-0.034	MAIN:	0.03 UG/L	PA	-0.014	-0.009
		PH	0.001	-0.003			PH	0.001	-0.001
HG	RB-3B		AA-BG	BG	HG			AA-BG	BG
MAIN:	0.05 UG/L	PA	0.022	-0.009	MAIN:	0.07 UG/L	PA	0.003	-0.006
		PH	0.001	-0.002			PH	0.002	-0.000
HG	#1		AA-BG	BG	HG	LD		AA-BG	BG
MAIN:	0.55 UG/L	PA	0.248	-0.006	MAIN:	0.65 UG/L	PA	0.288	0.006
		PH	0.013	-0.002			PH	0.016	-0.000
HG	1T		AA-BG	BG	HG	1S		AA-BG	BG
MAIN:	0.61 UG/L	PA	0.237	-0.029	MAIN:	5.79 UG/L	PA	2.503	0.016
		PH	0.015	-0.003			PH	0.140	-0.001
HG	2		AA-BG	BG	HG	2D		AA-BG	BG
MAIN:	0.30 UG/L	PA	0.162	0.021	MAIN:	0.61 UG/L	PA	0.228	-0.007
		PH	0.007	0.001			PH	0.015	-0.002
HG	3		AA-BG	BG	HG	3D		AA-BG	BG
MAIN:	0.50 UG/L	PA	0.241	0.012	MAIN:	0.56 UG/L	PA	0.281	-0.020
		PH	0.012	-0.001			PH	0.014	-0.002
HG	CCV		AA-BG	BG	HG	CCB		AA-BG	BG
MAIN:	4.51 UG/L	PA	2.010	0.060	MAIN:	-0.03 UG/L	PA	-0.049	-0.036
		PH	0.109	0.002			PH	-0.001	-0.004

3MA 400 Analysis Ver. 4.10 Tue 09/29/98 - 15:34:08

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nod File Name: NI Replicates:4 Read Delay: 65
arks: NI ONLY Data File:

Wt file is 80911

ANDARD #1			REPLICATE #1					1537 9/29/98	
	ni231	EM	692						
ANDARD #1			REPLICATE #2						
	ni231	EM	691						
ANDARD #1			REPLICATE #3						
	ni231	EM	689				peak-noisy		
ANDARD #1			REPLICATE #4						
	ni231	EM	694						
	ni231	AV	691.5	SD	2.1	CV	0.3	CONC	0.1000
ANDARD #2			REPLICATE #1					1539 9/29/98	
	ni231	EM	1185						
ANDARD #2			REPLICATE #2						
	ni231	EM	1200						
ANDARD #2			REPLICATE #3						
	ni231	EM	1240						
ANDARD #2			REPLICATE #4						
	ni231	EM	1286						
	ni231	AV	1227.8	SD	45.2	CV	3.7	CONC	0.5000
ANDARD #3			REPLICATE #1					1541 9/29/98	
	ni231	EM	1855						
ANDARD #3			REPLICATE #2						
	ni231	EM	1823						
ANDARD #3			REPLICATE #3						
	ni231	EM	1873						
ANDARD #3			REPLICATE #4						
	ni231	EM	1878						
	ni231	AV	1857.3	SD	24.9	CV	1.3	CONC	1.0000
ANDARD #4			REPLICATE #1					1543 9/29/98	
	ni231	EM	3069						
ANDARD #4			REPLICATE #2						
	ni231	EM	3181						
ANDARD #4			REPLICATE #3						

'ANDARD #4 REPLICATE #4
ni231 EM 3604

ni231 AV 3228.5 SD 256.3 CV 7.9 CONC 2.0000

.ANK REPLICATE #1 1545 9/29/98
ni231 EM 592

.ANK REPLICATE #2
ni231 EM 601

.ANK REPLICATE #3
ni231 EM 583

.ANK REPLICATE #4
ni231 EM 685

ni231 AV 615.3 SD 47.1 CV 7.7 CONC 0.0000

ni231 CC 0.9996 SLOPE 1315.8527 INT 576.6360

:V REPLICATE #1 1547 9/29/98
ni231 EM 1833 0.9548 mg/L

:V REPLICATE #2
ni231 EM 1828 0.9510 mg/L

:V REPLICATE #3
ni231 EM 1823 0.9472 mg/L

:V REPLICATE #4
ni231 EM 1854 0.9707 mg/L

ni231 AV 1834.5 EM SD 13.6 CV 0.7

ni231 AV 0.9559 mg/L SD 0.0104 CV 1.08

:B REPLICATE #1 1549 9/29/98
ni231 EM 593 0.0124 mg/L peak-noisy

:B REPLICATE #2
ni231 EM 600 0.0178 mg/L peak-noisy

:B REPLICATE #3
ni231 EM 601 0.0185 mg/L peak-noisy

:B REPLICATE #4
ni231 EM 597 0.0155 mg/L peak-noisy

ni231 AV 597.8 EM SD 3.6 CV 0.6

ni231 AV 0.0160 mg/L SD 0.0027 CV 17.02

3—1 REPLICATE #1 1551 9/29/98
ni231 EM 594 0.0132 mg/L peak-noisy

3—1 REPLICATE #2
ni231 EM 601 0.0185 mg/L

‡—2A			REPLICATE #2		
ni231	EM	590	0.0102 mg/L	peak-noisy	
‡—2A			REPLICATE #3		
ni231	EM	591	0.0109 mg/L	peak-noisy	
‡—2A			REPLICATE #4		
ni231	EM	609	0.0246 mg/L	peak-noisy	
ni231	AV	605.8 EM	SD	20.2	CV 3.3
ni231	AV	0.0221 mg/L	SD	0.0153	CV 69.23
:V			REPLICATE #1		1633 9/29/98
ni231	EM	1963	1.0536 mg/L		
:V			REPLICATE #2		
ni231	EM	1830	0.9525 mg/L		
:V			REPLICATE #3		
ni231	EM	1987	1.0718 mg/L		
:V			REPLICATE #4		
ni231	EM	1899	1.0049 mg/L		
ni231	AV	1919.8 EM	SD	70.4	CV 3.7
ni231	AV	1.0207 mg/L	SD	0.0535	CV 5.24
:B			REPLICATE #1		1635 9/29/98
ni231	EM	609	0.0246 mg/L	peak-noisy	
:B			REPLICATE #2		
ni231	EM	612	0.0269 mg/L	peak-noisy	
:B			REPLICATE #3		
ni231	EM	598	0.0162 mg/L	peak-noisy	
:B			REPLICATE #4		
ni231	EM	607	0.0231 mg/L	peak-noisy	
ni231	AV	606.5 EM	SD	6.0	CV 1.0
ni231	AV	0.0227 mg/L	SD	0.0046	CV 20.18
)915.LB			REPLICATE #1		1637 9/29/98
ni231	EM	603	0.0200 mg/L	peak-noisy	
)915.LB			REPLICATE #2		
ni231	EM	582	0.0041 mg/L	peak-noisy	
)915.LB			REPLICATE #3		
ni231	EM	573	-0.0028 mg/L	peak-noisy	
)915.LB			REPLICATE #4		
ni231	EM	592	0.0117 mg/L	peak-noisy	
ni231	AV	587.5 EM	SD	12.9	CV 2.2
ni231	AV	0.0083 mg/L	SD	0.0098	CV 118.95
)915.1			REPLICATE #1		1639 9/29/98
ni231	EM	768	0.1454 mg/L		

ni231 EM 768 0.1454 mg/L

)915.1 REPLICATE #3
ni231 EM 771 0.1477 mg/L peak-noisy

)915.1 REPLICATE #4
ni231 EM 737 0.1219 mg/L peak-noisy

ni231 AV 761.0 EM SD 16.1 CV 2.1

ni231 AV 0.1401 mg/L SD 0.0122 CV 8.71

)915.1S REPLICATE #1 1641 9/29/98
ni231 EM 3241 2.0248 mg/L

)915.1S REPLICATE #2
ni231 EM 3139 1.9473 mg/L

)915.1S REPLICATE #3
ni231 EM 3479 2.2057 mg/L

)915.1S REPLICATE #4
ni231 EM 3310 2.0773 mg/L

ni231 AV 3292.3 EM SD 142.9 CV 4.3

ni231 AV 2.0638 mg/L SD 0.1086 CV 5.26

)915.2 REPLICATE #1 1643 9/29/98
ni231 EM 806 0.1743 mg/L peak-noisy

)915.2 REPLICATE #2
ni231 EM 760 0.1393 mg/L

)915.2 REPLICATE #3
ni231 EM 788 0.1606 mg/L

)915.2 REPLICATE #4
ni231 EM 780 0.1545 mg/L

ni231 AV 783.5 EM SD 19.1 CV 2.4

ni231 AV 0.1572 mg/L SD 0.0145 CV 9.22

)915.2D REPLICATE #1 1644 9/29/98
ni231 EM 703 0.0960 mg/L

)915.2D REPLICATE #2
ni231 EM 744 0.1272 mg/L peak-noisy

)915.2D REPLICATE #3
ni231 EM 746 0.1287 mg/L peak-noisy

)915.2D REPLICATE #4
ni231 EM 746 0.1287 mg/L peak-noisy

ni231 AV 734.8 EM SD 21.2 CV 2.9

ni231 AV 0.1202 mg/L SD 0.0161 CV 13.40

)915.3 REPLICATE #1 1646 9/29/98
ni231 EM 728 0.1150 mg/L peak-noisy

)915.3 REPLICATE #2

)915.3 REPLICATE #3
ni231 EM 765 0.1431 mg/L peak-noisy

)915.3 REPLICATE #4
ni231 EM 762 0.1409 mg/L peak-noisy

ni231 AV 753.0 EM SD 17.0 CV 2.3

ni231 AV 0.1340 mg/L SD 0.0129 CV 9.63

:V REPLICATE #1 1648 9/29/98
ni231 EM 1813 0.9396 mg/L

:V REPLICATE #2
ni231 EM 1738 0.8826 mg/L

:V REPLICATE #3
ni231 EM 1786 0.9191 mg/L

:V REPLICATE #4
ni231 EM 1763 0.9016 mg/L

ni231 AV 1775.0 EM SD 32.0 CV 1.8

ni231 AV 0.9107 mg/L SD 0.0243 CV 2.67

:B REPLICATE #1 1650 9/29/98
ni231 EM 587 0.0079 mg/L peak-noisy

:B REPLICATE #2
ni231 EM 632 0.0421 mg/L peak-noisy

:B REPLICATE #3
ni231 EM 584 0.0056 mg/L peak-noisy

:B REPLICATE #4
ni231 EM 583 0.0048 mg/L peak-noisy

ni231 AV 596.5 EM SD 23.7 CV 4.0

ni231 AV 0.0151 mg/L SD 0.0180 CV 119.45

SMA 400 Analysis Ver. 4.10 Wed 09/30/98 - 13:43:52

hod File Name: P Replicates:3 Read Delay: 65
arks: Data File:

Wt file is 80915

ΓANDARD #1			REPLICATE	#1				1348	9/30/98
	P214	EM	449				peak-noisy		
ΓANDARD #1			REPLICATE	#2					
	P214	EM	444				peak-noisy		
ΓANDARD #1			REPLICATE	#3					
	P214	EM	440						
	P214	AV	444.3	SD	4.5	CV	1.0	CONC	0.2000
ΓANDARD #2			REPLICATE	#1				1350	9/30/98
	P214	EM	630						
ΓANDARD #2			REPLICATE	#2					
	P214	EM	633						
ΓANDARD #2			REPLICATE	#3					
	P214	EM	616						
	P214	AV	626.3	SD	9.1	CV	1.4	CONC	1.0000
ΓANDARD #3			REPLICATE	#1				1352	9/30/98
	P214	EM	859						
ΓANDARD #3			REPLICATE	#2					
	P214	EM	867						
ΓANDARD #3			REPLICATE	#3					
	P214	EM	851						
	P214	AV	859.0	SD	8.0	CV	0.9	CONC	2.0000
ΓANDARD #4			REPLICATE	#1				1354	9/30/98
	P214	EM	1563						
ΓANDARD #4			REPLICATE	#2					
	P214	EM	1594						
ΓANDARD #4			REPLICATE	#3					
	P214	EM	1614						
	P214	AV	1590.3	SD	25.7	CV	1.6	CONC	5.0000
_ANK			REPLICATE	#1				1356	9/30/98
	P214	EM	418						
_ANK			REPLICATE	#2					
	P214	EM	406						

P214 EM 419

P214 AV 414.3 SD 7.2 CV 1.7 CONC 0.0000

P214 CC 0.9997 SLOPE 237.0154 INT 398.1614

:V REPLICATE #1 1358 9/30/98
P214 EM 863 1.9612 mg/L

:V REPLICATE #2
P214 EM 863 1.9612 mg/L

:V REPLICATE #3
P214 EM 968 2.4042 mg/L

P214 AV 898.0 EM SD 60.6 CV 6.8

P214 AV 2.1089 mg/L SD 0.2558 CV 12.13

:B REPLICATE #1 1400 9/30/98
P214 EM 398 -0.0007 mg/L peak-noisy

:B REPLICATE #2
P214 EM 400 0.0078 mg/L peak-noisy

:B REPLICATE #3
P214 EM 395 -0.0133 mg/L peak-noisy

P214 AV 397.7 EM SD 2.5 CV 0.6

P214 AV -0.0021 mg/L SD 0.0106 CV 508.66

>915.LB REPLICATE #1 1402 9/30/98
P214 EM 401 0.0120 mg/L peak-noisy

>915.LB REPLICATE #2
P214 EM 401 0.0120 mg/L peak-noisy

>915.LB REPLICATE #3
P214 EM 398 -0.0007 mg/L window-edge

P214 AV 400.0 EM SD 1.7 CV 0.4

P214 AV 0.0078 mg/L SD 0.0073 CV 94.21

>915.1 REPLICATE #1 1404 9/30/98
P214 EM 608 0.8853 mg/L peak-noisy

>915.1 REPLICATE #2
P214 EM 612 0.9022 mg/L

>915.1 REPLICATE #3
P214 EM 613 0.9064 mg/L

P214 AV 611.0 EM SD 2.6 CV 0.4

P214 AV 0.8980 mg/L SD 0.0112 CV 1.24

>915.2 REPLICATE #1 1406 9/30/98
P214 EM 646 1.0457 mg/L peak-noisy

>915.2 REPLICATE #2
P214 EM 635 0.9993 mg/L peak-noisy

P214 AV 637.7 EM SD 7.4 CV 1.2

P214 AV 1.0105 mg/L SD 0.0311 CV 3.08

915.2D REPLICATE #1 1408 9/30/98
P214 EM 603 0.8642 mg/L

915.2D REPLICATE #2
P214 EM 587 0.7967 mg/L

915.2D REPLICATE #3
P214 EM 673 1.1596 mg/L peak-noisy

P214 AV 621.0 EM SD 45.7 CV 7.4

P214 AV 0.9402 mg/L SD 0.1930 CV 20.53

915.3 REPLICATE #1 1410 9/30/98
P214 EM 601 0.8558 mg/L

915.3 REPLICATE #2
P214 EM 603 0.8642 mg/L

915.3 REPLICATE #3
P214 EM 610 0.8938 mg/L

P214 AV 604.7 EM SD 4.7 CV 0.8

P214 AV 0.8713 mg/L SD 0.0199 CV 2.29

V REPLICATE #1 1412 9/30/98
P214 EM 948 2.3198 mg/L

V REPLICATE #2
P214 EM 954 2.3452 mg/L

V REPLICATE #3
P214 EM 958 2.3620 mg/L

P214 AV 953.3 EM SD 5.0 CV 0.5

P214 AV 2.3423 mg/L SD 0.0212 CV 0.91

B REPLICATE #1 1414 9/30/98
P214 EM 400 0.0078 mg/L peak-noisy

B REPLICATE #2
P214 EM 402 0.0162 mg/L peak-noisy

B REPLICATE #3
P214 EM 405 0.0289 mg/L peak-noisy

P214 AV 402.3 EM SD 2.5 CV 0.6

P214 AV 0.0176 mg/L SD 0.0106 CV 60.32

```
lement File: SE.GEL          Element: Se                    Wavelength: 196.0
ate: 10/01/98                Time: 14:44                    Slit: 2.00 L
ata File:                    ID/Wt File: 80911.IDW          Lamp Current: 0
echnique: HGA                Calib. Type: Linear            Energy: 36
-----------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
e    ID: 0 PPB              Seq. No.: 00108    A/S Pos.: 0     Date: 10/01/

eplicate  1                              Time: 14:44
eak Area (A-s): -0.006                   Peak Height (A): 0.023
ackground Pk Area (A-s): 0.146           Background Pk Height (A): 0.094
lank Corrected Pk Area (A-s): -0.006

eplicate  2                              Time: 14:47
eak Area (A-s): -0.002                   Peak Height (A): 0.034
ackground Pk Area (A-s): 0.153           Background Pk Height (A): 0.085
lank Corrected Pk Area (A-s): -0.002

ean Pk Area (A-s):      -0.004           SD: 0.0028                RSD(%): 66.33

uto-zero performed.

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
e    ID: 10 PPB             Seq. No.: 00109    A/S Pos.: 1     Date: 10/01/

eplicate  1                              Time: 14:50
eak Area (A-s): 0.018                    Peak Height (A): 0.041
ackground Pk Area (A-s): 0.150           Background Pk Height (A): 0.081
lank Corrected Pk Area (A-s): 0.022

eplicate  2                              Time: 14:53
eak Area (A-s): 0.017                    Peak Height (A): 0.044
ackground Pk Area (A-s): 0.157           Background Pk Height (A): 0.086
lank Corrected Pk Area (A-s): 0.021

ean Pk Area (A-s):      0.022            SD: 0.0007                RSD(%): 3.36

tandard number 1 applied.  [10.00]
orrelation coefficient: 1.00000          Slope: 0.0022

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e    ID: 25 PPB             Seq. No.: 00110    A/S Pos.: 2     Date: 10/01/

eplicate  1                              Time: 14:57
eak Area (A-s): 0.043                    Peak Height (A): 0.070
ackground Pk Area (A-s): 0.160           Background Pk Height (A): 0.081
lank Corrected Pk Area (A-s): 0.047
oncentration (ug/L  ): 21.66

eplicate  2                              Time: 15:00
eak Area (A-s): 0.046                    Peak Height (A): 0.074
ackground Pk Area (A-s): 0.173           Background Pk Height (A): 0.083
lank Corrected Pk Area (A-s): 0.050
oncentration (ug/L  ): 23.09

ean Conc  (ug/L  ):     22.38            SD: 1.008                 RSD(%): 4.51

tandard number 2 applied.  [25.00]
```

orrelation coefficient: 0.99489 Slope: 0.0020

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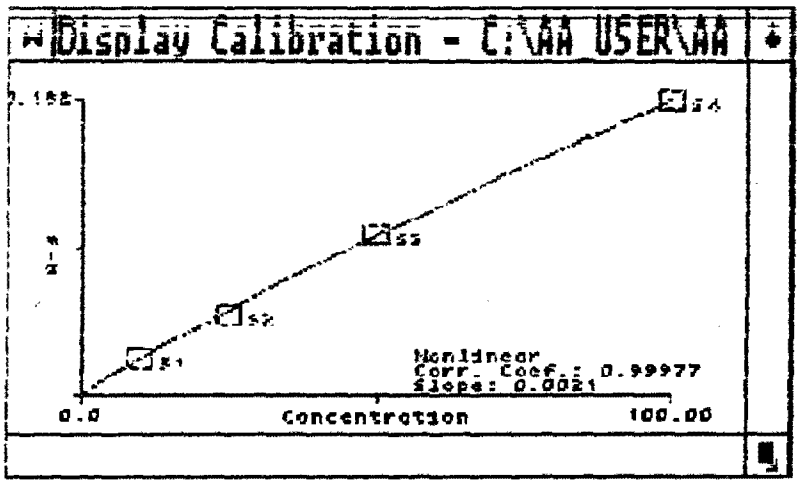
Display Calibration - C:\AA USER\AA
Nonlinear
Corr. Coef.: 0.99977
Slope: 0.0021
0.0
Concentration
100.00

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oncentration (ug/L): 78.10

eplicate 2 Time: 15:44
oncentration (ug/L): 73.35

ean Conc (ug/L): 75.72 SD: 3.361 RSD(%): 4.44

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oncentration (ug/L): 46.68

eplicate 2 Time: 16:17
oncentration (ug/L): 50.03

lean Conc (ug/L): 48.35 SD: 2.369 RSD(%): 4.90

IC sample is within range

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le ID: CCB Seq. No.: 00122 A/S Pos.: 0 Date: 10/01

Replicate 1 Time: 16:20
Concentration (ug/L): 3.55

Replicate 2 Time: 16:23
Concentration (ug/L): 0.12

Mean Conc (ug/L): 1.82 SD: 2.424 RSD(%): 132.

IC sample is within range

```
lement File: AG.GEL          Element: Ag                    Wavelength: 328.1
ate: 10/02/98                Time: 10:28                    Slit: 0.7 L
ata File:                    ID/Wt File: 80911.IDW          Lamp Current: 10
echnique: HGA                Calib. Type: Linear            Energy: 56
------------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
g    ID: BLANK                Seq. No.: 00002    A/S Pos.: 0     Date: 10/02/

leplicate  1                                   Time: 10:28
eak Area (A-s): 0.094                          Peak Height (A): 0.084
ackground Pk Area (A-s): 0.026                 Background Pk Height (A): 0.025
lank Corrected Pk Area (A-s): 0.094

leplicate  2                                   Time: 10:31
eak Area (A-s): 0.096                          Peak Height (A): 0.088
ackground Pk Area (A-s): 0.045                 Background Pk Height (A): 0.031
lank Corrected Pk Area (A-s): 0.096

lean Pk Area (A-s):      0.095                 SD: 0.0011                RSD(%): 1.16

uto-zero performed.

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g    ID: BLANK                Seq. No.: 00003    A/S Pos.: 0     Date: 10/02/

eplicate  1                                    Time: 10:34
eak Area (A-s): 0.094                          Peak Height (A): 0.083
ackground Pk Area (A-s): 0.044                 Background Pk Height (A): 0.029
lank Corrected Pk Area (A-s): -0.001

eplicate  2                                    Time: 10:37
eak Area (A-s): 0.096                          Peak Height (A): 0.086
ackground Pk Area (A-s): 0.046                 Background Pk Height (A): 0.030
lank Corrected Pk Area (A-s): 0.001

lean Pk Area (A-s):      0.000                 SD: 0.0016                RSD(%): 411.2

uto-zero performed.

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g    ID: 5 PPB AG             Seq. No.: 00004    A/S Pos.: 1     Date: 10/02

eplicate  1                                    Time: 10:40
eak Area (A-s): 0.187                          Peak Height (A): 0.163
ackground Pk Area (A-s): 0.054                 Background Pk Height (A): 0.032
lank Corrected Pk Area (A-s): 0.092

eplicate  2                                    Time: 10:43
eak Area (A-s): 0.190                          Peak Height (A): 0.166
ackground Pk Area (A-s): 0.053                 Background Pk Height (A): 0.033
lank Corrected Pk Area (A-s): 0.095

lean Pk Area (A-s):      0.093                 SD: 0.0020                RSD(%): 2.19

tandard number 1 applied.  [5.00]
orrelation coefficient: 1.00000                Slope: 0.0187             Int: 0.000
```

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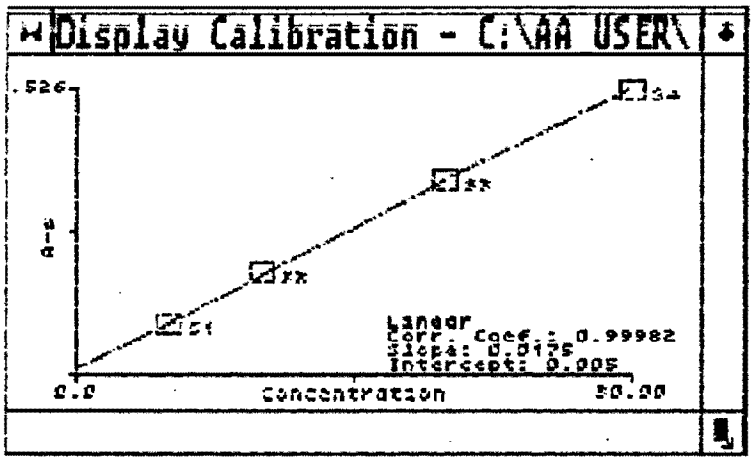
Display Calibration - C:\AA USER\
.526
0.0
Concentration
50.00
Linear
Corr. Coef.: 0.99982
Slope: 0.0175
Intercept: 0.005

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Concentration (ug/L): 1.00

Replicate 2 Time: 11:30
Concentration (ug/L): 0.92

Mean Conc (ug/L): 0.96 SD: 0.056 RSD(%): 5.83

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Replicate 2 Time: 12:01
Concentration (ug/L): 20.68

Mean Conc (ug/L): 20.76 SD: 0.106 RSD(%): 0.51

QC sample is within range 15.5 - 24.49

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```
lement File: TL.GEL          Element: Tl                    Wavelength: 276.8
ate: 10/01/98                Time: 12:29                    Slit: 2.00 H
ata File:                    ID/Wt File: 80911.IDW          Lamp Current: 7
echnique: HGA                Calib. Type: Linear            Energy: 45
```

```
1    ID: BLANK                Seq. No.: 00092    A/S Pos.: 0     Date: 10/01/

eplicate  1                                     Time: 12:29
eak Area (A-s): 0.001                           Peak Height (A): 0.015
ackground Pk Area (A-s): 0.004                  Background Pk Height (A): 0.011
lank Corrected Pk Area (A-s): 0.001

eplicate  2                                     Time: 12:32
eak Area (A-s): 0.000                           Peak Height (A): 0.013
ackground Pk Area (A-s): -0.001                 Background Pk Height (A): 0.013
lank Corrected Pk Area (A-s): 0.000

ean Pk Area (A-s):       0.001                  SD: 0.0007                RSD(%): 120.0

uto-zero performed.
```

```
1    ID: 10 PPB TL            Seq. No.: 00093    A/S Pos.: 1     Date: 10/01/

eplicate  1                                     Time: 12:35
eak Area (A-s): 0.015                           Peak Height (A): 0.024
ackground Pk Area (A-s): 0.018                  Background Pk Height (A): 0.018
lank Corrected Pk Area (A-s): 0.015

eplicate  2                                     Time: 12:38
eak Area (A-s): 0.024                           Peak Height (A): 0.025
ackground Pk Area (A-s): 0.017                  Background Pk Height (A): 0.021
lank Corrected Pk Area (A-s): 0.023

ean Pk Area (A-s):       0.019                  SD: 0.0061                RSD(%): 32.22

tandard number 1 applied.  [10.00]
orrelation coefficient: 1.00000                 Slope: 0.0019             Int: 0.000
```

```
1    ID: 20 PPB TL            Seq. No.: 00094    A/S Pos.: 2     Date: 10/01/

eplicate  1                                     Time: 12:41
eak Area (A-s): 0.042                           Peak Height (A): 0.043
ackground Pk Area (A-s): 0.031                  Background Pk Height (A): 0.027
lank Corrected Pk Area (A-s): 0.041
oncentration (ug/L  ): 21.54

eplicate  2                                     Time: 12:45
eak Area (A-s): 0.042                           Peak Height (A): 0.038
ackground Pk Area (A-s): 0.032                  Background Pk Height (A): 0.034
lank Corrected Pk Area (A-s): 0.042
oncentration (ug/L  ): 21.85

ean Conc  (ug/L  ):      21.70                  SD: 0.224                 RSD(%): 1.03

tandard number 2 applied.  [20.00]
```

Correlation coefficient: 0.99898 Slope: 0.0021 Int: -0.001

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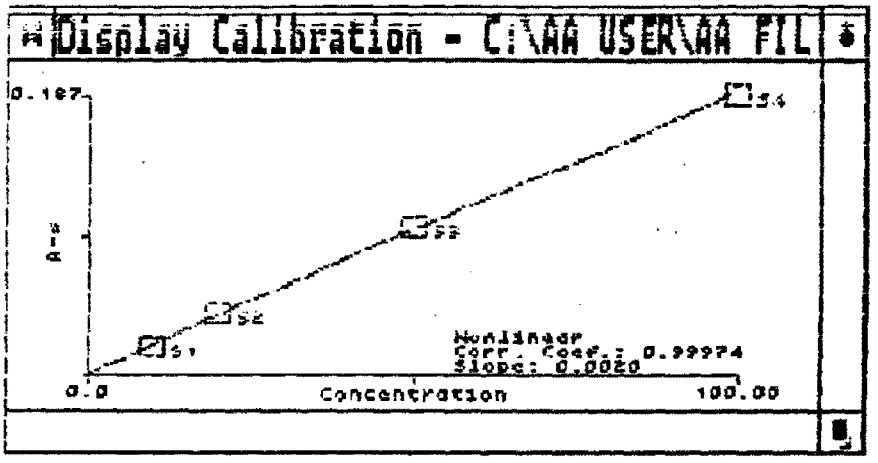
Display Calibration - C:\AA USER\AA FIL
0.187
0.0
Concentration
100.00
Nonlinear
Corr. Coef.: 0.99974
Slope: 0.0020

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Replicate 2 Time: 13:25
Concentration (ug/L): 15.59

Mean Conc (ug/L): 15.39 SD: 0.284 RSD(%): 1.85

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ean Conc (ug/L): 14.42 SD: 0.290 RSD(%): 2.01

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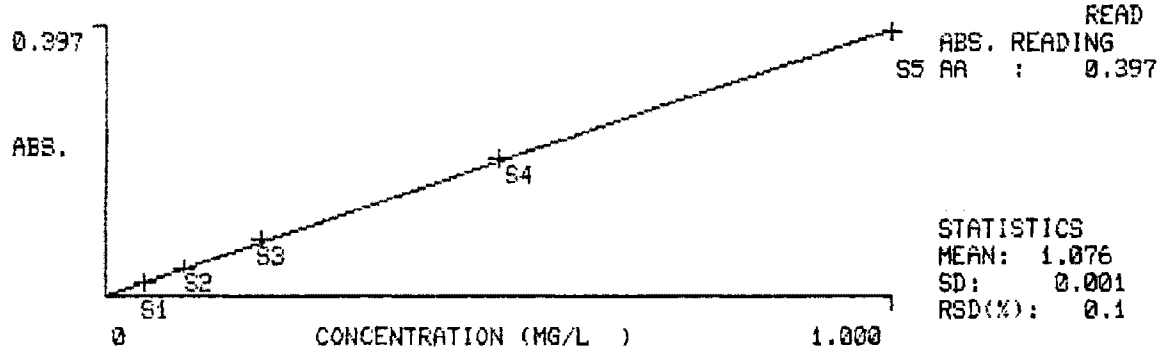
MAIN: -0.001 MG/L	AA HO-0.000		MAIN: -0.003 MG/L	AA HO-0.001	
ZN	MEAN: -0.002 MG/L	SD: 0.001 RSD: 54.4	AUTOZERO	0.000	
MAIN: 0.051 MG/L	AA HO 0.018		MAIN: 0.053 MG/L	AA HO 0.019	
ZN	MEAN: 0.052 MG/L	SD: 0.002 RSD: 3.3	1.STANDARD	0.052 MG/L	
MAIN: 0.116 MG/L	AA HO 0.041		MAIN: 0.115 MG/L	AA HO 0.041	
ZN	MEAN: 0.115 MG/L	SD: 0.001 RSD: 0.9	2.STANDARD	0.115 MG/L	
MAIN: 0.235 MG/L	AA HO 0.084		MAIN: 0.238 MG/L	AA HO 0.085	
ZN	MEAN: 0.237 MG/L	SD: 0.002 RSD: 0.7	3.STANDARD	0.235 MG/L	
MAIN: 0.562 MG/L	AA HO 0.202		MAIN: 0.573 MG/L	AA HO 0.205	
ZN	MEAN: 0.568 MG/L	SD: 0.008 RSD: 1.4	4.STANDARD	0.552 MG/L	
MAIN: 1.077 MG/L	AA HO 0.397		MAIN: 1.076 MG/L	AA HO 0.397	
ZN	MEAN: 1.076 MG/L	SD: 0.001 RSD: 0.1	5.STANDARD	0.993 MG/L	

FLAME DISPLAY CALIBRATION MODE
ELEMENT: ZN

REPL. 0 OF 2

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

0.993
READ



ABS. READING
S5 AA : 0.397

STATISTICS
MEAN: 1.076
SD: 0.001
RSD(%): 0.1

C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN: 0.004 MG/L	AA HO 0.000		MAIN: 0.004 MG/L	AA HO 0.000	

	MAIN: 0.505 MG/L	AA HO 0.202		MAIN: 0.510 MG/L	AA HO 0.204
ZN ICV	MEAN: 0.507 MG/L	SD: 0.003 RSD: 0.7			
	MAIN: 0.001 MG/L	AA HO 0.000		MAIN: -0.000 MG/L	AA HO-0.000
ZN ICB	MEAN: 0.000 MG/L	SD: 0.001 RSD: 99.9			
	MAIN: 0.119 MG/L	AA HO 0.048		MAIN: 0.086 MG/L	AA HO 0.035
ZN RB-1	MEAN: 0.103 MG/L	SD: 0.023 RSD: 22.7			
	MAIN: 0.094 MG/L	AA HO 0.038		MAIN: 0.093 MG/L	AA HO 0.037
ZN RB-1	MEAN: 0.094 MG/L	SD: 0.001 RSD: 0.7			
	MAIN: 0.136 MG/L	AA HO 0.055		MAIN: 0.131 MG/L	AA HO 0.052
ZN FB-1	MEAN: 0.134 MG/L	SD: 0.004 RSD: 2.7			
	MAIN: 0.339 MG/L	AA HO 0.136		MAIN: 0.336 MG/L	AA HO 0.134
ZN 01-1x40	MEAN: 0.338 MG/L	SD: 0.002 RSD: 0.6			
	MAIN: 0.687 MG/L	AA HO 0.274		MAIN: 0.700 MG/L	AA HO 0.280
ZN 01-1x40S	MEAN: 0.693 MG/L	SD: 0.009 RSD: 1.4			
	MAIN: 0.767 MG/L	AA HO 0.307		MAIN: 0.773 MG/L	AA HO 0.309
ZN 02-1x20	MEAN: 0.770 MG/L	SD: 0.004 RSD: 0.5			
	MAIN: 0.780 MG/L	AA HO 0.312		MAIN: 0.778 MG/L	AA HO 0.311
ZN 02 DUPL -1x20	MEAN: 0.779 MG/L	SD: 0.001 RSD: 0.2			
	MAIN: 0.956 MG/L	AA HO 0.382		MAIN: 0.946 MG/L	AA HO 0.378
ZN 03-1x20	MEAN: 0.951 MG/L	SD: 0.007 RSD: 0.7			

MAIN:	0.204 MG/L	HO	AA 0.081	MAIN:	0.233 MG/L	HO	AA 0.093
ZN 02-2A	MEAN: 0.218 MG/L	SD: 0.020	RSD: 9.4				
MAIN:	0.218 MG/L	HO	AA 0.087	MAIN:	0.187 MG/L	HO	AA 0.075
ZN 02-2AD	MEAN: 0.202 MG/L	SD: 0.021	RSD: 10.6				
MAIN:	0.155 MG/L	HO	AA 0.062	MAIN:	0.140 MG/L	HO	AA 0.056
ZN 03-2A	MEAN: 0.147 MG/L	SD: 0.011	RSD: 7.3				
MAIN:	0.225 MG/L	HO	AA 0.090	MAIN:	0.241 MG/L	HO	AA 0.096
ZN I1-2A	MEAN: 0.233 MG/L	SD: 0.011	RSD: 4.9				
MAIN:	0.175 MG/L	HO	AA 0.070	MAIN:	0.177 MG/L	HO	AA 0.071
ZN I2-2A	MEAN: 0.176 MG/L	SD: 0.001	RSD: 0.7				
MAIN:	0.204 MG/L	HO	AA 0.081	MAIN:	0.183 MG/L	HO	AA 0.073
ZN I3-2A	MEAN: 0.193 MG/L	SD: 0.015	RSD: 7.6				
MAIN:	0.523 MG/L	HO	AA 0.209	MAIN:	0.532 MG/L	HO	AA 0.213
ZN CCV	MEAN: 0.527 MG/L	SD: 0.007	RSD: 1.3				
MAIN:	0.017 MG/L	HO	AA 0.007	MAIN:	0.016 MG/L	HO	AA 0.007
ZN CCB	MEAN: 0.017 MG/L	SD: 0.000	RSD: 2.3				
MAIN:	0.014 MG/L	HO	AA 0.006	MAIN:	0.021 MG/L	HO	AA 0.008
ZN CCB	MEAN: 0.018 MG/L	SD: 0.005	RSD: 26.0				
MAIN:	0.010 MG/L	HO	AA 0.004	MAIN:	0.009 MG/L	HO	AA -0.000
ZN CCB	MEAN: 0.009 MG/L	SD: 0.000	RSD: 1.8	AUTOZERO	0.000		

80515

	AA		AA
MAIN: 0.101 MG/L	HO 0.040	MAIN: 0.088 MG/L	HO 0.035

ZN LB MEAN: 0.094 MG/L SD: 0.009 RSD: 9.9

	AA		AA
MAIN: 0.747 MG/L	HO 0.299	MAIN: 0.758 MG/L	HO 0.303

ZN 1 MEAN: 0.753 MG/L SD: 0.008 RSD: 1.0

	AA		AA
MAIN: 0.724 MG/L	HO 0.289	MAIN: 0.725 MG/L	HO 0.290

ZN 2 MEAN: 0.724 MG/L SD: 0.001 RSD: 0.1

	AA		AA
MAIN: 0.772 MG/L	HO 0.308	MAIN: 0.741 MG/L	HO 0.296

ZN 2D MEAN: 0.756 MG/L SD: 0.022 RSD: 2.9

	AA		AA
MAIN: 0.768 MG/L	HO 0.307	MAIN: 0.825 MG/L	HO 0.330

ZN 3 MEAN: 0.796 MG/L SD: 0.040 RSD: 5.0

	AA		AA
MAIN: 0.511 MG/L	HO 0.204	MAIN: 0.504 MG/L	HO 0.201

ZN CW MEAN: 0.507 MG/L SD: 0.005 RSD: 1.0

	AA		AA
MAIN: -0.009 MG/L	HO-0.004	MAIN: -0.006 MG/L	HO-0.003

ZN CCB MEAN:-0.008 MG/L SD: 0.002 RSD: 22.4

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Concentration (ug/L): 105.60 Corrected Conc (ug/L): 211.21

Mean Conc (ug/L): 109.05 SD: 4.871 RSD(%): 4.47
Corrected Conc (ug/L): 218.10

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SMA 400 Analysis Ver. 4.10 Wed 09/30/98 - 13:01:58

hod File Name: BA Replicates:3 Read Delay: 65
arks: BA ONLY Data File:

Wt file is 80915

TANDARD #1			REPLICATE #1					1306 9/30/98	
	BA455	EM	163						
TANDARD #1			REPLICATE #2						
	BA455	EM	166			peak-noisy			
TANDARD #1			REPLICATE #3						
	BA455	EM	184						
	BA455	AV	171.0	SD	11.4	CV	6.6	CONC	0.1000
TANDARD #2			REPLICATE #1					1308 9/30/98	
	BA455	EM	490						
TANDARD #2			REPLICATE #2						
	BA455	EM	517						
TANDARD #2			REPLICATE #3						
	BA455	EM	545						
	BA455	AV	517.3	SD	27.5	CV	5.3	CONC	0.5000
TANDARD #3			REPLICATE #1					1310 9/30/98	
	BA455	EM	939						
TANDARD #3			REPLICATE #2						
	BA455	EM	951						
TANDARD #3			REPLICATE #3						
	BA455	EM	957						
	BA455	AV	949.0	SD	9.2	CV	1.0	CONC	1.0000
TANDARD #4			REPLICATE #1					1313 9/30/98	
	BA455	EM	1771						
TANDARD #4			REPLICATE #2						
	BA455	EM	1769						
TANDARD #4			REPLICATE #3						
	BA455	EM	1824						
	BA455	AV	1788.0	SD	31.2	CV	1.7	CONC	2.0000
LANK			REPLICATE #1					1315 9/30/98	
	BA455	EM	75						
LANK			REPLICATE #2						
	BA455	EM	78						

BA455 EM 75

BA455 AV 76.0 SD 1.7 CV 2.3 CONC 0.0000

BA455 CC 0.9999 SLOPE 854.5002 INT 85.0266

CV REPLICATE #1 1317 9/30/98
BA455 EM 933 0.9924 mg/L

CV REPLICATE #2
BA455 EM 937 0.9970 mg/L

CV REPLICATE #3
BA455 EM 975 1.0415 mg/L

BA455 AV 948.3 EM SD 23.2 CV 2.4

BA455 AV 1.0103 mg/L SD 0.0271 CV 2.69

CB REPLICATE #1 1319 9/30/98
BA455 EM 86 0.0011 mg/L peak-noisy

CB REPLICATE #2
BA455 EM 90 0.0058 mg/L peak-noisy

CB REPLICATE #3
BA455 EM 82 -0.0035 mg/L peak-noisy

BA455 AV 86.0 EM SD 4.0 CV 4.7

BA455 AV 0.0011 mg/L SD 0.0047 CV 410.91

0915.1 REPLICATE #1 1321 9/30/98
BA455 EM 91 0.0070 mg/L peak-noisy

0915.1 LB REPLICATE #2
BA455 EM 83 -0.0024 mg/L peak-noisy

0915.1 REPLICATE #3
BA455 EM 85 -0.0000 mg/L peak-noisy

BA455 AV 86.3 EM SD 4.2 CV 4.8

BA455 AV 0.0015 mg/L SD 0.0049 CV 318.60

0915.1S REPLICATE #1 1323 9/30/98
BA455 EM 240 0.1814 mg/L

0915.1S REPLICATE #2
BA455 EM 244 0.1860 mg/L

0915.1S REPLICATE #3
BA455 EM 245 0.1872 mg/L

BA455 AV 243.0 EM SD 2.6 CV 1.1

BA455 AV 0.1849 mg/L SD 0.0031 CV 1.67

0915.2 REPLICATE #1 1325 9/30/98
BA455 EM 257 0.2013 mg/L

0915.2 1S REPLICATE #2

>915.1 REPLICATE #3
BA455 EM 274 0.2212 mg/L peak-noisy

BA455 AV 261.0 EM SD 11.5 CV 4.4

BA455 AV 0.2059 mg/L SD 0.0135 CV 6.55

>915.2D REPLICATE #1 1327 9/30/98
BA455 EM 244 0.1860 mg/L

>915.2D REPLICATE #2
BA455 EM 243 0.1849 mg/L

>915.2D REPLICATE #3
BA455 EM 247 0.1896 mg/L

BA455 AV 244.7 EM SD 2.1 CV 0.9

BA455 AV 0.1868 mg/L SD 0.0024 CV 1.30

>915.3 REPLICATE #1 1329 9/30/98
BA455 EM 234 0.1743 mg/L

>915.3 REPLICATE #2
BA455 EM 244 0.1860 mg/L

>915.3 REPLICATE #3
BA455 EM 240 0.1814 mg/L

BA455 AV 239.3 EM SD 5.0 CV 2.1

BA455 AV 0.1806 mg/L SD 0.0059 CV 3.26

REPLICATE #1 1331 9/30/98
BA455 EM 229 0.1685 mg/L

REPLICATE #2
BA455 EM 235 0.1755 mg/L

REPLICATE #3
BA455 EM 234 0.1743 mg/L

BA455 AV 232.7 EM SD 3.2 CV 1.4

BA455 AV 0.1728 mg/L SD 0.0038 CV 2.18

REPLICATE #1 1333 9/30/98
BA455 EM 945 1.0064 mg/L

REPLICATE #2
BA455 EM 961 1.0251 mg/L

REPLICATE #3
BA455 EM 958 1.0216 mg/L

BA455 AV 954.7 EM SD 8.5 CV 0.9

BA455 AV 1.0177 mg/L SD 0.0100 CV 0.98

AMPLE #10 REPLICATE #1 1336 9/30/98
BA455 EM 85 -0.0000 mg/L peak-noisy

AMPLE #10 REPLICATE #2
BA455 EM 83 -0.0024 mg/L peak-noisy

BA455	EM	86	0.0011 mg/L	peak-noisy

BA455	AV	84.7	EM	SD	1.5	CV	1.8
BA455	AV	-0.0004	mg/L	SD	0.0018	CV	424.44

Element File: BE.GEL Element: Be Wavelength: 234.
Date: 09/28/98 Time: 12:28 Slit: 0.7 L
Data File: 80911BE.DAT ID/Wt File: 80911.IDW Lamp Current: 3(
Technique: HGA Calib. Type: Linear Energy: 66

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Be ID: BLANK Seq. No.: 00001 A/S Pos.: 0 Date: 09/2E

Replicate 1 Time: 12:28
Peak Area (A-s): -0.002 Peak Height (A): 0.002
Background Pk Area (A-s): 0.321 Background Pk Height (A): 0.175
Blank Corrected Pk Area (A-s): -0.002

Replicate 2 Time: 12:31
Peak Area (A-s): -0.002 Peak Height (A): 0.003
Background Pk Area (A-s): 0.167 Background Pk Height (A): 0.103
Blank Corrected Pk Area (A-s): -0.002

Mean Pk Area (A-s): -0.002 SD: 0.0004 RSD(%): 19.5

Auto-zero performed.

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Be ID: 0.5 PPB Seq. No.: 00002 A/S Pos.: 1 Date: 09/2E

Replicate 1 Time: 12:34
Peak Area (A-s): 0.009 Peak Height (A): 0.025
Background Pk Area (A-s): 0.124 Background Pk Height (A): 0.134
Blank Corrected Pk Area (A-s): 0.011

Replicate 2 Time: 12:37
Peak Area (A-s): 0.009 Peak Height (A): 0.027
Background Pk Area (A-s): 0.107 Background Pk Height (A): 0.132
Blank Corrected Pk Area (A-s): 0.011

Mean Pk Area (A-s): 0.011 SD: 0.0003 RSD(%): 2.52

Standard number 1 applied. [0.50]
Correlation coefficient: 1.00000 Slope: 0.0222 Int: 0.000

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Be ID: 2 PPB Seq. No.: 00003 A/S Pos.: 2 Date: 09/28

Replicate 1 Time: 12:40
Peak Area (A-s): 0.039 Peak Height (A): 0.118
Background Pk Area (A-s): 0.171 Background Pk Height (A): 0.317
Blank Corrected Pk Area (A-s): 0.041
Concentration (ug/L): 1.87

Replicate 2 Time: 12:43
Peak Area (A-s): 0.041 Peak Height (A): 0.120
Background Pk Area (A-s): 0.165 Background Pk Height (A): 0.322
Blank Corrected Pk Area (A-s): 0.043
Concentration (ug/L): 1.95

Mean Conc (ug/L): 1.91 SD: 0.056 RSD(%): 2.93

Standard number 2 applied. [2.00]
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Correlation coefficient: 0.99992 Slope: 0.0211 Int: 0.000

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Replicate 2 Time: 15:22
Concentration (ug/L): 0.04

Mean Conc (ug/L): 0.04 SD: 0.000 RSD(%): 0.60

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QC sample is within range 3.5 - 6.49

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Mean Conc (ug/L): 7.06 SD: 0.161 RSD(%): 2.29

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Concentration (ug/L): 0.62 Corrected Conc (ug/L): 6.2

Mean Conc (ug/L): 0.59 SD: 0.033 RSD(%): 5.63
Corrected Conc (ug/L): 5.9

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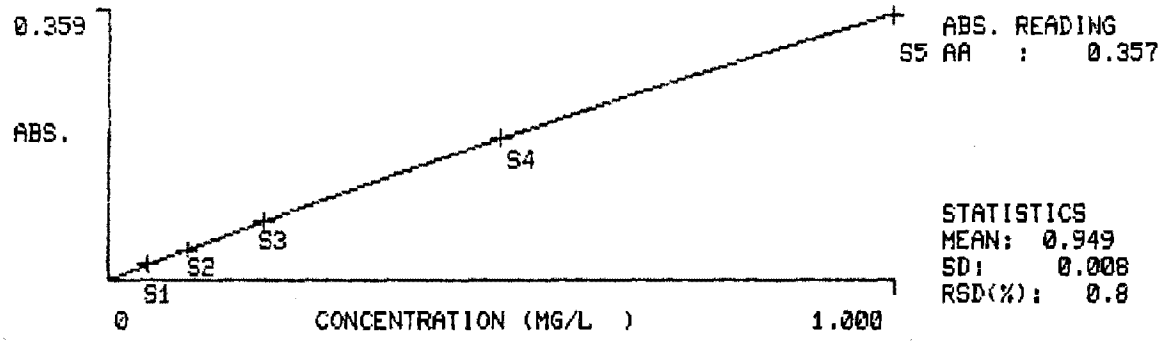
MAIN: -0.002 MG/L	AA HO-0.001		MAIN: -0.001 MG/L	AA HO-0.001	
CD	MEAN: -0.002 MG/L	SD: 0.001 RSD: 41.4	AUTOZERO	0.000	
MAIN: 0.053 MG/L	AA HO 0.020		MAIN: 0.055 MG/L	AA HO 0.021	
CD	MEAN: 0.054 MG/L	SD: 0.001 RSD: 2.1	1.STANDARD	0.054 MG/L	
MAIN: 0.107 MG/L	AA HO 0.040		MAIN: 0.105 MG/L	AA HO 0.039	
CD	MEAN: 0.106 MG/L	SD: 0.002 RSD: 1.8	2.STANDARD	0.106 MG/L	
MAIN: 0.213 MG/L	AA HO 0.080		MAIN: 0.212 MG/L	AA HO 0.080	
CD	MEAN: 0.213 MG/L	SD: 0.001 RSD: 0.3	3.STANDARD	0.212 MG/L	
MAIN: 0.518 MG/L	AA HO 0.195		MAIN: 0.506 MG/L	AA HO 0.191	
CD	MEAN: 0.512 MG/L	SD: 0.009 RSD: 1.7	4.STANDARD	0.510 MG/L	
MAIN: 0.955 MG/L	AA HO 0.362		MAIN: 0.943 MG/L	AA HO 0.357	
CD	MEAN: 0.949 MG/L	SD: 0.008 RSD: 0.8	5.STANDARD	0.980 MG/L	

FLAME DISPLAY CALIBRATION MODE
ELEMENT: CD

REPL. 0 OF 2

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

0.980



C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN: -0.000 MG/L	AA HO-0.000		MAIN: 0.002 MG/L	AA HO 0.001	

MAIN:	0.473 MG/L	AA HO 0.182	MAIN:	0.480 MG/L	AA HO 0.184

CD ICV MEAN: 0.476 MG/L SD: 0.004 RSD: 0.9

MAIN:	0.002 MG/L	AA HO 0.001	MAIN:	0.001 MG/L	AA HO 0.001

CD ICB MEAN: 0.002 MG/L SD: 0.001 RSD: 39.5

MAIN:	0.014 MG/L	AA HO 0.006	MAIN:	0.013 MG/L	AA HO 0.005

CD RB-1 MEAN: 0.014 MG/L SD: 0.001 RSD: 4.0

MAIN:	0.011 MG/L	AA HO 0.005	MAIN:	0.012 MG/L	AA HO 0.005

CD FB-1 MEAN: 0.012 MG/L SD: 0.001 RSD: 6.9

MAIN:	0.297 MG/L	AA HO 0.117	MAIN:	0.300 MG/L	AA HO 0.118

CD 01-1 MEAN: 0.298 MG/L SD: 0.002 RSD: 0.8

MAIN:	0.713 MG/L	AA HO 0.266	MAIN:	0.693 MG/L	AA HO 0.259

CD 01-1S MEAN: 0.703 MG/L SD: 0.014 RSD: 2.0
(+400)

MAIN:	0.343 MG/L	AA HO 0.134	MAIN:	0.353 MG/L	AA HO 0.138

CD 02-1 MEAN: 0.348 MG/L SD: 0.007 RSD: 2.0

MAIN:	0.333 MG/L	AA HO 0.130	MAIN:	0.341 MG/L	AA HO 0.133

CD 02D MEAN: 0.337 MG/L SD: 0.006 RSD: 1.8

MAIN:	0.424 MG/L	AA HO 0.164	MAIN:	0.432 MG/L	AA HO 0.167

CD 03-1 MEAN: 0.428 MG/L SD: 0.006 RSD: 1.3

MAIN:	0.353 MG/L	AA HO 0.138	MAIN:	0.350 MG/L	AA HO 0.137

CD I1-1(x100) MEAN: 0.352 MG/L SD: 0.002 RSD: 0.6

	MAIN: 0.019 MG/L	AA HO 0.008		MAIN: 0.021 MG/L	AA HO 0.009		
CD 63-2A	MEAN: 0.020 MG/L	SD: 0.001	RSD: 6.9				
	MAIN: 0.026 MG/L	AA HO 0.010		MAIN: 0.025 MG/L	AA HO 0.010		
CD I1-2A	MEAN: 0.026 MG/L	SD: 0.000	RSD: 1.3				
	MAIN: 0.025 MG/L	AA HO 0.010		MAIN: 0.026 MG/L	AA HO 0.011		
CD I2-2A	MEAN: 0.026 MG/L	SD: 0.000	RSD: 1.9				
	MAIN: 0.022 MG/L	AA HO 0.009		MAIN: 0.023 MG/L	AA HO 0.009		
CD I3-2A	MEAN: 0.022 MG/L	SD: 0.001	RSD: 2.8				
	MAIN: 0.503 MG/L	AA HO 0.192		MAIN: 0.494 MG/L	AA HO 0.189		
CD CCV	MEAN: 0.498 MG/L	SD: 0.006	RSD: 1.2				
	MAIN: 0.001 MG/L	AA HO 0.000		MAIN: -0.000 MG/L	AA HO-0.000		
CD CCB	MEAN: 0.000 MG/L	SD: 0.001	RSD: 99.9				
315	MAIN: 0.016 MG/L	AA HO 0.007		MAIN: 0.014 MG/L	AA HO 0.006		
CD LB	MEAN: 0.015 MG/L	SD: 0.002	RSD: 11.4				
	MAIN: 0.032 MG/L	AA HO 0.013		MAIN: 0.034 MG/L	AA HO 0.014		
CD 1	MEAN: 0.033 MG/L	SD: 0.001	RSD: 3.1				
	MAIN: 0.403 MG/L	AA HO 0.156		MAIN: 0.414 MG/L	AA HO 0.160		
CD 1S	MEAN: 0.408 MG/L	SD: 0.007	RSD: 1.8				
	MAIN: 0.029 MG/L	AA HO 0.012		MAIN: 0.030 MG/L	AA HO 0.012		
CD 2	MEAN: 0.030 MG/L	SD: 0.001	RSD: 2.7				

MAIN:	0.014 MG/L	HO	AA 0.006	MAIN:	0.013 MG/L	HO	AA 0.005

CD MEAN: 0.014 MG/L SD: 0.001 RSD: 6.6

MAIN:	0.036 MG/L	HO	AA 0.015	MAIN:	0.036 MG/L	HO	AA 0.015

CD 2D MEAN: 0.036 MG/L SD: 0.000 RSD: 0.6

MAIN:	0.035 MG/L	HO	AA 0.014	MAIN:	0.038 MG/L	HO	AA 0.015

CD 3 MEAN: 0.036 MG/L SD: 0.002 RSD: 6.0

MAIN:	0.503 MG/L	HO	AA 0.193	MAIN:	0.503 MG/L	HO	AA 0.193

CD CCV MEAN: 0.503 MG/L SD: 0.000 RSD: 0.1

MAIN:	0.001 MG/L	HO	AA 0.000	MAIN:	0.002 MG/L	HO	AA 0.001

CD CCB MEAN: 0.001 MG/L SD: 0.001 RSD: 72.1

3MA 400 Analysis Ver. 4.10 Wed 09/30/98 - 08:33:52

ıod File Name: CR Replicates:4 Read Delay: 65
arks: CR ONLY Data File: 911CR

Jt file is B0911

ANDARD #1			REPLICATE #1					0837 9/30/98	
	cr267	EM	565						
ANDARD #1			REPLICATE #2						
	cr267	EM	564			peak-noisy			
ANDARD #1			REPLICATE #3						
	cr267	EM	596			peak-noisy			
ANDARD #1			REPLICATE #4						
	cr267	EM	596			peak-noisy			
	cr267	AV	580.3	SD	18.2	CV	3.1	CONC	0.1000
ANDARD #2			REPLICATE #1					0839 9/30/98	
	cr267	EM	1122						
ANDARD #2			REPLICATE #2						
	cr267	EM	1218						
ANDARD #2			REPLICATE #3						
	cr267	EM	1110						
ANDARD #2			REPLICATE #4						
	cr267	EM	1135						
	cr267	AV	1146.3	SD	48.9	CV	4.3	CONC	0.5000
ANDARD #3			REPLICATE #1					0841 9/30/98	
	cr267	EM	1781						
ANDARD #3			REPLICATE #2						
	cr267	EM	1735						
ANDARD #3			REPLICATE #3						
	cr267	EM	1795						
ANDARD #3			REPLICATE #4						
	cr267	EM	1699						
	cr267	AV	1752.5	SD	43.9	CV	2.5	CONC	1.0000
ANDARD #4			REPLICATE #1					0843 9/30/98	
	cr267	EM	3118						
ANDARD #4			REPLICATE #2						
	cr267	EM	3153						
ANDARD #4			REPLICATE #3						

ANDARD #4 REPLICATE #4
cr267 EM 3139

cr267 AV 3107.8 SD 59.6 CV 1.9 CONC 2.0000

ANK REPLICATE #1 0845 9/30/98
cr267 EM 475

ANK REPLICATE #2
cr267 EM 467

ANK REPLICATE #3
cr267 EM 492

ANK REPLICATE #4
cr267 EM 519

cr267 AV 488.3 SD 23.0 CV 4.7 CONC 0.0000

cr267 CC 0.9998 SLOPE 1313.7744 INT 469.0825

:V REPLICATE #1 0847 9/30/98
cr267 EM 1810 1.0207 mg/L

:V REPLICATE #2
cr267 EM 1811 1.0214 mg/L

:V REPLICATE #3
cr267 EM 1817 1.0260 mg/L

:V REPLICATE #4
cr267 EM 1823 1.0306 mg/L

cr267 AV 1815.3 EM SD 6.0 CV 0.3

cr267 AV 1.0247 mg/L SD 0.0046 CV 0.45

:B REPLICATE #1 0849 9/30/98
cr267 EM 489 0.0152 mg/L peak-noisy

:B REPLICATE #2
cr267 EM 473 0.0030 mg/L

:B REPLICATE #3
cr267 EM 474 0.0037 mg/L peak-noisy

:B REPLICATE #4
cr267 EM 477 0.0060 mg/L

cr267 AV 478.3 EM SD 7.4 CV 1.5

cr267 AV 0.0070 mg/L SD 0.0056 CV 80.34

:—1 REPLICATE #1 0851 9/30/98
cr267 EM 471 0.0015 mg/L window-edge

:—1 REPLICATE #2
cr267 EM 455 -0.0107 mg/L peak-noisy

:—1 REPLICATE #3
cr267 EM 466 -0.0023 mg/L peak-noisy

:—1 REPLICATE #4
cr267 EM 459 -0.0077 mg/L peak-noisy

cr267 EM 460 -0.0069 mg/L peak-noisy

3-2A REPLICATE #4
cr267 EM 480 0.0083 mg/L peak-noisy

cr267 AV 476.8 EM SD 12.1 CV 2.5

cr267 AV 0.0058 mg/L SD 0.0092 CV 158.44

:V REPLICATE #1 0933 9/30/98
cr267 EM 1865 1.0625 mg/L

:V REPLICATE #2
cr267 EM 1825 1.0321 mg/L

:V REPLICATE #3
cr267 EM 1764 0.9856 mg/L

:V REPLICATE #4
cr267 EM 1768 0.9887 mg/L

cr267 AV 1805.5 EM SD 48.5 CV 2.7

cr267 AV 1.0172 mg/L SD 0.0369 CV 3.63

:B REPLICATE #1 0935 9/30/98
cr267 EM 506 0.0281 mg/L

:B REPLICATE #2
cr267 EM 489 0.0152 mg/L peak-noisy

:B REPLICATE #3
cr267 EM 488 0.0144 mg/L peak-noisy

:B REPLICATE #4
cr267 EM 481 0.0091 mg/L peak-noisy

cr267 AV 491.0 EM SD 10.6 CV 2.2

cr267 AV 0.0167 mg/L SD 0.0081 CV 48.43

)915.LB REPLICATE #1 0937 9/30/98
cr267 EM 501 0.0243 mg/L peak-noisy

)915.LB REPLICATE #2
cr267 EM 489 0.0152 mg/L peak-noisy

)915.LB REPLICATE #3
cr267 EM 457 -0.0092 mg/L peak-noisy

)915.LB REPLICATE #4
cr267 EM 466 -0.0023 mg/L peak-noisy

cr267 AV 478.3 EM SD 20.3 CV 4.2

cr267 AV 0.0070 mg/L SD 0.0154 CV 221.30

)915.1 REPLICATE #1 0939 9/30/98
cr267 EM 713 0.1857 mg/L

)915.1 REPLICATE #2
cr267 EM 641 0.1309 mg/L

)915.1 REPLICATE #3

>915.1 REPLICATE #4
cr267 EM 654 0.1408 mg/L

cr267 AV 664.8 EM SD 32.6 CV 4.9

cr267 AV 0.1489 mg/L SD 0.0248 CV 16.68

>915.1S REPLICATE #1 0941 9/30/98
cr267 EM 3351 2.1936 mg/L

>915.1S REPLICATE #2
cr267 EM 3408 2.2370 mg/L

>915.1S REPLICATE #3
cr267 EM 3443 2.2636 mg/L

>915.1S REPLICATE #4
cr267 EM 3340 2.1852 mg/L

cr267 AV 3385.5 EM SD 48.6 CV 1.4

cr267 AV 2.2199 mg/L SD 0.0370 CV 1.66

>915.2 REPLICATE #1 0943 9/30/98
cr267 EM 751 0.2146 mg/L

>915.2 REPLICATE #2
cr267 EM 670 0.1529 mg/L

>915.2 REPLICATE #3
cr267 EM 665 0.1491 mg/L

>915.2 REPLICATE #4
cr267 EM 669 0.1522 mg/L

cr267 AV 688.8 EM SD 41.6 CV 6.0

cr267 AV 0.1672 mg/L SD 0.0316 CV 18.92

>915.2D REPLICATE #1 0945 9/30/98
cr267 EM 649 0.1369 mg/L peak-noisy

>915.2D REPLICATE #2
cr267 EM 655 0.1415 mg/L peak-noisy

>915.2D REPLICATE #3
cr267 EM 798 0.2504 mg/L peak-noisy

>915.2D REPLICATE #4
cr267 EM 632 0.1240 mg/L

cr267 AV 683.5 EM SD 77.0 CV 11.3

cr267 AV 0.1632 mg/L SD 0.0586 CV 35.89

>915.3 REPLICATE #1 0947 9/30/98
cr267 EM 628 0.1210 mg/L

>915.3 REPLICATE #2
cr267 EM 661 0.1461 mg/L peak-noisy

>915.3 REPLICATE #3
cr267 EM 623 0.1172 mg/L

cr267 AV 637.3 EM SD 16.9 CV 2.6

cr267 AV 0.1280 mg/L SD 0.0128 CV 10.03

:V REPLICATE #1 0949 9/30/98
cr267 EM 2010 1.1729 mg/L

:V REPLICATE #2
cr267 EM 1838 1.0420 mg/L

:V REPLICATE #3
cr267 EM 1882 1.0755 mg/L

:V REPLICATE #4
cr267 EM 1877 1.0717 mg/L

cr267 AV 1901.8 EM SD 74.8 CV 3.9

cr267 AV 1.0905 mg/L SD 0.0569 CV 5.22

:B REPLICATE #1 0951 9/30/98
cr267 EM 490 0.0159 mg/L peak-noisy

:B REPLICATE #2
cr267 EM 496 0.0205 mg/L peak-noisy

:B REPLICATE #3
cr267 EM 494 0.0190 mg/L peak-noisy

:B REPLICATE #4
cr267 EM 499 0.0228 mg/L peak-noisy

cr267 AV 494.8 EM SD 3.8 CV 0.8

cr267 AV 0.0195 mg/L SD 0.0029 CV 14.71

(TRA POS'N REPLICATE #1 0953 9/30/98
cr267 EM 1865 1.0625 mg/L

(TRA POS'N 1/-1 x20 REPLICATE #2
cr267 EM 1730 0.9598 mg/L

(TRA POS'N REPLICATE #3
cr267 EM 1781 0.9986 mg/L

(TRA POS'N REPLICATE #4
cr267 EM 1830 1.0359 mg/L

cr267 AV 1801.5 EM SD 58.8 CV 3.3

cr267 AV 1.0142 mg/L SD 0.0448 CV 4.41

(TRA REPLICATE #1 0954 9/30/98
cr267 EM 1316 0.6446 mg/L

(TRA REPLICATE #2
cr267 EM 1346 0.6675 mg/L

(TRA REPLICATE #3
cr267 EM 1321 0.6485 mg/L

(TRA REPLICATE #4
cr267 EM 1347 0.6682 mg/L

80911 + 80911c

SMA 400 Analysis Ver. 4.10 Tue 09/29/98 - 13:22:07

hod File Name: CU Replicates:3 Read Delay: 60
arks: CU ONLY Data File:

Wt file is 80911

ΓANDARD #1			REPLICATE	#1				1326 9/29/98	
	CU324	EM	2203						
ΓANDARD #1			REPLICATE	#2					
	CU324	EM	2206						
ΓANDARD #1			REPLICATE	#3					
	CU324	EM	2256						
	CU324	AV	2221.7	SD	29.8	CV	1.3	CONC	0.1000
ΓANDARD #2			REPLICATE	#1				1327 9/29/98	
	CU324	EM	7020						
ΓANDARD #2			REPLICATE	#2					
	CU324	EM	6757						
ΓANDARD #2			REPLICATE	#3					
	CU324	EM	6749						
	CU324	AV	6842.0	SD	154.2	CV	2.3	CONC	0.5000
ΓANDARD #3			REPLICATE	#1				1329 9/29/98	
	CU324	EM	12159						
ΓANDARD #3			REPLICATE	#2					
	CU324	EM	12295						
ΓANDARD #3			REPLICATE	#3					
	CU324	EM	12450						
	CU324	AV	12301.3	SD	145.6	CV	1.2	CONC	1.0000
ΓANDARD #4			REPLICATE	#1				1331 9/29/98	
	CU324	EM	24616						
ΓANDARD #4			REPLICATE	#2					
	CU324	EM	24309						
ΓANDARD #4			REPLICATE	#3					
	CU324	EM	23697						
	CU324	AV	24207.3	SD	467.9	CV	1.9	CONC	2.0000
_ANK			REPLICATE	#1				1333 9/29/98	
	CU324	EM	1765						
_ANK			REPLICATE	#2					
	CU324	EM	1674						

CU324 EM 1696

CU324 AV 1711.7 SD 47.5 CV 2.8 CONC 0.0000

CU324 CC 0.9994 SLOPE 11362.325 INT 1275.9258

:V REPLICATE #1 1335 9/29/98
CU324 EM 12987 1.0307 mg/L

:V REPLICATE #2
CU324 EM 12769 1.0115 mg/L

:V REPLICATE #3
CU324 EM 12796 1.0139 mg/L

CU324 AV 12850.7 EM SD 118.8 CV 0.9

CU324 AV 1.0187 mg/L SD 0.0105 CV 1.03

:B REPLICATE #1 1336 9/29/98
CU324 EM 1476 0.0176 mg/L peak-noisy

:B REPLICATE #2
CU324 EM 1528 0.0222 mg/L window-edge

:B REPLICATE #3
CU324 EM 1496 0.0194 mg/L

CU324 AV 1500.0 EM SD 26.2 CV 1.7

CU324 AV 0.0197 mg/L SD 0.0023 CV 11.71

3—1 REPLICATE #1 1338 9/29/98
CU324 EM 1469 0.0170 mg/L window-edge

3—1 REPLICATE #2
CU324 EM 1458 0.0160 mg/L peak-noisy

3—1 REPLICATE #3
CU324 EM 1457 0.0159 mg/L

CU324 AV 1461.3 EM SD 6.7 CV 0.5

CU324 AV 0.0163 mg/L SD 0.0006 CV 3.59

3—1 REPLICATE #1 1340 9/29/98
CU324 EM 1521 0.0216 mg/L

3—1 REPLICATE #2
CU324 EM 1531 0.0224 mg/L

3—1 REPLICATE #3
CU324 EM 1526 0.0220 mg/L peak-noisy

CU324 AV 1526.0 EM SD 5.0 CV 0.3

CU324 AV 0.0220 mg/L SD 0.0004 CV 2.00

1—1 REPLICATE #1 1342 9/29/98
CU324 EM 9654 0.7374 mg/L

1—1 REPLICATE #2

CU324 EM 12233 0.9643 mg/L

CU324 AV 12208.0 EM SD 66.1 CV 0.5

CU324 AV 0.9621 mg/L SD 0.0058 CV 0.61

3—2A REPLICATE #1 1410 9/29/98
CU324 EM 1552 0.0243 mg/L peak-noisy

3—2A REPLICATE #2
CU324 EM 1530 0.0224 mg/L peak-noisy

3—2A REPLICATE #3
CU324 EM 1593 0.0279 mg/L peak-noisy

CU324 AV 1558.3 EM SD 32.0 CV 2.1

CU324 AV 0.0249 mg/L SD 0.0028 CV 11.32

1—2A REPLICATE #1 1412 9/29/98
CU324 EM 1659 0.0337 mg/L

1—2A REPLICATE #2
CU324 EM 1638 0.0319 mg/L

1—2A REPLICATE #3
CU324 EM 1685 0.0360 mg/L peak-noisy

CU324 AV 1660.7 EM SD 23.5 CV 1.4

CU324 AV 0.0339 mg/L SD 0.0021 CV 6.12

2—2A REPLICATE #1 1414 9/29/98
CU324 EM 1631 0.0313 mg/L peak-noisy

2—2A REPLICATE #2
CU324 EM 1616 0.0299 mg/L

2—2A REPLICATE #3
CU324 EM 1649 0.0328 mg/L

CU324 AV 1632.0 EM SD 16.5 CV 1.0

CU324 AV 0.0313 mg/L SD 0.0015 CV 4.64

3—2A REPLICATE #1 1415 9/29/98
CU324 EM 1710 0.0382 mg/L peak-noisy

3—2A REPLICATE #2
CU324 EM 1664 0.0342 mg/L peak-noisy

3—2A REPLICATE #3
CU324 EM 1678 0.0354 mg/L

CU324 AV 1684.0 EM SD 23.6 CV 1.4

CU324 AV 0.0359 mg/L SD 0.0021 CV 5.78

CV REPLICATE #1 1417 9/29/98
CU324 EM 14658 1.1778 mg/L

CV REPLICATE #2
CU324 EM 14416 1.1565 mg/L

CV REPLICATE #3

CU324 AV 14527.3 EM SD 122.2 CV 0.8

CU324 AV 1.1663 mg/L SD 0.0108 CV 0.92

CB REPLICATE #1 1419 9/29/98
CU324 EM 1569 0.0258 mg/L peak-noisy

CB REPLICATE #2
CU324 EM 1576 0.0264 mg/L peak-noisy

CB REPLICATE #3
CU324 EM 1593 0.0279 mg/L peak-noisy

CU324 AV 1579.3 EM SD 12.3 CV 0.8

CU324 AV 0.0267 mg/L SD 0.0011 CV 4.07

0915.LB REPLICATE #1 1421 9/29/98
CU324 EM 1519 0.0214 mg/L peak-noisy

0915.LB REPLICATE #2
CU324 EM 1447 0.0151 mg/L

0915.LB REPLICATE #3
CU324 EM 1491 0.0189 mg/L peak-noisy

CU324 AV 1485.7 EM SD 36.3 CV 2.4

CU324 AV 0.0185 mg/L SD 0.0032 CV 17.30

0915.1 REPLICATE #1 1422 9/29/98
CU324 EM 3009 0.1525 mg/L

0915.1 REPLICATE #2
CU324 EM 2964 0.1486 mg/L

0915.1 REPLICATE #3
CU324 EM 3187 0.1682 mg/L

CU324 AV 3053.3 EM SD 117.9 CV 3.9

CU324 AV 0.1564 mg/L SD 0.0104 CV 6.63

0915.1S REPLICATE #1 1424 9/29/98
CU324 EM 27070 2.2701 mg/L

0915.1S REPLICATE #2
CU324 EM 27640 2.3203 mg/L

0915.1S REPLICATE #3
CU324 EM 28171 2.3670 mg/L

CU324 AV 27627.0 EM SD 550.6 CV 2.0

CU324 AV 2.3192 mg/L SD 0.0485 CV 2.09

0915.2 REPLICATE #1 1426 9/29/98
CU324 EM 3196 0.1690 mg/L

0915.2 REPLICATE #2
CU324 EM 3139 0.1640 mg/L

CU324 EM 3049 0.1560 mg/L

CU324 AV 3128.0 EM SD 74.1 CV 2.4

CU324 AV 0.1630 mg/L SD 0.0065 CV 4.00

>915.2D REPLICATE #1 1428 9/29/98
CU324 EM 9129 0.6912 mg/L

I 2-1x250

>915.2D REPLICATE #2
CU324 EM 8946 0.6750 mg/L

>915.2D REPLICATE #3
CU324 EM 9268 0.7034 mg/L

CU324 AV 9114.3 EM SD 161.5 CV 1.8

x250

CU324 AV 0.6899 mg/L SD 0.0142 CV 2.06

>915.3 REPLICATE #1 1429 9/29/98
CU324 EM 2694 0.1248 mg/L

>915.3 REPLICATE #2
CU324 EM 2814 0.1354 mg/L

>915.3 REPLICATE #3
CU324 EM 2759 0.1305 mg/L

CU324 AV 2755.7 EM SD 60.1 CV 2.2

CU324 AV 0.1302 mg/L SD 0.0053 CV 4.06

>V REPLICATE #1 1431 9/29/98
CU324 EM 14289 1.1453 mg/L

>V REPLICATE #2
CU324 EM 14323 1.1483 mg/L

>V REPLICATE #3
CU324 EM 13937 1.1143 mg/L

CU324 AV 14183.0 EM SD 213.7 CV 1.5

CU324 AV 1.1360 mg/L SD 0.0188 CV 1.66

>B REPLICATE #1 1433 9/29/98
CU324 EM 1656 0.0335 mg/L peak-noisy

>B REPLICATE #2
CU324 EM 1557 0.0247 mg/L peak-noisy

>B REPLICATE #3
CU324 EM 1534 0.0227 mg/L

CU324 AV 1582.3 EM SD 64.8 CV 4.1

CU324 AV 0.0270 mg/L SD 0.0057 CV 21.16

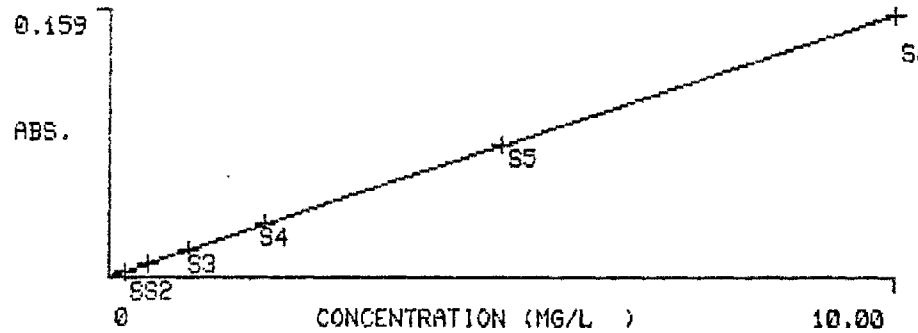
MAIN:	-0.02 MG/L	AA HO-0.000		MAIN:	-0.02 MG/L	AA HO-0.000	
PB	MEAN: -0.02 MG/L		SD: 0.005	RSD: 25.8	AUTOZERO	0.00	
MAIN:	0.23 MG/L	AA HO 0.004		MAIN:	0.23 MG/L	AA HO 0.004	
PB	MEAN: 0.23 MG/L		SD: 0.003	RSD: 1.2	1.STANDARD	0.23 MG/L	
MAIN:	0.54 MG/L	AA HO 0.009		MAIN:	0.54 MG/L	AA HO 0.009	
PB	MEAN: 0.54 MG/L		SD: 0.002	RSD: 0.4	2.STANDARD	0.54 MG/L	
MAIN:	1.07 MG/L	AA HO 0.017		MAIN:	1.08 MG/L	AA HO 0.017	
PB	MEAN: 1.07 MG/L		SD: 0.008	RSD: 0.7	3.STANDARD	1.07 MG/L	
MAIN:	0.02 MG/L	AA HO 0.000		MAIN:	0.03 MG/L	AA HO 0.000	
PB	MEAN: 0.02 MG/L		SD: 0.008	RSD: 34.2	AUTOZERO	0.00	
MAIN:	2.02 MG/L	AA HO 0.032		MAIN:	2.04 MG/L	AA HO 0.032	
PB	MEAN: 2.03 MG/L		SD: 0.013	RSD: 0.6	4.STANDARD	2.03 MG/L	
MAIN:	5.08 MG/L	AA HO 0.080		MAIN:	5.04 MG/L	AA HO 0.080	
PB	MEAN: 5.06 MG/L		SD: 0.026	RSD: 0.5	5.STANDARD	4.98 MG/L	
MAIN:	9.81 MG/L	AA HO 0.157		MAIN:	10.04 MG/L	AA HO 0.161	
PB	MEAN: 9.92 MG/L		SD: 0.162	RSD: 1.6	6.STANDARD	9.98 MG/L	

FLAME DISPLAY CALIBRATION MODE
ELEMENT: PB

REPL. 0 OF 2

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

9.98



ABS. READING
S6 AA : 0.161

STATISTICS
MEAN: 9.92
SD: 0.162
RSD(%): 1.6

C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN:	0.03 MG/L	AA HO 0.001		MAIN:	0.03 MG/L	AA HO 0.000	
PB	MEAN: 0.03 MG/L	SD: 0.002	RSD: 7.6	AUTOZERO	0.00		
MAIN:	4.94 MG/L	AA HO 0.079		MAIN:	4.95 MG/L	AA HO 0.079	
PB ICV	MEAN: 4.94 MG/L	SD: 0.004	RSD: 0.1				
MAIN:	0.03 MG/L	AA HO 0.000		MAIN:	0.02 MG/L	AA HO 0.000	
PB ICB	MEAN: 0.02 MG/L	SD: 0.005	RSD: 20.1				
MAIN:	0.03 MG/L	AA HO 0.000		MAIN:	0.04 MG/L	AA HO 0.001	
PB RB-1	MEAN: 0.03 MG/L	SD: 0.006	RSD: 17.4				
MAIN:	0.06 MG/L	AA HO 0.001		MAIN:	0.08 MG/L	AA HO 0.001	
PB FB-1	MEAN: 0.07 MG/L	SD: 0.018	RSD: 25.9				
MAIN:	4.67 MG/L	AA HO 0.075		MAIN:	4.78 MG/L	AA HO 0.076	
PB 01-1	MEAN: 4.73 MG/L	SD: 0.080	RSD: 1.7				
MAIN:	6.68 MG/L	AA HO 0.107		MAIN:	6.73 MG/L	AA HO 0.107	

			AA				AA
MAIN:	0.13 MG/L	HO	0.002	MAIN:	0.10 MG/L	HO	0.002

PB 01-2A MEAN: 0.12 MG/L SD: 0.016 RSD: 14.1

			AA				AA
MAIN:	2.06 MG/L	HO	0.033	MAIN:	2.10 MG/L	HO	0.034

PB 01-2AS MEAN: 2.08 MG/L SD: 0.033 RSD: 1.6

			AA				AA
MAIN:	0.15 MG/L	HO	0.002	MAIN:	0.16 MG/L	HO	0.003

PB 02-2A MEAN: 0.16 MG/L SD: 0.008 RSD: 4.7

			AA				AA
MAIN:	0.16 MG/L	HO	0.002	MAIN:	0.11 MG/L	HO	0.002

PB 02-2AD MEAN: 0.13 MG/L SD: 0.030 RSD: 22.4

			AA				AA
MAIN:	0.12 MG/L	HO	0.002	MAIN:	0.12 MG/L	HO	0.002

PB 03-2A MEAN: 0.12 MG/L SD: 0.002 RSD: 1.6

			AA				AA
MAIN:	0.06 MG/L	HO	0.001	MAIN:	0.04 MG/L	HO	0.001

PB std Ø MEAN: 0.05 MG/L SD: 0.015 RSD: 30.8 AUTOZERO 0.00

			AA				AA
MAIN:	0.10 MG/L	HO	0.002	MAIN:	0.11 MG/L	HO	0.002

PB I1-2A MEAN: 0.10 MG/L SD: 0.010 RSD: 9.5

			AA				AA
MAIN:	0.10 MG/L	HO	0.002	MAIN:	0.11 MG/L	HO	0.002

PB I2-2A MEAN: 0.11 MG/L SD: 0.002 RSD: 1.7

			AA				AA
MAIN:	0.11 MG/L	HO	0.002	MAIN:	0.11 MG/L	HO	0.002

PB I3-2A MEAN: 0.11 MG/L SD: 0.001 RSD: 1.3

			AA				AA
MAIN:	4.89 MG/L	HO	0.078	MAIN:	4.86 MG/L	HO	0.078

PB CCV MEAN: 4.87 MG/L SD: 0.020 RSD: 0.4

MAIN:	0.03 MG/L	HO	AA 0.000	MAIN:	-0.00 MG/L	HO	AA -0.000

PB CCB MEAN: 0.01 MG/L SD: 0.023 RSD: 99.9

0915 MAIN:	0.06 MG/L	HO	AA 0.001	MAIN:	0.07 MG/L	HO	AA 0.001

PB LB MEAN: 0.07 MG/L SD: 0.003 RSD: 5.2

MAIN:	0.72 MG/L	HO	AA 0.011	MAIN:	0.72 MG/L	HO	AA 0.012

PB 1 MEAN: 0.72 MG/L SD: 0.002 RSD: 0.3

MAIN:	2.74 MG/L	HO	AA 0.044	MAIN:	2.75 MG/L	HO	AA 0.044

PB 1S MEAN: 2.74 MG/L SD: 0.003 RSD: 0.1

MAIN:	0.72 MG/L	HO	AA 0.011	MAIN:	0.74 MG/L	HO	AA 0.012

PB 2 MEAN: 0.73 MG/L SD: 0.016 RSD: 2.2

MAIN:	0.76 MG/L	HO	AA 0.012	MAIN:	0.75 MG/L	HO	AA 0.012

PB 2D MEAN: 0.76 MG/L SD: 0.005 RSD: 0.7

MAIN:	0.76 MG/L	HO	AA 0.012	MAIN:	0.80 MG/L	HO	AA 0.013

PB 3 MEAN: 0.78 MG/L SD: 0.031 RSD: 3.9

MAIN:	5.16 MG/L	HO	AA 0.082	MAIN:	5.10 MG/L	HO	AA 0.081

PB CCV MEAN: 5.13 MG/L SD: 0.048 RSD: 0.9

MAIN:	-0.02 MG/L	HO	AA -0.000	MAIN:	-0.00 MG/L	HO	AA -0.000

PB CCB MEAN: -0.01 MG/L SD: 0.014 RSD: 99.9

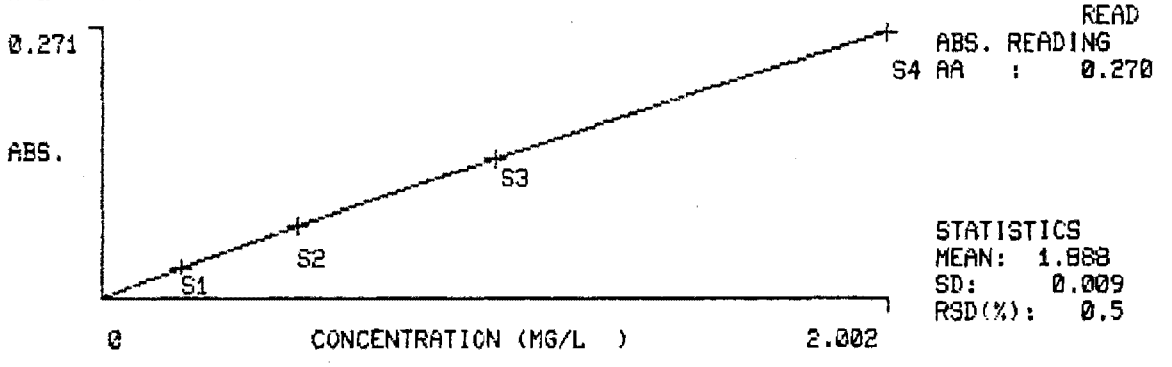
MAIN: -0.000	AA HO-0.000		MAIN: -0.000	AA HO-0.000	
MN	MEAN: -0.000	SD: 0.000	RSD: 13.9	AUTOZERO	0.000
MAIN: 0.001	AA HO 0.001		MAIN: 0.001	AA HO 0.000	
MN	MEAN: 0.001	SD: 0.000	RSD: 26.8	AUTOZERO	0.000
MAIN: 0.030	AA HO 0.030		MAIN: 0.030	AA HO 0.030	
MN	MEAN: 0.030	SD: 0.000	RSD: 0.3	1.STANDARD	0.200 MG/L
MAIN: 0.497 MG/L	AA HO 0.076		MAIN: 0.480 MG/L	AA HO 0.073	
MN	MEAN: 0.488 MG/L	SD: 0.011	RSD: 2.3	2.STANDARD	0.498 MG/L
MAIN: 0.961 MG/L	AA HO 0.143		MAIN: 0.943 MG/L	AA HO 0.141	
MN	MEAN: 0.952 MG/L	SD: 0.013	RSD: 1.4	3.STANDARD	0.988 MG/L
MAIN: 1.895 MG/L	AA HO 0.272		MAIN: 1.882 MG/L	AA HO 0.270	
MN	MEAN: 1.888 MG/L	SD: 0.009	RSD: 0.5	4.STANDARD	1.970 MG/L

FLAME DISPLAY CALIBRATION MODE
ELEMENT: MN

PRINTER: ON
BG CORR: OFF
UNITS : MG/L

REPL. 0 OF 2

1.970
READ



ABS. READING
S4 AA : 0.270

STATISTICS
MEAN: 1.888
SD: 0.009
RSD(%): 0.5

C2H2: 2.5 L/MIN OXIDANT: 8.0 L/MIN FLAME: C2H2-AIR

MAIN: 0.018 MG/L	AA HO 0.003		MAIN: 0.020 MG/L	AA HO 0.003	

	AA		AA
MAIN: 0.969 MG/L	HO 0.138	MAIN: 0.990 MG/L	HO 0.141

MN ICV MEAN: 0.980 MG/L SD: 0.015 RSD: 1.6

	AA		AA
MAIN: 0.005 MG/L	HO 0.001	MAIN: 0.006 MG/L	HO 0.001

MN ICB MEAN: 0.006 MG/L SD: 0.001 RSD: 12.3

	AA		AA
MAIN: 0.028 MG/L	HO 0.004	MAIN: 0.036 MG/L	HO 0.006

MN CB MEAN: 0.032 MG/L SD: 0.006 RSD: 17.8

	AA		AA
MAIN: 1.352 MG/L	HO 0.189	MAIN: 1.359 MG/L	HO 0.190

MN 1 MEAN: 1.355 MG/L SD: 0.005 RSD: 0.4

	AA		AA
MAIN: 1.757 MG/L	HO 0.240	MAIN: 1.731 MG/L	HO 0.237

MN 1S MEAN: 1.744 MG/L SD: 0.018 RSD: 1.0

	AA		AA
MAIN: 1.403 MG/L	HO 0.195	MAIN: 1.412 MG/L	HO 0.196

MN 2 MEAN: 1.407 MG/L SD: 0.006 RSD: 0.4

	AA		AA
MAIN: 1.369 MG/L	HO 0.191	MAIN: 1.379 MG/L	HO 0.192

MN 2D MEAN: 1.374 MG/L SD: 0.007 RSD: 0.5

	AA		AA
MAIN: 1.330 MG/L	HO 0.186	MAIN: 1.323 MG/L	HO 0.185

MN 3 MEAN: 1.326 MG/L SD: 0.005 RSD: 0.4

	AA		AA
MAIN: 1.020 MG/L	HO 0.145	MAIN: 1.030 MG/L	HO 0.146

MN CCV MEAN: 1.025 MG/L SD: 0.007 RSD: 0.7

	AA		AA
MAIN: 0.030 MG/L	HO 0.005	MAIN: 0.032 MG/L	HO 0.005

MN CCB MEAN: 0.031 MG/L SD: 0.001 RSD: 4.2

```
                    AA-BG    BG
: -0.005          PA-0.013  0.006
                  PH-0.005  0.002
```

00 AUTOZERO

```
                    AA-BG    BG
:  0.010          PA 0.193 -0.014
                  PH 0.010 -0.002
```

50 1.STANDARD

```
                    AA-BG    BG
:    1.30 UG/L    PA 0.384 -0.034
                  PH 0.026 -0.004
```

Sample concentration greater than highest standard

04 2.STANDARD

```
                    AA-BG    BG
:    1.77 UG/L    PA 0.736 -0.016
                  PH 0.044 -0.002
```

Sample concentration greater than highest standard

94 3.STANDARD

```
                    AA-BG    BG
:    5.18 UG/L    PA 1.908  0.000
                  PH 0.119 -0.002
```

Sample concentration greater than highest standard

03 4.STANDARD

```
                    AA-BG    BG
:   10.26 UG/L    PA 3.965  0.008
                  PH 0.242 -0.001
```

Sample concentration greater than highest standard

06 5.STANDARD

TECHNICAL REPORT DATA

Please read instructions on the reverse before completing

1. REPORT NO. EPA-454/R-99-001b	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Final Report - Emissions Testing of Combustion Stack and Pushing Operations at Coke Battery No. 2 at Bethlehem Steel Corporation's Burns Harbor Division in Chesterton, Indiana Volume II of III		5. REPORT DATE February 1999 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Franklin Meadows Daniel F. Scheffel		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Pacific Environmental Services, Inc. Post Office Box 12077 Research Triangle Park, North Carolina 27709-2077		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO. 68-D-98-004
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency Office of Air Quality Planning and Standards Emissions, Monitoring and Analysis Division Research Triangle Park, North Carolina 27711		13. TYPE OF REPORT AND PERIOD COVERED Final 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The United States Environmental Protection Agency (EPA) is investigating the coke making industry to characterize hazardous air pollutants (HAPs) emitted from coke pushing operations and combustion (underfire) stacks. This test report addresses pushing emissions from a coke oven, and emissions from the combustion (underfire) stack that serves Coke Battery No. 2 at Bethlehem Steel Corporation's Burns Harbor Division in Chesterton, Indiana. The purpose of this test program was to quantify emissions from the inlet and outlet of the baghouse controlling emissions from the coke pushing operation and to quantify emissions from the combustion outlet stack. The data may be used by the EPA in the future to support a residual risk assessment for coke oven facilities.

The testing was performed to quantify uncontrolled and controlled air emissions of filterable particulate matter (PM), methylene chloride extractable matter (MCEM) and 19 polycyclic aromatic hydrocarbons (PAHs) including acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(e)pyrene, benzo(k)fluoranthene, benzo(ghi)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnapthalene, napthalene, perylene, phenanthrene, and pyrene. In addition, following the PM and MCEM analyses, the samples were analyzed to screen for the presence of 17 trace metals. Baghouse dust samples were also collected and analyzed for 16 trace metals. Simultaneous testing was performed at the inlet and outlet of the baghouse controlling emissions from the coke pushing operation. Sampling was also performed on the combustion outlet stack. In addition to pollutant testing, oxygen (O_2) and carbon dioxide (CO_2) were measured at each location. During the sampling program, Research Triangle Institute (RTI), another EPA contractor, monitored and recorded process and emission control system operating parameters.

This volume (Volume II) is comprised of 376 pages and contains Appendix C (Analytical Data)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTIONS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COASTI Field/Group
Baghouse Coke Ovens Emission Measurements Hazardous Air Pollutants Metals Methylene Chloride Extractable Matter Particulate Matter Polycyclic Aromatic Hydrocarbons		

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	20. SECURITY CLASS *(This page)* Unclassified	22. PRICE