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		Date: 12/05/94
Project Title/Work Order WHC-SD-WM-DP-079, Rev. 0 216-Day Report for Tank 241-C-111, Cores 58 and 59		EDT NO.: EDT-140746
		ECN NO.: N/A

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		Date: 12/05/94			
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Release Date: December 5, 1994

**This document was reviewed following the
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P.O. Box 1970 Richland, WA 99352

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL SERVICES

**Project: 216-DAY REPORT FOR TANK 241-C-111,
CORES 58 AND 59**

Date Printed: DECEMBER 1, 1994

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NARRATIVE

From: Program Support
Phone: 373-4225
Date: December 1, 1994
Subject: 216 DAY REPORT FOR TANK 241-C-111, CORES 58 AND 59

8E480-94-110

To: D. R. Bratzel

cc: A. D. Rice T6-06
JGK File/LB

- References:
- (1) WHC-SD-WM-TP-209, Rev. 1, "Tank 241-C-111 Tank Characterization Plan", dated April 20, 1994, Westinghouse Hanford Company, Richland, WA. 99352
 - (2) Internal Memo 7E720-94-115, "Prioritization of Tank 241-C-111 Analyses", dated April 20, 1994, Westinghouse Hanford Company, Richland, WA 99352
 - (3) Internal Memo 7E720-94-117, "Prioritization of Tank 241-C-111 Analyses", dated April 29, 1994, Westinghouse Hanford Company, Richland, WA 99352
 - (4) Internal Memo 7E720-94-118, "Guidance for Handling of Unusual "Rock-Like" Material in Tank 241-C-111 Core 58 Sample", dated April 29, 1994, Westinghouse Hanford Company, Richland, WA. 99352
 - (5) Internal Memo 7R260-94-001, "Guidance for Analysis of Tank 241-C-111 Samples", dated May 9, 1994, Westinghouse Hanford Company, Richland, WA. 99352
 - (6) Internal Memo 8E480-94-003, "45 Day Safety Screening For Tank 241-C-111, Cores 58 and 59", dated June 6, 1994, Westinghouse Hanford Company, Richland, WA. 99352
 - (7) Internal Memo 9454392, "Correction to C-111 Data Evaluation", dated June 21, 1994, Westinghouse Hanford Company, Richland, WA. 99352

Summary

Three core samples from tank C-111, and a field blank, were received by the 222-S laboratories. Cores 58, 59, and the field blank were analyzed in accordance with references (1), (2), (3), (4), and (5) above. A hot cell blank was analyzed at the direction of the hot cell chemist. No sample results exceeded the notification limits. Core 60 was not analyzed, in accordance with (5) above. The results of the safety screening analyses (DSC, TGA, and AT) for cores 58, 59, and the field blank were reported in (6), and

amended in (7) above.

Sample Receipt and Extrusion

Core 58

The first C-111 sample (core 58) was taken from riser 6 on 4/11/94 and shipped to the 222-S lab the following day. A field blank, which consisted of demineralized water in a clean sampler, was included in this shipment. Core 58 was extruded on 4/14/94. This resulted in approximately 1.5 inches of sample, with a mass of 26.5 grams. About 9 inches of sample was expected.

The sample was dark brown, clay-like in consistency, and appeared homogeneous. No drainable liquid was present. 2.4 grams of liner liquid were recovered, but due to the small volume, the sample was discarded.

The Characterization Program, in accordance with the TCP, was notified of the low sample recovery (cc:mail dated 4/14/94), and guidance was requested and received from the program concerning how to proceed with analyses. It was decided to perform the safety screen analyses first (DSC, TGA, AT). Characterization analyses would not be performed until the safety screen work was completed.

During homogenization of core 58, it was noted that a portion of the sample appeared to be a rock. The Characterization Program was notified, and guidance was requested and received for handling and possible analysis of the "rock". In accordance with (4) above, it was later determined to be a rock, with a mass of about 8 grams. No analyses were performed on the rock, which was archived.

Core 59

Core 59, the second C-111 sample, was sampled from riser 3 on 4/22/94, and received at 222-S the same day. Core 59 was extruded on 4/25/94. About 1.7 grams of off-white, crusty material was recovered. Approximately 8 inches of sample was expected. No drainable liquid or liner liquid was detected. In accordance with the TCP, the Characterization Program was notified (cc:mail dated 4/25/94), and direction for analysis was requested and received from the program. It was decided to analyze for DSC, TGA, AT, and GEA only. No sample remained following these analyses, so no other data appears in this report for core 59.

Core 60

Due to the poor recoveries with the previous two samples, a third was requested. Core 60 was sampled from riser 6 on 4/29/94, and received at 222-S the same day. Extrusion took place on 5/2/94. About one inch of sample, with a mass of 19.7 grams, was recovered. Six inches of sample were expected. The appearance of this sample was very similar to core 58. No liquid was present. In accordance with the TCP, the program was notified (cc:mail dated 5/2/94), and direction for analysis was requested and received from the program. The program requested that this sample be set aside. No work was performed on core 60.

Field Blank

The field blank was collected in the hot cell, using the extrusion apparatus, on 4/26/94. The sampler valve was opened, allowing the liquid to flow over the sample collection pan into a graduated sample jar. The volume of liquid collected was approximately 170 ml.

Analytical Results

TGA (Moisture)

The weight percent water by Thermogravimetric Analysis (TGA) was performed by procedure LA-560-112. No analytical problems were encountered. Core 58 contained about 32% water by weight. This was at the low end of the expected range for a typical ferrocyanide sludge sample. Core 59 contained 0% water by weight. This sample was off white, dry, and crust-like in appearance.

Based on the DSC/TGA, the sample is believed to be composed primarily of aluminum hydroxide. The field blank contained > 99% water by weight, as expected.

DSC

The Differential Thermal Analysis was performed by procedure LA-514-113, and a Mettler Model 20 Differential Scanning Calorimeter (DSC). No analytical problems were noted. Core 58 contained a small exotherm averaging about 13 calories/gram (dry weight basis). The precision for core 58, as assessed by the relative percent deviation (RPD) of duplicate analyses, was 15.2%, which exceeded the requested 10% criteria. This is due to the relatively small peak that was detected. Core 59 contained no exotherms. DSC on the field blank was not requested.

Alpha Total

The Alpha Total (AT) analysis was performed by procedure LA-508-101. No analytical problems were noted. The core 59 alpha activity was more than a factor of ten times lower than core 58. This was in keeping with the atypical nature of this sample. The upper saltcake layer, from which the core 59 sample probably originated, is expected to contain significantly less radioactive material than the ferrocyanide sludge below.

ICP Ni

The ICP analysis for nickel was performed by procedure LA-505-151. No analytical problems were noted. To ensure that all the nickel in the sample was quantified, the nickel analysis was requested on a fusion preparation as well as an acid preparation. The fusion preparation was performed in a zirconium rather than a nickel crucible. This was to minimize the possible introduction of nickel into the sample during the fusion process. The acid preparation results were slightly higher (7.5%) than the fusion results, but likely within the systematic error. This would indicate that the acid digestion is sufficient to quantify Ni in a ferrocyanide tank. The average nickel results for core 58, $2.01\text{E}+4$ $\mu\text{g/g}$ (fusion) and $2.15\text{E}+4$ $\mu\text{g/g}$ (acid) were within the expected range of $1\text{E}+4$ $\mu\text{g/g}$ Ni.

Nickel was present in the hot cell blank just slightly above the detection limit for the sample, and less than detectable in the duplicate. The field blank Ni results were both below the detection limit.

Cyanide

The cyanide (CN) analysis was performed by procedure LA-695-102. No analytical problems were noted. The results for core 58 were much lower than expected, with the average being 55.0 μg CN/g (dry weight basis), and the expected range being 1000 μg CN/g.

No CN was detected in the field blank.

Total Organic Carbon

The total organic carbon (TOC) analysis was performed by procedure LA-342-100 for the solid sample (core 58), and LA-344-105 for the liquid samples (field and hot cell blanks). No analytical problems were noted. The solid sample procedure was chosen because it contains a step designed to break down tank sludge, and the liquid procedure was chosen because it provides a better detection limit. A spike was requested on the solid matrix sample, but was not performed. Spikes have proven unreliable for this procedure, apparently due to homogeneity problems, and the additional dose required to perform this test was not warranted given the limited usefulness of past spike results. The core 58 average result of 724 μg C/g was well below the notification limit, and in the expected range of 1000 μg C/g.

The field blank and hot cell blank results were below the detection limit for TOC.

Gamma Energy Analysis Cs-137

The gamma energy analysis (GEA) was performed by procedure LA-548-121. No analytical problems were noted. Initially a GEA was requested for both a fusion and a water preparation. The water preparation was dropped as unnecessary (cc:mail dated 6/28/94) due to the limited usefulness of the data and the sample dose rate. The Cs-137 results for core 58, 85.8 $\mu\text{Ci/g}$, were lower than the expected range of 1000 $\mu\text{Ci/g}$. The core 59 results were very low at 0.72 $\mu\text{Ci/g}$. This sample was probably from the salt cake layer of the tank, which was expected to be low in activity compared to the sludge.

The hot cell blank was below the detection limit for Cs-137, but the field blank sample and duplicate results were above the detection limit. The small amount of contamination in the field blank bears no significance to core 58 and 59 results, which are at least a factor of 1000 higher.

Strontium 90

The Sr-90 analysis was performed by procedure LA-220-101. One rerun was requested. No other analytical problems were noted. The Sr-90 analysis was requested on both a fusion and an acid preparation. The results compare very well to one another, indicating that the acid digestion is sufficient to quantify Sr in tank wastes of this type. The average result for core 58, 4160

D. R. Bratzel
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$\mu\text{Ci/g}$ (fusion) and 4270 $\mu\text{Ci/g}$ (acid), were within the expected range of 1000 $\mu\text{Ci/g}$.

The field blank Sr-90 result averaged $2.21\text{E-}3$ $\mu\text{Ci/ml}$. This was most likely due to contamination during analysis, and is not significant compared to the core sample results.

Sincerely,

Andrew D. Rice
Project Coordinator
373-4225

Attachments	Sample Data Summary
	Communications
	Raw Data

WHC-SD-WM-DP-079, REV. 0

SAMPLE DATA SUMMARY

DSC
LA-514-113

Sample I.D.	Lab I.D.	Notification Limit Cal/g*	Standard Recovery %	Sample Cal/g*	Duplicate Sample Cal/g*	Average Result Cal/g*	RPD %
Core 58, Segment 1	K211	125	101.2	14.2	12.2	13.2	15.2
Core 59, Segment 1	K218	125	104	no exotherm	no exotherm	no exotherm	NA
Hot Cell Blank	K216	NA	95	no exotherm	NA	NA	NA

⊙* Dry weight basis

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TGA (% Water)
LA-560-112

Sample I.D.	Lab I.D.	Notification Limit %	Standard Recovery %	Sample %	Duplicate Sample %	Average Result %	RPD %
Core 58, Segment 1	K211	$((0.0932 * \text{DSC}) - 10.7)$	99.6	30.8	32.5	31.6	5.4
Core 59, Segment 1	K218	$((0.0932 * \text{DSC}) - 10.7)$	98.4	0	0	0	NA
Hot Cell Blank	K216	NA	98.9	99.9	NA	NA	NA
Field Blank	K214	NA	98.8	99.9	99.7	99.8	0.2

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CN
LA-695-102

Sample I.D.	Lab I.D.	Notification Limit ug CN/g*	Standard Recovery %	Prep. Blank ug CN/g	Sample Result ug CN/g*	Duplicate Sample ug CN/g*	Average Result ug CN/g*	RPD %	SPIKE RESULT % REC	(Mean)/(Detection Limit)	Detection Limit ug CN/g
Core 58, Segment 1	K211	3.9E+04	93.0	<2.00E-02	5.13E+01	5.85E+01	5.50E+01	13.0	109.1	22.65	1.66E+00

Sample I.D.	Lab I.D.	Notification Limit ug CN/mL	Standard Recovery %	Prep. Blank ug CN/mL	Sample Result ug CN/mL	Duplicate Sample ug CN/mL	Average Result ug CN/mL	RPD %	SPIKE RESULT % REC	(Mean)/(Detection Limit)	Detection Limit ug CN/mL
Field Blank	K214	NA	100.3	<0.03	<0.03	<0.03	NA	NA	101.9	NA	0.03

* Dry weight basis.

TOC
LA-342-100 / LA-344-105

Sample I.D.	Lab I.D.	Notification Limit ug C/g	Standard Recovery %	Prep. Blank ug C/g	Sample Result ug C/g	Duplicate Sample ug C/g	Average Result ug C/g	RPD %	Spike Recovery %	(Mean)/(Detection Limit)	Detection Limit ug C/g
Core 58, Segment 1	K211	3.0E+04	90.0	19.1	7.09E+02	7.38E+02	7.24E+02	4.01	NA	1.81	4.00E+02

Sample I.D.	Lab I.D.	Notification Limit ug C/mL	Standard Recovery %	Prep. Blank ug C/mL	Sample Result ug C/mL	Duplicate Sample ug C/mL	Average Result ug C/mL	RPD %	Spike Recovery %	(Mean)/(Detection Limit)	Detection Limit ug C/mL
Hot Cell Blank	K216	NA	100.3	N/A	<5.50E+00	NA	NA	NA	NA	NA	5.50E+00
Field Blank	K214	NA	95.0	<5.00E+00	<5.50E+00	<5.50E+00	NA	NA	100.3	NA	5.50E+00

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1.2

Total Alpha
LA-508-101

Sample I.D.	Lab I.D.	Notification Limit uCi/g	Standard Recovery %	Prep. Blank uCi/g	Sample uCi/g	Duplicate Sample uCi/g	Average Result uCi/g	RPD %	Spike Recovery %	(Mean)/(Detection Limit)	Detection Limit uCi/g
Core 58, Segment 1	K211	41	81.6	<1.93E-01	2.59E+00	2.30E+00	2.45E+00	11.9	89.9	8.17	3.02E-01
Core 59, Segment 1	K218	41	102.4	<1.22E-02	1.21E-01	1.25E-01	1.23E-01	3.25	96.5	3.92	3.14E-02

Sample I.D.	Lab I.D.	Notification Limit uCi/mL	Standard Recovery %	Prep. Blank uCi/mL	Sample uCi/mL	Duplicate Sample uCi/mL	Average Result uCi/mL	RPD %	Spike Recovery %	(Mean)/(Detection Limit)	Detection Limit uCi/mL
Hot Cell Blank	K216	NA	93.3	NA	9.67E-07	NA	NA	NA	NA	NA	2.05E-07
Field Blank	K214	NA	90.5	<2.09E-07	<4.33E-07	<4.19E-07	NA	NA	101.6	NA	5.24E-07

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Cs-137
LA-548-121

Sample I.D.	Lab I.D.	Notification Limit uCi/g	Standard Recovery %	Prep. Blank uCi/g	Sample Result uCi/g	Duplicate Sample uCi/g	Average Result uCi/g	RPD %	(Mean)/(Detection Limit)	Detection Limit uCi/g
Core 58, Segment 1	K211	NA	96.1	<5.51E-01	8.85E+01	8.30E+01	8.58E+01	6.41	155.72	5.51E-01
Core 59, Segment 1	K218	NA	105.5	<4.01E-02	7.15E-01	7.36E-01	7.25E-01	2.88	18.08	4.01E-02

Sample I.D.	Lab I.D.	Notification Limit uCi/mL	Standard Recovery %	Prep. Blank uCi/mL	Sample Result uCi/mL	Duplicate Sample uCi/mL	Average Result uCi/mL	RPD %	(Mean)/(Detection Limit)	Detection Limit uCi/mL
Hot Cell Blank	K216	NA	99.5	NA	<2.65E-04	NA	NA	NA	NA	NA
Field Blank	K214	NA	98.6	<2.27E-06	1.67E-04	1.63E-04	1.65E-04	0.02	72.69	2.27E-06

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Ni
LA-220-101

Sample I.D.	Lab I.D.	Notification Limit ug Ni/g	Standard Recovery %	Prep. Blank ug Ni/mL	Sample Result ug Ni/g	Duplicate Sample ug Ni/g	Average Result ug Ni/g	RPD %	Spike Recovery %	(Mean)/(Detection Limit)	Detection Limit ug Ni/g
Core 58, Seg. 1 (fusion)	K211	NA	101.5	0.061	2.02E+04	1.99E+04	2.01E+04	1.49	104.0	NA	0.061
Core 58, Seg. 1 (acid)	K211	NA	94.74	<.02	2.13E+04	2.17E+04	2.15E+04	1.86	94.74	NA	0.021

Sample I.D.	Lab I.D.	Notification Limit ug Ni/mL	Standard Recovery %	Prep. Blank ug Ni/mL	Sample Result ug Ni/mL	Duplicate Sample ug Ni/mL	Average Result ug Ni/mL	RPD %	Spike Recovery %	(Mean)/(Detection Limit)	Detection Limit ug Ni/mL
Hot Cell Blank	K216	NA	99.72	<0.020	7.30E-02	NA	NA	NA	NA	NA	0.020
Field Blank	K214	NA	99.72	<0.020	<0.020	<0.020	NA	NA	101.4	NA	0.020

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Sr-90
LA-220-101

Sample I.D.	Lab I.D.	Notification Limit uCi/g	Standard Recovery %	Prep. Blank uCi/g	Sample Result uCi/g	Duplicate Sample uCi/g	Average Result uCi/g	RPD %	(Mean)/(Detection Limit)	Detection Limit uCi/g
Core 58, Seg. 1 (fusion)	K211	NA	102	1.92E-01	4.13E+03	4.19E+03	4.16E+03	1.44	1704.92	2.44E+00
Core 58, Seg. 1 (acid)	K211	NA	99.7	1.17E+00	4.22E+03	4.31E+03	4.27E+03	2.11	1914.79	2.23E+00

Sample I.D.	Lab I.D.	Notification Limit uCi/mL	Standard Recovery %	Prep. Blank uCi/mL	Sample Result uCi/mL	Duplicate Sample uCi/mL	Average Result uCi/mL	RPD %	(Mean)/(Detection Limit)	Detection Limit uCi/mL
Field Blank	K214	NA	102	<3.42E-06	2.22E-03	2.19E-03	2.21E-03	1.36	0.32	6.86E-06

WHC-SD-WM-DP-079, REV. 0

SAMPLING AND CUSTODY DATA

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 594-001 (2) Sample Number 94-001 (3) Supervisor* M.C. Jones
 (4) Tank 241-C-III (5) Riser 6 (6) Segment 1 (7) Core 058 (8) Cask Serial Number 1007-C

Radiation Survey Data:		(9) FIELD	(26) LABORATORY	(10) Shipment Description:	
Over Top Dose Rate	<u>< 0.5 m/hr</u>	<u>< 0.5 m/hr</u>	A. Work Package Number	<u>2E-92-01256</u>	
Side Dose Rate	<u>3 m/hr</u>	<u>3 m/hr</u>	B. Cask Seal Number	<u>3761</u>	
Bottom Dose Rate	<u>2 m/hr</u>	<u>7 m/hr</u>	C. Sampler Number Used	<u>93-009</u>	
Smearable Contamination	<u>< Det</u> (alpha)	<u>< Det</u> (alpha)	D. Date and Time Sampler Unseated	<u>4-11-94 / 13:25</u>	
	<u>< Det</u> (beta-gamma)	<u>< Det</u> (beta-gamma)	E. Expected Liquid Content	<u>20%</u>	
	RPT* <u>T. Jones</u> (Signature)	RPT* <u>M. Jones</u> (Signature)	F. Expected Solid Content	<u>80%</u>	
			G. Dose Rate Through Drill String	<u>60 mR</u>	
			H. Expected Sample Length	<u>7.5" To 9.5"</u>	

(11) INFORMATION (Include statement of laboratory tests to be performed.)

TANK characterization plan WAC-SD-CM-TP-209

WAC-SD-CM-TP-209, REV 1

(12) Field Comments: hit a hard layer 2" before end of stroke.

(27) Laboratory Comments

(13) POINT OF ORIGIN <u>241-C-III</u> <u>200 EAST</u>	(14) SENDER NAME <u>Michael Jones</u>	(16) DATE RELEASED <u>4-12-94</u>	(18) DESTINATION <u>222-S</u>	(20) RECIPIENT NAME <u>Sandra Cobb</u>	(22) DATE RECEIVED <u>04-12-94</u>
	(15) SENDER SIGNATURE* <u>[Signature]</u>	(17) TIME RELEASED <u>14:25</u>		(21) RECIPIENT SIGNATURE* <u>[Signature]</u>	(23) TIME RECEIVED <u>1430</u>

(19) Seal Intact Upon Release? ☒ Yes ☐ No	(24) Seal Intact Upon Receipt? ☒ Yes ☐ No	(25) Seal Data Consistent with this Record?		
		Shipment No. ☒ Yes ☐ No	Cask Seal No. ☒ Yes ☐ No	Sample No. ☒ Yes ☐ No

DISTRIBUTION: White - Office of Sample Management
 Pink - Process Engineering, R1-51

Yellow - Recipient of Sample
 Goldenrod - Tank Farm Operations, T4-01

BC-6000-309 (02/90)

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number 594-002 (2) Sample Number N/A (3) Supervisor* Michael C. Jones
 (4) Tank 241-C-111 (5) Riser 6 (6) Segment N/A (7) Core N/A (8) Cask Serial Number 1005-C

Radiation Survey Data:		(9) FIELD	(26) LABORATORY	(10) Shipment Description:	
Over Top Dose Rate	< 0.5 mR/hr	< 0.5 mR/hr	< 0.5 mR/hr	A. Work Package Number	2E-92-01256
Side Dose Rate	< 0.5 mR/hr	< 0.5 mR/hr	< 0.5 mR/hr	B. Cask Seal Number	3762
Bottom Dose Rate	< 0.5 mR/hr	< 0.5 mR/hr	< 0.5 mR/hr	C. Sampler Number Used	92-216
Smearable Contamination	< Det. (alpha)	< Det. (alpha)	< Det. (alpha)	D. Date and Time Sampler Unseated	4-12-94 11:40
	< Det. (beta-gamma)	< Det. (beta-gamma)	< Det. (beta-gamma)	E. Expected Liquid Content	100 %
RPT* <u>[Signature]</u> (Signature)		RPT* <u>[Signature]</u> (Signature)		F. Expected Solid Content	0 %
				G. Dose Rate Through Drill String	N/A
				H. Expected Sample Length	185 cc.

(11) INFORMATION (Include statement of laboratory tests to be performed.)

TANK Characterization Plan WHC-SD-WM-TP-209

WHC-SD-WM-DP-079, REV 8

(12) Field Comments:

WATER SAMPLE,
Done in the field ON 4-12-94

Blank

(27) Laboratory Comments

(13) POINT OF ORIGIN	(14) SENDER NAME	(16) DATE RELEASED	(18) DESTINATION	(20) RECIPIENT NAME	(22) DATE RECEIVED
241-C TANK Farm	Michael Jones	4-12-94	222-S	Sandra Cobb	04-12-94
	(15) SENDER SIGNATURE*	(17) TIME RELEASED		(21) RECIPIENT SIGNATURE*	(23) TIME RECEIVED
	[Signature]	14:05		[Signature]	1430
(19) Seal Intact Upon Release?		(24) Seal Intact Upon Receipt?		(25) Seal Data Consistent with this Record?	
☒ Yes ☐ No		☒ Yes ☐ No		Shipment No. ☒ Yes ☐ No Cask Seal No. ☒ Yes ☐ No Sample No. ☒ Yes ☐ No	

DISTRIBUTION: White - Office of Sample Management
 Pink - Process Engineering, R1-51

Yellow - Recipient of Sample
 Goldenrod - Tank Farm Operations, T4-01

BC-6000-309 (02/90)

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number S94-002 (2) Sample Number 94-002 (3) Supervisor* MIC JONES
 (4) Tank C-III (5) Riser 3 (6) Segment 1 (7) Core 059 (8) Cask Serial Number C-1029

Radiation Survey Data:		(9) FIELD	(26) LABORATORY	(10) Shipment Description:
Over Top Dose Rate	<u>LO.5 mrem</u>	<u>LO.5 mrem</u>	<u>LO.5 mrem</u>	A. Work Package Number <u>2E-92-01256</u>
Side Dose Rate	<u>LO.5 mrem</u>	<u>LO.5 mrem</u>	<u>LO.5 mrem</u>	B. Cask Seal Number <u>3778</u>
Bottom Dose Rate	<u>LO.5 mrem</u>	<u>LO.5 mrem</u>	<u>LO.5 mrem</u>	C. Sampler Number Used <u>93-024</u>
Smearable Contamination	<u>LD mrem</u> (alpha)	<u>LD mrem</u> (alpha)	<u>LD mrem</u> (alpha)	D. Date and Time Sampler Unseated <u>4-22-94 / 9:40</u>
	<u>LD</u> (beta-gamma)	<u>LD</u> (beta-gamma)	<u>LD</u> (beta-gamma)	E. Expected Liquid Content <u>0%</u>
	RPT* <u>[Signature]</u> (Signature)	RPT* <u>[Signature]</u> (Signature)		F. Expected Solid Content <u>100%</u>
				G. Dose Rate Through Drill String <u>L.5</u>
				H. Expected Sample Length <u>7 7/8"</u>

(11) INFORMATION (Include statement of laboratory tests to be performed.)

Characterization plan WHC-SD-WM-TP-209

WHC-SD-WM-DP-079, REV. 0

(12) Field Comments:

FIRST SAMPLE IS THROUGH SOME HARD SALT CAKE.
 DOSE RATE SHOWS THAT THERE MAY BE NO SAMPLE
 IN SAMPLER. ALSO TOTAL LENGTH OF SAMPLE SHOWN ON DRILL TRUCK
 WAS 10" LONG.

(27) Laboratory Comments

(13) POINT OF ORIGIN <u>241-C-III</u>	(14) SENDER NAME <u>MIC JONES</u>	(16) DATE RELEASED <u>4-22-94</u>	(18) DESTINATION <u>222-S</u>	(20) RECIPIENT NAME <u>NATALIE LAPIERS</u>	(22) DATE RECEIVED <u>4-22-94</u>
	(15) SENDER SIGNATURE* <u>[Signature]</u>	(17) TIME RELEASED <u>2:10</u>	<u>LAB</u>	(21) RECIPIENT SIGNATURE* <u>[Signature]</u>	(23) TIME RECEIVED <u>1450</u>
(19) Seal Intact Upon Release? ☒ Yes ☐ No		(24) Seal Intact Upon Receipt? ☒ Yes ☐ No		(25) Seal Data Consistent with this Record?	
				Shipment No. ☒ Yes ☐ No	Cask Seal No. ☒ Yes ☐ No
				Sample No. ☒ Yes ☐ No	

DISTRIBUTION: White - Office of Sample Management
 Pink - Process Engineering, R1-51

Yellow - Recipient of Sample
 Goldenrod - Tank Farm Operations, T4-01

BC-6000-309 (02/90)

20

WHC-SD-WM-DP-079, REV. 0

BC-6000-309 (02/90)

REQUEST FOR SPECIAL ANALYSIS (RSA)					RSA No. 1890		
1. Sample Origin <div style="font-size: 1.2em; margin-top: 10px;">C-III</div>		2. Date Submitted 4-25-94		4. Requester Name ANDY RICE		6. Charge Code/Work Package N43CB	
		3. Submitted By RK FULLER		5. Requester Phone/MSIN 373-55781		7. Date Required 5-25-94	
8. Customer ID		Collected Date Time		9. Laboratory ID		12. Number of Samples 1	
C58S1		(JMR #6005)		K211		13. Volume of Samples 10 grams	
						14. Protocols ☐ None ☐ RCRA ☐ NQA-1 ☒ Other ☐ CERCLA <u>SEL TCR</u>	
						15. Sample Type ☐ Solid ☐ Soil ☐ Slurry ☐ Gas ☐ Water ☐ Waste ☐ Solution ☒ Sludge ☐ Oil ☐ Other (specify) _____	
						16. Storage Requirements ☐ None ☒ Specify <u>222-S procedure for Rad samples</u>	
						17. Process Knowledge/Known Listed Wastes ☒ Unknown ☐ Known (Please attach list) ☐ Previously submitted for this Project	
10. Determination		11. Expected Range		18. Survey		Dose Rate	
Direct ANALYSES:				 HPT Signature		<u>22 RAD/hr</u> Sample	
• DSC				19. Disposition of Waste ☒ Return to Client/Location <u>RK FULLER/HOT CELLS</u> ☐ Dispose per 222-S Procedures ☐ Other _____			
• IGA				20. Additional Information <u>ALL DUPS SPICE CN, TC, VAT</u> <u>* Andy Rice will review CHADS.</u> <u>* Fusion digestion must be done using Zirconium crucibles.</u> <u>* Note to be added to CN cards to perform dissolution by EDTA.</u> <u>STD K209 Blank K210</u>			
CN							
TOC							
FUSION DIGEST							
ICP (Ni only)							
ITA							
Sr-90							
Cs-137							
Pu-239/240 AR-G-21-94							
WATER DIG / CEA max needed SKM 6-28-94							
ACID DIG / ICP Sr							
21. Chain of Custody ☒ No ☐ Yes Number: _____		22. Assigned Custodial Group (select one) ☐ PCL ☒ PSDU ☐ ENV ☐ Process		23. Sample Received By: Date: <u>04-28-94</u> Time: <u>1455</u>		24. Laboratory Manager (if required) <div style="font-size: 1.5em; margin-top: 10px;">31</div> Date: _____	

REQUEST FOR SPECIAL ANALYSIS (RSA)						RSA No.
1. Sample Origin C-111		2. Date Submitted 4-26-94		4. Requester Name AD RICE		RSA No. 1892
		3. Submitted By AD RICE		5. Requester Phone/MSIN 3-5878		
6. Charge Code/Work Package N4C3B		7. Date Required 5-26-94				
8. Customer ID CSFB	Collected		9. Laboratory ID K214	12. Number of Samples 1	13. Volume of Samples ≈ 200 ml	14. Protocols None RCRA NQA-1 CERCLA Other SEE TCP
	Date	Time				
	(JAR# 6008)					
10. Determination ICP - Ni CN TGA TOC GEA Sr-90 TA		11. Expected Range CLLD		15. Sample Type Solid Gas Solution Other (specify) Soil Water Sludge Oil None Waste Oil		
				☒ Solid ☐ Gas ☐ Solution ☐ Other (specify)		
				☐ Soil ☒ Water ☐ Sludge ☐ Oil		
				☐ None ☐ RCRA ☐ NQA-1 ☒ Other		
				☐ CERCLA SEE TCP		
				16. Storage Requirements ☒ None Specify		
				☐ Specify		
				17. Process Knowledge/Known Listed Wastes ☒ Unknown Known (Please attach list) Previously submitted for this Project		
				☐ Known (Please attach list)		
				☐ Previously submitted for this Project		
				18. Survey HPT Signature Dose Rate		
				☒ Return to Client/Location Dispose per 222-S Procedures Other CONTACT A.D. RICE PRIOR TO DISPOSAL		
				☐ Disposal per 222-S Procedures		
				☒ Other CONTACT A.D. RICE PRIOR TO DISPOSAL		
				20. Additional Information This sample is a field blank, shipped with Core 58. ALL ANALYSES IN DUPLICATE. MATRIX SPIKE FOR ICP,CN,TOC,TA. STD K212 Blank K213		
				21. Chain of Custody No Yes Number:		
				22. Assigned Custodial Group (select one) PCLE PSDU ENV Process		
				23. Sample Received By: Date: Time:		
				24. Laboratory Manager (If required) Date:		

REQUEST FOR SPECIAL ANALYSIS (RSA)					RSA No. <div style="font-size: 1.5em; margin-top: -10px;">1894</div>
Sample Origin <div style="font-size: 1.2em; margin-top: -10px;">C-111</div>		2. Date Submitted 4/28-94		4. Requester Name RK FULLER	
		3. Submitted By Ron Hale		5. Requester Phone/MSIN 373-2886 / T6-31	
8. Customer ID <div style="font-size: 1.2em; margin-top: -10px;">CSE HCB</div>		Collected		6. Charge Code/Work Package N4C3B	
		Date	Time		
		9. Laboratory ID <div style="font-size: 1.2em; margin-top: -10px;">K216</div>		7. Date Required 5/28/94	
				12. Number of Samples <div style="font-size: 1.5em; margin-top: -10px;">1</div>	
				13. Volume of Samples <div style="font-size: 1.2em; margin-top: -10px;">150mL</div>	
				14. Protocols ☒ None ☐ RCRA ☐ NQA-1 ☐ Other ☐ CERCLA	
				15. Sample Type ☐ Solid ☐ Soil ☐ Slurry ☐ Gas ☒ Water ☐ Waste ☐ Solution ☐ Sludge ☐ Oil ☐ Other (specify) _____	
				16. Storage Requirements ☒ None ☐ Specify _____ _____ _____	
				17. Process Knowledge/Known Listed Wastes ☒ Unknown ☐ Known (Please attach list) ☐ Previously submitted for this Project	
10. Determination Direct:		11. Expected Range		18. Survey	
GEA, IC,				Dose Rate <div style="font-size: 1.2em; margin-top: -10px;"><0.5</div>	
ICP, OH ⁻				HPT Signature <div style="font-family: cursive; font-size: 1.2em; margin-top: -10px;">[Signature]</div>	
PH, TA,				19. Disposition of Waste ☐ Return to Client/Location _____ ☒ Dispose per 222-S Procedures ☐ Other _____	
TB, TIC					
TOC, DSC				20. Additional Information <div style="margin-top: 10px;">* Acidify sample prior to ICP ANALYSIS.</div> <div style="margin-top: 10px;">* No Blanks, duplicates, or Spikes.</div> <div style="margin-top: 10px; font-size: 1.2em;">Std K215</div>	
TGA					
21. Chain of Custody ☒ No ☐ Yes Number: _____		22. Assigned Custodial Group (select one) ☐ PCL ☒ PDSU ☐ ENV ☐ Process		24. Laboratory Manager (if required) <div style="font-size: 1.5em; margin-top: -10px;">33</div>	
23. Sample Received By: <div style="font-family: cursive; font-size: 1.2em; margin-top: -10px;">[Signature]</div> Date: 04-29-94 Time: 0900					

[illegible]

WHC-SD-WM-DP-079, REV. 0

COMMUNICATIONS

[3] From: David R Bratzel at ~WHC268 4/14/94 5:08PM (1057 bytes: 19 ln)

To: Brett C Simpson

cc: Cherri DeFigh-Price, Andrew D Rice at ~WHC168

Subject: C-111 Segment Recovery

----- Message Contents -----

WHC-SD-WM-DP-079, REV. 0

Brett - 26 grams of material is sufficient to do minimal
analyses - let's discuss and prioritize - Dave Bratzel

This is to inform you, in accordance with the C-111 Tank
Characterization Procedure (WHC-SD-WM-TP-209), that the
amount of material recovered from core 58 was insufficient
to perform the requested analyses and permit a minimum of
10 grams archive material. Approximately 1.5" (26 grams) of
sample was obtained from Core 58. As instructed, no
analyses will be performed on this material unless
specifically requested to do so.

AD Rice

C-111 Project Coordinator

[20] From: Andrew D Rice at ~WHC168 4/25/94 4:13PM (1052 bytes: 12 ln)
To: John L Deichman at ~WHC321, Joseph E Meacham at ~WHC129
cc: John G Kristofzski, Richard K (Keith) Fuller at ~WHC169, Ruth D Schreiber at
~WHC163, Robert J (Bob) Cash at ~WHC129

Andrew D Rice

Subject: Core 59 Extrusion Results

WHC-SD-WM-DP-079, REV. 0

----- Message Contents -----

The second core from Tank C-111, Core 59, was extruded this afternoon. The sampler contained about 1.7 grams of fairly dry and crustlike material, with a dirty white appearance. Only a very limited number of analyses could be performed on this sample. This material is clearly very different from the material obtained from Core 58. Please provide guidance as to how you would like the lab to proceed with this sample.

AD Rice
PC

[49] From: Andrew D Rice at ~WHC168 5/2/94 1:55PM (1217 bytes: 16 ln)
To: Robert J (Bob) Cash at ~WHC129, John L Deichman at ~WHC321, Joseph E Meacham
at ~WHC129
cc: Richard K (Keith) Fuller at ~WHC169, John G Kristofzski, Ruth D Schreiber at
IC163

Andrew D Rice

Subject: C-111 Core 60 Extrusion Results

WHC-SD-WM-DP-079, REV. 0

----- Message Contents -----

Core 60 of Tank C-111 was extruded this morning (5-2-94). About one inch of sample, with a mass of 19.7 grams, was obtained. The sample was dark brown, with a thick and clay-like consistency. This sample was very similar in appearance to core 58. No drainable or liner liquid was detected.

Six inches of sample were expected to be recovered in core 60. The results of this extrusion constitute insufficient segment recovery as defined in the C-111 Tank Characterization Procedure. The 222S lab therefore requests a Letter of Instruction to prioritize analyses of core 60.

AD Rice
PC

[86] From: Robert J (Bob) Cash at ~WHC129 6/28/94 11:59AM (1545 bytes: 31 ln)
To: Andrew D Rice at ~WHC168
cc: John G Kristofzski at ~WHC168, Raymond (Ray) Akita at ~WHC168,
and II Griffin at ~WHC32, Robert J (Bob) Cash, Joseph E Meacham,
D Schreiber at ~WHC163, Gary T Dukelow
Subject: C-111 Core 58 Water Digest

----- Message Contents -----

WHC-SD-WM-DP-079, REV. 0

Gentlemen:

The Tank Characterization Plan for C-111 currently requires Gamma Energy Analysis (GEA) on both a fusion and water preparation. I am not aware of any rationale for the water prep. I commented on this for the revision to the Ferrocyanide DQO, and the water prep GEA was dropped.

The lab is ready to perform the water prep. Core 58 has a substantial dose rate, so I would like to minimize technician contact with this sample. The only analysis performed on the water digest is the GEA. I propose that the water prep GEA be dropped. The fusion should provide the information you need. If you agree, please send me a cc: to this effect.

AD Rice
PC

* *****

Andy,

We agree. Pls proceed without doing the water digest.

We have corrected this in the new DQO going out in a few weeks.

TNX,

Bob Cash

WHC-SD-WM-DP-079, REV. 0

LOGBOOK

Table of Contents

WHC-SD-WM-DP-079, REV. 0

PAGE NO.

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6	Chain of Custody information
7-10	Extrusion information C-III Segment #1 C-58
11	Homogenization C-III C 58 Segment #1
11-13	Extrusion info C-III C 58 Seg. #1
14	C-III Core 58 Seg #1 35mm Photo
15	C-III Core 58 ⁵⁹ Seg #1 35mm Photo
16-18	C-III Field Blank Extrusion
19	Sample Information / Submitted to Lab
20-21	C-III Core 60 Seg #1 Extrusion
22	Photography C-III Core 60 Seg #1
23	C-III Core 58 SEGMENT #1 Rock
24	C-III Core 58 Segment #1 Rock - photograph
25	C-III CORE 58 SEGMENT #1 Rock
26	C-III CORE 58 SEGMENT #1 Rock - PHOTOGRAPH

4-14-94

1. Received field blank and segment #1 of
Core 58 (C-111) on 4-12-94.

TANK C-111

Shipment	Sample	Cask	Core	Segment / Riser
(1) S94-001	NA	1005-C	NA	NA (FIELD BLANK)
(2) S94-001	94-001	1007-C	58	1 Riser 6
(3) S94-002	94-002	C-1029	59	1 Riser 3
(4) S94-003	94-003	C-1028	60	1 Riser 6

A. Chain of Custody information

(1) Field blank: Radiation survey

- Over Top Dose Rate $< 0.5 \text{ mr/hr}$
- Side Dose Rate $< 0.5 \text{ mr/hr}$
- Bottom Dose Rate $< 0.5 \text{ mr/hr}$
- Smearable Contamination $< \text{Det. alpha}$
 $< \text{Det. Beta/Gamma}$

Work package 2E-92-01256

Cask Seal # 3762

Sample # 92-216

Expected liquid Content 100%

Expected Solid Content 0%

Field comments: Field blank take 4/12/94

(2) C-111 Segment 1 Core 58

Radiation survey

- Over Top Dose $< 0.5 \text{ mr/hr}$
- Side Dose Rate 3 mr/hr
- Bottom Dose Rate 7 mr/hr
- Smearable Cont. $< \text{Det}$

Work package 2E-92-01256

Cask Seal # 3761

Samples # 93-009

Expected liquid 20%

Expected Solid 80%

Dose Rate thru Drill String 60 mR

Expected sample length 7.5" to 9.5"

Field comment: Hit a hard layer 2" before end of stroke.

Keith Fuller

33

4-14-94

4/14/94

Balance Check

WHC-SD-WM-DP-079, REV. 0

500 gram weight .. 499.81 grams
 20 gram weight 19.97 grams

Liner Liquid Collection jug

317.4 grams ~~gross weight~~ ^{tare RKT #11/64}
319.8 grams gross weight
 2.4 grams

jar # 6000 TK C-111 Segment #1

246.1 grams gross weight
 219.6 grams tare weight
 26.5 grams net weight C-111 Segment #1

Polaroid photograph of C-111
 Segment #1.

Notes on Extrusion:

- (1) About 1/2 of the total recovered sample fell out of the end of sampler, as the sampler was transferred to the extruder. See page 89 ^{to} ~~for~~ _{RKT #11/64} explanation.
- (2) Did not note valve position prior to cutting the Cables

Keith Fuller
 4-14-94

Keith Fuller
4/14/94

TANK C-111

WHC-SD-WM-DP-079, REV. 0

EXTRUDED SEGMENT DESCRIPTION SHEET

LOGBOOK # WHC-N-742 1SAMPLE 94-001
RISER 6CORE 58
SEGMENT 1

GENERAL DESCRIPTION OF SAMPLE:

		(A) LINER LIQUID	(B) DRAINABLE LIQUID
1. JAR/VIAL #		NA	NA
2. TARE WEIGHT (g)		Did not collect	No drainable liquid
3. GROSS WEIGHT (g)		liner liquid	
4. NET WEIGHT (g)			
5. TOTAL VOLUME (mL)			
6. DENSITY (g/mL)		↓	↓ RKT

COLOR

Dark brown

PHYSICAL APPEARANCE

solid, homogeneous - approximately 26 grams recovered.

DIAMETER OF SAMPLER (in)

1.125 inches

APP. SEGMENT LENGTH (in)

*1.5 inches*VOLUME OF SEGMENT (cm³)*24.4 cm³*

OTHER

About 2.4 grams of liner liquid was measured. Liner liquid was mostly colorless.

SKETCH

Approximately 1.5" of sample recovered. Sample was placed in jar # 6000.

HOT CELL TECHNICIAN:

DATE:

COGNIZANT SCIENTIST:

*Keith Fuller*DATE: *4/14/94*

REVIEWED BY:

DATE:

C-III Core 58 Segment #1

9

C-III

C-III

C-III

C-III

This portion of C-III segment #1 fell out of sampler when sampler was moved into position on the extruder.

Sample fell here on the extruder ^{4/14/94} tray and was scooped onto the tray.

Keith Fuller
4-14-94

36

4-14-94

1. Deviations from procedure LT-549-104:

page 7 steps 9, 10, and 11. These steps were done in reverse order due to problems associated with cutting the sampler valve cables while the sampler is on the extruder. Modification of procedure is required.

page 7 step 8. Did not remove rubber ring from valve end of sampler. This is due to the difference between the rotary mode sampler and push mode sampler. This procedural step is for the push mode sampler.

page 6 step 6.b. should be appendix A.

page 6 step 4 of prestart conditions. Used (reusable) 250ml I-Chem vial that ^{was} calibrated outside of Hot Cell.

Keith Fuller
4-14-94

4-25-94

1. Homogenization of sample in jar # 6000 (C-111 Core 58 segment # 1). Sample is brown. Sample also contains a "rock hard" chunk of material that cannot be blended with softer material. The soft material (see photo on page 9) is the material closest to piston / valve end of sample.
2. Transferred 8.72 grams from jar # 6000 to 20mL vial # 6005. Jar # 6005 will be submitted to Lab for analysis according to LOI # 7E720-94-115.
3. Reweighed jar # 6000 to determine remaining material in jar.

235.6 grams gross weight after subsampling

219.6 grams original tare weight

16.0 grams net weight of material, jar # 6000

4. Homogenized samples for 10 minutes with a spatula.
5. Remaining material in jar # 6000 C-111 Core 58 seg 1 is "rock hard" material.

4-25-94 Afternoon

Balance check 499.75g

C-111 Core 59 SEGMENT #1

20.03g

- 1.) No liner liquid collected.
- 2) Valve on sampler was closed before cutting cables
- 3) Valve on sampler closed after cutting one cable
- 4) Valve on sampler closed after cutting both cables
- 5) Began extrusion. No material observed exiting the sampler until the very end of extrusion. A small amount of material resembling white corks extruded just before the piston became visible.

Heath Fuller
4/25/94

4-25-94

6. Photographing extrusion tray and sample.
7. No drainable liquid collected
8. 35mm camera pictures #3/#4 contain C-111
Core 59 Segment #1.
9. Jar # 6004 20ml. Laboratory I.D. K218

1.76 grams of material collected (jar # 6004)

Polaroid photo: Solids only,
barely visible. (See next
page for closer shot of
solid material.)

Solids: Color: White

Consistency: NA (see picture)

Homogeneity: Crust type material

Texture: See picture next page

No Liner Liquid

No Drainable Liquid

Sampler Efficiency: $< 1\%$

4/25/94

*This page reserved for Photographs**C-111 Core 59 Segment #1*

These pictures were taken off the video camera tape using a Sony Video Printer. C-111 core 59 segment #1 amounted to 1.76 grams of material

140

Keith Fuller 4/26/94

This page Reserved for Photograph

C-III Core 58 Segment #1

TANK C-III Core 58 WHC-SD-WM-DP-079, REV. 0

"Rock-LIKE" substance that
Fell out of sampler.

This page Reserved for Photograph

TANK C-III CORE 58 SEGMENT #1

TANK C-III CORE 58 SEGMENT #1

16 4-26-94

C-111 Field Blank

WHC-SD-WM-DP-079, REV. 0

Sample : Field Blank

Balance check:

Riser : 6

Core : 58

20 gram wt = 20.0 g

Segment : Field Blank

500 gram wt = 499.7 g

(1) Liner liquid: Less than 5 ml, clear, colorless.

Collection jar: 6006 C58FBLL (20mL VIAL)

Gross weight: NA

Tare weight: NA

Net weight: 7.40 grams collected

No. of Phases: 1 phase, colorless, clear

-RKF 4/26/94

(2) Drainable Liquid -

Collection jar: 6008 (250mL)

Gross Weight: 396.3 grams

Tare Weight: 225.2 grams

Net Weight: 171.1 grams

No. of Phases: 1 phase, clear, colorless

(3) Drainable liquid Density:

Total Weight: 171.1 grams

Total Volume: ~170 mL

Density: ~1.006 g/mL ^{4/26/94} _{RKF}Turbidity: Clear, ~~clear~~ colorless

Comments: NA

(4) Sampler Efficiency - Push Mode Sampler

Volume of Sampler: 187 mL

% Volume of Air: 9.1%

% Volume of liquid: 90.9%

% Volume of Solids: 0%

Comments:

Comments:

4/27/94

Physical observations: WHC-SD-WM-DP-079, REV. 0

- * Lines liquid less than 5ml.
- * No allen screws in sampler. Observation of sampler showed press pins. Need to modify procedure 40-160-103 to allow for extrusion of blanks without removing the pins or screws that stop the piston.

continued operation on 4/27/94:

Balance check:

20.00 g wt = 20.0g

500.00 g wt = 499.9g

Valve orientation - closed before cutting cables

Valve orientation - closed after cutting cables

Photograph (Polaroid)

C-111

Core 58 Field Blank

Drainable liquid jar collected approx 170mL.

35mm Camera used
exposures 7 & 8

Video Photograph using Sony Video Printer

Laboratory ID K214
RSA # 1892

jar # 6008

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Keith Fuller 4/27/94

C-III FIELD BLANK

C-III FIELD BLANK

4-27-94

WHC-SD-WM-DP-079, REV. 0

RX7 46044
Hot Cell ~~Field~~ Blank

C-111 Core 58

JAR # 16001

Gross Weight 410.0 grams

Tare Weight 225.2 grams

Net Weight grams

Collected Hot Cell Blank in jar #6001

Customer ID. C58 HCB

Laboratory ID K216 RSA #

4-28-94

Samples submitted to laboratory for analysis

jar #	customer ID	LAB I.D.	RSA #
6005	C58 S1	K211	1890
6008	C58 FB	K214	1892
6001	C58 HCB	K216	1894

Keith Fuller
4-28-94

Keith Fuller 5/2/94

WHC-SD-WM-DP-079, REV. 0

5/2/94

Base Rate through
Drill String = 110 ^{msec}/_{ft}

Tank 241-C-111

Extruded Segment Description Sheet

Sample 44-003 Riser 6 Core 60 Segment 1

General Description of Sample: Expected sample ^{RET 5/2/94} Recovery = 6".
 Valve closed before cutting cables. Valve closed after cutting
 cables. Extruded approximately 1" of dark brown solids.

Sketch:

<p>Photo</p>	<p>Sampler Efficiency ^{mLs}</p> <p>Volume of Sampler <u>309 ^{cm³}</u></p> <p>%Volume of Air <u>94.7%</u></p> <p>%Volume of Liquid <u>0</u></p> <p>%Volume of Solids <u>5.3%</u></p> <p>Comments: _____</p>	<p>Drainable Liquid Density</p> <p>Total Weight <u>NA</u></p> <p>Total Volume <u>NA</u></p> <p>Density <u>NA</u></p> <p>Turbidity <u>NA</u></p> <p>Comments: <u>No drain- able liquid</u></p>
<p>Solids</p> <p>Color <u>Dark Brown</u></p> <p>Consistency <u>softer than peanut butter</u></p> <p>Homogeneity <u>Homogeneous</u></p> <p>Texture _____</p> <p>Penetrometer <u>NA</u></p>	<p>Liner Liquid</p> <p>Collection Jar <u>NA</u></p> <p>Gross Wt. <u>NA</u></p> <p>Tare Wt. <u>NA</u></p> <p>Net Wt. <u>NA</u></p> <p>No. Phases <u>NA</u></p>	<p>Drainable Liquid</p> <p>Collection Jar <u>NA</u></p> <p>Gross Wt. <u>NA</u></p> <p>tare Wt. <u>NA</u></p> <p>Net Wt. <u>NA</u></p> <p>No. Phases <u>NA</u></p>

Cognizant Scientist:

Keith Fuller 5/2/94

Reviewed By:

A. J. R. 5-3-94

5/2/94

Balance check 20.00g = 20.00
500.00g = 499.94g

C-111 Core 60 Segment #1 Solids

jar # 6012 245.2g Gross weight
225.5g Tare weight
19.7g

% Recovery based on expected 6".

$$\frac{1"}{6"} \times 100 = 16.7\%$$

35mm exposures 9 & 10.

Keith Fuller
5/2/94

WHC-SD-WM-DP-079, REV. 0

C-III CORE 60 SEGMENT #1

C-111 Core 58

5/3/94

jar # 6000 500.18 grams gross weight RKT 5/3/94

Balance check 500.00g = 500.18 grams
 20.00g = 20.18 grams

jar # 6000 contains the "Rock-like" material
 from C-111 Core 58 segment #1.

jar # 6000. 236.18 grams gross weight

- Remove material from jar 6000 and placed on tray for video and photography.
- jabbed material with knife, screw driver, and spatula. Only able to ^{by RKT} flake material off the rock in small amounts.

* Polaroid of the rock-like material.

* "Rocklike" material was transferred from jar #6000 to jar # 6014 (125 mL).

* Jar #6000 still contains the dry/crust material from C-111 Core 58 segment #1

Used exposures 11 & 12 to photograph rock.

jar # 6014	NA	gross weight	* see next page
	130.4 g	tare weight	for Rock net weight
	NA	weight of Rock	

Keith Fuller
 5/6/94

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5/5/94

C111 CORE 58 Rock

WHG-SD-WM-DP-079, REV. 0

Rock material in
jar # 6014.6000.

Rock after water
rinse. Net weight
of rock

Rock material on
10 lb. slip lid can

C-111 Core 58

Jar #6014 contains the Rock like material
from C-111 Core 58 segment #1.

- Removed material from jar and placed on Tmoye.

- Rinsed material with DI water and jiggled with
a spatula. Material has sharp edges, does not flake
and resembles a rock.

Jar #6016	132.91 grams gross weight
	<u>125.22 grams tare weight</u>
	7.69 grams net weight

Jar #6014	208.33	gross weight. / Liquid
-----------	--------	------------------------

Transferred rock from jar #6014 to jar #6016
after water rinse.

Jar #6014 contains H₂O rinse from rock

Jar #6016 contains C-111 Core 58 segment #1 rock.

~~With Fuller
Arthur B. Brown~~

C-111 CORE 58 ROCK

C-111 CORE 58 "Rock"

WHC-SD-WM-DP-079, REV. 0

PHOTOGRAPHS

C-111 Core 58 seg 1

C-111 Field Blank

C-111 CORE 59 SEGMENT #1
SOLIDS

C-111 Case 60 seg. 1

WHC-SD-WM-DP-079, REV. 0

SAMPLE PREPARATIONS

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No.

K-211

Customer ID:

C-111

Analysis:

ACD PREP

Sample Prep:

DIRECT

Instrument: SNF04495

Procedure/ Rev: LA-505-159/B-1

Technologist: LH STANDLEY

Date: 07/07/94

Starting Time: 0730

Temperature 95 C

Ending Time: 0830

Chemist: B. GRIFFIN

Comments: BATCH# 3820

	Description	Lab ID
1	STD	K-209 8500
2	BLK	K-210 8600
3	SAM	K-211 8700
4	DUP	K-211 8800
5	SPIKE	K-211 8900
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
WHC-1	G3MWHC1N10G2.5ml			50ml
		160		

WHC-SD-WM-DP-079, REV. 0

[illegible]

NO SPECIAL PROBLEMS / METHOD VARIATIONS IN THIS BATCH

NARRATIVE -- LIST SPECIFIC PROBLEMS / VARIATIONS FOR THIS BATCH

ACID DIGESTION ANALYSIS

WHC-SD-WM-DP-079, REV. 0

Batch 3820

Serial No K 208.-8500	Sample Point C-111	Date 4-25-84	Time Issued 14:54	Priority 23
Determination ACD DGST	Method Standard LA-505-159	Result Units % RECOVERY	Charge Code N405B	Retuns 0
Sample Size ? <i>2.5 ml → 50 ml</i>			Customer ID STD	
Remarks Calculations, Results LMCS CHECK SAMPLE LMCS ID <i>G3MMWHCINIOG</i> $D.F. = \frac{50 \text{ ml}}{2.5 \text{ ml}} = (20)$				
Analyst - 1 <i>[Signature]</i> Hrs	Analyst - 2 Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs
Date 7-7-94	Time Completed 0830	Lab Unit Mgr <i>[Signature]</i> <i>Richard L. Hillman II</i>		

54-6800-061 (R-10-83)

Serial No K 210.-8500	Sample Point C-111	Date 4-25-94	Time Issued 14:55	Priority 23
Determination ACD DGST	Method Standard LA-505-159	Result Units G/L	Charge Code N405B	Retuns 0
Sample Size ? <i>50 ml</i>			Customer ID ELANK	
Remarks Calculations Results REAGENT BLANK <i>Total Volume / COMPLETE</i>				
Analyst - 1 <i>[Signature]</i> Hrs	Analyst - 2 Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs
Date 7-7-94	Time Completed 0830	Lab Unit Mgr <i>[Signature]</i> <i>Richard L. Hillman II</i>		

54-6800-061 (R-10-83)

ACID DIGESTION ANALYSIS WHC-SD-WM-DP-079, REV. 0

Serial No R 211.-8700	Sample Point C-111	Date 4-25-84	Time Issued 14:57	Priority 13
Determination ACD DGET	Method Standard LA-505-150	Result Units G/L	Charge Code N405E	Returns 0
Sample Size ? .5536g → 50mL			Customer ID C5851	
Remarks Calculations Results JAR 115 GRAMS SAMPLE 0.5536g VOLUME ON COMPLETION .050L $\frac{0.5536g}{.050L} = 11.0720g/L$				
Analyst - 1 <i>[Signature]</i> Hrs	Analyst - 2 <i>[Signature]</i> Hrs	Analyst - 3 <i>[Signature]</i> Hrs	Analyst - 4 <i>[Signature]</i> Hrs	Analyst - 5 <i>[Signature]</i> Hrs
Date 7-7-94	Time Completed 0830	Lab Unit Mgr <i>[Signature]</i> Bethand Griffin II		

54-6800-061 (R 10-83)

 ** JET_WT ** REV 0 **

 WT 1: 0.0013
 WT 2: 0.5549
 NET WEIGHT:
 ---> 0.5536
 07/07/94

 * DATA REPRODUCED *
 * FOR CLARITY *

Serial No R 211.-8800	Sample Point C-111	Date 4-25-84	Time Issued 14:57	Priority 13
Determination ACD DGET	Method Standard LA-505-150	Result Units G/L	Charge Code N405E	Returns 0
Sample Size ? .5414g → 50mL			Customer ID C5851	
Remarks Calculations Results DUPLICATE SAMPLE JAR 115 GRAMS SAMPLE 0.5414g VOLUME ON COMPLETION .050L $\frac{0.5414g}{.050L} = 10.8280g/L$				
Analyst - 1 <i>[Signature]</i> Hrs	Analyst - 2 <i>[Signature]</i> Hrs	Analyst - 3 <i>[Signature]</i> Hrs	Analyst - 4 <i>[Signature]</i> Hrs	Analyst - 5 <i>[Signature]</i> Hrs
Date 7-7-94	Time Completed 0830	Lab Unit Mgr <i>[Signature]</i> Bethand Griffin II		

54-6800-061 (R-10-83)

 ** JET_WT ** REV 0 **

 WT 1: 0.0000
 WT 2: 0.5414
 NET WEIGHT:
 ---> 0.5414
 07/07/94

 * DATA REPRODUCED *
 * FOR CLARITY *

Serial No K 211.-8900	Sample Point C-111	Date 4-28-94	Time Issued 14:57	Priority 23
Determination ACD DNST	Method Standard LA-505-158	Result Units G/L	Charge Code N4C3E	Retuns 0
Sample Size 0.5630g → 50ml			Customer ID C56S1	
Remarks, Calculations, Results SPIKE SAMPLE SPIKE 10.63M WHC/10G SPIKE VOLUME 2.5ml $\frac{0.5630g}{.050L} = 11.2600g/L$				
Analyst - 1 <i>[Signature]</i> Hrs	Analyst - 2 <i>[Signature]</i> Hrs	Analyst - 3 <i>[Signature]</i> Hrs	Analyst - 4 <i>[Signature]</i> Hrs	Analyst - 5 <i>[Signature]</i> Hrs
Date 7-7-94	Time Completed 0830	Lab Unit Mgr <i>[Signature]</i>		

54-6600-061 (R-10-83)

** JET WT ** REV 0 **

WT 1: 0.0001
WT 2: 0.5631

NET WEIGHT:

---> 0.5630

07/07/94

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ANALYTICAL BATCH SUMMARY SHEET						
METHOD:		DATE START:	TIME START:			
PREPARED BY:		DATE COMPLETE:	TIME COMPLETE:			
LA- 549-141 C-0		5-11-94	0800			
SPL NAME		SPL ID	g/L of DF	g or mL	mL	STD, SPL, DUP, SPK
BLK		A-210-6600	RESULT	SAMPLE SIZE	FINAL VOL.	REMARKS
3AM		A-211-6700	2.9036	0.7259	250	Total Vol. 250mL
3AM		A-211-6800	2.9260	0.7315	250	0.7259g → 250mL
						0.7315g → 250mL
<p><i>Bertland Griffin II</i> 5-12-94</p>						

☒

- Sample and Sample Duplicate had different appearances. Sample K-211-6700 appeared to have a rock solid chunk during step #3 (the weighing of the sample) but by step 13 it seemed to all fuse together. Sample K-211-6800 was a thick homogenous sludge.

Bertrand Shipin II
5-12-94

FUSION DIGESTION ANALYSIS

WHC-SD-WM-DP-079, REV. 0

Batch 3253

Serial No K 210.-6600		Sample Point C-111		Date 4-25-94	Time Issued 14:55	Priority 23
Determination FUSION		Method Standard LA-549-141		Result Units G/L	Charge Code N4C3B	Retuns 0
Sample Size <i>250mL total volumes</i>					Customer ID BLANK	
Remarks Calculations Results <i>use zirconium crucibles</i> <i>Complete</i>						
Analyst - 1 <i>[Signature]</i> Hrs		Analyst - 2 Hrs		Analyst - 3 Hrs		Analyst - 4 Hrs
Analyst - 5 Hrs						
Date <i>5-11-95</i> <i>5-9-95</i> <i>5-11-95</i>		Time Completed <i>0920</i>		Lab Unit Mgr <i>5-12-94</i> <i>Burton & Huffin II</i> <i>[Signature]</i>		

54-6600-DE1 (R-10-B3)

Serial No K 211.-6700		Sample Point C-111		Date 4-25-94	Time Issued 14:57	Priority 23
Determination FUSION		Method Standard LA-549-141		Result Units G/L	Charge Code N4C3B	Retuns 0
Sample Size <i>0.7259g → 250mL</i>					Customer ID C58S1	
Remarks Calculations Results JAR ID# GRAMS SAMPLE <i>0.7259g</i> VOLUME ON COMPLETION <i>.250L</i> $\frac{0.7259g}{.250L} = 2.9036g/L$						
Analyst - 1 <i>[Signature]</i> Hrs		Analyst - 2 Hrs		Analyst - 3 Hrs		Analyst - 4 Hrs
Analyst - 5 Hrs						
Date <i>5-11-95</i> <i>5-9-95</i>		Time Completed <i>0920</i>		Lab Unit Mgr <i>5-12-94</i> <i>Burton & Huffin II</i> <i>[Signature]</i>		

54-6600-DE1 (R-10-B3)

 ** JET WT ** REV 0 **

 WT 1: 0.0000
 WT 2: 0.7259
 NET WEIGHT:
 ---> 0.7259
 05/11/94

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FUSION DIGESTION ANALYSIS WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-6800	C-111	4-25-94	14:57	23
Determination	Method Standard	Result Units	Charge Code	Retuns
FUSION	LA-549-141	G/L	N4C3B	0
Sample Size			Customer ID	
0.7315g → 250mL			C58S1	
Remarks Calculations Results				
<p>DUPLICATE SAMPLE</p> <p>JAR ID#</p> <p>GRAMS SAMPLE 0.7315g</p> <p>VOLUME ON COMPLETION .250L</p> <p style="text-align: center;"> $\frac{0.7315g}{.250L} = 2.9260g/L$ </p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Unit Mgr		
5-11-95	0920	5-12-94		
<i>[Signature]</i>		<i>[Signature]</i>		
SWS 5-11-95		64-6600-061 (R-10-83)		

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WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No. K-218	Customer ID: C59 S1
Analysis: FUSION	Sample Prep: DIRECT

Instrument: SNF04495	Procedure/ Rev: LA-549-141 C-0
Technologist: LH STANDLEY	Date: 05/23/94
Starting Time: 0800	Temperature 23 C
Ending Time: 1130	Chemist: K. FULLER

Comments: SAMPLE WAS NOT HOMOGENOUS.

K-218 LOOKED LIKE MANY SMALL ROCKS

K-218 DUP. ONE LARGE ROCK.

	Description	Lab ID		Description	Lab ID
1	BLK	K-219-6600	11		
2	SAM	K-218-6700	12		
3	DUP	K-218-6800	13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard

ANALYTICAL BATCH SUMMARY SHEET

PERUNS # 0	S.P. → C-111
METHOD: LA-549-141 C-0	DATE START: 5-23-94
PREPARED BY: J. J. O'Connell	DATE COMPLETE: 5-23-94
	TIME START: 0800
	TIME COMPLETE: 1130

SPL NAME	SPL ID	g/L or DF	g or mL	mL	STD, SPL, DUP, SPK
		RESULT	SAMPLE SIZE	FINAL VOL.	REMARKS
BLK	K-219-6600	—	—	250	Total Volume: 250ml
SAM	K-218-6700	3.2980	.8245	250	.8245g → 250ml
DUP	K-218-6700	3.3404	.8351	250	.8351g → 250ml
<div style="transform: rotate(-30deg);"> Section 2 Sample II 5-31-94 </div>					

NARRATIVE: ☒ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

FUSION DIGESTION ANALYSIS WHC-SD-WM-DP-079, REV. 0

Serial No K 218.-6800	Sample Point C-111	Date 5- 4-94	Time Issued 16:38	Priority 20
Determination FUSION	Method Standard LA-549-141	Result Units G/L	Charge Code N4C3B	Retuns 0
Sample Size ? .835/g → 2.50ml			Customer ID C59.S1	
Remarks Calculations Results DUPLICATE SAMPLE JAK ID# GRAMS SAMPLE .835/g VOLUME ON COMPLETION .250 l $\frac{.835 \text{ g}}{.250 \text{ l}} = (3.340 \text{ g/l})$				
Analyst - 1 <i>[Signature]</i> Hrs			Analyst - 2 Hrs	
Analyst - 3 Hrs			Analyst - 4 Hrs	
Analyst - 5 Hrs				
Date 5- 23 - 94		Time Completed 1130 Lab Unit Mgr <i>[Signature]</i>		

 ** JET_WT ** REV 0 **

Sequence #: 182
 WT 1: 0.0002
 WT 2: 0.8353

NET WEIGHT:
 ---> 0.8351

05/23/94

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54-6800-061 (R-10-83)

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FUSION DIGESTION ANALYSIS WHC-SD-WM-DP-079, REV. 0

Batch 3499

Serial No K 219.-6600	Sample Point C-111	Date 5-18-94	Time Issued 13:33	Priority 20
Determination FUSION	Method Standard LA-549-141	Result Units G/L	Charge Code N4C3B	Reruns 0
Sample Size ? 250 ml			Customer ID ELANK	
Remarks Calculations Results Complete				
Analyst - 1 <i>W. H. H. H. H.</i>	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-23-94	Time Completed 1130	Lab Unit Mgr <i>Robert D. Phillips II</i>		

54-6500-061 (R-10-83)

Serial No K 218.-6700	Sample Point C-111	Date 5-4-94	Time Issued 16:38	Priority 20
Determination FUSION	Method Standard LA-549-141	Result Units G/L	Charge Code N4C3B	Reruns 0
Sample Size ? 0.8245g → 250 ml			Customer ID C59 S1	
Remarks Calculations Results JAR ID# GRAMS SAMPLE 0.8245g VOLUME ON COMPLETION 250 ml $\frac{0.8245g}{250ml} = 3.2980g/l$				
Analyst - 1 <i>W. H. H. H. H.</i>	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-23-94	Time Completed 1130	Lab Unit Mgr <i>Robert D. Phillips II</i>		

54-6500-061 (R-10-83)

** JET_WT ** REV 0 **

WT 1: 0.0001
WT 2: 0.8246

NET WEIGHT:

---> 0.8245

05/23/94

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WHC-SD-WM-DP-079, REV. 0

PHYSICAL ANALYSES

WHC-SD-WM-DP-079, REV. 0
DIFFERENTIAL SCANNING CALORIMETRY ANALYSIS - UNDIGESTED SAMPLE

Batch 3251

Serial No. K 209.-5511	Sample Point C-111	Date 4-25-94	Time Issued 14:54	Priority 23
Determination DSC	Method Standard LA-514-113	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size 6.680 mg			Customer ID 12N14A	
Remarks, Calculations, Results <div style="text-align: center; font-size: 1.2em;"> <i>28.8 g/g</i> <i>% Rec</i> <i>101.2%</i> </div> <div style="margin-top: 20px;"> <i>ROBBY WENDLAND</i> </div>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-24-94		Time Completed 1100		
Lab Unit Mgr <i>J.M. Lutz</i>		<i>Jeslie Day</i>		

54-6800-061 (R-10-83)

Serial No. K 211.-5711	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination DSC	Method Standard LA-514-113	Result Units EXOTHERMS	Charge Code N4C3B	Reruns 0
Sample Size 23.434 mg			Customer ID C58S1	
Remarks, Calculations, Results <div style="text-align: center; font-size: 1.2em;"> <i>41.1 g/g exotherm at 190.3°C</i> </div> <div style="margin-top: 20px;"> <i>ROBBY WENDLAND</i> <i>Run in air</i> </div>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-24-94		Time Completed 1100		
Lab Unit Mgr <i>J.M. Lutz</i>		<i>Jeslie Day</i>		

54-6800-061 (R-10-83)

DIFFERENTIAL SCANNING CALORIMETRY ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
K 211.-5811	C-111	4-25-94	14:57	23
Determination	Method Standard	Result Units	Charge Code	Reruns
DSC	LA-514-113	EXOTHERMS	N4C3B	0
Sample Size	Customer ID			
17.136mg	C58S1			
Remarks, Calculations, Results				
DUPLICATE SAMPLE				
34.5g/g exotherm at 198.4°C				
<div style="display: flex; justify-content: space-between;"> BOBBY WENDLAND Run in air </div>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
His	His	His	His	His
Date	Time Completed	Lab Unit Mgr		
5-24-94	1100	J. M. Lape Leslie Day		

54-6800-061 (R-10-83)

James M. Luge
5/25/94

DSCSTD
6.680 mg

Rate: 10.0 °C/min

File: 00025.001
Ident: 0.0

DSC METTLER 24-May-94
222-S Laboratory

exo >

20. mW

DSC STD

Integration
Delta H 193 mJ.
28.8 J/g
Peak 159.8 °C
-13.1 mW

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 77 TO 79.

WHC-SD-WM-DP-079, REV. 0

120.

140.

160.

180.

°C

File: 00027.001 DSC METTLER 24-May-94
Ident: 0.0 222-S Laboratory

WHC-SD-WM-DP-079, REV. 0

K211 DUP
17.136 mg

Rate: 10.0 °C/min

exo v

Integration
Delta H 590 mJ
34.5 J/g
Peak 198.4°C
1.7 mW

50. mW

K211 DUP

°C

400.

300.

200.

100.

K211

23.434 mg

File: 00026.001 DSC METTLER 24-May-94

Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

exo

50 mW

Integration

Delta H 964 mJ

41.1 J/g

Peak

190.3°C

3.1 mW

K211

WHC-SD-WM-DP-079, REV. 0

°C

400.

300.

200.

100.

DIFFERENTIAL SCANNING CALORIMETRY ANALYSIS - UNDIGESTED SAMPLE

Batch 3391

Serial No. K 217.-5511	Sample Point C-111	Date 5- 4-94	Time Issued 16:34	Priority 20
Determination DSC	Method-Standard LA-514-113	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size ?	<i>6.68mg</i>		<i>12N14A</i>	
Customer ID STD				
Remarks, Calculations, Results: <div style="text-align: center;"> <i>29.62/g</i> <i>104.0% Rec.</i> </div> <i>ROBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date 5-9-94	Time Completed 1200	Lab Unit Mgr <i>J. M. Lutz</i>	<i>PHB</i>	

54-6800-061 (R-10-83)

Serial No. K 218.-5711	Sample Point C-111	Date 5- 4-94	Time Issued 16:36	Priority 20
Determination DSC	Method-Standard LA-514-113	Result Units EXOTHERMS	Charge Code N4C3B	Reruns 0
Sample Size ?	<i>11.623mg</i>		<i>C59 S1</i>	
Customer ID				
Remarks, Calculations, Results: <div style="text-align: center;"> <i>Run in air</i> <i>No exotherm, has an endotherm</i> <i>at 310-320°C</i> </div> <i>ROBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date 5-9-94	Time Completed 1200	Lab Unit Mgr <i>J. M. Lutz</i>	<i>PHB</i>	

54-6800-061 (R-10-83)

DIFFERENTIAL SCANNING CALORIMETRY ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
K 218.-5811	C-111	5- 4-94	16:36	20
Determination	Method-Standard	Result Units	Charge Code	Reruns
DSC	LA-514-113	EXOTHERMS	N4C3B	0
Sample Size	Customer ID			
? 19.555 mg	C59 S1			
Remarks, Calculations, Results:				
DUPLICATE SAMPLE <i>Run in air</i> <i>No exotherms, has an</i> <i>endotherm at 310-320°C</i> <i>REBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Unit Mgr		
5-9-94	1200	<i>J.M. Lys</i>	<i>MS</i>	

54-5800-061 (R-10-83)

James M. Long
5/25/94

DSC STD
6.680 mg

File: 00001.001 DSC METTLER 08-May-94
Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

exo >

DSC STD

Integration
Delta H 198 mJ
Peak 29.6 J/g
160.0 °C
-13.2 mW

10. mW

WHC-SD-WM-DP-079, REV. 0

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 83 TO 85

120. 140. 160. 180. °C

File: 00005.001 DSC METTLER 08-May-94
Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

K218
11.623 mg

WHC-SD-WM-DP-079, REV. 0

K218 DUP

19.555 mg

Rate: 10.0 °C/min

File: 00007.001

DSC METTLER

08-May-94

Ident: 0.0

222-S Laboratory

exo >

50. mW

K218 DUP

MHC-SD-WM-DP-079, REV.0

100.

200.

300.

400.

°C

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No.

K216

Customer ID:

C58HCB

C111

Analysis:

DSC

Sample Prep:

DIRECT

Instrument: WC16134

Procedure/ Rev: LA 514-113/B-0

Technologist: R. WENDLAND

Date: 05/02/94

Starting Time: 8:00

Temperature N/A

Ending Time: 12:00

Chemist: J. FRYE

Comments:

	Description	Lab ID
1	LMCS	K215-5511
2	SAMPLE	K216-5711
3		
4		
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	12N14-A			

186

John M. Long
5/25/94

DSC STD
6.680 mg

File: 00098.001 DSC METTLER 01-May-94
Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

WHC-SD-WM-DP-079, REV. 0

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 87 TO 88

DIFFERENTIAL SCANNING CALORIMETRY ANALYSIS - DIRECT

WHC-SD-WM-DP-079, REV. 0

BATCH 3351

Serial No	Sample Point	Date	Time Issued	Priority
K 215.-5511	C-111	4-28-94	11:14	21
Determination	Method Standard	Result Units	Charge Code	Returns
DSC	LA-514-113	% RECOVERY	N4C3B	0
Sample Size			Customer ID	
<i>6.680mg</i>	<i>12N1A</i>		STD	
Remarks, Calculations, Results				
<i>27.09/g , 95% Rec.</i>				
<i>ROBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
		<i>Pukete</i>		<i>Pukete</i>
Date	Time Completed	Lab Unit Mgr		
<i>5-2-94</i>	<i>1200</i>	<i>J.M. Feige</i>	<i>Ph...</i>	

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
K 216.-5711	C-111	4-28-94	11:23	21
Determination	Method Standard	Result Units	Charge Code	Returns
DSC	LA-514-113	EXOTHERMS	N4C3B	0
Sample Size			Customer ID	
<i>9.059mg</i>			C58HCB	
Remarks, Calculations, Results				
<i>no exotherm</i>				
<i>ROBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
		<i>Pukete</i>		
Date	Time Completed	Lab Unit Mgr		
<i>5-2-94</i>	<i>1200</i>	<i>J.M. Feige</i>	<i>Ph...</i>	

54-6800-061 (R-10-83)

K216

9.059 mg

Rate: 10.0 °C/min

File: 00100.001 DSC METTLER 01-May-94

Ident: 0.0 222-S Laboratory

exo >

K216

50. mW

WHC-SD-WM-DP-079, REV. 0

°C

400.

300.

200.

100.

WHC-SD-WM-DP-079, REV. 0

THERMAL GRAVIMETRIC ANALYSIS - UNDIGESTED SAMPLE

Batch 3252

Serial No K 209.-5512	Sample Point C-111	Date 4-25-94	Time Issued 14:54	Priority 23
Determination TGA	Method/Standard LA-560-112	Result Units % RECOVERY	Charge Code N4C3B	Retuns 0
Sample Size 15.041mg			Customer ID STD	
Remarks, Calculations, Results 59.02% H₂O 99.6% Rec.				
Analyst - 1 ROBBY WENDLAND			Analyst - 5 Air Atmosphere	
Analyst - 2	Analyst - 3	Analyst - 4		
Hrs	Hrs	Hrs	Hrs	
Date 5-20-94		Time Completed 1200	Lab Unit Mgr J. M. Luy	PhB

64-6800-061 (R-10-83)

Serial No K 211.-5712	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination TGA	Method/Standard LA-560-112	Result Units % H₂O	Charge Code N4C3B	Retuns 0
Sample Size 18.682mg			Customer ID C58S1	
Remarks, Calculations, Results 30.85% H₂O, This sample also lost 11.27% wt. loss between 220°C & 300°C				
Analyst - 1 ROBBY WENDLAND			Analyst - 5 Air Atmosphere	
Analyst - 2	Analyst - 3	Analyst - 4		
Hrs	Hrs	Hrs	Hrs	
Date 5-20-94		Time Completed 1200	Lab Unit Mgr J. M. Luy	PhB

64-6800-061 (R-10-83)

BEST AVAILABLE COPY

THERMAL GRAVIMETRIC ANALYSIS - DIRECT

WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-5812	C-111	4-25-94	14:57	23
Determination	Method/Standard	Result Units	Charge Code	Retuns
TGA	LA-560-112	% H2O	N4C3B	0
Sample Size	Customer ID			
29.333 mg	C5BS1			
Remarks Calculations, Results				
<p>DUPLICATE SAMPLE</p> <p>32.54% H₂O, The sample also lost 10.31% wt. loss between 220° and 300°</p> <p><i>Robby Wendland</i></p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
MS	MS	MS	MS	MS
<p><i>Debits</i></p>				
Date	Time Completed	Lab. Unit	Mgt	
5-20-94	1200	<i>J.M. Lutz</i>	<i>Ph...</i>	

54-6000-061 (R-10-83)

James M. Saye
5/25/94

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
~~COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES~~ 93 TO 95.

TGA STD
15.041 mg

Rate: 10.0 °C/min

File: 00022.001

TG

METTLER

20-May-94

Ident: 0.0

222-S Laboratory

TGA STD

5. mg

Step Analysis

Height -8.88 mg

-59.02 %

ResidC. 6.16 mg

40.96 %

Dpeak 92.5 °C

WHC-SD-WM-DP-079, REV.0

50.

100.

150.

200.

°C

K211

18.682 mg

Rate: 10.0 °C/min

File: 00023.001

TG

METTLER

20-May-94

Ident: 0.0

222-S Laboratory

16:

5. mg

Step Analysis

Height -5.76 mg

-30.85 %

ResiC. 12.90 mg

69.07 %

Dpeak 85.0 °C

K211

Step Analysis

Height -2.11 mg

-11.27 %

ResiC. 10.51 mg

56.27 %

Dpeak 285.0 °C

WHC-SD-WM-DP-079, REV. 0

100.

200.

300.

400.

°C

K211 DUP
29.333 mg

Rate: 10.0 °C/min

File: 00024.001 TG METTLER 20-May-94
Ident: 0.0 222-S Laboratory

Step Analysis
Height -9.55 mg
-32.54 %
ResiC. 19.76 mg
67.35 %

K211 DUP

Step Analysis
Height -3.02 mg
-10.31 %
ResiC. 16.31 mg
55.61 %
Dpeak 283.0 °C

WHC-SD-WM-DP-079, REV. 0

THERMAL GRAVIMETRIC ANALYSIS - UNDIGESTED SAMPLE
WHC-SD-WM-DP-079, REV. 0

Batch 3273

Serial No K 212.-5512	Sample Point C-111	Date 4-27-94	Time Issued 10: 2	Priority 21
Determination TGA	Method Standard LA-560-112	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size <i>18.449mg</i>			Customer ID STD	
Remarks, Calculations, Results <div style="display: flex; justify-content: space-around;"> <div><i>STO VAL.</i> 59.25</div> <div><i>% H₂O</i> 58.54</div> <div><i>% Recovery</i> 98.8</div> </div>				
<i>ROBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs <i>[Signature]</i>
Date 4-28-94	Time Completed 1200	Lab Unit Mgr <i>[Signature]</i>		

54-6800-061 (R-10-83)

Serial No K 214.-5712	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination TGA	Method Standard LA-560-112	Result Units % H₂O	Charge Code N4C3B	Reruns 0
Sample Size <i>9.893mg</i>			Customer ID C58FB	
Remarks, Calculations, Results <div style="display: flex; justify-content: center; align-items: center;"> <div><i>99.93%</i></div> </div>				
<i>ROBBY WENDLAND</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs <i>[Signature]</i>	Mrs	Mrs
Date 4-28-94	Time Completed 1200	Lab Unit Mgr <i>[Signature]</i>		

54-6800-061 (R-10-83)

THERMAL GRAVIMETRIC ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 214.-5812	C-111	4-27-94	10:17	21
Determination	Method-Standard	Result Units	Charge Code	Reruns
TGA	LA-560-112	% H2O	N4C3B	0
Sample Size	Customer ID			
9.889mg	C58FB			
Remarks, Calculations, Results				
DUPLICATE SAMPLE				
99.67%				
RPD .262				
Robby Wendland				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
His	His	His	His	His
		Petrole		
Date	Time Completed	Lab Unit Mgr		
4-28-94	1200	J.M. Luge	[Signature]	

54-6800-061 (R-10-83)

James M. Jure
5/25/94

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 99 TO 101.

TGA STD
18.449 mg

Rate: 10.0 °C/min

File: 00095.001

TG

METTLER

28-Apr-94

Ident: 0.0

222-S Laboratory

TGA STD

5. mg

Step Analysis

Height-10.80 mg

-58.54 %

Resid. 7.64 mg

41.39 %

Dpeak 104.2 °C

WHC-SD-WM-DP-079, REV. 0

50. 100. 150. 200. °C

File: 00096.001 TG METTLER 28-Apr-94
 Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

K214
 9.893 mg

K214

Step Analysis
 Height ~9.89 mg
 ~99.93 %
 Resid. ~0.03 mg
 ~0.35 %

5. mg

100

100. 200. 300. 400. °C

K214 DUP
9.889 mg

File: 00097.001 TG METTLER 28-Apr-94
Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

K214

5. mg

Step Analysis
Height -9.86 mg
-99.67 %
Resid. 0.02 mg
0.24 %

WHC-SD-WM-DP-079, REV. 0

100. 200. 300. 400. °C

THERMAL GRAVIMETRIC ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

Batch 3350

Serial No K 215.-5512	Sample Point C-111	Date 4-28-94	Time Issued 11:14	Priority 21
Determination TGA	Method-Standard LA-560-112	Result Units % RECOVERY	Charge Code N4C3B	Retuns 0
Sample Size 16.955 mg			Customer ID STD	
Remarks, Calculations, Results S10 VAL 59.25 58.58%, 98.9% Recovery ROBERT WENDLAND				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-2-94	Time Completed 1200	Lab Unit Mgr J. M. Luge		

54-6800-061 (R-10-83)

Serial No K 216.-5712	Sample Point C-111	Date 4-28-94	Time Issued 11:23	Priority 21
Determination TGA	Method-Standard LA-560-112	Result Units % H2O	Charge Code N4C3B	Retuns 0
Sample Size 10.011 mg			Customer ID C58HCB	
Remarks, Calculations, Results 99.88% H ₂ O > 99% H ₂ O ROBERT WENDLAND				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-2-94	Time Completed 1200	Lab Unit Mgr J. M. Luge		

54-6800-061 (R-10-83)

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James M. Jager
5/25/94

TGA STD
16.955 mg

Rate: 10.0 °C/min

File: 00099.001

Ident: 0.0

TG METTLER 01-May-94

222-S Laboratory

TGA STD

Step Analysis

Height -9.93 mg

-58.58 %

ResidC. 7.02 mg

41.38 %

Dpeak 91.7 °C

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 104 TO 105 .

WHC-SD-WM-DP-079, REV. 0

K216

10.011 mg

Rate: 10.0 °C/min

File: 00101.001

TG

METTLER

01-May-94

Ident: 0.0

222-S Laboratory

K216

Step Analysis

Height-10.00 mg

-99.88 %

Resid. -0.02 mg

-0.16 %

5. mg

WHC-SD-WM-DP-079, REV. 0

100.

200.

300.

400.

°C

QA
2

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No. K218	Customer ID: C59 S1 <i>CIII</i>
Analysis: TGA	Sample Prep: DIRECT

Instrument: WC16130	Procedure/ Rev: LA 560-112/A-1
Technologist: R. WENDLAND	Date: 05/09/94
Starting Time: 0800	Temperature N/A
Ending Time: 1200	Chemist: J. FRYE

Comments: _____

	Description	Lab ID
1	LMCS	K217-5512
2	SAMPLE	K218-5712
3	DUP	K218-5812
4		
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	24N8-A			

106

THERMAL GRAVIMETRIC ANALYSIS - UNDIGESTED SAMPLE
WHC-SD-WM-DP-079, REV. 0

Bulet 3390

Serial No K 217.-5512	Sample Point C-111	Date 5- 4-94	Time Issued 16:34	Priority 20
Determination TGA	Method-Standard LA-560-112	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size ? 16.820 mg			Customer ID STD	
Remarks, Calculations, Results <p align="center"><i>58.32% H₂O 98.4% Rec</i></p> <p><i>ROBBY WENDLAND</i></p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs <i>[Signature]</i>
Date 5-9-94	Time Completed 1200	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i>	

54-6800-061 (R-10-83)

Serial No K 218.-5712	Sample Point C-111	Date 5- 4-94	Time Issued 16:36	Priority 20
Determination TGA	Method-Standard LA-560-112	Result Units % H₂O	Charge Code N4C3B	Reruns 0
Sample Size ? 17.451 mg			Customer ID C59 S1	
Remarks, Calculations, Results <p align="center"><i>Has no weight loss in the boiling range of water. The sample does loose weight beginning at about 260°C to 320°C. The weight loss was 27.6%, but is not water.</i></p> <p><i>ROBBY WENDLAND</i></p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date 5-9-94	Time Completed 1200	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i>	

54-6800-061 (R-10-83)

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**THERMAL GRAVIMETRIC ANALYSIS - UNDIGESTED SAMPLE
WHC-SD-WM-DP-079, REV. 0**

Serial No K 218.-5812	Sample Point C-111	Date 5- 4-94	Time Issued 16:36	Priority 20
Determination TGA	Method/Standard LA-560-112	Result Units % H2O	Charge Code N4C3B	Reruns 0
Sample Size ? 23.176mg			Customer ID C59 S1	
Remarks, Calculations, Results DUPLICATE SAMPLE <i>This sample lost no weight in the boiling range of water. However it does loose weight from 260°C to 320°C, 27.6%. But this is not water.</i> ROBBY WENDLAND				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-4-94	Time Completed 1200	Lab Unit Mgr <i>J. M. Faye</i>	<i>[Signature]</i>	

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

James M. Lutz
6/25/94

TGA STD
16.820 mg

Rate: 10.0 °C/min

File: 00002.001

TG

METTLER

08-May-94

Ident: 0.0

222-S Laboratory

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 109 TO 113 .

TGA STD

5. mg

Step Analysis
Height -9.81 mg
-58.32 %
ResiC. 7.01 mg
41.68 %
Dpeak 95.8 °C

WHC-SD-WM-DP-079, REV. 0

50.

100.

150.

200.

°C

K218

17.451 mg

Rate: 10.0 °C/min

File: 00008.001

TG

METTLER

08-May-94

Ident: 0.0

222-S Laboratory

K218

2. mg

WHC-SD-WM-DP-079, REV. 0

100.

200.

300.

400.

°C

K218

17.451 mg

Rate: 10.0 °C/min

File: 00008.001

TG

METTLER

08-May-94

Ident: 0.0

222-S Laboratory

WHC-SD-WM-DP-079, REV. 0

K218 DUP

23.176 mg

Rate: 10.0 °C/min

File: 00009.001

TG

METTLER

08-May-94

Ident: 0.0

222-S Laboratory

K218 DUP

5. mg

WHC-SD-MM-DP-079, REV.0

100.

200.

300.

400.

°C

112

K218 DUP

23.176 mg

Rate: 10.0 °C/min

File: 00009.001

TG

METTLER

08-May-94

Ident: 0.0

222-S Laboratory

WHC-SD-MM-DP-079, REV. 0

WHC-SD-WM-DP-079, REV. 0

INORGANIC ANALYSES

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No. K211	Customer ID: C58S1
Analysis: CN SOLID	Sample Prep: DIRECT

Instrument: AL 10724	Procedure/ Rev: LA-695-102 B2
Technologist: JAMES T KNIGHT JR.	Date: 08/02/94
Starting Time: 08:00	Temperature 25 CENTIGRADE
Ending Time: 15:00	Chemist: R. SCHROEDER

Comments: BATCH #3815

THE STANDARD WAS ADDED TO 10 ML VOLUME OF .125 MOLAR NaOH FOR THE INITIAL DILUTION. THE DILUTIONS WERE MADE WITH 5ML OF EDTA. THE SPIKE USED THE SAME DILUTION THAT WAS USED ON THE FIRST SAMPLE.

	Description	Lab ID
1	INITIAL LMCS STANDARD	K209-5578
2	REAGENT BLANK	K210-5678
3	SAMPLE	K211-5777
4	SAMPLE DUPLICATE	K211-5877
5	SAMPLE SPIKED	K211-5977
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	31N8D 0.100 ML			
SPIKE	31N8D 0.100ML			
			115	

54-6800-061 (R-10-23)

8.18.94

CYANIDE ANALYSIS - UNDIGESTED SAMPLE **WHC-SD-WM-DP-079, REV. 0**

Serial No A 210.-5678	Sample Point C-111	Date 4-22-94	Time Issued 14:55	Priority 25
Determination CN	Method Standard LA-685-102	Result Units UG/ML	Charge Code N403B	Reruns 0
Sample Size 5ml EDTA solution			Customer ID BLANK	
Remarks: Calculations Results REAGENT BLANK perform dissolution by EDTA $\frac{(0.011 - 0.011) - (0.00625)}{0.160059} = \frac{0.00}{5 \times 1} = 0.0$ $\text{D.L.} = 0.1 \mu\text{g} / 5\text{mL} = < 2.0 \text{E-}2$				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs
Date 8-2-94	Time Completed	Lab Unit Mgr B-4-94 <i>[Signature]</i>	<i>[Signature]</i>	

54-6800-061 (R-10-B3)

Serial No L 211.-5777	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 25
Determination CN SOLID	Method Standard LA-685-102	Result Units UG/G	Charge Code N403B	Reruns 0
Sample Size 3.3005 grams 1ml solution			Customer ID C56S1	
Remarks: Calculations Results $\frac{(0.355 - 0.011) - (0.00625)}{0.160059} = \frac{2.11 \text{E}+0 \mu\text{g CN}}{3.5 \text{E} \mu\text{g}} =$ $\frac{(0.3005 \cdot 1 \text{mL})}{5 \text{mL}} = 6.01 \text{E-}2 \text{ g of sample}$ $\text{D.L.} = 0.1 \mu\text{g CN} / 6.01 \text{E-}2 \text{ g} = 1.66 \text{E}+0 \mu\text{g/g}$ $3.51 \text{E}+1 \mu\text{g CN/g}$				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs
Date 8-2-94	Time Completed	Lab Unit Mgr B-4-94 <i>[Signature]</i>	<i>[Signature]</i>	

54-6800-061 (R-10-B3)

CYANIDE ANALYSIS - UNDIGESTED SAMPLE WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-5677	C-111	4-25-94	14:57	28
Determination	Method Standard	Result Units	Charge Code	Returns
CN SOLID	LA-695-102	UG/G	N403B	0
Sample Size			Customer ID	
0.3112 grams			C58S1	
Remarks, Calculations, Results				
$\frac{(0.3112 - 0.011) - (0.00625)}{0.160059} = 2.49 E+0 \text{ } \mu\text{g CN} / 6.22 E-2 =$ $\frac{(0.3112 \cdot 1 \text{ mL})}{5 \text{ mL}} = 6.22 E-2 \text{ g of sample}$ $D.L. = 0.1 \text{ } \mu\text{g CN} / 6.22 E-2 = 1.61 E+0 \text{ } \mu\text{g CN/g}$ <div style="border: 1px solid black; padding: 2px; display: inline-block;">4.00 E+1 $\mu\text{g CN/g}$</div>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Date	Time Completed	Lab Unit Mgr	8-4-94	
8-2-94		Rw Schroeder	Jey Hammett	

54-6500-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-5978	C-111	4-25-94	14:57	28
Determination	Method Standard	Result Units	Charge Code	Returns
CN	LA-695-102	% RECOVERY	N403B	0
Sample Size			Customer ID	
0.3005 grams 1 ml solution			C58S1	
Remarks, Calculations, Results				
$\frac{(0.758 - 0.011) - (0.00625)}{0.160059} = 4.63 \text{ } \mu\text{g CN stsp}$ $\frac{100 \cdot 4.63 \text{ } \mu\text{g CN stsp} - 2.11 \text{ } \mu\text{g CN S}}{2.31 \text{ } \mu\text{g CN sp}} = 109.1 \% \text{ REC.}$				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Date	Time Completed	Lab Unit Mgr	8-4-94	
8-2-94		Rw Schroeder	Jey Hammett	

54-6500-061 (R-10-83)

BATCH # 3278

0A7

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No. K-214	Customer ID: C58FB C111
Analysis: CYANIDE	Sample Prep: DIRECT + EDTA/EN

Instrument: AL 10724	Procedure/ Rev: LA-695-102 B-2
Technologist: E.H. COLVIN <i>E.H. Colvin</i>	Date: 05/13/94
Starting Time: 0630	Temperature 25 CENTIGRADE
Ending Time: 1500	Chemist: R.W. SCHROEDER

Comments: _____

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	K-212-5578	11		
2	REAGENT BLANK	K-213-5678	12		
3	SAMPLE	K-214-5778	13		
4	SAMPLE DUPLICATE	K-214-5878	14		
5	SAMPLE + SPIKE	K-214-5978	15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	19N8-E .500 ML			
CN SPIKE	19N8-E .500ML			
			120	

ANALYTICAL BATCH SUMMARY SHEET							
METHOD: La-695-102		ANALYTE: CN		ANALYSIS START DATE 5/13/94			
PREPARED BY: Rob Schroeder		SUMMARY DATE: 5/18/94					
PROJECT C-111		UNITS: ug CN/mL		SAMPLE PREP: Direct			
SPL ID	SERIAL NO	RESULT #1	RESULT #2	RPD%	% REC	DET LIM	DIG WT
STD	K212-5578	9.17E+2			100.3		
Reag.B1	K213-5678	<0.03				0.03	
C58FB	K214-5778	<0.03	<0.03	NA		0.03	
SPIKE	K214-5978				101.9

NO SPECIAL PROBLEMS / METHOD VARIATIONS IN THIS BATCH

NARRATIVE -- LIST SPECIFIC PROBLEMS / VARIATIONS FOR THIS BATCH

Batch was run using the EDTA/en dissolution option, as requested.

Robert W. Schroeder

5-26-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Data 3278

Serial No K 212.-5578	Sample Point C-111	Date 4-27-94	Time Issued 10: 2	Priority 21
Determination CN	Method-Standard LA-695-102	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size <i>5-13-94 EP</i> <i>22 ml .100ml-10ml-.500ml</i>			Customer ID STD	
Remarks, Calculations, Results <i>S244 KCN E+2 ABS. 728</i> <i>STD# 19N8E RESULT 9.17</i> <i>STD VAL 8.99 E+2 %REC 100.3%</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-13-94	Time Completed 1500	Lab Unit Mgr <i>5-18-94</i> <i>RW Schroeder</i>		

PH. Cohen

PH. Cohen

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

CN- DETERMINATION : LA-695-102 (B-2) BLANK, LIQUID, SOLID

Type	SAMPLE	DUPLICATE
LIQUID	Sample Aliquot in mL	0.10000
Work List	Flask Volume in mL	10.00000
3278	Sample Aliquot Taken in mL (SS)	0.50000
Test Code	Absorbance of Blank	0.0080
	Absorbance of Sample	0.7280
Matrix	Y-Intercept Value	-0.003130
LIQUID	Slope Value	0.157645
Sample #	µG of Cyanide	4.59
K212-5578	µG/mL CN-	9.17E+02
Instrument Code	$\mu\text{G of Cyanide} = ((\text{Absorb. of Sample} - \text{Absorb. of Blank}) - (\text{Y-Intercept})) / \text{Slope Value}$	
Analyst	$\mu\text{G/mL of Cyanide} = \mu\text{G Cyanide} / \text{SS (mL)} * \text{Dilution Factor}$	
COLVIN	$\text{Dilution Factor} = \text{Flask Volume (mL)} / \text{Sample Aliquot (mL)}$	
Date	Detection Limit = 0.1µG Cyanide	
05/13/94		
Time	v RESULTS v	
15:00	Cyanide Concentration (µG/mL)	9.17E+02

Data Entry by: <i>PH. Cohen</i>	Date: 17-May-94
Approved by: <i>RW Schroeder</i>	Date: 5-18-94

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Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 213.-5678	Sample Point C-111	Date 4-27-94	Time Issued 10: 7	Priority 21
Determination CN	Method/Standard LA-695-102	Result Units uG/ML	Charge Code N4C3B	Reruns 0
Sample Size <i>5-13-94 EC</i> 22 ML <i>4 mL</i>			Customer ID BLANK	
Remarks, Calculations, Results REAGENT BLANK <i>ABS .008</i> <i>2.03 uG/mL</i> <i>P.H. Cohen</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date <i>5-13-94</i>	Time Completed <i>1500</i>	Lab Unit Mgr <i>5-18-94</i> <i>RW Schroeder</i>		

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

CN- DETERMINATION : LA-695-102 (B-2) BLANK, LIQUID, SOLID

Type		SAMPLE	DUPLICATE
LIQUID	Sample Aliquot in mL	4.00000	
Work List	Flask Volume in mL	0.00000	
3278	Sample Aliquot Taken in mL (SS)	4.00000	
Test Code	Absorbance of Blank	0.0080	
	Absorbance of Sample	0.0080	
Matrix	Y-Intercept Value	-0.003130	-0.003130
LIQUID	Slope Value	0.157645	0.157645
Sample #	uG of Cyanide	0.02	N/A
K213-5678	uG/mL CN-	0.00E+00	N/A
Instrument Code	$\mu\text{G of Cyanide} = (((\text{Absorb. of Sample} - \text{Absorb. of Blank}) - (\text{Y-Intercept}))) / \text{Slope Value}$		
Analyst	$\mu\text{G/mL of Cyanide} = \mu\text{G Cyanide} / \text{SS (mL)} * \text{Dilution Factor}$		
COLVIN	$\text{Dilution Factor} = \text{Flask Volume (mL)} / \text{Sample Aliquot (mL)}$		
Date	Detection Limit = 0.1 uG Cyanide		
05/13/94			
Time	v RESULTS v		
15:00	Cyanide Concentration (uG/mL)	<0.1 uG Cyanide	
		<0.03 uG/mL Cyanide	

Data Entry by: <i>P.H. Cohen</i>	Date: 17-May-94
Approved by: <i>RW Schroeder</i>	Date: 5-18-94

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 214.-5778	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination CN LIQ	Method/Standard LA-695-102	Result Units uG/ML	Charge Code N4C3B	Reruns 0
Sample Size <i>5-13-94 EE</i> <i>22 ML 4ml + 100L EDTA/EN</i>			Customer ID C58FB	
Remarks, Calculations Results <i>ABS .008</i> <i>< .03 uG/ml</i> <i>PR. Cohen</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-13-94	Time Completed 1500	Lab Unit Mgr <i>5-18-94</i> <i>RW Schroeder</i>		

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

CN- DETERMINATION : LA-695-102 (B-2) BLANK, LIQUID, SOLID

Type		SAMPLE	DUPLICATE
LIQUID	Sample Aliquot in mL	4.00000	
Work List	Flask Volume in mL	0.00000	
3278	Sample Aliquot Taken in mL (SS)	4.00000	
Test Code	Absorbance of Blank	0.0080	
	Absorbance of Sample	0.0080	
Matrix	Y-Intercept Value	-0.003130	-0.003130
LIQUID	Slope Value	0.157645	0.157645
Sample #	uG of Cyanide	0.02	N/A
K214-5778	uG/mL CN-	0.00E+00	N/A
Instrument Code	uG of Cyanide = (((Absorb. of Sample - Absorb. of Blank) - (Y-Intercept))) / Slope Value		
Analyst	uG/mL of Cyanide = uG Cyanide / SS (mL) * Dilution Factor		
COLVIN	Dilution Factor = Flask Volume (mL) / Sample Aliquot (mL)		
Date	Detection Limit = 0.1 uG Cyanide		
05/13/94			
Time	v RESULTS v		
15:00	Cyanide Concentration (uG/mL)	<0.1 uG Cyanide	
		<0.03 uG/mL Cyanide	

Data Entry by: <i>[Signature]</i>	Date: 17-May-94
Approved by: <i>RW Schroeder</i>	Date: 5-18-94

Serial No K 214.-5878	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination CN LIQ	Method Standard LA-695-102	Result Units uG/ML	Charge Code N4C3B	Reruns 0
Sample Size <u>5.13-94 PC</u> <u>22-ML 4MLT/ML EDTA/ML</u>			Customer ID C58FB	
Remarks, Calculations, Results DUPLICATE SAMPLE <u>ABS .009</u> <u><.03 uG/ml</u> <u>PR. Col</u>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-13-94	Time Completed 1500	Lab Unit Mgr <u>5-18-94</u> <u>RW Schneider</u>		

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

CN- DETERMINATION : LA-695-102 (B-2) BLANK, LIQUID, SOLID

Type		SAMPLE	DUPLICATE
LIQUID	Sample Aliquot in mL	4.00000	
Work List	Flask Volume in mL	0.00000	
3278	Sample Aliquot Taken in mL (SS)	4.00000	
Test Code	Absorbance of Blank	0.0090	
	Absorbance of Sample	0.0080	
Matrix	Y-Intercept Value	-0.003130	-0.003130
LIQUID	Slope Value	0.157645	0.157645
Sample #	uG of Cyanide	0.01	N/A
K214-5878	uG/mL CN-	0.00E+00	N/A
Instrument Code	uG of Cyanide = $((\text{Absorb. of Sample} - \text{Absorb. of Blank}) - (\text{Y-Intercept})) / \text{Slope Value}$		
Analyst	uG/mL of Cyanide = $\text{uG Cyanide} / \text{SS (mL)} * \text{Dilution Factor}$		
COLVIN	Dilution Factor = $\text{Flask Volume (mL)} / \text{Sample Aliquot (mL)}$		
Date	Detection Limit = 0.1 uG Cyanide		
05/13/94			
Time	v RESULTS v		
15:00	Cyanide Concentration (uG/mL)	<0.1 uG Cyanide	
		<0.03 uG/mL Cyanide	

Data Entry by: <u>RW Schneider</u>	Date: 17-May-94
Approved by: <u>RW Schneider</u>	Date: 5-18-94

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CYANIDE ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

Serial No K 214.-5978	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination CN	Method Standard LA-695-102	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size 5-13-94 EE 22 ML 4 MLT / ML EDTA / EN + 100 ml - 10 ml -			Customer ID C58FB	
<p>Remarks Calculations. Results. $\text{mg CN}^- \text{ in spike} = \text{RWS } 500 \text{ ML SPIKE}$ $\text{SAMPLE SPIKED ID (ATT) (0.500)} = 4.585 \text{ 5-17-94}$ $\text{SPIKE ID 198 E (ATT) 100} = 4.495 \text{ ABS } .727$ $\text{SPIKE VOLUME } 100 \text{ mL} - 10 \text{ mL} - 500 \text{ mL} (-0.00313)$ $\text{mg CN}^- \text{ in } = (0.727 - 0.008) - (0.008 - 0.008) \text{ 5-17-94} = 4.5807$ $\text{Sample + spike } 0.157645$ $\text{P.H. Celun } 4.5807 / 4.495 \times 100 = 101.9\% \text{ recovery}$ RWS 5-17-94</p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-13-94	Time Completed 1500	Lab Unit Mgr 5-17-94 RWS Schmedy		

54-6800-061 (R-10-83)

CYANIDE ANALYSIS REPORT

TODAYS DATE: 05/13/94

PAYROLL NO.:

WHC-SD-WM-DP-079, REV. 0

Y-INTERCEPT= -.00313

SLOPE= .157645

SAMPLE ID#: K-213 BLANK

SAMPLE SIZE: 4ML

WVL AND ABS= 580NM 0.008 A

SAMPLE ID#: K-212 19N8-E STD

SAMPLE SIZE: .100ML-10ML-.500ML

WVL AND ABS= 580NM 0.728 A

SAMPLE ID#: K-214

SAMPLE SIZE: 4ML + 1ML EDTA/EN

WVL AND ABS= 580NM 0.008 A

SAMPLE ID#: K-214 DUPLICATE

SAMPLE SIZE: 4ML + 1ML EDTA/EN

WVL AND ABS= 580NM 0.009 A

SAMPLE ID#: K-214 + SPIKE

SAMPLE SIZE: 4ML + 1ML EDTA/EN + .100ML-10ML-.500ML 19N8-E SPIKE

WVL AND ABS= 580NM 0.727 A

TECHNOLOGIST SIGNATURE: E.H. Colman

DATE SIGNED: 5-13-94

CALIBRATION CURVE LACHAT DISTILLED 25 ML

WHC-SD-WM-DP-079, REV. 0

CYANIDE DEC.16, 1993

CALIBRATION STANDARD # 39N16-B 1064 UG/ML CYANIDE

DILUTION FACTOR = $10/.1 = 100$. WORKING STD = $1064/100 = 10.64$

PIPET SIZE	MICROGRAMS CN	TOTAL ABS	NET ABS
BLANK	0	0.009	0
0.050ML WS#2	0.0532	0.011	0.002
0.100ML WS#2	0.1064	0.02	0.011
0.200ML WS#2	0.2128	0.038	0.029
0.050ML WS#1	0.532	0.092	0.083
0.075ML WS#1	0.798	0.135	0.126
0.100ML WS#1	1.064	0.175	0.166
0.200ML WS#1	2.128	0.338	0.329
0.500ML WS#1	5.32	0.845	0.836

Regression Output:

Constant Output:	-0.00313 (Y-INTERCEPT)
Std Err of Y Est	0.002900
R Squared	0.999898
No. of Observations	9
Degrees of Freedom	7

X Coefficient(s)	0.157645 (SLOPE)
Std Err of Coef.	0.000600

CYANIDE CALIBRATION CURVE

[illegible]

NARRATIVE -- LIST SPECIFIC PROBLEMS / VARIATIONS FOR THIS BATCH

IFIC PROBLEMS / VARIATIONS FOR
Robert W. Schaefer
8-4-94

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE
WHC-SD-WM-DP-079, REV. 0

Serial No K 211.-5718	Sample Point C-111	Date 4-25-84	Time Issued 14:57	Priority 23
Determination TIC/TOC	Method Standard LA-342-100	Result Units ug C/G	Charge Code N4CSE	Returns 0
Sample Size ? 0.0795g			Customer ID C5881	
Remarks Calculations Results TIC VALUE $2.56 \text{ E}+2 / 0.0795 = 3.22 \text{ E}+3 \text{ ug/g}$ TOC VALUE $56.4 \text{ E}+0 / 0.0795 = 7.09 \text{ E}+2 \text{ ug/g}$				
Analyst - 1		Analyst - 3	Analyst - 4	Analyst - 5
Hrs		Hrs	Hrs	Hrs
Date 8-3-94		Time Completed	Lab Unit Mgr 8-4-94 RW Schroeder

54-6600-061 (R-10-83)

Serial No K 211.-5818	Sample Point C-111	Date 4-25-84	Time Issued 14:57	Priority 23
Determination TIC/TOC	Method Standard LA-342-100	Result Units ug C/G	Charge Code N4CSE	Returns 0
Sample Size ? 0.0843g			Customer ID C5881	
Remarks Calculations Results TIC DUPLICATE VALUE $2.855 \text{ E}+2 / 0.0843 = 3.39 \text{ E}+3 \text{ ug/g}$ TOC DUPLICATE VALUE $62.2 \text{ E}+0 / 0.0843 = 7.38 \text{ E}+2 \text{ ug/g}$				
Analyst - 1		Analyst - 3	Analyst - 4	Analyst - 5
Hrs		Hrs	Hrs	Hrs
Date 8-3-94		Time Completed	Lab Unit Mgr 8-4-94 RW Schroeder

54-6600-061 (R-10-83)

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE
WHC-SD-WM-DP-079, REV. 0

Batch 3816

Serial No K 209.-5518	Sample Point C-111	Date 4-25-94	Time Issued 14:54	Priority 23
Determination TIC/TOC	Method Standard LA-342-100	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size ?			Customer ID STD	
Remarks Calculations Results R225 TIC STD # 15N1B RESULT 4.90E-2 STD VAL 5.0E-2M %REC 90.0% <i>8-4-94</i> R226 TOC STD # 16N12C RESULT 2.70 g/L STD VAL 3.00 g/L %REC 90.0				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>[Signature]</i>	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 8-3-94	Time Completed	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i> 54-6800-061 (R-10-83)	

Serial No K 210.-5518	Sample Point C-111	Date 4-25-94	Time Issued 14:55	Priority 23
Determination TIC/TOC	Method Standard LA-342-100	Result Units UG C/ML	Charge Code N4C3B	Reruns 0
Sample Size ?			Customer ID BLANK	
Remarks Calculations Results TIC REAGENT BLANK 3.90 ug C TOC REAGENT BLANK 19.1 ug C				
Analyst - 1 <i>[Signature]</i>	Analyst - 2 <i>[Signature]</i>	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 8-3-94	Time Completed	Lab Unit Mgr <i>[Signature]</i>	<i>[Signature]</i> 54-6800-061 (R-10-83)	

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: K 209-5518

Date: 08/03/94

Time: 18:48:09

Sample Size = 1000 uL

Dil Factor = 1

Blank ID # =

Blank Value = .35 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	37.50	100.00
3	1.50	233.20	83.92
4	2.00	413.20	43.56
5	2.50	509.60	18.92
6	3.00	558.10	8.69
7	3.50	576.20	3.14
8	4.00	582.90	1.15
9	4.50	585.80	0.50
10	5.00	587.00	0.20
11	5.50	587.90	0.15
12	6.00	588.60	0.12
13	6.50	589.00	0.07
14	7.00	589.50	0.08
15	7.50	589.80	0.05
16	8.00	590.20	0.07
17	8.50	590.50	0.05
18	9.00	590.90	0.07
19	9.50	591.00	0.02
20	10.00	591.30	0.05
21	10.50	591.50	0.03
22	11.00	591.80	0.05

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 134 TO 140.

USER INPUT BLANK VALUE

BLANK VALUE = 3.849957 micrograms carbon

BLANK FACTOR = 3.849957 / 10.99988 = +3.5E-01 ug/min Carbon

SAMPLE RESULTS:

(591.8 - 3.850555)(1)/(1000) =

(591.8 - 3.850555)(1)/(1000)(12) =

133

Sample Run By:

TOC

Sam:

			.00
			.00.00
			93.79
		290.70	73.96
		547.60	46.91
	3.00	701.00	21.88
	3.50	768.20	8.75
8	4.00	798.60	3.81
9	4.50	809.90	1.40
10	5.00	815.40	0.67
11	5.50	818.70	0.40
12	6.00	820.90	0.27
13	6.50	822.30	0.17
14	7.00	823.50	0.15
15	7.50	824.40	0.11
16	8.00	825.20	0.10
17	8.50	825.90	0.08
18	9.00	826.60	0.08
19	9.50	827.20	0.07
20	10.00	827.70	0.06
21	10.50	828.20	0.06
22	11.00	828.70	0.06

BEST AVAILABLE COPY

USER INPUT BLANK VALUE

BLANK VALUE = 19.13979 micrograms carbon

BLANK FACTOR = 19.13979 / 10.99988 = +1.7E+00 ug/min Carbon

SAMPLE RESULTS:

(828.7 - 19.14106)(1)/(300) = +2.699E+00 g/L Carbon
 (828.7 - 19.14106)(1)/(300)(12) = +2.249E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

134

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: K 210-5618

Date: 08/03/94

Time: 18:22:28

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = K 210-5618

Blank Value = N/A

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time =====	Coulometer =====	% Difference ==
1	0.51	0.10	0.00
2	1.01	0.30	66.67
3	1.51	0.70	57.14
4	2.01	1.10	36.36
5	2.51	1.30	15.38
6	3.01	1.60	18.75
7	3.51	1.70	5.88
8	4.01	1.80	5.56
9	4.50	2.00	10.00
10	5.00	2.20	9.09
11	5.50	2.40	8.33
12	6.00	2.50	4.00
13	6.50	2.60	3.85
14	7.00	2.90	10.34
15	7.50	2.90	0.00
16	8.00	3.10	6.45
17	8.50	3.30	6.06
18	9.00	3.40	2.94
19	9.50	3.50	2.86
20	10.00	3.70	5.41
21	10.50	3.90	5.13
22	11.00	3.90	0.00

BLANK VALUE = 3.9 micrograms carbon

BLANK FACTOR = 3.9 / 10.99976 =

+3.5E-01

ug/min Carbon

!135

Sample Run By:

KR MONTEITH

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
 TICTOC REV 2.0
 <<< BLANK ANALYSIS >>>

Sample: K 210-5618

Date: 08/03/94

Time: 18:35:34

Sample Size = 1 uL
 Dil Factor = 1
 Blank ID # = K 210-5618
 Blank Value = N/A

Analyst : KR MONTEITH
 Min Readings = 22
 Max Readings = 22
 % Difference = 10

== Reading ==	==== Analysis Time =====	Coulometer =====	% Difference ==
1	0.51	0.00	0.00
2	1.01	0.00	0.00
3	1.51	0.30	100.00
4	2.00	3.70	91.89
5	2.50	8.10	54.32
6	3.00	10.90	25.69
7	3.50	12.50	12.80
8	4.00	13.50	7.41
9	4.50	14.30	5.59
10	5.00	14.90	4.03
11	5.50	15.30	2.61
12	6.00	15.80	3.16
13	6.50	16.10	1.86
14	7.00	16.50	2.42
15	7.50	16.90	2.37
16	8.00	17.10	1.17
17	8.50	17.50	2.29
18	9.00	17.80	1.69
19	9.50	18.10	1.66
20	10.00	18.30	1.09
21	10.50	18.70	2.14
22	11.00	19.10	2.09

BLANK VALUE = 19.1 micrograms carbon

BLANK FACTOR = 19.1 / 10.99988 =

+1.74E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

: 136

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-079, REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: K 211-5818

Date: 08/03/94

Time: 21:21:09

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .35 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	7.30	100.00
3	1.50	51.50	85.83
4	2.00	116.10	55.64
5	2.50	181.80	36.14
6	3.00	223.60	18.69
7	3.50	242.60	7.83
8	4.00	249.70	2.84
9	4.50	252.70	1.19
10	5.00	254.00	0.51
11	5.50	255.10	0.43
12	6.00	255.70	0.23
13	6.50	256.40	0.27
14	7.00	257.00	0.23
15	7.50	257.40	0.16
16	8.00	257.90	0.19
17	8.50	258.30	0.15
18	9.00	258.80	0.19
19	9.50	259.10	0.12
20	10.00	259.40	0.12
21	10.50	259.80	0.15
22	11.00	260.10	0.12

USER INPUT BLANK VALUE

BLANK VALUE = 3.849957 micrograms carbon

BLANK FACTOR = 3.849957 / 10.99988 = +3.5E-01 ug/min Carbon

SAMPLE RESULTS:

(260.1 - 3.849573)(1)/(1) = +2.563E+02 g/L Carbon
 (260.1 - 3.849573)(1)/(1)(12) = +2.135E+01 Molar Carbon

137

Sample Run By:

KR MONTEITH

00000

0.0795g SAMPLE

WHC-SD-WM-DP-079, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: K 211-5818

Date: 08/03/94

Time: 21:33:26

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.74 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.00	0.00
2	1.01	5.00	100.00
3	1.51	23.40	78.63
4	2.00	39.40	40.61
5	2.50	49.40	20.24
6	3.00	54.90	10.02
7	3.50	58.70	6.47
8	4.00	61.50	4.55
9	4.50	63.40	3.00
10	5.00	64.90	2.31
11	5.50	66.20	1.96
12	6.00	67.50	1.93
13	6.50	68.60	1.60
14	7.00	69.60	1.44
15	7.50	70.60	1.42
16	8.00	71.40	1.12
17	8.50	72.20	1.11
18	9.00	72.90	0.96
19	9.50	73.50	0.82
20	10.00	74.30	1.08
21	10.50	74.90	0.80
22	11.00	75.50	0.79

USER INPUT BLANK VALUE

BLANK VALUE = 19.13979 micrograms carbon

BLANK FACTOR = 19.13979 / 10.99988 = +1.7E+00 ug/min Carbon

SAMPLE RESULTS:

(75.5 - 19.14128)(1)/(1) = +5.64E+01 g/L Carbon

(75.5 - 19.14128)(1)/(1)(12) = +4.70E+00 Molar Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

: 138

Sample Run By:

KR MONTEITH

00000

08432 SAMPLE

WHC-SD-WM-DP-079, REV.0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: K 211

Date: 08/03/94

Time: 22:22:25

Sample Size = 1 uL
Dil Factor = 1
Elank ID # =
Elank Value = 1.74 ug/minute C

Analyst : KR MONTEITH
Min Readings = 22
Max Readings = 22
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.10	0.00
2	1.01	3.80	97.37
3	1.51	18.30	79.23
4	2.00	35.10	47.86
5	2.50	47.60	26.26
6	3.00	55.10	13.61
7	3.50	60.40	8.77
8	4.00	64.10	5.77
9	4.50	66.50	3.61
10	5.00	68.60	3.06
11	5.50	70.70	2.97
12	6.00	72.10	1.94
13	6.50	73.40	1.77
14	7.00	74.70	1.74
15	7.50	75.80	1.45
16	8.00	76.60	1.04
17	8.50	77.70	1.42
18	9.00	78.50	1.02
19	9.50	79.40	1.13
20	10.00	80.00	0.75
21	10.50	80.60	0.74
22	11.00	81.30	0.86

USER INPUT BLANK VALUE

BLANK VALUE = 19.13979 micrograms carbon

BLANK FACTOR = 19.13979 / 10.99988 =

+1.7E+00 ug/min Carbon

SAMPLE RESULTS:

(81.3 - 19.14106) (1)/(1) =

+6.22E+01 q/L Carbon

(81.3 - 19.14106) (1)/(12) =

+5.18E+00 Molar Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

139

Sample Run By:

KR MONTEITH

00000

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No. K212, K213, K214, K214, K214	Customer ID: C58FB
Analysis: TOC	Sample Prep: DIRECT LIQUID

Instrument: MODEL 5011 WC 16130	Procedure/ Rev: LA-344-105 B-2
Technologist: <i>Brenda Severson</i> <i>Brenda Severson</i>	Date: 5-12-94
Starting Time: 2005	Temperature NA
Ending Time: 2315	Chemist: R. SCHROEDER

Comments: RERUN- use 2mL Sample Size + 0.200mL
acid - 0.200 inject volume. Thanks, Rob S.

	Description	Lab ID		Description	Lab ID
1	STD	K212-5526	11		
2	REAGENT BLANK	K213-5626	12		
3	SAMPLE	K214-5726	13		
4	SAMPLE DUPLICATE	K214-5824	14		
5	SAMPLE + SPIKE	K214-5926	15		
6			16		
7			17		
8			18		
9			19		
10	(		20		

[illegible]

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE
WHC-SD-WM-DP-079, REV. 0

RERUN *3456 3455*

Serial No K 212.-5526	Sample Point C-111	Date 4-27-94	Time Issued 10: 5	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units % RECOVERY	Charge Code N4C3B	Reruns 1
Sample Size .200ML-2ML-.200ML			Customer ID STD	
Remarks, Calculations, Results S356 COSTOC STD# 10N12C RESULT 2.82 g/lk STD VAL 3.00 g/l%REC 94.0%				
OUT FOR RERUN <i>Debra Swenson</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5/12/94	Time Completed 2315	Lab Unit Mgr 5-17-94 <i>RW Schneider</i>		<i>RW Schneider</i>

54-6800-061 (R-10-83)

RERUN

Serial No K 213.-5626	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 1
Sample Size .200 ML			Customer ID BLANK	
Remarks, Calculations, Results REAGENT BLANK OUT FOR RERUN < 5.00 mg c/ml				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-12-94	Time Completed 2315	Lab Unit Mgr 5-17-94 <i>RW Schneider</i>		<i>RW Schneider</i>

54-6800-061 (R-10-83)

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

RERUN

Serial No K 214.-5726	Sample Point C-111	Date 4-27-94	Time Issued 10:23	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 1
Sample Size ? .200 ML - 2 ML - .200 ML			Customer ID C58FB	
Remarks, Calculations, Results OUT FOR RERUN				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-12-94	Time Completed 2315	Lab Unit Mgr

54-6800-061 (R-10-83)

RERUN

Serial No K 214.-5826	Sample Point C-111	Date 4-27-94	Time Issued 10:23	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 1
Sample Size .200ML-2ML-.200ML			Customer ID C58FB	
Remarks, Calculations, Results DUPLICATE SAMPLE OUT FOR RERUN				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-12-94	Time Completed 2315	Lab Unit Mgr

54-6800-061 (R-10-83)

TOTAL ORGANIC CARBON ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

Serial No K 214.-5926		Sample Point C-111		Time Issued 4-27-94		Priority 21
Determination TOC	Method Standard LA-344-105	Result Units % RECOVERY		Charge Code N4C3B	Reruns 1	
Sample Size ? .200ML-2ML .5M H ₂ SO ₄ → .400ML + .400ML SPIKE				Customer ID C58FB		
Remarks Calculations Results INJECT .200ML SAMPLE SPIKED ID K214 SPIKE ID 11N12-C SPIKE VOLUME .400ML OUT FOR RERUN						
Analyst - 1		Analyst - 2		Analyst - 3		Analyst - 4
Hrs		Hrs		Hrs		Hrs
Date 5-12-94		Time Completed 2315		Lab Unit Mgr

54-650-061 (R-10-83)

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: STD K212

Date: 05/12/94

Time: 22:13:35

Sample Size = 200 uL

Dil Factor = 11

Blank ID # = BLK

Blank Value = .8137323 ug/minute C

Analyst : BC SEVERSON

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.60	0.00
2	1.01	11.20	94.64
3	1.51	32.90	65.96
4	2.01	43.80	24.89
5	2.51	48.90	10.43
6	3.00	50.90	3.93
7	3.51	51.80	1.74
8	4.01	52.90	2.08
9	4.50	53.50	1.12
10	5.00	54.50	1.83
11	5.50	54.80	0.55
12	6.00	55.40	1.08
13	6.50	56.00	1.07
14	7.00	56.50	0.88

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 145 TO 150.

BLANK VALUE = 5.7 micrograms carbon

BLANK FACTOR = 5.7 / 7.004761 =

+8.1E-01 ug/min Carbon

SAMPLE RESULTS:

(56.5 - 5.700099)(11)/(200) =

+2.79E+00 g/L Carbon

(56.5 - 5.700099)(11)/(200)(12) =

+2.33E-01 Molar Carbon

Sample Run By:

BC SEVERSON

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>> WHC-SD-WM-DP-079, REV. 0

Sample: BLK

Date: 05/12/94

Time: 22:03:13

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = N/A

Analyst : BC SEVERSON

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	0.50	100.00
3	1.51	1.20	58.33
4	2.01	2.00	40.00
5	2.51	2.60	23.08
6	3.01	2.80	7.14
7	3.51	3.30	15.15
8	4.01	4.00	17.50
9	4.51	4.40	9.09
10	5.01	4.30	2.22
11	5.51	4.80	6.25
12	6.01	5.40	11.11
13	6.50	5.40	0.00
14	7.00	5.70	5.26

BLANK VALUE = 5.7 micrograms carbon

BLANK FACTOR = 5.7 / 7.004761 =

+8.1E-01 ug/min Carbon

Sample Run By:

BC SEVERSON

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K213

Date: 05/12/94

Time: 22:31:41

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .8137323 ug/minute C

Analyst : RC SEVERSON

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.30	0.00
2	1.01	0.80	62.50
3	1.51	1.40	42.86
4	2.01	1.80	22.22
5	2.51	2.10	14.29
6	3.01	2.50	16.00
7	3.51	2.80	10.71
8	4.01	3.20	12.50
9	4.51	3.50	8.57
10	5.01	3.80	7.89
11	5.51	4.10	7.32
12	6.01	4.40	6.82
13	6.51	4.60	4.35
14	7.01	5.30	13.21

BLANK VALUE = 5.7 micrograms carbon

BLANK FACTOR = 5.7 / 7.004761 =

+8.1E-01 ug/min Carbon

SAMPLE RESULTS:

(5.3 - 5.700894)(1)/(200) =

< 5.00 E-3 g/L Carbon

(5.3 - 5.700894)(1)/(200)(12) =

< 4.17 E-4 Molar Carbon

<<<< WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT >>>>

Sample Run By:

RC SEVERSON

00000

TOC-- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K214

Date: 05/12/94

Time: 22:44:10

Sample Size = 200 uL

Dil Factor = 11

Blank ID # = BLK

Blank Value = .8137323 ug/minute C

Analyst : BC SEVERSON

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	0.00	0.00
3	1.51	0.60	100.00
4	2.01	1.10	45.45
5	2.51	1.50	26.67
6	3.01	2.00	25.00
7	3.51	2.00	0.00
8	4.01	2.40	16.67
9	4.51	2.80	14.29
10	5.01	3.10	9.68
11	5.51	3.50	11.43
12	6.01	3.80	7.89
13	6.51	3.80	0.00
14	7.00	4.20	9.52

BLANK VALUE = 5.7 micrograms carbon

BLANK FACTOR = 5.7 / 7.004761 =

+8.1E-01 ug/min Carbon

SAMPLE RESULTS:

(4.2 - 5.700099)(11)/(200) =

< 5.00 E-3 g/L Carbon

(4.2 - 5.700099)(11)/(200)(12) =

< 4.17 E-4 Molar Carbon

Sample Run By:

BC SEVERSON

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K214 DUP

Date: 05/12/94

Time: 22:52:26

Sample Size = 200 uL

Dil Factor = 11

Blank ID # = BLK

Blank Value = .8137323 ug/minute C

Analyst : BC SEVERSON

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.20	0.00
2	1.01	0.80	75.00
3	1.51	1.30	38.46
4	2.01	1.80	27.78
5	2.51	1.80	0.00
6	3.01	2.30	21.74
7	3.51	2.60	11.54
8	4.00	2.90	10.34
9	4.50	3.30	12.12
10	5.00	3.50	5.71
11	5.50	3.80	7.89
12	6.00	4.20	9.52
13	6.50	4.50	6.67
14	7.00	4.80	6.25

BLANK VALUE = 5.7 micrograms carbon

BLANK FACTOR = 5.7 / 7.004761 =

+8.1E-01 ug/min Carbon

SAMPLE RESULTS:

(4.8 - 5.699404)(11)/(200) =
(4.8 - 5.699404)(11)/(200)(12) =

< 5.00 E-3 g/L Carbon
< 4.17 E-4 Molar Carbon

Sample Run By:

BC SEVERSON

00000

149

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K214 SPIKE Date: 05/12/94 Time: 23:00:44

Sample Size = 200 uL Analyst : BC SEVERSON
Dil Factor = 22 Min Readings = 14
Blank ID # = BLK Max Readings = 14
Blank Value = .8137323 ug/minute C % Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	17.60	100.00
3	1.51	42.60	58.69
4	2.01	53.30	20.08
5	2.51	58.80	9.35
6	3.01	63.00	6.67
7	3.51	65.50	3.82
8	4.01	67.40	2.82
9	4.50	68.40	1.46
10	5.00	69.10	1.01
11	5.50	69.80	1.00
12	6.00	70.70	1.27
13	6.50	71.20	0.70
14	7.00	71.60	0.56

BLANK VALUE = 5.7 micrograms carbon
BLANK FACTOR = 5.7 / 7.004761 =

+8.1E-01 ug/min Carbon

SAMPLE RESULTS:

(71.6 - 5.699305)(22)/(200) = +7.25E+00 g/L Carbon
(71.6 - 5.699305)(22)/(200)(12) = +6.04E-01 Molar Carbon

Sample Run By:

BC SEVERSON

00000

Q A
15

WHC-SD-WM-DP-079, REV. 0

Instrument: WC 16130	Procedure/ Rev: LA-344-105/B-2
Technologist: Rob King	Date: 5-23-94
Starting Time: 11:30	Temperature NA
Ending Time: 12:00 5-25-94 14:30	Chemist: B. Schroeder

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	K212-5526	11		
2	REAGENT BLANK	K213-5626	12		
3	Sample	K214-5726	13		
4	Sample Dup.	K214-5826	14		
5	Sample + spike	K214-5926	15		
6			16		
7			17		
8			18		
9			19		
10			20		

А.6000-МН1 (03/77)

[illegible]

NO SPECIAL PROBLEMS / METHOD VARIATIONS IN THIS BATCH

NARRATIVE -- LIST SPECIFIC PROBLEMS / VARIATIONS FOR THIS BATCH

Robert W. Schroeder
5-26-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

RERUN *Batch 3531*

Serial No K 212.-5526	Sample Point C-111	Date 4-27-94	Time Issued 10: 5	Priority 21
Determination TOC	Method/Standard LA-344-105	Result Units % RECOVERY	Charge Code N4C3B	Reruns 2
Sample Size .200ML-2ML-.200ML			Customer ID STD	
Remarks, Calculations, Results S356 CO3TOC STD#10112C RESULT 2.85 g/L STD VAL 3.0 g/L %REC 95.0 <i>Not King</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5/23/94	Time Completed 11:30	Lab Unit Mgr 5-24-94 <i>Rus Schneider</i>	<i>Teslie Day</i> <i>Teslie Day</i>	

54-6800-061 (R-10-83)

WHC-SD-MM-DE-079, REV. 0

TOC: LA-344-105 (B-2)		LIQUIDS		STANDARD
Type	Sample Volume in mL	(SS)		0.200
STANDARD	H2SO4 Volume in mL	(VR)		2.000
Work List	Volume Injected in mL	(VI)		0.200
3531	Dilution Factor	(DF)		11 7.1
Test Code	Digest Dilution Factor	(DDF)		1
	µg of Carbon in Sample	(C1)		55.8
Matrix	µg of Carbon in Blank	(C2)		4
LIQUID	g of Carbon/L	=	2.85 E+0	2.85E-01
Sample #	g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$			
K212-5526				
Instrument Code	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L			
WC16130				
Analyst	Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$			
R.W.KING				
Date				
05/23/94				
Time				
11:30				

Rus 8-18-94
Rus 8-18-94

µg Carbon/mL =	2.85E+02	DETECTION LEVEL
		in µg/mL
		5.50E+00

Data Entry by: <i>SA Olan</i>	Date: 24-May-94
Approved by: <i>Rus Schneider</i>	Date: 5-24-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 213.-5626		Sample Point C-111		Date 4-27-94	Time Issued 10:17	Priority 21
Determination TOC	Method/Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 2		
Sample Size .200 ML				Customer ID BLANK		
Remarks, Calculations, Results REAGENT BLANK <div style="text-align: center; font-size: 1.2em;"> $< 5.00 \text{ ug/mL}$ </div>						
Analyst - 1 Hrs	Analyst - 2 Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs		
Date 5/23/94	Time Completed 11:40	Lab Unit Mgr 5-24-94 RW Schroeder				

54-6800-051 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

TOC: LA-344-105 (B-2)		LIQUIDS		BLANK
Type	Sample Volume in mL	(SS)		0.200
BLANK	H2SO4 Volume in mL	(VR)		0.000
Work List	Volume Injected in mL	(VI)		0.200
3531	Dilution Factor	(DF)		1
Test Code	Digest Dilution Factor	(DDF)		1
	ug of Carbon in Sample	(C1)		5
Matrix	ug of Carbon in Blank	(C2)		4
LIQUID	g of Carbon/L	=		5.00E-03
Sample #	g of Carbon/L = $\frac{(C1 - C2) * DF * DDF}{VI * 1000}$			
K213-5626				
Instrument Code	ug of Carbon/mL = g of Carbon/L * 1000000 ug/g / 1000 mL/L			
WC16130				
Analyst				
R.W.KING				
Date	Detection Level (ug/mL) = $\frac{1 \text{ ug C} * DF * DDF}{VI}$			
05/23/94				
Time				
11:40				

ug Carbon/mL =	5.00E + 00	DETECTION LEVEL
		in ug/mL 5.00E+00

Data Entry by: SA Olan	Date: 24-May-94
Approved by: RW Schroeder	Date: 5-24-94

RERUN

Serial No K 214.-5726	Sample Point C-111	Date 4-27-94	Time Issued 10:23	Priority 21
Determination TOC	Method-Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 2
Sample Size ? 2 ml - .2 ml acid - .200 inject			Customer ID C58FB	
Remarks, Calculations, Results <div style="text-align: center; font-size: 1.2em;"> $< 5.50 \text{ ug/mL}$ </div>				
Analyst - 1 Hrs	Analyst - 2 Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs
Date 5/23/94	Time Completed 11:50	Lab Unit Mgr 5-24-94 Rui Schroeder		

WHC-SD-WM-DP-079, REV.0

TOC: LA-344-105 (B-2)

LIQUIDS

		SAMPLE
Type	Sample Volume in mL (SS)	2.000
SAMPLE	H2SO4 Volume in mL (VR)	0.200
Work List	Volume Injected in mL (VI)	0.200
3531	Dilution Factor (DF)	1.1
Test Code	Digest Dilution Factor (DDF)	1
	ug of Carbon in Sample (C1)	4.9
Matrix	ug of Carbon in Blank (C2)	4
LIQUID	g of Carbon/L =	< 5.50E-03
Sample #		
K214-5726		
Instrument Code		
WC16130		
Analyst		
R.W.KING		
Date		
05/23/94		
Time		
11:50		

$$\text{g of Carbon/L} = \frac{(C1 - C2) * DF * DDF}{VI * 1000}$$

$$\mu\text{g of Carbon/mL} = \text{g of Carbon/L} * 1000000 \mu\text{g/g} / 1000 \text{ mL/L}$$

$$\text{Detection Level } (\mu\text{g/mL}) = \frac{1 \mu\text{g C} * DF * DDF}{VI}$$

NOTE: Reported Result is Below Detection Level.

$\mu\text{g Carbon/mL} = < 5.50\text{E} + 00$	DETECTION LEVEL
	in $\mu\text{g/mL}$ 5.50E+00

Data Entry by: <i>SH Olson</i>	Date: 24-May-94
Approved by: <i>Rui Schroeder</i>	Date: 5-24-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 214.-5826	Sample Point C-111	RERUN		Date 4-27-94	Time Issued 10:23	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 2		
Sample Size, 4ml ? 2ml - .2ml acid - 12ml inject				Customer ID C58FB		
Remarks DUPLICATE SAMPLE 5.50 ug C/mL						
Analyst - 1 Hrs	Analyst - 2 Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs		
Date 5/23/94	Time Completed 12:10	Lab Unit Mgr 5-24-94 Rui Schroeder				

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

TOC: LA-344-105 (B-2)

LIQUIDS

		SAMPLE
Type	Sample Volume in mL (SS)	2.000
SAMPLE	H2SO4 Volume in mL (VR)	0.200
Work List	Volume Injected in mL (VI)	0.200
3531	Dilution Factor (DF)	1.1
Test Code	Digest Dilution Factor (DDF)	1
	ug of Carbon in Sample (C1)	4.4
Matrix	ug of Carbon in Blank (C2)	4
LIQUID	g of Carbon/L =	< 5.50E-03
Sample #		
K214-5826		
Instrument Code		
WC16130		
Analyst		
R.W.KING		
Date		
05/23/94		
Time		
12:10		

$$\text{g of Carbon/L} = \frac{(C1 - C2) * DF * DDF}{VI * 1000}$$

$$\mu\text{g of Carbon/mL} = \text{g of Carbon/L} * 1000000 \mu\text{g/g} / 1000 \text{ mL/L}$$

$$\text{Detection Level } (\mu\text{g/mL}) = \frac{1 \mu\text{g C} * DF * DDF}{VI}$$

NOTE: Reported Result is Below Detection Level.

$\mu\text{g Carbon/mL} = < 5.50E + 00$	DETECTION LEVEL
	in $\mu\text{g/mL}$ 5.50E+00

Data Entry by: <i>SA Olam</i>	Date: 24-May-94
Approved by: <i>Rui Schroeder</i>	Date: 5-24-94

Serial No					Sample Point		Date		Time Issued		Priority		
K 214.-5926					C-111		4-27-94		10:23		21		
Determination			Method/Standard			Result Units			Charge Code			Reruns	
TOC			LA-344-105			% RECOVERY			N4C3B			2	
Sample Size						Customer ID							
2.0 ml						C58FB							
Recovery Results													
SAMPLE SPIKED ID SPIKE ID 1117-D SPIKE VOLUME .400ml 100.3% recovery Not King													
Analyst - 1		Analyst - 2		Analyst - 3		Analyst - 4		Analyst - 5					
Hrs		Hrs		Hrs		Hrs		Hrs					
Date		Time Completed		Lab Unit Mgr		5-24-94		5-24-94					
5/23/94		13:00		Rw Schneider		Jeslie Day							

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

TOC: LA-344-105

SPIKED SAMPLE

SPIKE

Type	>>>>> Sample Vial Data <<<<<<	>>>>> Spiked Vial Data <<<<<<
SPIKE	Sample Volume in mL	2.000
Work List	H2SO4 Volume in mL	0.200
3531	Volume Injected in mL	0.200
Test Code	µg of Carbon in Sample	4.9
	µg of Carbon in Blank	4
Matrix		
LIQUID		
Sample #		
K214-5926		
Instrument Code		
WC16130		
Analyst		
R.W.KING		
Date		
05/23/94		
Time		
13:00		

** NOTE: Sample Dilution Factor does not include amount sample is diluted in Spiked Vial.

PERCENT SPIKE RECOVERY = $\frac{\mu\text{g Carbon Recovered from Spike} \times 100}{\mu\text{g Carbon in Spike}}$

WHERE: $\mu\text{g Carbon Recovered from Spike} = [(\mu\text{gC in sample} + \text{spike} - \mu\text{gC in blank}) \times (\text{Spike Correction Factor})] - [(\mu\text{gC sample} - \mu\text{gC blank}) \times (\text{Sample Correction Factor}) \times (\text{Sample Size Correction Factor})]$

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample} \times \text{Spiked Vial DF}}$

Percent Spike Recovery = 100.3%

Data Entry by: SA Olan	Date: 24-May-94
Approved by: RW Schneider	Date: 5-25-94

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K212-5526

Date: 05/23/94

Time: 11:38:55

Sample Size = 200 uL

Dil Factor = 11

Elant. ID # = BLK

Blank value = .5211148 ug. minute L

Analyst : RW KING

Min Readings = 11

Max Readings = 14

% Difference = 10

== Reading ==	== Analysis time ==	== Coulometer ==	== % Difference ==
1	0.51	0.10	0.00
2	1.01	25.10	99.57
3	1.51	42.60	45.77
4	2.01	48.90	12.88
5	2.51	51.20	4.49
6	3.01	52.40	2.29
7	3.51	53.00	1.13
8	4.01	53.50	0.93
9	4.50	54.00	0.93
10	5.00	54.40	0.74
11	5.50	54.70	0.55
12	6.00	55.10	0.73
13	6.50	55.40	0.54
14	7.00	55.80	0.71

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 158 TO 163.

BLANK VALUE = 4 micrograms carbon

BLANK FACTOR = 4 / 7.003845 =

+5.7E-01 ug/min Carbon

SAMPLE RESULTS:

(55.3 - 4.000557) (11) / (200) =

+2.85E+00 g/L Carbon

(55.8 - 4.000557) (11) / (200) (12) =

+2.37E-01 Molar Carbon

Sample Run By: RW KING

RW KING

8:643

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>> WHC-SD-WM-DP-079, REV. 0

Sample: BLK

Date: 05/23/94

Time: 11:30:01

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = N/A

Analyst : RW KING

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.20	0.00
2	1.01	0.70	71.43
3	1.51	1.00	30.00
4	2.01	1.30	23.08
5	2.51	1.60	18.75
6	3.01	2.00	20.00
7	3.51	2.10	4.76
8	4.01	2.50	16.00
9	4.50	2.70	7.41
10	5.00	3.00	10.00
11	5.50	3.20	6.15
12	6.00	3.60	11.11
13	6.50	3.80	9.26
14	7.00	4.00	5.00

BLANK VALUE = 4 micrograms carbon

BLANK FACTOR = 4 / 7.003845 =

45.7E-01

ug/min Carbon

Sample Run By:

RW KING

03445

TDC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-070, REV. 0

Sample: K213-5626

Date: 05/23/94

Time: 11:47:48

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank value = .5711143 ug/minute C

Analyst : RU KING

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.40	0.00
2	1.01	1.10	63.64
3	1.51	1.40	21.43
4	2.01	1.80	22.22
5	2.51	2.20	18.18
6	3.01	2.50	12.00
7	3.51	2.90	13.79
8	4.00	3.30	12.12
9	4.50	3.70	10.81
10	5.00	3.70	0.00
11	5.51	4.20	11.90
12	6.01	4.50	6.67
13	6.51	4.70	4.26
14	7.00	5.00	6.00

BLANK VALUE = 4 micrograms carbon

BLANK FACTOR = 4 / 7.003845 =

15.7E-01 ug/min Carbon

SAMPLE RESULTS:

(5 - 4.000593)(1)/(200) =

(5 - 4.000393)(1)/(200)(12) =

< 5.00 RWS

< 5.00 E-3 g/L Carbon

< 4.17 E-4 Molar Carbon

Sample Run By:

RU KING

83645

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K214-5726

Date: 05/23/94

Time: 11:57:29

Sample Size = 200 uL

Dil Factor = 1.1

Blank ID # = BLK

Blank Value = .5711148 ug/minute C

Analyst : RW KING

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.20	0.00
2	1.01	0.90	77.78
3	1.51	1.40	35.71
4	2.01	1.70	17.65
5	2.51	2.00	15.00
6	3.01	2.40	16.67
7	3.51	2.70	11.11
8	4.01	3.00	10.00
9	4.51	3.30	9.09
10	5.01	3.60	8.33
11	5.51	4.00	10.00
12	6.01	4.30	6.98
13	6.51	4.60	6.52
14	7.00	4.90	6.12

BLANK VALUE = 4 micrograms carbon

BLANK FACTOR = 4 / 7.003845 =

+3.7E-01 ug/min Carbon

SAMPLE RESULTS:

(4.9 - 4.000593) (1.1) / (200) =

(4.9 - 4.000593) (1.1) / (200) (12) =

~~45.50~~ ²⁵⁵ 5-24-94
~~< 5.10~~ E-3 g/L Carbon
 < 4.17 E-4 Molar Carbon

Sample Run By:

RW KING

83645

TCC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICDOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K214-5826

Date: 05/23/94

Time: 12:06:50

Sample Size = 200 uL

Analyst : RW KING

Dil Factor = 1.1

Min Readings = 14

Blank ID # = BLK

Max Readings = 14

Blank Value = .5711148 ug/minute C

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.10	0.00
2	1.01	0.70	85.71
3	1.51	1.20	41.67
4	2.01	1.40	14.29
5	2.51	1.60	12.50
6	3.01	2.00	20.00
7	3.51	2.30	13.04
8	4.01	2.60	11.54
9	4.51	3.00	13.33
10	5.01	3.30	9.09
11	5.51	3.50	3.71
12	6.01	3.90	10.26
13	6.51	4.10	4.08
14	7.00	4.40	6.82

BLANK VALUE = 4 micrograms carbon
BLANK FACTOR = 4 / 7.003845 =

+5.7E-01 ug/min Carbon

SAMPLE RESULTS:

(4.4 - 4.000557) (1.1) / (200) =
(4.4 - 4.000557) (1.1) / (200) (12) =

<5.50 *raws 5-24-94*
~~< 5.00~~ E-3 g/L Carbon
< 4.17 E-4 Molar Carbon

Sample Run By:

RW KING

83645

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K214-5926

Date: 05/23/94

Time: 12:50:41

Sample Size = 200 uL

Dil Factor = 2.5

Blank ID # = BLK

Blank Value = .5711148 ug/minute C

Analyst : RW KING

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.30	0.00
2	1.01	25.50	98.82
3	1.50	49.60	48.59
4	2.00	56.20	11.74
5	2.50	59.00	4.75
6	3.00	60.20	1.99
7	3.50	61.30	1.79
8	4.00	61.90	0.97
9	4.50	62.30	0.64
10	5.00	62.80	0.80
11	5.50	63.10	0.40
12	6.00	63.50	0.63
13	6.50	63.80	0.47
14	7.00	64.20	0.62

BLANK VALUE = 4 micrograms carbon

BLANK FACTOR = 4 / 7.003845 =

+5.7E-01 ug/min Carbon

SAMPLE RESULTS:

(64.2 - 3.999512)(2.5)/(200) =

+7.53E-01 g/L Carbon

(64.2 - 3.999512)(2.5)/(200)(12) =

+6.27E-02 Molar Carbon

Sample Run By:

RW KING

83645

ANALYTICAL BATCH SUMMARY SHEET

METHOD: ^{LA}344-105 ANALYTE: TOC ANALYSIS START DATE: 5-1-94

PREPARED BY: Rob Schroeder SUMMARY DATE: 5-12-94

PROJECT: C-111 UNITS: $\mu\text{g/mL}$ SAMPLE PREP: Direct / Digest

[illegible]

☒ NO SPECIAL PROBLEMS / METHOD VARIATIONS IN THIS BATCH

NARRATIVE-LIST SPECIFIC PROBLEMS / VARIATIONS FOR THIS BATCH:

Robert W. Schroeder

5-12-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Batch 3346

Serial No K 215.-5526	Sample Point C-111	Date 4-28-94	Time Issued 11:14	Priority 21
Determination TOC	Method-Standard LA-344-105	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size .200 ml + 2 ml acid - .200 inject			Customer ID STD	
Remarks, Calculations, Results S356 C03TOC STD# 10N12-C RESULT 3.01 g/L STD VAL 3.00 g/L %REC 100.3 <i>Donald B Griffin</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-1-94	Time Completed 1748	Lab Unit Mgr 5-3-94 <i>RW Schneider</i> <i>Jay Hammond</i>		

54-6800-061 (R-10-83)

WHC-SD-WM-BP-079, REV. 0

TOC: LA-344-105 (B-2)

LIQUIDS

		STANDARD
Type	Sample Volume in mL (SS)	0.200
STANDARD	H2SO4 Volume in mL (VR)	2.000
Work List	Volume Injected in mL (VI)	0.200
3346	Dilution Factor (DF)	11
Test Code	Digest Dilution Factor (DDF)	1
TOC	µg of Carbon in Sample (C1)	58.2
Matrix	µg of Carbon in Blank (C2)	3.5
LIQUID	g of Carbon/L =	3.01E+00
Sample #		
K215-5526		
Instrument Code		
WC16130		
Analyst		
D GRIFFIN		
Date		
05/01/94		
Time		
17:48		

µg Carbon/mL =	3.01E+03	DETECTION LEVEL
		in µg/mL
		5.50E+01

Data Entry by: <i>Jay Hammond</i>	Date: 07-May-94
Approved by: <i>RW Schneider</i>	Date: 5-12-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 216.-5726	Sample Point C-111	Date 4-28-94	Time Issued 11:23	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 0
Sample Size 2 - .200 - .200			Customer ID C58HCB	
Remarks Calculations, Results <p style="text-align: center;">$< 5.50 \text{ E}+0 \text{ ug/mL}$</p> <p><i>Donald B. Griffin</i></p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-1-94	Time Completed 1748	Lab Unit Mgr 5-3-94 <i>RW Schroeder</i>	<i>Jim Humm</i>	

WHC-SD-WM-DP-079, REV. 6

54-6800-061 (R-10-83)

TOC: LA-344-105 (B-2)

LIQUIDS

		SAMPLE
Type	Sample Volume in mL (SS)	2.000
SAMPLE	H2SO4 Volume in mL (VR)	0.200
Work List	Volume Injected in mL (VI)	0.200
3346	Dilution Factor (DF)	1.1
Test Code	Digest Dilution Factor (DDF)	1
TOC	ug of Carbon in Sample (C1)	4.4
Matrix	ug of Carbon in Blank (C2)	3.5
LIQUID	g of Carbon/L =	< 5.50E-03
Sample #	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$	
K216-5726		
Instrument Code	ug of Carbon/mL = g of Carbon/L * 1000000 ug/g / 1000 mL/L	
WC16130		
Analyst	Detection Level (ug/mL) = $\frac{1 \text{ ug C} \cdot DF \cdot DDF}{VI}$	
D GRIFFIN		
Date		
05/01/94		
Time		
17:48		

NOTE: Reported Result is Below Detection Level.

ug Carbon/mL =	< 5.50E+00	DETECTION LEVEL in ug/mL 5.50E+00
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Data Entry by: <i>Jim Humm</i>	Date: 07-May-94
Approved by: <i>RW Schroeder</i>	Date: 5-12-94

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K215

Std

Date: 05/01/94

Time: 17:31:59

Sample Size = 200 uL
Dil Factor = 11
Blank ID # = BLK
Blank Value = .4997298 ug/minute C

Analyst : DG GRIFFIN
Min Readings = 14
Max Readings = 14
% Difference = 10

== Reading	==== Analysis	Time	==== Coulometer	==== % Difference	==
1	0.51		0.70	0.00	
2	1.01		19.30	96.37	
3	1.51		38.80	50.26	
4	2.01		47.20	17.80	
5	2.51		50.90	7.27	
6	3.01		53.50	4.86	
7	3.51		55.30	3.25	
8	4.01		55.80	0.90	
9	4.51		56.20	0.71	
10	5.01		56.70	0.88	
11	5.51		57.10	0.70	
12	6.01		57.50	0.70	
13	6.51		57.90	0.69	
14	7.01		58.20	0.52	

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 168 TO 170.

BLANK VALUE = 3.5 micrograms carbon
BLANK FACTOR = 3.5 / 7.003784 =

+5.0E-01 ug/min Carbon

SAMPLE RESULTS:

(58.2 - 3.500915)(11)/(200) = +3.01E+00 g/L Carbon
(58.2 - 3.500915)(11)/(200)(12) = +2.51E-01 Molar Carbon

Sample Run By:

D.S. Griffin
DG GRIFFIN

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

<<< BLANK ANALYSIS >>> WHC-SD-WM-DP-079, REV. 0

Sample: BLK

Date: 05/01/94

Time: 17:18:33

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = N/A

Analyst : DG GRIFFIN

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.20	0.00
3	1.50	0.40	50.00
4	2.00	0.80	50.00
5	2.50	1.00	20.00
6	3.00	1.20	16.67
7	3.50	1.50	20.00
8	4.00	1.80	16.67
9	4.50	2.50	28.00
10	5.00	2.60	3.85
11	5.50	3.10	16.13
12	6.00	3.10	0.00
13	6.50	3.50	11.43
14	7.00	3.50	0.00

BLANK VALUE = 3.5 micrograms carbon

BLANK FACTOR = $3.5 / 7.003784 =$

+5.0E-01 ug/min Carbon

Sample Run By:

D. B. Griffin
DG GRIFFIN

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TIC/OC REV 2.0

WHC-SD-WM-DP-079, REV. 0

Sample: K216

Date: 05/01/94

Time: 17:48:45

Sample Size = 200 uL

Dil Factor = 1.1

Blank ID # = BLK

Blank Value = .4997298 ug/minute C

Analyst : DG GRIFFIN

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.20	0.00
2	1.01	0.80	75.00
3	1.51	1.50	46.67
4	2.01	1.70	11.76
5	2.51	2.00	15.00
6	3.01	2.40	16.67
7	3.51	2.80	14.29
8	4.01	2.80	0.00
9	4.51	3.10	9.68
10	5.01	3.40	8.82
11	5.51	3.60	5.56
12	6.01	3.90	7.69
13	6.50	4.10	4.88
14	7.00	4.40	6.82

BLANK VALUE = 3.5 micrograms carbon

BLANK FACTOR = 3.5 / 7.003784 =

+5.0E-01 ug/min Carbon

SAMPLE RESULTS:

(4.4 - 3.500488) (1.1) / (200) =

(4.4 - 3.500488) (1.1) / (200) (12) =

< 5.50 *RWS 5-3-94*

< 5.62 E-3 g/L Carbon

< 4.17 E-4 Molar Carbon

Sample Run By:

DG Griffin
DG GRIFFIN

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No. <i>K209-211</i>	Customer ID: <i>C5851</i>
Analysis: <i>ICP</i>	Sample Prep: <i>FUS</i>

Instrument: <i>WB 39839</i>	Procedure/ Rev: <i>LA-505-151 / D-1</i>
Technologist: <i>B. GOECKE</i>	Date: <i>6-28-84</i>
Starting Time: <i>12:00</i>	Temperature <i>NA.</i>
Ending Time: <i>15:00</i>	Chemist: <i>B. WELLS</i>

Comments: _____

	Description	Lab ID		Description	Lab ID
1	SST4 (ICV) STD	K209-5530	11		
2	C-III, D/G. BLK CSES1	K210-6650	12		
3	C-III, STN., CSES1 LAD	K211-6755	13		
4	C-III, Dup, CSES1	K211-6855	14		
5	C-III, post spillie, CSES1	K211-6950	15		
6			16		
7			17		
8			18		
9			19		
10			20		

[illegible]

INDUCTIVELY COUPLED PLASMA ANALYSIS - FUSIONWHC-SD-WM-DP-079, REV. 0

Batch 3817

Serial No	Sample Point	Date	Time Issued	Priority
N 208.-5550	C-111	4-25-84	14:54	23
Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	N403E	0
Sample Size	Customer ID			
? SSTY 326410 DIRECT (I.V)				STD
Remarks, Calculations, Results				
LMOS CHECK SAMPLE				
Ni 5.075 / 5 (100) = 101.50% ✓				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Hrs	Hrs	Hrs	Hrs	Hrs
		<i>[Signature]</i>	<i>[Signature]</i>	
Date	Time Completed	Lab Unit Mgr		
6-25-84	14:20	S. Pang	6-29-84	

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
N 210.-0450	C-111	4-25-84	14:55	23
Determination	Method Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	UG/ML	N403E	0
Sample Size	Customer ID			
? DIRECT, DIGESTED BLANK				BLANK
Remarks, Calculations, Results				
REAGENT BLANK				
Ni only				
Ni .061 ✓				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Hrs	Hrs	Hrs	Hrs	Hrs
		<i>[Signature]</i>	<i>[Signature]</i>	
Date	Time Completed	Lab Unit Mgr		
6-25-84	14:20	S. Pang	6-29-84	

54-6800-061 (R-10-83)

INDUCTIVELY COUPLED PLASMA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-6755	C-111	4-25-84	14:57	23
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP-SOL	LA-505-151	ug/G Rec	N403B	0
Sample Size	Customer ID			
? .7259 g in 250ul - 1ul-9ul - 1ul-4ul C58S1				
Remarks Calculations Results				
$Ni \ 5.867(250)(10)/.7259 = 2.02E4 \checkmark$ <p>REPORTED 10x sample dil.</p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i> Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr		
6-28-84	14:20	S. Parry	6-28-84	

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-6855	C-111	4-25-84	14:57	23
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP-SOL	LA-505-151	ug/G Rec	N403B	0
Sample Size	Customer ID			
? .7315 g in 250ul - 1ul-9ul - 1ul-4ul C58S1				
Remarks Calculations Results				
<p>DUPLICATE SAMPLE</p> $Ni \ 5.814(250)(10)/.7315 = 1.99E4 \checkmark$ <p>REPORTED 10x dup. dil.</p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i> Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr		
6-28-84	14:20	S. Parry	6-28-84	

54-6800-061 (R-10-83)

INDUCTIVELY COUPLED PLASMA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-6950	C-111	4-25-94	14:57	23
Determination	Method Standard	Result Units	Charge Code	Reuns
ICP	LA-505-151	% RECOVERY	N403B	0
Sample Size			Customer ID	
? 1ml sample - 9ml			C58S1	
Remarks, Calculations, Results				
<p>SAMPLE SPIKED ID</p> <p>SPIKE ID 326416</p> <p>SPIKE VOLUME 2ml</p> <p>Ni $6.907 - 5.867 = 1.04 / 1 (100) = 104.00\%$ ✓</p>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
His	His	His	His	His
		<i>[Signature]</i>	<i>[Signature]</i>	
Date	Time Completed	Lab Unit Mgr		
6-29-94	14:20	67100/54 S-Pang	6-29-94	

54-680C-DE1 (R-10-23)

Identity 1: wp-284 Identity 2: wp-284 12:40 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.001	0.001	0.007	0.344	0.152	0.044	0.010	0.001
S.D.	0.000	0.000	0.006	0.002	0.010	0.001	0.001	0.001
% R.S.D.	23.669	23.106	84.723	0.605	6.328	3.338	8.510	104.088
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.014	0.018	-0.001	0.030	0.025	0.006	-0.008	0.070
S.D.	0.000	0.003	0.000	0.003	0.000	0.001	0.025	0.063
% R.S.D.	1.984	16.128	2.654	11.141	1.063	14.957	317.249	90.085
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.030	-0.008	0.029	-0.002	0.100	0.001	0.026	0.116
S.D.	0.010	0.011	0.000	0.001	0.003	0.000	0.005	0.003
% R.S.D.	33.367	135.278	0.504	58.107	3.356	10.574	19.234	2.655
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.001	0.008	-0.001	0.042	-0.000	0.009	0.040	-0.001
S.D.	0.000	0.013	0.000	0.011	0.001	0.001	0.001	0.009
% R.S.D.	9.677	162.579	34.798	25.518	1176.762	7.080	2.129	844.205
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.014	0.045	0.132	0.030	0.010			
S.D.	0.000	0.028	0.000	0.000	0.024			
% R.S.D.	1.474	61.989	0.338	0.567	244.261			

K 208-211
C-111 FUS
Ni ONLY
JAC 6-29-94

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 175 TO 192 .

Identity 1: icv Identity 2: 32b48b

12:45 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	5.014	5.017	5.002	4.257	4.951	5.028	5.117	5.035
S.D.	0.008	0.011	0.027	0.008	0.006	0.016	0.010	0.015
% R.S.D.	0.168	0.218	0.543	0.195	0.127	0.316	0.204	0.307
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	5.043	5.075	5.110	5.099	4.770	5.079	5.285	9.654
S.D.	0.010	0.004	0.004	0.012	0.010	0.004	0.019	0.052
% R.S.D.	0.199	0.074	0.087	0.228	0.208	0.072	0.356	0.536
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	4.994	4.973	5.053	4.192	4.663	5.044	5.016	5.017
S.D.	0.019	0.008	0.009	0.118	0.077	0.011	0.001	0.021
% R.S.D.	0.380	0.154	0.181	2.815	1.657	0.223	0.021	0.417
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	5.056	5.504	5.327	5.044	4.930	5.120	4.996	5.154
S.D.	0.022	0.030	0.004	0.014	0.010	0.008	0.013	0.036
% R.S.D.	0.435	0.547	0.067	0.273	0.207	0.158	0.253	0.698
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	5.084	4.901	5.091	5.187	5.026			
S.D.	0.006	0.054	0.003	0.013	0.024			
% R.S.D.	0.112	1.110	0.067	0.251	0.471			

Identity 1: icb Identity 2: icb 12:48 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.001	0.001	-0.007	-0.005	0.004	-0.002	0.003	0.002
S.D.	0.001	0.000	0.007	0.001	0.008	0.000	0.001	0.001
% R.S.D.	92.781	5.793	93.559	19.653	176.751	23.589	24.290	34.084

	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.001	0.001	-0.008	-0.003	0.001	0.001	0.007	-0.136
S.D.	0.000	0.001	0.002	0.001	0.000	0.001	0.016	0.064
% R.S.D.	44.034	119.799	24.545	25.745	24.358	207.289	237.018	46.990

	Ce	Sm	Ba	P	S	Hg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.004	-0.047	0.000	-0.009	-0.004	0.001	-0.005	0.032
S.D.	0.009	0.016	0.000	0.007	0.001	0.000	0.001	0.007
% R.S.D.	195.794	33.460	234.767	75.729	24.388	25.954	10.386	22.348

	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.024	-0.001	0.000	0.000	0.002	0.007	-0.067
S.D.	0.000	0.013	0.000	0.008	0.000	0.001	0.001	0.013
% R.S.D.	21.473	52.485	27.042	21660.219	894.765	24.588	12.522	19.340

	Mn	Sb	V	Be	Tl
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.000	0.021	-0.002	0.001	-0.043
S.D.	0.000	0.015	0.001	0.000	0.029
% R.S.D.	82.280	71.613	37.273	8.983	67.425

Identity 1: icsa_i Identity 2: icsa 12:51 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.001	0.007	-0.007	0.253	193.742 ✓	0.003	-0.007	0.002
S.D.	0.000	0.000	0.004	0.005	171.470	0.000	0.000	0.000
% R.S.D.	56.518	0.356	55.096	1.936	88.504	4.149	6.223	14.546

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.017	-0.031	0.029	137.206 ✓	-1.049	0.002	1.141	0.050
S.D.	0.000	0.001	0.003	0.593	0.000	0.001	0.015	0.026
% R.S.D.	0.617	3.744	10.117	0.432	0.000	68.413	1.349	51.578

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.001	0.393	0.002	0.070	2.657	154.734 ✓	0.048	0.216
S.D.	0.004	0.009	0.000	0.001	0.018	0.080	0.003	0.002
% R.S.D.	374.992	2.232	2.066	0.944	0.673	0.051	5.635	0.821

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.003	0.030	-0.004 ✓	-0.102	0.000	-0.003	-0.012	-0.018
S.D.	0.000	0.015	0.000	0.091	0.000	0.000	0.001	0.016
% R.S.D.	12.613	49.201	6.110	89.781	75.018	14.433	11.103	86.571

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.101	0.015	-0.001	0.003	-0.046
S.D.	0.000	0.016	0.000	0.000	0.006
% R.S.D.	0.284	103.657	23.312	4.651	12.410

Identity 1: xxx Identity 2: rinse

12:58 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.002	0.000	-0.027	-0.002	0.027	-0.001	0.002	0.002
S.D.	0.000	0.000	0.018	0.003	0.003	0.001	0.000	0.000
% R.S.D.	21.070	7.206	68.580	174.069	11.246	62.291	28.804	6.184

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	-0.000	0.002	-0.003	0.006	0.030	0.001	-0.025	0.137
S.D.	0.000	0.001	0.003	0.001	0.001	0.002	0.013	0.027
% R.S.D.	388.529	53.031	134.436	18.068	4.742	323.060	50.635	19.584

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.003	0.015	0.000	-0.007	-0.001	0.013	0.005	0.006
S.D.	0.004	0.004	0.000	0.011	0.003	0.000	0.001	0.013
% R.S.D.	131.581	24.346	36.548	166.357	230.144	3.264	16.686	208.182

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.002	-0.022	0.000	-0.001	0.001	-0.000	0.001	-0.055
S.D.	0.001	0.005	0.000	0.009	0.000	0.000	0.001	0.017
% R.S.D.	26.643	20.846	443.563	1252.985	24.414	389.898	173.389	31.132

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.000	-0.011	-0.001	0.001	0.012
S.D.	0.000	0.017	0.001	0.000	0.007
% R.S.D.	343.993	158.187	50.174	35.796	61.646

Identity 1: K210 dig blk Identity 2: direct

1:02 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	4.054	0.003	0.002	0.193	0.080	-0.002	0.005	0.000
S.D.	0.032	0.000	0.010	0.006	0.022	0.002	0.002	0.002
% R.S.D.	0.791	15.350	573.516	2.961	27.262	82.787	44.866	468.623

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.010	0.061	-0.000	0.098	0.148	0.005	-0.042	1.035
S.D.	0.001	0.001	0.002	0.004	0.001	0.001	0.031	0.179
% R.S.D.	5.549	2.258	882.683	4.044	0.958	18.874	72.562	17.326

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.024	-0.014	0.020	0.003	0.021	0.034	-0.001	3.809
S.D.	0.038	0.059	0.001	0.009	0.009	0.002	0.003	0.044
% R.S.D.	159.320	419.464	4.025	270.445	44.433	6.634	334.369	1.144

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.008	-0.013	0.005	-0.003	0.004	0.000	0.001	-113.663
S.D.	0.001	0.012	0.003	0.008	0.001	0.001	0.002	0.000
% R.S.D.	13.912	91.530	60.253	242.999	25.559	252.083	207.778	0.000

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.001	0.000	0.038	0.001	-0.006
S.D.	0.000	0.021	0.002	0.000	0.042
% R.S.D.	16.521	13412.745	5.138	22.336	756.922

Identity 1: K211 .7259gin250ml Identity 2: 1ml-9ml-1ml-4ml

1:08 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.096	0.009	0.098	0.517	8.946	-0.001	0.009	0.002
S.D.	0.000	0.000	0.003	0.002	0.019	0.001	0.000	0.000
% R.S.D.	0.503	1.108	3.205	0.338	0.216	112.984	0.866	21.499

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.048	1.257	0.023	3.379	0.477	0.009	0.028	0.220
S.D.	0.000	0.008	0.002	0.013	0.001	0.002	0.011	0.070
% R.S.D.	0.330	0.640	6.640	0.395	0.293	21.427	38.703	31.799

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.038	-0.021	0.003	0.098	0.067	0.031	0.002	2.414
S.D.	0.012	0.017	0.000	0.007	0.004	0.001	0.003	0.003
% R.S.D.	30.257	83.346	7.637	7.625	6.366	2.240	139.228	0.127

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.001	0.027	0.002	0.363	0.013	0.001	-0.001	258.508
S.D.	0.001	0.015	0.001	0.007	0.001	0.000	0.001	0.545
% R.S.D.	57.824	54.530	28.751	2.055	3.896	22.366	188.019	0.211

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.011	0.016	-0.000	0.001	-0.017
S.D.	0.000	0.023	0.000	0.000	0.018
% R.S.D.	1.999	141.784	115.576	23.791	101.575

Identity 1: K211 .7315gin250ml Identity 2: 1ml-9ml-1ml-4ml

1:11 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.034	0.009	0.093	0.583	7.702	0.003	0.005	0.001
S.D.	0.001	0.000	0.006	0.002	0.023	0.000	0.000	0.001
% R.S.D.	3.052	1.463	6.674	0.407	0.299	2.999	8.725	55.852

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.011	1.202	0.026	3.414	0.533	0.005	0.031	0.444
S.D.	0.000	0.006	0.002	0.005	0.001	0.001	0.016	0.063
% R.S.D.	1.586	0.466	6.776	0.148	0.272	13.956	52.459	14.092

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.052	0.035	0.004	0.167	0.061	0.030	0.003	2.451
S.D.	0.017	0.019	0.000	0.017	0.002	0.000	0.004	0.003
% R.S.D.	33.593	52.708	7.072	10.010	4.049	0.600	156.462	0.125

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.001	0.011	0.004	0.341	0.017	0.000	-0.002	229.205
S.D.	0.001	0.010	0.000	0.005	0.000	0.000	0.001	0.576
% R.S.D.	192.143	95.505	9.888	1.341	2.311	91.049	33.273	0.251

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.011	0.048	0.000	0.000	0.061
S.D.	0.000	0.007	0.000	0.000	0.015
% R.S.D.	1.545	14.736	93.081	36.027	24.335

Identity 1: K211 sam dil Identity 2: .7259gin250ml-1-9

1:17 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.453	0.040	0.466	2.552	42.096	0.001	0.021	0.002
S.D.	0.002	0.000	0.013	0.017	0.310	0.002	0.000	0.000
% R.S.D.	0.479	0.485	2.739	0.652	0.737	238.019	0.669	20.654
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.037	5.867	0.127	15.837	2.150	0.033	0.180	1.548
S.D.	0.001	0.027	0.004	0.058	0.008	0.000	0.010	0.011
% R.S.D.	1.741	0.452	3.158	0.363	0.368	1.162	5.323	0.703
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.170	0.067	0.017	0.733	0.269	0.119	-0.001	10.997
S.D.	0.007	0.006	0.000	0.012	0.001	0.001	0.003	0.052
% R.S.D.	4.347	9.201	1.021	1.637	0.280	0.564	363.336	0.476
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.003	0.029	0.008	1.694	0.066	0.001	-0.000	1182.971
S.D.	0.001	0.006	0.000	0.008	0.001	0.000	0.001	2.533
% R.S.D.	35.304	20.274	5.629	0.498	0.959	9.098	985.687	0.214
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.049	0.006	0.008	0.001	0.007			
S.D.	0.001	0.010	0.001	0.000	0.010			
% R.S.D.	1.132	179.346	10.871	16.684	147.882			

Identity 1: K211 dup dil Identity 2: .7315gin250ml-1-9

1:20 PM June 29, 1994

Task name : TWC93

WHC-SD-WM-DP-079, REV. 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.148	0.042	0.494	2.877	37.756	0.003	0.022	0.003
S.D.	0.001	0.000	0.011	0.002	0.033	0.001	0.001	0.001
% R.S.D.	0.848	0.077	2.229	0.086	0.088	31.749	3.142	29.393
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.051	5.814	0.125	16.582	2.530	0.034	0.176	1.357
S.D.	0.000	0.007	0.003	0.029	0.006	0.000	0.007	0.070
% R.S.D.	0.267	0.118	2.106	0.176	0.219	1.289	4.048	5.193
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.166	-0.016	0.016	1.008	0.301	0.134	0.002	11.924
S.D.	0.013	0.022	0.000	0.006	0.003	0.000	0.000	0.011
% R.S.D.	7.622	138.029	2.414	0.574	1.050	0.159	15.273	0.090
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.000	0.005	0.002	1.750	0.079	0.011	0.001	1073.485
S.D.	0.000	0.008	0.001	0.005	0.000	0.015	0.001	3.228
% R.S.D.	67.604	164.655	42.268	0.280	0.577	134.551	152.849	0.301
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	0.054	0.009	0.002	0.001	-0.039			
S.D.	0.000	0.013	0.001	0.000	0.020			
% R.S.D.	0.204	134.228	59.507	11.776	52.561			

Identity 1: K211 post spike Identity 2: 1ml sample - 9ml

1:24 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	1.437	1.010	1.439	3.443	43.362	0.971	1.008	0.973
S.D.	0.006	0.006	0.012	0.021	0.243	0.008	0.006	0.005
% R.S.D.	0.440	0.623	0.846	0.623	0.561	0.814	0.561	0.522
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.990	6.907	1.106	16.867	3.064	1.010	1.168	3.363
S.D.	0.005	0.036	0.007	0.119	0.019	0.007	0.003	0.079
% R.S.D.	0.552	0.516	0.660	0.707	0.604	0.658	0.278	2.340
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	1.155	1.039	0.992	1.605	1.215	1.084	0.994	11.998
S.D.	0.006	0.018	0.006	0.017	0.015	0.006	0.005	0.070
% R.S.D.	0.512	1.690	0.591	1.068	1.215	0.529	0.547	0.582
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.989	1.064	1.006	2.666	1.022	0.970	0.958	1178.180
S.D.	0.006	0.016	0.004	0.007	0.006	0.004	0.003	4.923
% R.S.D.	0.557	1.536	0.438	0.272	0.608	0.430	0.274	0.418
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	1.017	0.973	0.990	1.003	0.931			
S.D.	0.005	0.009	0.007	0.006	0.023			
% R.S.D.	0.472	0.905	0.690	0.612	2.477			

Identity 1: ccv_1 Identity 2: ccv 1:27 PM June 29, 1994

Task name : TWC93

WHC-SD-WM-DP-079, REV. 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	5.110	5.123	5.162	4.352	5.108	5.151	5.207	5.137
S.D.	0.021	0.028	0.008	0.015	0.024	0.019	0.024	0.030
% R.S.D.	0.416	0.538	0.156	0.335	0.463	0.374	0.457	0.588
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	5.152	5.175	5.183	5.225	4.848	5.178	5.307	9.811
S.D.	0.020	0.014	0.028	0.030	0.027	0.018	0.018	0.079
% R.S.D.	0.391	0.276	0.532	0.578	0.547	0.352	0.347	0.807
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	5.206	5.220	5.152	4.731	4.979	5.157	5.148	5.108
S.D.	0.008	0.005	0.028	0.053	0.039	0.022	0.016	0.008
% R.S.D.	0.152	0.104	0.553	1.123	0.787	0.436	0.304	0.159
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	5.194	5.602	2.694	5.159	5.039	5.225	5.085	6.795
S.D.	0.020	0.042	0.016	0.019	0.024	0.014	0.021	0.167
% R.S.D.	0.384	0.754	0.586	0.367	0.483	0.260	0.417	2.451
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	5.181	4.966	5.189	5.314	5.122			
S.D.	0.017	0.042	0.023	0.026	0.026			
% R.S.D.	0.334	0.848	0.434	0.498	0.509			

Identity 1: ccb_1 Identity 2: ccb 1:31 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.002	-0.032	0.009	0.007	-0.000	0.002	0.003
S.D.	0.001	0.000	0.007	0.002	0.007	0.001	0.000	0.000
% R.S.D.	31.423	3.293	20.509	22.309	96.992	395.204	4.950	8.657

	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.001	-0.005	-0.001	0.033	-0.000	-0.008	0.095
S.D.	0.000	0.002	0.002	0.002	0.000	0.000	0.016	0.057
% R.S.D.	7.734	252.747	44.889	129.022	0.189	187.075	201.436	60.501

	Ce	Sm	Ba	P	S	Hg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.000	0.012	0.002	0.000	0.001	0.002	0.005	0.010
S.D.	0.004	0.015	0.000	0.002	0.002	0.000	0.003	0.010
% R.S.D.	1881.862	119.792	11.593	549.999	165.425	3.132	53.189	96.438

	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.011	0.367	0.007	0.002	0.002	0.005	0.498
S.D.	0.001	0.014	0.004	0.001	0.000	0.000	0.001	0.035
% R.S.D.	35.642	133.828	1.168	16.191	9.513	14.424	18.300	7.107

	Mn	Sb	V	Be	Tl
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.008	0.001	0.002	0.035
S.D.	0.000	0.008	0.000	0.000	0.006
% R.S.D.	16.070	97.905	13.575	3.577	18.609

Mean	0.003	0.008	0.002	0.002	0.256	296.437	0.004	-0.006	0.000	0.000	8.788
S.D.	-0.003	0.000	0.000	0.005	0.005	0.003	0.004	0.000	0.000	0.000	0.000
% R.S.D.	23.501	0.320	295.378	1.315	0.946	0.319	8.544	3.199	0.000	0.000	0.000
Zn	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.016	-0.036	0.024	139.003	-1.068	0.002	0.002	1.178	-0.028	0.039	140.184
S.D.	0.000	0.003	0.001	0.850	0.611	0.000	0.001	0.013	-0.028	0.039	140.184
% R.S.D.	1.012	7.286	5.837	0.611	0.611	0.000	38.371	1.126	-0.028	0.039	140.184
Ce	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.022	0.349	0.002	0.086	2.664	155.458	0.050	0.050	0.236	0.005	2.259
S.D.	0.004	0.008	0.000	0.012	0.064	0.103	0.005	0.005	0.005	0.005	0.005
% R.S.D.	19.548	2.401	9.297	13.732	2.399	0.066	9.269	9.269	2.259	0.005	2.259
Se	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.012	0.016	-0.054	-0.000	-0.003	-0.014	-0.014	0.377	0.004	1.143
S.D.	0.001	0.021	0.001	0.001	0.000	0.000	0.001	0.001	0.004	0.004	0.004
% R.S.D.	30.215	178.322	5.113	1.679	128.573	8.493	4.438	4.438	0.377	0.004	1.143
Mn	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.102	0.053	-0.001	0.003	-0.049	39.033	0.019	0.019	0.377	0.004	1.143
S.D.	0.000	0.010	0.001	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.004
% R.S.D.	0.473	18.499	68.048	3.444	39.033	0.019	0.019	0.019	0.377	0.004	1.143
Sb	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
V	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Be	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Tl	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Ag	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Pb	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Pd	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
P	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
S	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Hg	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
As	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Na	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
K	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)

WHC-SD-WM-DP-079, REV. 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

Task name : TWC93

Identity 1: fcsa Identity 2: fcsa

1:35 PM June 29, 1994

Identity 1: icsab_f Identity 2: icsab

1:38 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.035	0.011	0.145	0.301	182.087	0.436	0.467	0.018
S.D.	0.071	0.007	0.251	0.107	162.645	0.010	0.010	0.029
% R.S.D.	205.494	64.767	173.652	35.391	89.323	2.351	2.156	167.811

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.904	0.832	0.044	131.421	-1.039	0.452	1.259	2.035
S.D.	0.042	0.021	0.042	8.226	0.000	0.011	0.226	4.094
% R.S.D.	4.657	2.576	94.913	6.259	0.000	2.336	17.993	201.198

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.386	0.852	0.461	0.130	2.568	150.334	0.048	0.370
S.D.	0.670	1.012	0.021	0.055	0.054	5.796	0.034	0.304
% R.S.D.	173.615	118.719	4.641	42.779	2.087	3.856	71.224	82.309

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.006	0.085	0.654	0.820	0.013	0.875	-0.005	1.063
S.D.	0.014	0.140	0.009	0.160	0.025	0.026	0.017	0.777
% R.S.D.	261.283	165.978	1.315	19.486	195.773	2.953	351.775	73.078

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.539	0.170	0.465	0.450	0.561
S.D.	0.031	0.147	0.011	0.030	1.222
% R.S.D.	5.770	86.962	2.320	6.638	218.031

Identity 1: xxx Identity 2: rinse 1:42 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.001	0.000	-0.019	-0.002	0.056	0.001	0.000	0.000
S.D.	0.001	0.000	0.009	0.002	0.009	0.001	0.000	0.001
% R.S.D.	78.668	15.362	49.460	103.416	16.707	66.733	288.678	290.905

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.005	0.001	-0.002	0.028	0.068	-0.001	-0.025	-0.004
S.D.	0.000	0.001	0.003	0.001	0.004	0.001	0.013	0.044
% R.S.D.	0.603	133.865	133.416	4.356	5.195	68.255	52.795	1184.343

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.000	-0.006	0.000	-0.016	-0.005	0.053	-0.003	0.016
S.D.	0.008	0.011	0.000	0.007	0.003	0.004	0.002	0.011
% R.S.D.	2725.063	176.787	461.773	43.448	56.543	7.328	79.872	65.848

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.000	0.006	0.682	-0.007	-0.000	0.001	-0.001	0.162
S.D.	0.000	0.006	0.022	0.004	0.000	0.000	0.001	0.005
% R.S.D.	952.586	96.243	3.268	52.020	286.628	23.074	79.726	3.023

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.000	-0.004	-0.001	0.001	0.007
S.D.	0.000	0.007	0.000	0.000	0.003
% R.S.D.	168.375	176.061	52.389	0.538	35.844

Identity 1: ccv_2 Identity 2: ccv

1:45 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	5.274	5.267	5.244	4.470	5.351	5.286	5.377	5.290
S.D.	0.029	0.034	0.037	0.019	0.010	0.025	0.033	0.030
% R.S.D.	0.557	0.648	0.698	0.429	0.186	0.472	0.617	0.572
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	5.307	5.339	5.365	5.449	5.058	5.345	5.579	10.273
S.D.	0.024	0.025	0.025	0.028	0.025	0.031	0.024	0.013
% R.S.D.	0.456	0.464	0.472	0.506	0.497	0.578	0.426	0.130
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	5.272	5.342	5.301	5.138	5.170	5.380	5.284	5.266
S.D.	0.018	0.028	0.035	0.131	0.079	0.018	0.034	0.023
% R.S.D.	0.337	0.518	0.652	2.558	1.520	0.325	0.649	0.442
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	5.322	5.756	3.656	5.350	5.186	5.391	5.287	5.741
S.D.	0.029	0.043	0.265	0.025	0.028	0.023	0.040	0.036
% R.S.D.	0.552	0.755	7.241	0.476	0.542	0.432	0.756	0.623
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	5.348	5.140	5.363	5.477	5.266			
S.D.	0.029	0.040	0.031	0.032	0.021			
% R.S.D.	0.551	0.780	0.570	0.579	0.398			

Identity 1: ccb_2 Identity 2: ccb 1:49 PM June 29, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.005	0.001	-0.006	0.011	0.026	0.002	0.003	0.003
S.D.	0.002	0.000	0.007	0.003	0.004	0.001	0.001	0.001
% R.S.D.	38.171	13.871	117.545	26.443	16.447	29.896	21.826	34.850
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.020	0.003	-0.000	0.007	0.039	0.001	-0.020	0.287
S.D.	0.001	0.002	0.004	0.003	0.000	0.001	0.011	0.115
% R.S.D.	3.499	64.300	1634.606	36.187	0.868	145.307	55.726	40.025
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.047	0.073	0.002	-0.000	0.005	0.014	-0.002	0.020
S.D.	0.017	0.029	0.001	0.009	0.001	0.000	0.002	0.008
% R.S.D.	36.868	39.440	21.970	4870.410	18.456	1.488	72.944	39.687
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.002	0.014	0.797	0.000	0.003	0.002	0.005	0.150
S.D.	0.000	0.005	0.014	0.005	0.001	0.001	0.002	0.032
% R.S.D.	6.939	32.991	1.704	7313.218	29.858	25.831	40.713	21.469
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.002	0.021	0.002	0.001	0.115			
S.D.	0.000	0.012	0.000	0.000	0.026			
% R.S.D.	11.957	59.771	15.428	5.841	22.580			

Handwritten signature
6-29-94

WHC-SD-WM-DP-078, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No.

K 212-14+16

Customer ID:

C58FB C58HCB CIII

Analysis:

Иср

Sample Prep:

ADONÉ

Instrument:

WB 35939

Procedure/ Rev:

LA-505-151 / 15-1

Technologist:

B. G. ECKE

Date:

5-20-94

Starting Time:

13:20

Temperature

NA

Ending Time:

15.30

Chemist:

B. WIELS

Comments:

	Description	Lab ID
1	ICV (SSY)	K212-5550
2	ICB	K213-5650
3	C-III SAM C58FB	K214-5750
4	C-III DUP C58FB	K214-5850
5	C-III SAM C58/ICB	K216-5750
6	POST SPIKE	K214-5950
7	CCV-1	---
8	CCB-1	---
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

[illegible]

INDUCTIVELY COUPLED PLASMA ANALYSIS

WHC-SD-WM-DP-079, REV. 0

Batch 3277

Serial No	Sample Point	Date	Time Issued	Priority
K 212.-5550	C-111	4-27-94	10: 2	21
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP	LA-505-151	% RECOVERY	N4C3B	0
Sample Size	Customer ID			
<i>ICV (SST4 30848) DIRECT</i> STD				
Remarks, Calculations, Results				
LMCS CHECK SAMPLE <i>Ni 4.98 = 99.72 % /</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>B. Laxche</i>				
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr		
5-20-94		<i>S. H. Parry</i>	<i>6-1-94</i> <i>05/24/94</i>	

54-680C-061 (R-10-B31)

Serial No	Sample Point	Date	Time Issued	Priority
K 213.-5650	C-111	4-27-94	10: 7	21
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP	LA-505-151	UG/ML	N4C3B	0
Sample Size	Customer ID			
<i>ICB (HND, BLK)</i> BLANK				
Remarks, Calculations, Results				
REAGENT BLANK <i>Ni ND < 0.020</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>B. Laxche</i>				
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr		
5-20-94		<i>S. H. Parry</i>	<i>6-1-94</i> <i>05/24/94</i>	

54-680C-061 (R-10-B31)

INDUCTIVELY COUPLED PLASMA ANALYSIS

WHC-SD-WM-DP-079, REV.0

Serial No	Sample Point	Date	Time Issued	Priority
K 214.-5750	C-111	4-27-94	10:17	21
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP-LIQ	LA-505-151	UG/ML	N4C3B	0
Sample Size	Customer ID			
DIRECT				
Remarks Calculations Results				
Ni ND < 0.020 ✓				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Mrs	Mrs	Mrs	Mrs	Mrs
		<i>[Signature]</i>	C	
Date	Time Completed	Lab Unit Mgr		
5-20-94		S.M. Pang	6-1-94	
		05/24/94		

54-EEOC-DE1 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
K 214.-5850	C-111	4-27-94	10:17	21
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP-LIQ	LA-505-151	UG/ML	N4C3B	0
Sample Size	Customer ID			
DIRECT				
Remarks Calculations Results				
DUPLICATE SAMPLE				
Ni ND < 0.020 ✓				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Mrs	Mrs	Mrs	Mrs	Mrs
		<i>[Signature]</i>		
Date	Time Completed	Lab Unit Mgr		
5-20-94		S.M. Pang	6-1-94	
		05/24/94		

54-EEOC-DE1 (R-10-83)

INDUCTIVELY COUPLED PLASMA ANALYSIS

WHC-SD-WM-DP-079, REV. 0

Series No	Sample Point	Date	Time Issued	Priority
K 214.-5950	C-111	4-27-94	10:17	21
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP	LA-505-151	% RECOVERY	N4C3E	0
Sample Size	Customer ID			
1ml sample - 4/27	C58FE			
Remarks Calculations Results				
SAMPLE SPIKED ID SPIKE ID 30848 SPIKE VOLUME 1ml Ni = 101.4 % ✓				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
His	His	His	His	His
Date	Time Completed	Lab Unit Mgr		
5-25-94		S.M. Pany <i>[Signature]</i>	4-1-94	
		5/24/94	54-68DC-061 (R 10-83)	

Series No	Sample Point	Date	Time Issued	Priority
K 216.-5750	C-111	4-28-94	11:23	21
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP-LIQ	LA-505-151	ug/ML	N4C3B	0
Sample Size	Customer ID			
DIRECT	C58HCB			
Remarks Calculations Results				
Ni = 7.30 E-2 ✓				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
His	His	His	His	His
Date	Time Completed	Lab Unit Mgr		
5-20-94		S.M. Pany <i>[Signature]</i>	4-1-94	
		5/24/94	54-68DC-061 (R 10-83)	

Identity 1: wp-284 Identity 2: wp-284 1:49 PM May 20, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.003	0.001	-0.018	0.378	0.129	0.046	0.010	0.001
S.D.	0.001	0.000	0.003	0.005	0.003	0.001	0.000	0.000
% R.S.D.	17.994	13.412	17.643	1.355	2.135	2.719	3.519	43.953
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.019	0.014	-0.005	0.029	0.036	0.005	-0.011	-0.213
S.D.	0.000	0.001	0.002	0.002	0.000	0.000	0.005	0.018
% R.S.D.	0.956	9.699	38.319	7.643	0.195	4.886	46.359	8.265
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.063	-0.049	0.027	-0.011	0.079	0.001	0.035	0.111
S.D.	0.003	0.003	0.000	0.010	0.002	0.000	0.005	0.006
% R.S.D.	4.957	6.298	0.532	91.123	3.015	4.949	14.774	5.000
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.000	0.026	-0.002	0.045	-0.000	0.011	0.039	-0.083
S.D.	0.001	0.010	0.000	0.001	0.000	0.000	0.000	0.013
% R.S.D.	348.003	38.708	12.051	1.154	199.791	4.678	0.557	15.953
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	0.013	-0.026	0.133	0.030	-0.069			
S.D.	0.000	0.001	0.001	0.000	0.006			
% R.S.D.	1.933	4.071	0.929	1.063	8.018			

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 198 TO 205 .

Jesus Diaz
12-1-94

Identity 1: ICV Identity 2: Quality Control

1:53 PM May 20, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	4.940	4.772	4.900	4.740	4.866	4.971	4.954	4.841
S.D.	0.002	0.008	0.025	0.003	0.008	0.005	0.004	0.005
% R.S.D.	0.045	0.171	0.518	0.074	0.173	0.110	0.076	0.109

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	5.059	4.986	4.885	4.933	4.747	4.997	5.051	9.613
S.D.	0.007	0.013	0.011	0.020	0.006	0.003	0.007	0.070
% R.S.D.	0.141	0.258	0.227	0.398	0.121	0.056	0.148	0.723

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	4.762	4.785	4.828	5.369	5.117	4.801	4.954	4.897
S.D.	0.010	0.010	0.008	0.009	0.023	0.007	0.020	0.000
% R.S.D.	0.209	0.208	0.163	0.168	0.443	0.136	0.395	0.000

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	4.955	5.373	4.926	5.012	4.826	5.025	5.025	5.032
S.D.	0.013	0.042	0.003	0.017	0.004	0.004	0.003	0.015
% R.S.D.	0.268	0.773	0.054	0.342	0.078	0.081	0.058	0.308

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	4.988	4.817	5.008	5.067	4.946
S.D.	0.003	0.033	0.001	0.004	0.011
% R.S.D.	0.059	0.685	0.017	0.070	0.217

Identity 1: ICB Identity 2: Quality Control 1:58 PM May 20, 1994
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.005	0.001	0.001	-0.012	0.002	0.001	0.001	0.002
S.D.	0.002	0.000	0.010	0.001	0.004	0.001	0.001	0.001
% R.S.D.	35.447	9.528	1175.302	5.802	229.153	127.893	172.816	32.021
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.002	-0.004	-0.004	0.001	0.003	0.002	0.018	-0.315
S.D.	0.000	0.002	0.003	0.001	0.000	0.001	0.015	0.083
% R.S.D.	8.865	55.201	64.775	126.180	4.054	33.064	82.972	26.187
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.069	-0.079	-0.001	0.028	-0.007	0.000	0.003	0.006
S.D.	0.012	0.027	0.000	0.006	0.003	0.000	0.003	0.003
% R.S.D.	17.532	34.423	20.371	22.452	35.527	17.321	101.687	50.000
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.002	0.027	-0.002	-0.004	-0.001	0.001	0.003	-0.068
S.D.	0.000	0.020	0.001	0.006	0.001	0.000	0.001	0.018
% R.S.D.	11.024	74.652	26.416	147.841	58.823	15.322	23.399	26.060
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	-0.001	-0.005	-0.002	0.000	-0.105			
S.D.	0.000	0.018	0.001	0.000	0.026			
% R.S.D.	14.470	368.052	68.496	2.443	24.337			

Identity 1: K214 sam Identity 2: direct

2:01 PM May 20, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.005	0.007	-0.016	0.561	0.002	0.003	0.004	0.004
S.D.	0.003	0.001	0.012	0.002	0.009	0.002	0.002	0.001
% R.S.D.	53.042	17.482	71.879	0.367	543.225	61.755	44.584	33.923

	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.154	0.019	0.003	0.044	0.489	0.004	-0.001	0.114
S.D.	0.003	0.001	0.002	0.001	0.010	0.002	0.014	0.112
% R.S.D.	2.059	6.599	62.734	1.580	2.023	68.416	1787.469	98.159

	Ce	Sm	Ba	P	S	Hg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.016	0.023	0.004	0.044	0.212	0.079	0.002	1.283
S.D.	0.016	0.026	0.001	0.016	0.009	0.002	0.002	0.034
% R.S.D.	99.626	111.712	31.915	35.550	4.070	2.769	72.802	2.616

	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.004	0.017	0.004	-0.004	0.004	0.004	0.068	0.078
S.D.	0.002	0.008	0.002	0.004	0.002	0.001	0.002	0.034
% R.S.D.	40.397	48.024	52.709	86.922	41.433	33.402	2.644	44.186

	Mn	Sb	V	Be	Tl
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.037	0.017	0.004	0.003	0.026
S.D.	0.002	0.028	0.002	0.001	0.040
% R.S.D.	4.818	160.932	41.335	30.749	153.750

Identity 1: K214 dup Identity 2: direct

2:06 PM May 20, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.001	0.004	0.004	0.552	0.003	-0.001	0.002	0.001
S.D.	0.001	0.000	0.001	0.001	0.003	0.001	0.000	0.001
% R.S.D.	101.851	3.557	32.182	0.091	111.099	66.050	18.685	56.460

	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.145	0.015	0.001	0.039	0.488	0.000	0.014	-0.005
S.D.	0.001	0.002	0.001	0.002	0.001	0.000	0.004	0.051
% R.S.D.	0.986	13.038	97.657	5.609	0.245	142.231	28.245	1056.923

	Ce	Sm	Ba	P	S	Hg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.010	-0.003	0.001	0.032	0.208	0.074	0.003	1.295
S.D.	0.013	0.011	0.000	0.001	0.005	0.000	0.001	0.008
% R.S.D.	131.004	358.498	21.992	4.633	2.529	0.401	49.092	0.619

	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.003	0.023	-0.000	0.009	0.000	0.002	0.067	0.032
S.D.	0.000	0.002	0.000	0.010	0.001	0.000	0.002	0.028
% R.S.D.	6.667	9.040	305.572	107.859	227.564	23.727	2.419	86.951

	Mn	Sb	V	Be	Tl
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.033	-0.013	-0.000	0.000	0.009
S.D.	0.000	0.008	0.001	0.000	0.020
% R.S.D.	0.813	66.406	946.137	90.487	230.422

Identity 1: K216 sam Identity 2: direct

2:10 PM May 20, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.005	0.095	-0.014	1.324	-0.161	-0.010	-0.001	-0.010
S.D.	0.003	0.002	0.007	0.023	0.013	0.001	0.000	0.001
% R.S.D.	60.539	1.618	47.326	1.761	7.779	6.450	53.650	11.295
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	1.245	0.073	-0.002	-0.004	17.801	-0.014	-0.131	-0.238
S.D.	0.013	0.002	0.001	0.003	0.237	0.000	0.016	0.134
% R.S.D.	1.026	3.255	50.127	72.062	1.329	2.947	12.385	56.227
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.057	-0.031	0.034	0.003	4.677	4.479	-0.028	2.774
S.D.	0.024	0.032	0.001	0.003	0.082	0.071	0.002	0.062
% R.S.D.	41.197	102.955	2.330	79.481	1.763	1.582	6.609	2.252
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.009	-0.111	-0.003	-0.072	-0.001	-0.003	-0.007	0.730
S.D.	0.000	0.004	0.001	0.006	0.001	0.001	0.001	0.038
% R.S.D.	2.728	3.792	46.931	8.860	40.698	21.324	14.752	5.261
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.129	-0.087	-0.001	-0.001	-0.085			
S.D.	0.002	0.010	0.001	0.000	0.030			
% R.S.D.	1.826	11.008	66.587	11.184	35.592			

Identity 1: K214 post spike Identity 2: 1ml sample - 4ml

2:15 PM May 20, 1994

Task name : 7WC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.989	0.970	0.984	1.259	0.983	1.008	1.006	0.986
S.D.	0.004	0.003	0.012	0.004	0.009	0.006	0.003	0.004
% R.S.D.	0.383	0.316	1.171	0.350	0.886	0.571	0.254	0.369

	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	1.034	1.014	0.985	1.015	1.138	1.010	1.031	1.600
S.D.	0.003	0.005	0.004	0.005	0.007	0.002	0.009	0.050
% R.S.D.	0.291	0.478	0.406	0.539	0.590	0.196	0.891	3.151

	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.906	0.878	0.977	1.077	1.071	1.000	0.986	1.262
S.D.	0.013	0.009	0.003	0.027	0.011	0.001	0.007	0.003
% R.S.D.	1.484	1.076	0.295	2.511	0.983	0.137	0.666	0.220

	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	1.002	1.114	0.981	1.005	0.970	1.006	1.027	0.923
S.D.	0.003	0.010	0.002	0.002	0.003	0.006	0.003	0.014
% R.S.D.	0.344	0.855	0.187	0.218	0.349	0.585	0.290	1.516

	Mn	Sb	V	Be	Tl
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	1.015	0.932	1.003	1.023	0.881
S.D.	0.003	0.012	0.004	0.004	0.018
% R.S.D.	0.250	1.335	0.392	0.383	2.078

Identity 1: CCV Identity 2: Quality Control 2:18 PM May 20, 1994
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	5.045	4.871	4.981	4.838	4.944	5.096	5.044	4.919
S.D.	0.038	0.042	0.041	0.027	0.027	0.031	0.042	0.043
% R.S.D.	0.749	0.863	0.826	0.557	0.550	0.608	0.831	0.870
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	5.174	5.104	4.984	5.063	4.848	5.122	5.134	9.555
S.D.	0.027	0.037	0.044	0.023	0.041	0.032	0.045	0.064
% R.S.D.	0.525	0.728	0.881	0.455	0.848	0.627	0.877	0.666
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	4.848	4.824	4.921	5.576	5.284	4.922	5.047	4.983
S.D.	0.034	0.036	0.044	0.113	0.055	0.032	0.029	0.038
% R.S.D.	0.701	0.739	0.889	2.034	1.045	0.654	0.578	0.765
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	5.078	5.499	5.006	5.123	4.935	5.159	5.148	5.033
S.D.	0.036	0.012	0.032	0.035	0.038	0.030	0.041	0.016
% R.S.D.	0.718	0.213	0.647	0.692	0.775	0.588	0.804	0.320
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	5.101	4.958	5.121	5.216	4.925			
S.D.	0.035	0.026	0.039	0.041	0.047			
% R.S.D.	0.683	0.534	0.770	0.785	0.951			

Identity 1: CCB Identity 2: Quality Control 2:22 PM May 20, 1994
 Task name : TWC93
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.003	0.002	-0.022	-0.010	0.020	0.002	0.004	0.003
S.D.	0.002	0.000	0.008	0.004	0.010	0.001	0.001	0.001
% R.S.D.	48.337	6.762	38.323	38.105	48.897	39.564	21.922	14.672
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Hd (ug/mL)	U (ug/mL)
Mean	0.004	-0.002	-0.001	0.005	0.005	0.005	0.018	-0.329
S.D.	0.000	0.002	0.002	0.000	0.000	0.001	0.012	0.104
% R.S.D.	1.310	91.675	160.127	8.580	3.029	22.220	67.543	31.532
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.070	-0.092	0.000	0.030	-0.007	0.002	0.002	0.027
S.D.	0.017	0.021	0.000	0.015	0.005	0.000	0.005	0.009
% R.S.D.	25.035	22.466	592.043	48.849	64.924	0.000	224.661	33.254
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.005	0.050	-0.002	0.010	0.000	0.003	0.006	-0.091
S.D.	0.001	0.008	0.001	0.007	0.001	0.001	0.001	0.021
% R.S.D.	12.642	16.969	73.303	76.586	1006.664	26.511	10.665	23.395
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.001	-0.005	-0.001	0.002	-0.084			
S.D.	0.000	0.013	0.001	0.000	0.033			
% R.S.D.	33.920	251.901	194.326	9.825	39.902			

WHC-SD-WM-DP-079, REV. C

Instrument: <i>WB39939</i>	Procedure/ Rev: <i>LG-505-151 / D-1</i>
Technologist: <i>B.J. Goetze</i>	Date: <i>07-22-94</i>
Starting Time: <i>1300</i>	Temperature <i>N/A</i>
Ending Time: <i>1530</i>	Chemist: <i>B. Wells S. Parony</i>

	Description	Lab ID
1	Digested Std	K209-8550
2	Digested Blank	K210-8650
3	Sample	K211-8755
4	Duplicate Sample	K211-8855
5	Spike	K211-8950
6		
7		
8		
9		
10		

[illegible]

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

Bottle 3321

Serial No	Sample Point	Date	Time Issued	Priority
N 208.-8850	C-111	4-25-84	14:54	23
Determination	Method Standard	Result Units	Charge Code	Re:uns
ICP	LA-505-151	% RECOVERY	N406B	0
Sample Size	Customer ID			
2.5 g in 50 ml	STD			
Remarks Calculations Results				
1st STD Digested STD				
Ni 4.737 / 5 (100) = 94.74 %				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>	Mrs	Mrs	Mrs	<i>[Signature]</i>
Date	Time Completed	Lab Unit Mgr	7-25-84	
7-22-84	1530	S. Parry		

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
N 210.-8880	C-111	4-25-84	14:55	23
Determination	Method Standard	Result Units	Charge Code	Re:uns
ICP	LA-505-151	UG/ML	N406B	0
Sample Size	Customer ID			
Direct	BLANK			
Remarks Calculations Results				
REAGENT BLANK D6-3723				
Ni only				
Ni < .02				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr	7-25-84	
7-22-84	1530	S. Parry		

54-6800-061 (R-10-83)

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
N 211.-8785	C-111	4-28-84	14:17	23
Determination	Method Standard	Result Units	Charge Code	Reruns
ICP-SOL	LA-505-151	UG/G Fac	N408B	0
Sample Size	Customer ID			
0.5536 g in 50 mL - 1 mL - 8 mL - 1 mL - 4 mL				
Remarks Calculations Results				
$Ni \quad 4.715 \times \frac{50}{0.5536} \times 10 \times 5 = 2.13 E4 \text{ ug/g}$				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr	7-25-84	
7-22-84	1530	S. Parry		

54-680C-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
N 211.-8885	C-111	4-28-84	14:17	23
Determination	Method Standard	Result Units	Charge Code	Reruns
ICP-SOL	LA-505-151	UG/G Fac	N408B	0
Sample Size	Customer ID			
0.5414 g in 50 mL - 1 mL - 8 mL - 1 mL - 4 mL				
Remarks Calculations Results				
<p>DUPLICATE SAMPLE</p> $Ni \quad 4.693 \times \frac{50}{0.5414} \times 10 \times 5 = 2.17 E4 \text{ ug/g}$				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i>				
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr	7-25-84	
7-22-84	1530	S. Parry		

54-680C-061 (R-10-83)

INDUCTIVELY COUPLED PLASMA ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
N 111.-C110	C-111	4-25-84	14:57	23
Determination	Method Standard	Result Units	Charge Code	Retuns
ICP	LA-505-151	% RECOVERY	N403E	0
Sample Size	Customer ID			
0.5430g in 50ml - 1cc-2cc	C6881			
Remarks Calculations Results OLIVE SAMPLE OLIVE ID W116-1 SPIKE VOLUME 2.5cc $Ni \quad 4.737 \times \frac{100}{5.0} = 94.74 \%$				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>[Signature]</i> Mrs	Mrs	Mrs	Mrs	<i>[Signature]</i> Mrs
Date	Time Completed	Lab Unit Mgr	X <i>[Signature]</i> 7-25-84	
7-22-84	1530	6/25/84 S. Parry		

54-6800-DE1 (R-10-83)

Identity 1: wp-284 Identity 2: wp-284 1:06 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.004	0.001	0.001	0.353	0.137	0.044	0.008	0.001
S.D.	0.001	0.000	0.004	0.004	0.006	0.001	0.001	0.000
% R.S.D.	16.485	17.262	259.720	1.065	4.120	1.412	8.431	23.740

	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.022	0.016	-0.003	0.030	0.031	0.007	-0.007	-0.142
S.D.	0.000	0.001	0.001	0.002	0.000	0.001	0.009	0.052
% R.S.D.	1.829	5.077	55.687	8.300	1.034	9.663	119.562	36.782

	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.015	-0.055	0.028	-0.007	0.084	0.001	0.032	0.112
S.D.	0.010	0.017	0.000	0.003	0.005	0.000	0.004	0.006
% R.S.D.	67.455	30.073	0.942	41.720	5.619	17.566	11.119	5.607

	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.000	0.002	-0.002	0.029	-0.001	0.009	0.040	-0.488
S.D.	0.001	0.018	0.001	0.006	0.001	0.000	0.003	0.018
% R.S.D.	264.558	937.685	23.938	19.773	75.171	3.431	7.295	3.738

	Mn	Sb	V	Be	Tl
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.014	0.067	0.130	0.030	-0.027
S.D.	0.000	0.009	0.001	0.000	0.022
% R.S.D.	1.145	13.037	0.502	0.592	81.864

BJ Goetze

7-22-94

C-III

K209-K211

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 210 TO 229 . .

Identity 1: ICV Identity 2: Quality Control
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

1:09 PM July 22, 1994

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	4.915	4.884	4.922	4.304	4.939	4.965	5.001	5.037
S.D.	0.019	0.019	0.011	0.015	0.023	0.021	0.016	0.017
% R.S.D.	0.383	0.397	0.231	0.357	0.456	0.416	0.323	0.328

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	4.973	4.863	4.942	4.930	4.895	4.921	5.095	9.693
S.D.	0.016	0.017	0.023	0.013	0.018	0.017	0.025	0.031
% R.S.D.	0.319	0.359	0.470	0.263	0.366	0.350	0.489	0.315

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	4.886	5.032	4.947	4.990	4.923	4.839	4.895	5.003
S.D.	0.015	0.016	0.019	0.050	0.018	0.018	0.016	0.015
% R.S.D.	0.304	0.325	0.393	0.998	0.376	0.372	0.318	0.296

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	4.914	5.620	4.940	4.865	4.818	4.886	4.931	4.808
S.D.	0.018	0.005	0.014	0.030	0.018	0.013	0.011	0.038
% R.S.D.	0.358	0.089	0.292	0.621	0.375	0.257	0.230	0.799

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	4.909	4.735	4.897	5.023	4.752
S.D.	0.015	0.038	0.015	0.020	0.005
% R.S.D.	0.310	0.812	0.305	0.396	0.103

Identity 1: ICB Identity 2: Quality Control 1:13 PM July 22, 1994
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.003	0.001	0.006	0.003	0.004	0.001	-0.000	0.001
S.D.	0.000	0.000	0.011	0.002	0.005	0.001	0.001	0.001
% R.S.D.	16.325	3.101	173.064	61.014	131.372	172.783	131.826	54.470

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.000	0.001	-0.001	0.000	0.001	0.001	0.005	-0.135
S.D.	0.000	0.001	0.002	0.001	0.000	0.001	0.001	0.034
% R.S.D.	40.124	194.247	188.609	480.108	13.887	139.755	12.619	24.797

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.008	-0.054	-0.000	-0.007	-0.020	0.001	-0.003	0.003
S.D.	0.004	0.006	0.000	0.011	0.002	0.000	0.003	0.010
% R.S.D.	48.695	11.349	95.985	156.604	10.739	8.665	118.749	305.085

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.001	-0.013	-0.000	-0.007	-0.001	0.000	0.000	-0.459
S.D.	0.000	0.006	0.000	0.004	0.000	0.001	0.002	0.028
% R.S.D.	35.715	46.037	49.939	50.805	29.602	270.612	1044.516	6.203

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.000	0.014	-0.001	0.001	-0.026
S.D.	0.000	0.012	0.001	0.000	0.023
% R.S.D.	123.367	87.597	71.130	25.183	91.267

Identity 1: icsai Identity 2: icsai

1:17 PM July 22, 1994

Task name : TWC93

WHC-SD-WM-DP-079, REV. 0

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.003	0.016	0.052	0.476	-6.503	0.002	-0.017	0.002
S.D.	0.001	0.000	0.009	0.001	0.000	0.001	0.000	0.001
% R.S.D.	25.979	0.384	17.912	0.187	0.006	32.467	1.949	23.316

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.046	-0.081	0.059	207.751	-2.382	-0.002	1.826	0.072
S.D.	0.000	0.002	0.001	0.593	0.000	0.002	0.021	0.078
% R.S.D.	0.881	1.924	2.406	0.285	0.000	93.436	1.148	108.289

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.017	0.876	0.005	0.114	6.225	-1.136	0.241	0.305
S.D.	0.014	0.026	0.000	0.012	0.044	0.000	0.006	0.002
% R.S.D.	80.284	2.996	4.430	10.375	0.708	0.000	2.598	0.593

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.004	0.065	-0.002	-0.402	-0.001	-0.006	-0.028	-0.221
S.D.	0.000	0.006	0.001	0.003	0.000	0.000	0.002	0.017
% R.S.D.	5.393	9.357	33.535	0.794	41.574	5.142	6.896	7.671

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.159	0.069	0.000	0.005	-0.053
S.D.	0.001	0.034	0.001	0.000	0.026
% R.S.D.	0.350	49.782	2144.803	2.588	48.521

Identity 1: xxx Identity 2: rinse 1:23 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.003	0.006	0.036	0.014	1.110	0.006	0.006	0.007
S.D.	0.002	0.003	0.005	0.004	0.488	0.003	0.003	0.003
% R.S.D.	55.434	45.413	13.402	31.354	43.976	40.935	50.214	36.965
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.006	0.006	0.005	0.431	1.063	0.006	0.017	-0.141
S.D.	0.003	0.003	0.002	0.191	0.459	0.003	0.000	0.013
% R.S.D.	55.628	59.180	28.883	44.255	43.172	50.857	2.747	9.116
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.028	-0.039	0.006	-0.008	0.010	1.069	0.006	0.007
S.D.	0.007	0.004	0.003	0.004	0.009	0.462	0.003	0.005
% R.S.D.	25.120	10.851	48.993	52.863	89.803	43.195	47.381	65.427
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.006	0.008	0.004	0.008	0.004	0.005	0.004	-0.452
S.D.	0.003	0.006	0.002	0.007	0.003	0.003	0.003	0.022
% R.S.D.	52.968	82.820	60.479	81.832	60.165	56.384	80.761	4.955
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.007	0.027	0.005	0.006	-0.011			
S.D.	0.003	0.013	0.002	0.003	0.014			
% R.S.D.	46.406	47.581	42.106	51.984	126.512			

Identity 1: K210 dig blk Identity 2: direct

1:27 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.004	0.000	0.005	0.015	0.058	0.003	0.001	0.002
S.D.	0.001	0.000	0.021	0.001	0.005	0.001	0.000	0.000
% R.S.D.	19.666	15.498	420.129	7.670	8.269	34.268	26.972	24.538
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.006	-0.003	-0.003	0.029	0.062	0.003	-0.031	-0.187
S.D.	0.000	0.002	0.003	0.004	0.002	0.001	0.009	0.021
% R.S.D.	3.417	60.606	111.999	13.660	3.263	29.258	27.830	11.011
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.025	-0.049	-0.001	-0.001	0.099	0.062	0.001	0.014
S.D.	0.005	0.009	0.000	0.004	0.003	0.002	0.003	0.002
% R.S.D.	19.933	18.755	7.095	466.207	3.119	3.146	186.215	13.319
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.002	0.004	0.008	-0.013	-0.001	0.001	0.003	0.501
S.D.	0.000	0.006	0.001	0.001	0.001	0.001	0.002	0.032
% R.S.D.	9.608	153.485	14.127	10.168	113.174	115.102	50.146	6.326
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.000	0.018	-0.001	0.000	-0.039			
S.D.	0.000	0.018	0.000	0.000	0.009			
% R.S.D.	110.800	96.153	14.502	145.312	22.948			

Identity 1: K209 dig std Identity 2: 2.5ml in 50ml

1:32 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.011	4.782	4.784	0.051	5.076	0.004	-0.002	4.969
S.D.	0.000	0.007	0.012	0.002	0.009	0.001	0.000	0.013
% R.S.D.	4.008	0.150	0.256	3.017	0.186	34.868	5.484	0.264

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.012	4.737	4.844	4.801	4.864	4.817	4.965	-1.772
S.D.	0.000	0.012	0.006	0.007	0.008	0.005	0.014	0.028
% R.S.D.	1.582	0.256	0.124	0.151	0.161	0.104	0.277	1.573

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	4.807	4.931	4.832	0.011	0.152	4.754	4.749	4.835
S.D.	0.012	0.012	0.007	0.019	0.007	0.008	0.014	0.003
% R.S.D.	0.258	0.244	0.138	176.858	4.859	0.159	0.305	0.065

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.001	5.341	4.633	4.696	-0.004	4.686	-0.005	5.787
S.D.	0.001	0.027	0.004	0.013	0.000	0.006	0.001	0.077
% R.S.D.	72.650	0.510	0.096	0.285	12.886	0.118	16.300	1.327

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	4.780	0.023	0.008	5.047	4.550
S.D.	0.006	0.029	0.000	0.011	0.006
% R.S.D.	0.124	124.751	3.365	0.226	0.138

Identity 1: K211 sam dil Identity 2: .5536gin50ml-1-9-1-4

1:36 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.002	0.034	0.462	0.256	26.868	0.002	0.016	0.003
S.D.	0.000	0.000	0.004	0.002	0.044	0.000	0.000	0.000
% R.S.D.	9.604	0.248	0.782	0.668	0.163	6.502	0.301	12.077

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.046	4.715	0.111	13.736	2.009	0.029	0.177	1.017
S.D.	0.000	0.008	0.002	0.025	0.003	0.001	0.005	0.026
% R.S.D.	0.639	0.174	1.545	0.179	0.169	3.702	2.642	2.585

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.176	-0.001	0.011	1.540	0.245	0.124	0.001	9.718
S.D.	0.005	0.012	0.000	0.004	0.001	0.004	0.001	0.020
% R.S.D.	2.577	1029.050	0.511	0.285	0.369	3.387	99.708	0.202

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.001	0.018	-0.000	1.334	0.034	0.001	0.003	0.247
S.D.	0.001	0.007	0.001	0.010	0.000	0.000	0.001	0.032
% R.S.D.	69.734	39.369	292.891	0.777	0.376	38.897	54.672	12.955

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.043	0.029	0.002	0.001	-0.045
S.D.	0.000	0.007	0.001	0.000	0.008
% R.S.D.	0.715	25.440	43.974	18.815	16.914

Identity 1: K211 sam dil Identity 2: ⁵⁵³⁶~~5446~~in50ml-1-9

1:55 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.013	0.166	2.210	1.282	133.660	0.008	0.078	0.006
S.D.	0.001	0.000	0.004	0.004	0.181	0.002	0.001	0.000
% R.S.D.	6.776	0.071	0.199	0.350	0.135	28.946	0.743	4.189

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.164	22.986	0.569	67.484	9.798	0.136	0.891	5.661
S.D.	0.000	0.010	0.004	0.063	0.014	0.003	0.004	0.032
% R.S.D.	0.162	0.045	0.627	0.093	0.139	2.037	0.471	0.572

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.758	0.107	0.054	7.470	1.156	0.451	0.002	48.127
S.D.	0.012	0.011	0.000	0.066	0.009	0.001	0.002	0.053
% R.S.D.	1.596	9.995	0.209	0.889	0.797	0.259	105.912	0.109

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.000	0.050	0.002	6.488	0.171	0.004	0.025	-0.010
S.D.	0.000	0.011	0.001	0.012	0.000	0.000	0.001	0.044
% R.S.D.	519.752	22.917	24.994	0.186	0.077	6.391	3.390	423.007

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.211	0.074	0.009	0.001	-0.100
S.D.	0.001	0.008	0.001	0.000	0.020
% R.S.D.	0.416	11.476	12.709	13.066	19.971

Identity 1: K211 dup dil Identity 2: .5414gin50ml-1-9-1-4

1:42 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.004	0.033	0.467	0.275	26.522	0.003	0.013	0.001
S.D.	0.001	0.000	0.025	0.002	0.078	0.001	0.001	0.001
% R.S.D.	32.976	0.288	5.310	0.787	0.294	19.184	4.549	80.451
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.032	4.693	0.112	13.655	1.980	0.029	0.162	1.229
S.D.	0.000	0.023	0.002	0.067	0.008	0.001	0.006	0.048
% R.S.D.	1.088	0.498	1.338	0.489	0.386	4.196	3.665	3.911
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.174	0.047	0.013	1.470	0.236	0.101	-0.000	9.593
S.D.	0.011	0.016	0.000	0.025	0.004	0.000	0.002	0.018
% R.S.D.	6.549	33.931	1.748	1.701	1.674	0.099	573.352	0.189
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	-0.002	-0.008	0.001	1.325	0.034	0.001	0.002	-0.067
S.D.	0.000	0.016	0.000	0.007	0.000	0.000	0.001	0.027
% R.S.D.	9.123	202.499	13.057	0.558	0.812	9.277	43.557	40.398
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	0.043	0.043	0.003	0.000	0.027			
S.D.	0.000	0.013	0.001	0.000	0.007			
% R.S.D.	0.124	30.717	21.051	42809.835	26.551			

Identity 1: K211 dup dil Identity 2: .5414gin50ml-1-9

1:58 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.018	0.161	2.191	1.344	131.230	0.005	0.067	-0.001
S.D.	0.001	0.001	0.020	0.012	0.732	0.001	0.002	0.000
% R.S.D.	5.772	0.619	0.921	0.861	0.558	23.650	2.374	30.801
	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.153	22.895	0.559	66.812	9.584	0.128	0.797	5.613
S.D.	0.001	0.156	0.003	0.419	0.054	0.001	0.010	0.069
% R.S.D.	0.803	0.681	0.525	0.628	0.558	0.715	1.197	1.228
	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.732	0.127	0.053	7.595	1.159	0.445	-0.024	46.951
S.D.	0.009	0.017	0.000	0.148	0.017	0.002	0.002	0.250
% R.S.D.	1.200	13.277	0.892	1.949	1.478	0.540	9.920	0.533
	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.003	-0.030	0.002	6.406	0.170	0.003	0.019	0.013
S.D.	0.001	0.011	0.001	0.036	0.001	0.001	0.002	0.031
% R.S.D.	27.474	36.657	80.209	0.562	0.729	23.750	13.019	247.100
	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)			
Mean	0.208	0.022	0.010	0.000	-0.045			
S.D.	0.001	0.010	0.001	0.000	0.036			
% R.S.D.	0.628	45.519	8.810	17.699	80.294			

Identity 1: K211 dig spike Identity 2: .5630gin50ml-1-9

2:02 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	0.026	0.608	1.992	0.840	106.344	0.007	0.059	0.491
S.D.	0.001	0.001	0.011	0.003	0.216	0.001	0.001	0.001
% R.S.D.	4.365	0.219	0.548	0.373	0.203	21.231	1.414	0.183

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.117	20.719	0.878	49.887	7.797	0.594	1.064	4.122
S.D.	0.000	0.068	0.003	0.190	0.021	0.003	0.015	0.099
% R.S.D.	0.414	0.326	0.361	0.380	0.272	0.563	1.377	2.410

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	1.016	0.595	0.529	5.533	0.845	0.893	0.483	33.684
S.D.	0.013	0.022	0.001	0.082	0.005	0.005	0.002	0.060
% R.S.D.	1.252	3.683	0.223	1.483	0.547	0.592	0.517	0.177

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.000	0.570	0.047	6.321	0.118	0.487	0.007	0.443
S.D.	0.001	0.006	0.001	0.028	0.000	0.002	0.001	0.018
% R.S.D.	187.816	1.040	2.564	0.448	0.187	0.377	13.004	4.104

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.638	0.075	0.009	0.509	0.441
S.D.	0.002	0.018	0.000	0.002	0.018
% R.S.D.	0.260	23.587	4.431	0.326	4.022

Range 0.0000 0.0500 0.1000

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Identity 1: K211 post spike Identity 2: .5536gin50ml-1-9

2:06 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-079, REV. 0

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	1.018	1.160	3.265	2.210	138.229	1.009	1.075	1.004
S.D.	0.003	0.004	0.028	0.007	0.450	0.005	0.002	0.003
% R.S.D.	0.335	0.326	0.870	0.294	0.325	0.520	0.226	0.273

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	1.132	24.995	1.590	71.311	11.093	1.133	1.914	7.798
S.D.	0.004	0.096	0.007	0.309	0.038	0.004	0.022	0.033
% R.S.D.	0.319	0.383	0.470	0.433	0.341	0.314	1.160	0.421

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	1.760	1.098	1.059	8.519	2.171	1.436	0.986	50.308
S.D.	0.006	0.011	0.003	0.038	0.011	0.004	0.009	0.137
% R.S.D.	0.369	0.968	0.316	0.443	0.491	0.307	0.868	0.273

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.997	1.168	0.763	7.737	1.153	0.982	1.016	0.976
S.D.	0.002	0.009	0.008	0.015	0.004	0.003	0.008	0.043
% R.S.D.	0.186	0.740	1.004	0.188	0.328	0.352	0.766	4.437

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	1.208	0.974	1.003	1.031	0.858
S.D.	0.004	0.017	0.003	0.003	0.010
% R.S.D.	0.307	1.731	0.304	0.278	1.144

1222

Range 10.00 10.00 10.00

 Identity 1: CCV Identity 2: Quality Control 2:09 PM July 22, 1994
 Task name : TWC93
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	4.972	4.894	4.962	4.313	5.044	4.962	5.036	5.014
S.D.	0.039	0.039	0.047	0.032	0.039	0.038	0.037	0.038
% R.S.D.	0.775	0.807	0.941	0.750	0.777	0.771	0.733	0.756

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	4.977	4.912	5.007	5.039	4.944	4.959	5.224	9.906
S.D.	0.038	0.035	0.039	0.033	0.037	0.039	0.032	0.057
% R.S.D.	0.761	0.709	0.769	0.663	0.747	0.789	0.614	0.571

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	4.811	4.930	4.968	4.799	4.799	4.837	4.895	4.994
S.D.	0.030	0.042	0.040	0.084	0.060	0.037	0.052	0.030
% R.S.D.	0.623	0.854	0.813	1.757	1.249	0.769	1.064	0.610

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	4.890	5.601	3.939	4.934	4.830	4.935	5.004	4.810
S.D.	0.044	0.060	0.068	0.036	0.040	0.037	0.027	0.086
% R.S.D.	0.890	1.071	1.721	0.731	0.836	0.740	0.538	1.788

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	4.958	4.702	4.942	5.053	4.824
S.D.	0.042	0.049	0.042	0.043	0.015
% R.S.D.	0.852	1.046	0.849	0.858	0.312

1223

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 Identity 1: CCB Identity 2: Quality Control 2:13 PM July 22, 1994
 Task name : TWC93
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.003	0.001	0.004	-0.001	-0.004	0.001	-0.000	0.002
S.D.	0.002	0.000	0.015	0.002	0.009	0.001	0.001	0.001
% R.S.D.	53.712	23.372	396.582	217.182	205.523	109.766	271.315	70.611

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.001	0.001	0.002	0.005	0.002	0.002	-0.022	-0.302
S.D.	0.000	0.002	0.002	0.001	0.000	0.001	0.005	0.089
% R.S.D.	39.892	127.623	95.543	13.552	14.886	37.888	25.172	29.420

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.018	-0.082	-0.000	-0.020	-0.011	0.002	0.004	0.000
S.D.	0.015	0.021	0.000	0.015	0.001	0.000	0.002	0.005
% R.S.D.	81.415	24.979	380.867	76.393	11.000	21.223	40.791	101065.629

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	0.001	-0.021	0.459	-0.019	-0.001	0.001	0.002	-0.647
S.D.	0.001	0.011	0.024	0.009	0.001	0.001	0.001	0.022
% R.S.D.	70.239	54.643	5.236	49.346	62.383	128.029	42.131	3.467

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.001	0.043	-0.001	0.001	-0.076
S.D.	0.000	0.016	0.002	0.000	0.024
% R.S.D.	43.175	37.828	237.270	36.968	32.199

1224

Range

Identity 1: icsaf Identity 2: icsaf 2:17 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.005	0.016	0.040	0.471	-6.419	-0.000	-0.017	0.003
S.D.	0.001	0.000	0.004	0.013	0.000	0.001	0.000	0.001
% R.S.D.	31.111	0.296	10.461	2.838	0.005	23243.278	2.023	25.751

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.047	-0.075	0.060	205.695	-2.373	0.001	1.802	-0.079
S.D.	0.000	0.004	0.002	1.511	0.000	0.003	0.021	0.064
% R.S.D.	0.622	5.444	3.997	0.735	0.000	285.713	1.146	81.404

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Hg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	-0.010	0.830	0.004	0.142	6.168	-1.103	0.241	0.316
S.D.	0.010	0.018	0.000	0.021	0.080	0.000	0.011	0.013
% R.S.D.	97.079	2.117	10.028	14.563	1.289	0.000	4.554	3.973

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.002	0.083	0.100	-0.381	-0.001	-0.005	-0.024	-0.295
S.D.	0.001	0.009	0.022	0.004	0.000	0.000	0.003	0.049
% R.S.D.	60.446	10.870	21.890	1.006	29.369	4.947	12.542	16.724

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.158	0.118	-0.002	0.005	-0.074
S.D.	0.000	0.011	0.000	0.000	0.013
% R.S.D.	0.309	9.150	20.442	2.576	17.027

Identity 1: icsabf Identity 2: icsabf 2:19 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	-0.004	0.015	0.038	0.430	-6.035	0.446	0.471	0.003
S.D.	0.001	0.000	0.002	0.002	0.000	0.002	0.002	0.000
% R.S.D.	14.130	0.264	5.662	0.445	0.002	0.463	0.446	3.132

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	0.980	0.802	0.050	181.815	-2.055	0.454	1.720	-0.002
S.D.	0.005	0.005	0.002	0.521	0.000	0.000	0.019	0.019
% R.S.D.	0.528	0.671	3.972	0.287	0.000	0.088	1.094	790.917

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	0.002	0.744	0.493	0.133	5.564	-0.997	0.222	0.276
S.D.	0.003	0.018	0.001	0.011	0.010	0.000	0.007	0.005
% R.S.D.	192.087	2.421	0.284	8.010	0.188	0.000	2.965	1.736

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	-0.005	0.065	0.970	0.509	-0.000	0.875	-0.023	-0.099
S.D.	0.001	0.006	0.002	0.009	0.000	0.003	0.000	0.023
% R.S.D.	17.960	9.328	0.206	1.854	68.410	0.322	2.098	23.447

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	0.610	0.101	0.476	0.482	-0.078
S.D.	0.002	0.029	0.001	0.002	0.001
% R.S.D.	0.364	28.536	0.130	0.393	1.855

1226

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Identity 1: xxx Identity 2: rinse 2:26 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.000	0.001	0.027	0.010	0.162	0.001	-0.000	0.001
S.D.	0.001	0.000	0.004	0.002	0.029	0.000	0.000	0.000
% R.S.D.	552.213	13.212	16.327	20.076	18.167	30.357	115.455	34.075
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.001	0.005	0.002	0.061	0.120	-0.001	-0.003	0.059
S.D.	0.000	0.002	0.001	0.012	0.023	0.001	0.008	0.014
% R.S.D.	46.611	32.466	49.271	19.838	19.317	194.566	279.419	24.119
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.009	0.003	0.001	0.003	-0.005	0.123	-0.007	0.018
S.D.	0.006	0.001	0.000	0.006	0.002	0.024	0.002	0.003
% R.S.D.	64.378	32.145	14.394	197.243	47.609	19.450	30.919	17.643
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.000	0.003	0.002	-0.002	0.001	0.000	-0.002	-0.354
S.D.	0.002	0.011	0.000	0.011	0.000	0.000	0.000	0.002
% R.S.D.	420.118	351.969	24.866	497.345	32.535	45.618	28.825	0.487
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	0.001	0.050	0.001	0.000	0.029			
S.D.	0.000	0.008	0.000	0.000	0.003			
% R.S.D.	23.904	15.602	28.052	37.880	11.794			

Identity 1: CCV Identity 2: Quality Control 2:29 PM July 22, 1994
Task name : TWC93
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr (ug/mL)	Sr (ug/mL)	Bi (ug/mL)	Si (ug/mL)	Al (ug/mL)	Co (ug/mL)	Cu (ug/mL)	Li (ug/mL)
Mean	5.024	4.967	5.019	4.395	5.125	5.116	5.067	5.050
S.D.	0.033	0.036	0.020	0.024	0.022	0.032	0.030	0.035
% R.S.D.	0.657	0.715	0.397	0.550	0.435	0.634	0.596	0.688

	Zn (ug/mL)	Ni (ug/mL)	La (ug/mL)	Fe (ug/mL)	Ca (ug/mL)	Cr (ug/mL)	Nd (ug/mL)	U (ug/mL)
Mean	5.083	5.014	5.045	5.123	4.979	5.059	5.145	10.071
S.D.	0.027	0.026	0.024	0.045	0.035	0.024	0.035	0.085
% R.S.D.	0.537	0.522	0.469	0.884	0.713	0.471	0.679	0.848

	Ce (ug/mL)	Sm (ug/mL)	Ba (ug/mL)	P (ug/mL)	S (ug/mL)	Mg (ug/mL)	As (ug/mL)	Na (ug/mL)
Mean	4.997	5.127	5.022	5.058	5.009	4.988	5.045	5.037
S.D.	0.022	0.015	0.036	0.079	0.052	0.031	0.013	0.026
% R.S.D.	0.435	0.297	0.722	1.564	1.037	0.617	0.264	0.507

	Mo (ug/mL)	Se (ug/mL)	Ag (ug/mL)	Pb (ug/mL)	Ti (ug/mL)	Cd (ug/mL)	B (ug/mL)	K (ug/mL)
Mean	5.055	5.756	4.962	5.001	4.922	5.066	5.021	5.123
S.D.	0.037	0.031	0.027	0.036	0.032	0.022	0.026	0.014
% R.S.D.	0.726	0.545	0.552	0.713	0.659	0.439	0.516	0.269

	Mn (ug/mL)	Sb (ug/mL)	V (ug/mL)	Be (ug/mL)	Tl (ug/mL)
Mean	5.032	4.777	5.014	5.182	4.932
S.D.	0.023	0.047	0.029	0.033	0.021
% R.S.D.	0.463	0.975	0.575	0.644	0.434

Identity 1: CCB

Identity 2: Quality Control

2:31 PM July 22, 1994

Task name : TWC93

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-079, REV. 0

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.001	0.002	0.025	0.004	0.034	0.002	0.001	0.002
S.D.	0.001	0.000	0.002	0.001	0.003	0.001	0.001	0.001
% R.S.D.	48.034	14.705	7.529	33.079	8.844	44.018	97.617	37.467
	Zn	Ni	La	Fe	Ca	Cr	Nd	U
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.002	0.002	0.001	0.023	0.037	0.002	-0.001	0.010
S.D.	0.000	0.002	0.003	0.002	0.001	0.001	0.009	0.054
% R.S.D.	17.289	64.193	215.257	8.174	3.034	36.676	646.077	543.039
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.008	-0.019	0.002	-0.016	-0.000	0.037	-0.003	0.004
S.D.	0.014	0.018	0.000	0.013	0.003	0.001	0.002	0.010
% R.S.D.	179.705	95.544	21.545	79.878	788.862	3.292	57.660	240.864
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)
Mean	0.003	-0.009	0.006	-0.008	0.001	0.003	0.006	-0.291
S.D.	0.000	0.005	0.001	0.005	0.000	0.000	0.001	0.038
% R.S.D.	12.298	54.397	9.531	70.460	30.750	12.059	16.677	12.992
	Mn	Sb	V	Be	Tl			
	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)	(ug/mL)			
Mean	0.002	0.032	0.001	0.002	-0.009			
S.D.	0.000	0.008	0.001	0.000	0.019			
% R.S.D.	7.445	24.126	119.095	18.479	206.553			

BJ Goecke

7-22-94

C-111

K209-K211

1229

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WHC-SD-WM-DP-079, REV. 0

RADIOCHEMICAL ANALYSES

1230

1-2 Batch 3254

Serial No K 209.-5525	Sample Point C-111	Date 4-25-94	Time Issued 14:54	Priority 23
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size 10 ML			Customer ID STD	
Remarks: Calculations, Results S510 EV-CRB STD# 142851 RESULT 8.48 E-3 STD VAL 1.0397 E-2 %REC 81.6%				
Analyst - 1 <i>Paul J. McCown</i> MIS	Analyst - 2 <i>Paul J. McCown</i> MIS	Analyst - 3 <i>Paul J. McCown</i> MIS 5-13-94	Analyst - 4 <i>Paul J. McCown</i> MIS	Analyst - 5 <i>Paul J. McCown</i> MIS
Date 5/12/94	Time Completed 23:30	Lab. Dir. Mgr. <i>Paul J. McCown</i>		

54-6500-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

AT: LA-508-101 (D-0) LIQUIDS		STD	REPLICATE
Type	DETECTOR NUMBER	13	13
STD	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1310	1344
3254	COUNT TIME in MINUTES (CT)	30	30
AT of TB?	BACKGROUND in cpm (BKG)	0.5	0.5
AT	SAMPLE SIZE in mL (SS)	10.000	10
Test Code	DILUTION FACTOR (DF)	1	1
	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
LIQUID	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	43.167	44.300
Sample #	SAMPLE CONCENTRATION in $\mu\text{Ci/L}$	8.37E-03	8.59E-03
K209-5525	AVG. $\mu\text{Ci/L}$ in SAMPLE and REPLICATE =	8.4839E-03	
Instrument Code	$R_s \text{ (Sample Count Rate)} = (TC / CT) - BKG$ $\text{ALPHA TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$ $\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$ $\text{Relative Counting Error} = \left(\frac{\text{The Square Root of } TC + BKG * CT}{TC - BKG * CT} \right) * 1.96 * 100$ Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
WB27810			
Analyst			
MCCOWN			
Date			
05/12/94			
Time			
23:30			
ALPHA TOTAL	in $\mu\text{Ci/L}$ (AVERAGE) =	8.48E-03	DETECTION

ALPHA TOTAL	in $\mu\text{Ci/L}$ (AVERAGE) =	8.48E-03	DETECTION LEVEL 2.18E-07 $\mu\text{Ci/mL}$
ALPHA TOTAL	in $\mu\text{Ci/mL}$ (AVERAGE) =	8.48E-06	
RELATIVE COUNTING ERROR	=	5.5%	

Data Entry by: <i>Paul J. McCown</i>	Date: 17-May-94
Approved by: <i>Paul J. McCown</i>	Date: 17-May-94

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2 5-13-94 AG. DF 1
55 10ml
K209-5525

$\frac{1310}{30}$

Alpha Calculation (CEPC CAL 2.0)
By: AL JOHANNSEN, on 05-13-1994 at 06:49:26
Det #13 2-inch mount Alpha eff. : .2322
Sample size : 10 mL Dilution : 1

Sample # K209-5525 Count # 1

$\frac{1344}{30}$

1310
----- 0.5 = 8.3746E-03 uCi/L alpha
30

Sample # K209-5525 Count # 2

1344
----- 0.5 = 8.5939E-03 uCi/L alpha
30

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

5-6

Serial No K 211.-6725	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Interpretation AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C3B	Returns 0
Sample Size .050ML-10ML-.500ML			Customer ID C58S1	
Remarks Calculations, Results COUNT AS uCi/L USE 13,14,15 OR 16				
Analyst-1 <i>John H. McCown</i> M's	Analyst-2 <i>Emilio</i> M's	Analyst-3 <i>APR</i> M's	Analyst-4 M's	Analyst-5 M's
Date 5/12/94	Time Completed 23:30	Lab. # 5-13-94	<i>APR</i>	

64-883C-061 (R-10-83)

WHC-SD-WM-DE-079 REV 0

AT: LA-508-101 (D-0) SOLIDS

		SAM	REPLICATE
Type	DETECTOR NUMBER	13	13
SAM	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	316	292
3254	COUNT TIME in MINUTES (CT)	30	30
AT: as TB?	DETECT TIME in MINUTES (BEG)	0.5	0.5
AT	BACKGROUND in cpm (SS)	0.500	0.500
Test Code	SAMPLE SIZE in mL (DF)	201	201
Matrix	DILUTION FACTOR (D g/L)	2.9036	2.9036
SOLID	DIGEST GRAMS of SOLIDS/LITER (EFF)	0.2322	0.2322
Sample #	EFFICIENCY FACTOR	10.033	9.233
K211-6725	IC, Pmax, or P _s (Sample Rate) as Appropriate	2.69E+00	2.48E+00
Instrument Code	CONCENTRATION in uCi/g		7.5126E+00
WB27810	AVG. uCi/L in DIGEST SOLUTION =		
Analyst	P _s (Sample Count Rate) = (TC / CT) - BEG		
MCCOWN	ALPHA TOTAL uCi/g = P _s * 1000mL/L * DF * / (EFF * SS * D g/L * 2220000dpm/uCi)		
Date	Relative Counting Error = 1 (The Square Root of TC + BEG * CT) / (TC - BEG * CT) * 1.96 * 100		
05/12/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Time			
23:30			
ALPHA TOTAL	in uCi/g (AVERAGE) =	2.59E+00	

RELATIVE COUNTING ERROR =

12.4%

DETECTION
LEVEL

3.02E-01
uCi/g

Date Entry by:
Approved by:

Date: 17-May-94

Date: 17-May-94

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Form L2 Rev. 2.1

1235

TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2 5-13-94 RJ

DF 402
1

K211-6725

$\frac{316}{30} = 10.5$

Alpha Calculation (CEPC_CAL 2.0)
By: AL JOHANSEN, I on 05-13-1994 at 06:51:11
Det #13 2-inch count Alpha eff. : .2322
Sample size : 1 mL Filtration : 402

$\frac{292}{30}$

Sample # K211-6725 Mount # 1

316
----- 0.5 = 7.8245E+00 uCi/L alpha
30

Sample # K211-6725 Mount # 2

292
----- 0.5 = 7.2666E+00 uCi/L alpha
30

1236

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

7-8

Serial No	Sample Point	Date	Time Issued	Priority
K 211.-6E25	C-111	4-25-94	14:57	23
Determination	Method Standard	Result Units	Charge Code	Returns
AT	LA-508-101	uCi/G Rec	N4C3B	0
Sample Size	.050ML-10ML-.500ML		Customer ID	
C58S1				
Remarks Calculations Results				
COUNT AS uCi/L USE 13,14,15 OR 16				
Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
Miss	Miss	Miss	Miss	Miss
Date	Time Completed	Lab Dir-1 Mgr		
5/12/94	23:30			

54-6500-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SOLIDS

	SAMPLE	REPLICATE
Type	13	13
DUP	2	2
Work List	282	265
3254	30	30
AT: TB?	0.5	0.5
AT	0.500	0.500
Test Code	201	201
Matrix	2.926	2.926
SOLID	0.2322	0.2322
Sample #	8.900	8.333
K211-6825	2.37E+00	2.22E+00
Instrument Code		6.7197E+00
WB27810		
Analyst		
MCCOWN		
Date		
05/12/94		
Time		
23:30		
ALPHA TOTAL	2.30E+00	

RELATIVE COUNTING ERROR = 13.1%

DETECTION LEVEL 3.00E-01 uCi/g

ALPHA TOTAL in uCi/g (AVERAGE) = 2.30E+00

RELATIVE COUNTING ERROR = 13.1%

Date: 17-May-94

Date: 17-May-94

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2

5-13-94 AG

DF 402

K211-6825

$\frac{282}{30}$

-0.5

Alpha Calculation (CEFC CAL 2.0)
By: AL JOHANSEN, OL 05-13-1994 at 09:35:36
Det #13 2-inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 402

$\frac{265}{30}$

Sample # K211-6825 Mount # 1

282

30

0.5 = 6.64071+00 uCi/L alpha

Sample # K211-6825 Mount # 2

265

30

0.5 = 6.45071+00 uCi/L alpha

1238

9-10

Serial No K 211.-6925	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY	Charge Code N4C5B	Returns 0
Sample Size .050ML-10ML--500ML + 10ML SPIKE			Customer ID C58S1	
Remarks Calculations Results SAMPLE SPIKED ID K211-6925 SPIKE ID 142851 SPIKE VOLUME 10ML				
Analyst-1 <i>[Signature]</i> MIS	Analyst-2 <i>[Signature]</i> MIS	Analyst-3 <i>[Signature]</i> MIS 5-13-94	Analyst-4 MIS	Analyst-5 MIS
Date 5/12/94	Time Completed 23:30	Lab Unit <i>[Signature]</i>	<i>[Signature]</i>	

54-660C-DE1 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	13	13
SPIKE	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1748	1751
3254	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.5	0.5
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.500	0.500
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	201	201
	SPIKE VOLUME in mL (SVol)	10.000	10.000
Matrix	SPIKE DILUTION FACTOR (SDF)	1	1
SOLID	SPIKE VALUE in pCi/L (SVal)	0.010397	0.010397
Sample #	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2322	0.2322
K211-6925	SAMPLE + SPIKE pCi/L (S+S)	4.50E+01	4.51E+01
Instrument Code	AVG. SAMPLE or DIGEST pCi/L from FORM #1	7.51E+00	
WB27810			
Analyst	Rs (Sample Count Rate) = (TC / CT) - BKG		
MCCOWN	SAMPLE + SPIKE pCi/L = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/pCi)		
Date	AVG. PERCENT SPIKE RECOVERY = (((S+S pCi/L (Spike) + S+S pCi/L (Replicate))/2) - Sample pCi/L) * ((SDF/SVol)/(DF/SS))		
05/12/94			
Time			
23:30			

RESULT AVG. PERCENT SPIKE RECOVERY = 89.9%

Data Entry by: <i>[Signature]</i>	Date: 17-May-94
Approved by: <i>[Signature]</i>	Date: 12-May-94

Form L3 Rev. 2.1

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2 5-13-94 AG

DF402

11211-6925

1748
30

Alpha Calculation (CEPC_CAL 2.0)
By: AL JOHANSEN, on 05-13-1994 at 16:54:35
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 402

1751
30

Sample # 11211-6925 Mount # 1

1748
----- 0.5 = 4.504E+01 uCi/L alpha
30

Sample # 11211-6925 Mount # 2

1751
----- 0.5 = 4.5127E+01 uCi/L alpha
30

3-4

Serial No K 210.-6625	Sample Point C-111	Date 4-25-94	Time Issued 14:55	Priority 23
Determination AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C3B	Returns 0
Sample Size 250mL - 10mL - .500mL			Customer ID BLANK	
Remarks Calculations Results COUNT AS uCi/L USE 13,14,15 OR 16 21.93 E-1				
Analyst - 1 <i>John J. McSwain</i> His	Analyst - 2 <i>John J. McSwain</i> His	Analyst - 3 <i>John J. McSwain</i> His 5-13-94	Analyst - 4 His	Analyst - 5 His
Date 5/12/94	Time Completed 23:30	Lat Unit Mgr's <i>John J. McSwain</i>	<i>John J. McSwain</i>	

54-650C-001 (R-10-E31)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SOLIDS

		BLK	REPLICATE
Type	DETECTOR NUMBER	13	13
BLK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	23	10
3254	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.5	0.5
AT	SAMPLE SIZE in mL (SS)	0.500	0.500
Test Code	DILUTION FACTOR (DF)	201	201
	DIGEST GRAMS of SOLIDS/LITER (D g/L)	2.9036	2.9036
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
SOLID	Lc, Rmax, or Rs (Sample Rate) as Appropriate	0.720	0.426
Sample #	CONCENTRATION in uCi/g	1.93E-01	1.14E-01
K210-6625	AVG. uCi/L in DIGEST SOLUTION =	<	4.4695E-01
Instrument Code			
WB27810	Rs (Sample Count Rate) = (TC / CT) - BKG		
Analyst	ALPHA TOTAL uCi/g = Rs * 1000mL/L * DF * / (EFF * SS * D g/L * 2220000dpm/uCi)		
MCCOWN	Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT) * 1.96 * 100		
Date	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
05/12/94			
Time			
23:30			
v RESULT v			
ALPHA TOTAL	in uCi/g (AVERAGE) =	< 1.93E-01	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.			3.02E-01
RELATIVE COUNTING ERROR =		196.0%	uCi/g
Data Entry by:	<i>John J. McSwain</i>	Date: 17-May-94	
Approved by:	<i>John J. McSwain</i>	Date: 17-May-94	

Form L2 Rev. 2.1

Page 1 of 1

TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2 5-13-94 AG

DF 402

K210-6625

$\frac{23}{30} - .5$

Alpha Calculation (CEPC CAL 2.0)
By: AL JOHANSEN, on 05-13-1994 at 08:50:30
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 402

$\frac{10}{30}$

Sample # K210-6625 Mount # 1

$\frac{23}{30} - .5 < 4.7236E-01 \text{ uCi/L alpha}$

Sample # K210-6625 Mount # 2

$\frac{10}{30} - .5 < 2.3456E-01 \text{ uCi/L alpha}$

ANALYTICAL BATCH SUMMARY SHEET

WHC-SD-WM-DP-079, REV. 0

DATE START:

May 12, 1994

DATE COMPLETE:

L. L. Fritts

5-25-94

May 25, 1994

[illegible]

X

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

RERUN *Batch 3442*

Serial No K 212.-5525	Sample Point C-111	Date 4-27-94	Time Issued 10: 2	Priority 21
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY	Charge Code N4C3B	Retuns 1
Sample Size ? 10ml			Customer ID STD	
Remarks Calculations Results S510 EV-CRB STD# 142851 <i>RESULT 9.4054 E-3 uCi/L</i> STD VAL 1,0397 <i>E-2 %REC 90.5%</i>				
Analyst - 1 <i>Alta Lewis</i>	Analyst - 2 <i>Raymond</i>	Analyst - 3 <i>Raymond</i>	Analyst - 4 <i>5-18-94</i>	Analyst - 5
MIS 5-12-94	MIS 5-12-94	MIS 5-12-94	MIS 5-18-94	MIS
Date 5/12/94	Time Completed 10:15	Lab Unit		

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

		std	REPLICATE
Type	DETECTOR NUMBER	13	13
std	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1477	1480
3442	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.8	0.8
AT	SAMPLE SIZE in mL (SS)	10.000	10
Test Code	DILUTION FACTOR (DF)	1	1
	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
LIQUID	L_s , R_{max} or R_s (SAMPLE RATE) as APPROPRIATE	48.433	48.533
Sample #	SAMPLE CONCENTRATION in pCi/L	9.40E-03	9.42E-03
K 212-5525	AVG. pCi/L in SAMPLE and REPLICATE =	9.4054E-03	
Instrument Code	R_s (Sample Count Rate) = $(TC / CT) - BKG$ ALPHA TOTAL pCi/L = $R_s \cdot 1000 \text{ mL/L} \cdot DF \cdot DDF / (EFF \cdot SS \cdot 2220000 \text{ dpm/pCi})$ ALPHA TOTAL pCi/mL = ALPHA TOTAL pCi/L / 1000 mL/L Relative Counting Error = $1 \cdot (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$ Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Analyst	v RESULTS v		
A LEWIS	ALPHA TOTAL in pCi/L (AVERAGE) =	9.41E-03	DETECTION LEVEL 2.62E-07 pCi/mL
Date	ALPHA TOTAL in pCi/mL (AVERAGE) =	9.41E-06	
05/12/94	RELATIVE COUNTING ERROR =	5.2%	
Time			

Date Entry by: <i>A. Lewis</i>	Date: 18-May-94
Approved by: <i>A. Lewis</i>	Date: 25 May 94

Form L1 Rev. 2/1 Page 0 of 1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

13/2 5-12-94 #1-2 10ml

$\frac{1477}{30} = 49.23$ ~~5-12-94~~ K212-5525

Calculation (CEPC_CEL 2.0)
 Det #13 2-inch mount Alpha eff. : .2322
 Sample size : 10 mL Dilution : 1

$\frac{1480}{30} = 49.33$ Sample # K212-5525 Mount # 1
 1477
 ----- 0.8 = 9.347E-03 uCi/L alpha
 30

Sample # K212-5525 Mount # 2
 1480
 ----- 0.8 = 9.43E-03 uCi/L alpha
 30

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

324

RERUN

Serial No	Sample Point	Date	Time Issued	Priority
K 213.-5625	C-111	4-27-94	10: 7	21
Determination	Method Standard	Result Units	Charge Code	Returns
AT	LA-508-101	uCi/ML	N4C3B	1
Sample Size	Customer ID			
? 5ml	ELANK			
Remarks Calculations Results				
COUNT AS uCi/L USE 13,14,15 OR 16				
< 2.09 E-7				
Alta Lewis				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	5-12-94	5-12-94		
Date	Time Completed	Lab Unit		
5/12/94	10:15			

WHC-SD-WM-DP-079, REV. 0

54-6500-061 (R-10-83)

AT: LA-508-101 (D-0) LIQUIDS

	BLK	REPLICATE
Type	13	13
BLK	2	2
Work List	10	13
3442	30	30
AT or TB?	0.8	0.8
AT	5.000	5
Test Code	1	1
	1	1
Matrix	0.2322	0.2322
LIQUID	0.539	0.539
Sample #	2.09E-04	2.09E-04
K 213-5625	<	2.0908E-04
Instrument Code		
Analyst	A LEWIS	
Date	05/12/94	
Time		
$Rs \text{ (Sample Count Rate)} = (TC / CT) - BKG$ $\text{ALPHA TOTAL } \mu\text{Ci/L} = Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$ $\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$ $\text{Relative Counting Error} = 1 / (\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT) * 1.96 * 100$ <p>Detection Levels and Less Than Values are determined from Procedure LA-508-002.</p>		
v RESULTS v		
ALPHA TOTAL in $\mu\text{Ci/L}$ (AVERAGE) =	< 2.09E-04	DETECTION LEVEL 5.24E-07 $\mu\text{Ci/mL}$
ALPHA TOTAL in $\mu\text{Ci/mL}$ (AVERAGE) =	< 2.09E-07	
LESS Than Value was Determined from Lc.		
RELATIVE COUNTING ERROR =	108.4%	
Date Entry by:	Date:	18-May-94
Approved by:	Date:	25 May 94
Form L1 Rev. 2.1		

:247

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

13/2 5-12-94 AJ #3-4 5ml
K213-5625

$\frac{10}{30} - .8$

Alpha Calculation (CRSC CAL 2.0)
By: VA LAMOND, . . . on 05-12-1994 at 21:59:51
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 5 ml Dilution : 1

$\frac{13}{30}$

Sample # K213-5625 Mount # 1

$\frac{10}{30} - 0.6 < 1.47621-64 \text{ uCi/L alpha}$

Sample # K213-5625 Mount # 2

$\frac{13}{30} - 0.6 < 1.47621-64 \text{ uCi/L alpha}$

576 **RERUN**

Serial No K 214.-5725	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination AT	Method Standard LA-508-101	Result Units pCi/ML	Charge Code N4C3B	Retuns 1
Sample Size ? 5ml	Customer ID C58FB			
Remarks Calculations Results COUNT AS pCi/L USE 13, 14, 15 OR 16 $< 4.33 E-7 \text{ pCi/ml}$ <i>Clito Lewis</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs <i>Blanca</i> 5-12-94	Mrs <i>Raymond</i> 5-12-94	Mrs	Mrs
Date 5/12/94	Time Completed 10:15	Lab Use Only		

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV 0

AT: LA-508-101 (D-0) LIQUIDS

		SAM	REPLICATE
Type	DETECTOR NUMBER	13	13
SAM	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	40	57
3442	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.8	0.8
AT	SAMPLE SIZE in mL (SS)	5.000	5
Test Code	DILUTION FACTOR (DF)	1	1
	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
LIQUID	LC, Rmax, or RS (SAMPLE RATE) as APPROPRIATE	1.115	1.100
Sample #	SAMPLE CONCENTRATION in pCi/L	4.33E-04	4.27E-04
K 214-5725	AVG. pCi/L in SAMPLE and REPLICATE =	<	4.2977E-04

Instrument Code	
Analyst	AL LEWIS
Date	05/12/94
Time	
Rs (Sample Count Rate)	= (TC / CT) - BKG
ALPHA TOTAL pCi/L	= Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/pCi)
ALPHA TOTAL pCi/mL	= ALPHA TOTAL pCi/L / 1000mL/L
Relative Counting Error	= (The Square Root of TC + BKG * CT) / (TC - BKG * CT) * 1.96 * 100
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL	in pCi/L (AVERAGE)	=	< 4.33E-04	DETECTION LEVEL 5.24E-07 pCi/mL
ALPHA TOTAL	in pCi/mL (AVERAGE)	=	< 4.33E-07	
LESS THAN Value was Determined from Rs.				
RELATIVE COUNTING ERROR	=	98.0%		

Date Entry by:	<i>Clito Lewis</i>	Date:	18-May-94
Approved by:	<i>Clito Lewis</i>	Date:	25 May 94
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TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

13/ 5-12-94 AD

5-6.

5ml

40
30

K214-5725

Alpha Calculation (CEPC_CAL 2.0)
By: VA RAYMOND, for 05-12-1994 at 21:30:21
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 5 mL Dilution : 1

57
30

Sample # K214-5725 Mount # 1

40

30

0.8 = 2.6653E-04 uCi/L alpha

Sample # K214-5725 Mount # 2

57

30

0.8 = 4.2476E-04 uCi/L alpha

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

778 RERUN

Serial No K 214.-5825	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination AT	Method Standard LA-508-101	Result Units uCi/ML	Charge Code N4C3B	Retuns 1
Sample Size ? 5 ml			Customer ID C58FB	
Remarks Calculations Results COUNT AS uCi/L USE 13,14,15 OR 16 $< 4.19E-7 \mu\text{Ci/ml}$ <i>Alita Lewis</i>				
Analyst - 1 Mrs	Analyst - 2 Mrs 5-12-94	Analyst - 3 Mrs 5-12-94	Analyst - 4 Mrs	Analyst - 5 Mrs
Date 5/12/94	Time Completed 10:15	Lab Use		

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

5-25-94

Type	DETECTOR NUMBER	DF-SAM	REPLICATE
Dup		13	13
Work List	DISH SIZE 1, 2, or 5 (MS)	2	2
3442	TOTAL COUNTS (TC)	29	39
AT or TB?	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.8	0.8
Test Code	SAMPLE SIZE in mL (SS)	5.000	5
Matrix	DILUTION FACTOR (DF)	1	1
LIQUID	DIGEST DILUTION FACTOR (DDF)	1	1
Sample #	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
K 214-5825	LC, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	0.719	1.079
Instrument Code	SAMPLE CONCENTRATION in pCi/L	2.79E-04	4.19E-04
	AVG. pCi/L in SAMPLE and REPLICATE =	<	3.4897E-04

Analyst	Rs (Sample Count Rate) = (TC / CT) - BKG
A LEWIS	ALPHA TOTAL pCi/L = $R_s \cdot 1000 \text{ mL/L} \cdot \text{DF} \cdot \text{DDF} / (\text{EFF} \cdot \text{SS} \cdot 2220000 \text{ dpm/pCi})$
Date	ALPHA TOTAL pCi/mL = ALPHA TOTAL pCi/L / 1000 mL/L
05/12/94	Relative Counting Error = $1 \cdot (\text{The Square Root of } \text{TC} + \text{BKG} \cdot \text{CT}) / (\text{TC} - \text{BKG} \cdot \text{CT}) \cdot 1.96 \cdot 100$
Time	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

v RESULTS v			DETECTION LEVEL
ALPHA TOTAL	in pCi/L (AVERAGE)	= < 4.19E-04	
ALPHA TOTAL	in pCi/mL (AVERAGE)	= < 4.19E-07	
LESS THAN Value was Determined from Rmax.			5.24E-07 pCi/mL
RELATIVE COUNTING ERROR	=	500.0%	

Date Entry by:	Date:	18-May-94
Approved by:	Date:	25 May 94
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TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079 REV. C

13/2 5-12-94 ~~AD~~ #7-8 5ml
K214-5825

$\frac{29}{30}$
 $\frac{39}{30}$

Alpha Calculation (CRPC CAL 2.0)
By: VA RAYMOND, 61544, on 05-12-1994 at 21:25:54
Det #13 2-inch count Alpha eff. : .2222
Sample size : 5 mL Dilution : 1

Sample # K214-5825 Mount # 1

29
----- 0.8 < 2.20(21-04 uCi/l) alpha
30

Sample # K214-5825 Mount # 2

39
----- 0.8 = 1.93(21-04 uCi/L) alpha
30

9870 **RERUN**

Serial No K 214.-5925	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY	Charge Code R4C3B	Retuns 1
Sample Size ? 5 ml			Customer ID C56FB	
Remarks Calculations, Results SAMPLE SPIKED ID SPIKE ID SPIKE VOLUME 10 ml 142 B51 101.6% Alton Lewis				
Analyst - 1	Analyst - 2 J. P. Lewis	Analyst - 3 R. J. Lewis	Analyst - 4	Analyst - 5
Mrs	Mrs 5-12-94	Mrs 5-12-94	Mrs	Mrs
Date 5/12/94	Time Completed 10:15	Lab Unit ID J. P. Lewis	54-650C-061 (R-10-83)	

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	13	13
SPIKE	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1658	1656
3442	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.8	0.8
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	5.000	5.000
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	1	1
	SPIKE VOLUME in mL (SVol)	10.000	10.000
Matrix	SPIKE DILUTION FACTOR (SDF)	1	1
LIQUID	SPIKE VALUE in $\mu\text{Ci/L}$ (SVol)	0.010397	0.010397
Sample #	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2322	0.2322
K214-5925	SAMPLE + SPIKE $\mu\text{Ci/L}$ (S+S)	2.11E-02	2.11E-02
Instrument Code	AVG. SAMPLE or DIGEST $\mu\text{Ci/L}$ from FORM #1	<4.2977E-4	
Analyst	Rs (Sample Count Rate) = $(TC / CT) - BKG$		
A LEWIS	SAMPLE + SPIKE $\mu\text{Ci/L}$ = $Rs * 1000 \text{ mL/L} * DF / (EFF * SS * 2220000 \text{ dpm}/\mu\text{Ci})$		
Date	AVG. PERCENT SPIKE RECOVERY = $((((S+S \mu\text{Ci/L (Spiked)} + S+S \mu\text{Ci/L (Replicate))} / 2) - \text{Sample } \mu\text{Ci/L}) * ((SDF/SVol) / (DF/SS)))$		
05/12/94			
Time	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for percent recovery calculation.		

RESULT AVG. PERCENT SPIKE RECOVERY = 101.6%

Date Entry by:	Date: 18-May-94
Approved by:	Date: 25 May 94

Form L3 Rev. 2.1 Page 1 of 1

TOTAL ALPHA ANALYSIS -- UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

13/2 5-12-94 AB #9-10

5ml

K214-5925

$\frac{1658}{30} - .8$

$\frac{1656}{30}$

Alpha Calculation (GFCO, CAL 2.0)
By: VA RAYMOND, on 05-12-1994 at 21:25:18
Det #13 2-inch count Alpha eff. : .2822
Sample size : 5 ml Dilution : 1

Sample # K214-5925 Mount # 1

$\frac{1656}{30} - 0.8 = 2.11321-02 \text{ uCi/g alpha}$

Sample # K214-5925 Mount # 2

$\frac{1656}{30} - 0.8 = 2.11321-02 \text{ uCi/g alpha}$

WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No. K215, K216	Customer ID: C58HCB <i>C111</i>
Analysis: AT	Sample Prep: DIRECT

Instrument: WA 57276	Procedure/ Rev: LA-508-101 - DO
Technologist: JD SPELLMAN	Date: 05/04/94
Starting Time: 0800	Temperature NA
Ending Time: 0300	Chemist: S. FITZGERALD

Comments: _____

	Description	Lab ID		Description	Lab ID
1	LMCS	K215-5525	11		
2	SAMPLE	K216-5725	12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
EV-CRB	142B51 10ML			
			1255	

WHC-SD-WM-DP-079, REV. 0

METHOD:

DATE START:

LA-508-101

MAY 4, 1994

PREPARED BY:

DATE COMPLETE:

S.L. FITZGERALD

MAY 6, 1994

[illegible]

NARRATIVE:

X

NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

~~A-11~~

5-6-94

Serial No K 215.-5525		Sample Point C-111		Date 4-28-94		Time Issued 11:14		Priority 21	
Determination AT		Method Standard LA-508-101		Result Units % RECOVERY		Charge Code N4C3B		Retuns 0	
Sample Size 10mL						Customer ID STD			
Remarks Calculations Results S510 EV-CRB STD# 142851 STD VAL 1.0398 RESULT 9.6997 E-3 %REC 93.3% <i>JMS</i>									
Analyst - 1 <i>JMS</i>		Analyst - 2 <i>W. J. Miller</i>		Analyst - 3 <i>P. J. Miller</i>		Analyst - 4 <i>P. J. Miller</i>		Analyst - 5 <i>P. J. Miller</i>	
Date 5-4-94		Time Completed 0300		Lab. # 1 Mgr. <i>P. J. Miller</i>		Lab. # 2 Mgr. <i>P. J. Miller</i>		Lab. # 3 Mgr. <i>P. J. Miller</i>	

54-6800-061 (R-10-83)

WHCSD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS			STD	REPLICATE
Type	DETECTOR NUMBER		14	14
STD	DISH SIZE 1, 2, or 5 (MS)		2	2
Work List	TOTAL COUNTS (TC)		1551	1411
3347	COUNT TIME in MINUTES (CT)		30	30
AT or TB 2	BACKGROUND in cpm (BKG)		0.4	0.4
AT	SAMPLE SIZE in mL (SS)		10.000	10
Test Code	DILUTION FACTOR (DF)		1	1
	DIGEST DILUTION FACTOR (DDF)		1	1
Matrix	EFFICIENCY FACTOR (EFF)		0.2274	0.2274
LIQUID	LC Rmax or Rs (SAMPLE RATE) as APPROPRIATE		51.300	46.633
Sample #	SAMPLE CONCENTRATION in pCi/L		1.02E-02	9.24E-03
K215-5525	AVG. pCi/L in SAMPLE and REPLICATE =		9.6997E-03	
Instrument Code	Ps (Sample Count Rate) = $(TC / CT) - BKG$ α ALPHA TOTAL pCi/L = $Rs * 1000 \text{ mL/L} * DF * DDF / (EFF * SS * 2220000 \text{ dpm/pCi})$ α ALPHA TOTAL pCi/mL = α ALPHA TOTAL pCi/L / 1000 mL/L Relative Counting Error = $(\sqrt{(TC + BKG * CT)} / (TC - BKG * CT)) * 1.96 * 100$ Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
Analyst	MEYERS			
Date	05/04/94			
Time	3:00			
v RESULTS v				
ALPHA TOTAL	in pCi/L (AVERAGE)	=	9.70E-03	DETECTION LEVEL 2.05E-07 pCi/mL
ALPHA TOTAL	in pCi/mL (AVERAGE)	=	9.70E-06	
RELATIVE COUNTING ERROR	=	5.3%		

Date Entry by:	<i>P. J. Miller</i>	Date:	05-May-94
Approved by:	<i>P. J. Miller</i>	Date:	6-May-94

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

14/2 3-4-94

1-2

K215-5525

1551
30

Alpha Calculation (CRPC_CAL 2.0)
By: RA WILLIAMS, on 05-04-1994 at 12:03:44
Det #14 2 -inch mount Alpha eff. : .2274
Sample size : 10 mL Dilution : 1

Sample # K215-5525 Mount # 1

1411
30

1551
----- 0.4 = 1.0162E-02 uCi/L alpha
30

Sample # K215-5525 Mount # 2

1411
----- 0.4 = 9.2375E-03 uCi/L alpha
30

Serial No	Sample Point	Date	Time Issued	Priority
K 216.-5725	C-111	4-28-94	11:23	21
Determination	Method Standard	Result Units	Charge Code	Returns
AT	LA-508-101	uCi/mL	N4C3B	0
Sample Size	Customer ID			
16 mL	C58HCB			
Remarks Calculations Results				
COUNT AS uCi/L USE 13,14,15 OR 16				
9.67 E-7 uCi/mL				
IR Sp				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Date	Time Completed	Lab. Dir. / Mgr.		
5-4-94	0300			

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

AT: LA-508-101 (D-0) LIQUIDS

		SAM	REPLICATE
Type	DETECTOR NUMBER	14	14
SAM	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	140	177
3347	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.4	0.4
AT	SAMPLE SIZE in mL (SS)	10.000	10
Test Code	DILUTION FACTOR (DF)	1	1
	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Pmax, or Rs (SAMPLE RATE) as APPROPRIATE	4.267	5.500
Sample #	SAMPLE CONCENTRATION in uCi/L	8.45E-04	1.09E-03
K216-5725	AVG. uCi/L in SAMPLE and REPLICATE =	9.6733E-04	
Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG		
Analyst	ALPHA TOTAL uCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/uCi)		
MEYERS	ALPHA TOTAL uCi/mL = ALPHA TOTAL uCi/L / 1000mL/L		
Date	Relative Counting Error = 1 (The Square Root of TC + BKG * CT) / (TC - BKG * CT) * 1.96 * 100		
05/04/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Time	v RESULTS v		
3:00	ALPHA TOTAL in uCi/L (AVERAGE) =	9.67E-04	DETECTION LEVEL 2.05E-07 uCi/mL
	ALPHA TOTAL in uCi/mL (AVERAGE) =	9.67E-07	
	RELATIVE COUNTING ERROR =	18.9%	

Data Entry by:	Date:	05-May-94
Approved by:	Date:	6-May-94
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1259

TOTAL ALPHA ANALYSIS -- UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

14/2 5-4-94 34 K216-5725

Alpha Calculation (CRPC CAL 2.0)
 By: EA WILLIAMS, on 05-04-1994 at 12:02:56
 Det #14 2-inch mount Alpha eff. : .2274
 Sample size : 10 mL Dilution : 1

140
 30

Sample # K216-5725 Mount # 1

$\frac{140}{30} \times 0.4 = 8.4517E-04 \text{ uCi/L alpha}$

177
 30

Sample # K216-5725 Mount # 2

$\frac{177}{30} \times 0.4 = 1.0895E-03 \text{ uCi/L alpha}$

WHC-SD-WM-DP-079, REV. 0

Sample Prep:

Chemist:

[illegible]

WHC-SD-WM-DP-079, REV. 0

DATE START:

June 2, 1994

DATE COMPLETE:

June 2, 1994

[illegible]

NARRATIVE:

x

NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

RERUN

Serial No K 219.-6625	Sample Point C-111	Time Issued 5-18-84	Priority 20
Determination AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N403B
Sample Size .025 ML	Customer ID BLANK		
Remarks Calculations Results COUNT AS uCi/L USE 13,14,15 CR 16 <i>3.91E-2 uCi/g</i> <i><1.22E-2 uCi/g</i> <i>alt Lewis</i>			
Analyst-1	Analyst-2	Analyst-3	Analyst-4
	<i>Rubert</i>	<i>D.H. Wilson</i>	
Mrs	Mrs	Mrs	Mrs
Date 6-2-94	Time Completed	Signature <i>Deke</i>	Signature <i>Ph...</i>

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SOLIDS

		BLANK	REPLICATE
Type	DETECTOR NUMBER	18	15
BLANK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	12	14
3578	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.6	0.7
AT	SAMPLE SIZE in mL (SS)	0.025	0.025
Test Code	DILUTION FACTOR (DF)	1	1
Matrix	DIGEST GRAMS of SOLIDS/LITER (D g/L)	3.298	3.298
SOLID	EFFICIENCY FACTOR (EFF)	0.2095	0.2380
Sample #	Lc, Rmax, or Rs (Sample Rate) as Appropriate	0.467	0.504
K219-6625	CONCENTRATION in uCi/g	1.22E-02	1.16E-02
Instrument Code	AVG. uCi/L in DIGEST SOLUTION =	<	3.9150E-02
Analyst	$R_s \text{ (Sample Count Rate)} = (TC / CT) - BKG$ $\text{ALPHA TOTAL } \mu\text{Ci/g} = R_s \cdot 1000 \text{ mL/L} \cdot DF \cdot / (EFF \cdot SS \cdot D \text{ g/L} \cdot 2220000 \text{ dpm}/\mu\text{Ci})$ $\text{Relative Counting Error} = 1 \cdot (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$		
Date	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
06/02/94			
Time			
ALPHA TOTAL	in uCi/g (AVERAGE) =	< 1.22E-02	DETECTION LEVEL
LESS Than Value was Determined from Lc.			3.14E-02
RELATIVE COUNTING ERROR	=	178.9%	pCi/g
Date Entry by:	Date: 02-Jun-94		
Approved by:	Date: 2 Jun 94		

TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

18/2 6-244

5 15/2

K 219-6625

12
30

12

30
0.6 < 2.6340E-02 uCi/L alpha

Sample # K-219-6625 Mount # 1
Alpha Calculation (CHPC CAL 2.0)
By: DH MILICIA, 61453, on 06-07-1994 at 15:56:10
Det #18 2-inch count Alpha eff. : .2095
Sample size : .025 mL Dilution : 1

14

30
0.7 < 2.6340E-02 uCi/L alpha

Sample # K-219-6625 Mount # 1
Alpha Calculation (CHPC CAL 2.0)
By: DH MILICIA, on 06-07-1994 at 15:55:54
Det #15 2-inch count Alpha eff. : .238
Sample size : .025 mL Dilution : 1

REDU 3578

Serial No K 217-5525	Sample Point C-111	Date 5-4-94	Time Issued 10:36	Priority LO
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY	Charge Code N403B	Reruns 1
Sample Size 10 ML			Customer ID STD	
Remarks Calculations Results VAL 1V-CR3 5B52 RESULT 7.99E-3 STD VAL 7.799E-3 RECD 75.8 102.4 <i>AT</i> 6.294 <i>Alita Lewis</i>				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 6-2-94	Time Completed	Lab Use Only		

54-680C-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS		STANDARD	REPLICATE
Type	DETECTOR NUMBER	18	15
STANDARD	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1225	1184
	COUNT TIME in MINUTES (CT)	30	30
AT or TB-7	BACKGROUND in cpm (BKG)	0.6	0.7
AT	SAMPLE SIZE in mL (SS)	10.000	10
Test Code	DILUTION FACTOR (DF)	1	1
	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2095	0.2380
LIQUID	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	40.233	38.767
Sample #	SAMPLE CONCENTRATION in pCi/L	8.65E-03	7.34E-03
K217-5525	AVG. pCi/L in SAMPLE and REPLICATE =	7.9939E-03	
Instrument Code	$Rs \text{ (Sample Count Rate)} = (TC / CT) - BKG$		
Analyst	$\text{ALPHA TOTAL pCi/L} = Rs * 1000 \text{ mL/L} * DF * DDF / (EFF * SS * 2220000 \text{ dpm/pCi})$		
A LEWIS	$\text{ALPHA TOTAL pCi/mL} = \text{ALPHA TOTAL pCi/L} / 1000 \text{ mL/L}$		
Date	$\text{Relative Counting Error} = [(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
06/02/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Time			
v RESULTS v			
ALPHA TOTAL	in pCi/L (AVERAGE)	=	7.99E-03
ALPHA TOTAL	in pCi/mL (AVERAGE)	=	7.99E-06
RELATIVE COUNTING ERROR	=	5.9%	
		DETECTION LEVEL	
		2.59E-07 pCi/mL	
Date Entry by: <i>ALJ</i>	Date:	02-Jun-94	
Approved by: <i>ALJ</i>	Date:	2-Jun-94	

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

18/2 6-2-94

15/2
K217-5525

1225
30

1225

30 0.6 = 8.6507E-03 uCi/L alpha

Sample # K-217-5525 Mount # 1

Alpha Calculation (CRPC CAL 2.0)
By: DH HILLICIA, 61453, on 06-02-1994 at 15:27:03
Det #10 2-inch mount Alpha eff. : .2095
Sample size : 10 mL Dilution : 1

1184

30 0.7 = 7.3372E-03 uCi/L alpha

Sample # K-217-5525 Mount # 1

Alpha Calculation (CRPC CAL 2.0)
By: DH HILLICIA, on 06-02-1994 at 15:26:29
Det #15 2-inch mount Alpha eff. : .238
Sample size : 10 mL Dilution : 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 218.-6725	Sample Point C-111	Release RERUN	Date 5- 4-94	Time Issued 16:38	Priority 20
Determination AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C3B	Retuns 1	
Sample Size .025 ML			Customer ID C59 S1		
Remarks Calculations Results COUNT AS uCi/L USE 13,14,15 OR 16 <i>1.21E-1 uCi/g</i> <i>1.21E-1 uCi/g</i> <i>2AD 66.84</i> <i>1.21E-1 uCi/g</i> <i>alida Lewis</i>					
Analyst - 1 Mrs	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs	
Date 6-2-94		Time Completed		Lab Use	

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

AT: LA-508-101 (D-0) SOLIDS			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		18	15
SAMPLE	DISH SIZE 1, 2, or 5 (MS)		2	2
Work List	TOTAL COUNTS (TC)		226	100
3678	COUNT TIME in MINUTES (CT)		30	30
AT or TB?	BACKGROUND in cpm (BKG)		0.6	0.7
AT	SAMPLE SIZE in mL (SS)		0.025	0.025
Test Code	DILUTION FACTOR (DF)		1	1
	DIGEST GRAMS OF SOLIDS/LITER (D g/L)		3.298	3.298
Matrix	EFFICIENCY FACTOR (EFF)		0.2095	0.2380
SOLID	LC, Rmax, or Rs (Sample Rate) as Appropriate		6.933	2.633
Sample #	CONCENTRATION in uCi/g		1.81E-01	6.04E-02
K218-6725	AVG. uCi/L in DIGEST SOLUTION =		3.9783E-01	
Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG			
Analyst	ALPHA TOTAL uCi/g = Rs * 1000mL/L * DF * / (EFF * SS * D g/L * 2220000dpm/uCi)			
A LEWIS	Relative Counting Error = ((The Square Root of TC + BKG * CT) / (TC - BKG * CT)) * 1.96 * 100			
Date	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
06/02/94				
Time				
v RESULT v				
ALPHA TOTAL	in uCi/g (AVERAGE)	=	1.21E-01	DETECTION LEVEL
				3.14E-02
				uCi/g
RELATIVE COUNTING ERROR	=	27.3%		
Date Entry by:			Date: 02-Jun-94	
Approved by:			Date: 23 Jun 94	

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

18/2 6-2-94

15/2

226
30

K-218-6725

Alpha Calculation
by: DH MUCIA, on 06-02-1994 at 15:27:47
Det #15 2-inch count Alpha eff. : .236
Sample size : .025 g. dilution : 1

Sample # K-218-6725 Mount # 1
100
----- 0.7 = 1.5356E-01 uCi/L alpha
30

Alpha Calculation
by: DH MUCIA, on 06-02-1994 at 15:28:13
Det #15 2-inch count Alpha eff. : .2995
Sample size : .025 g. dilution : 1
Sample # K-218-6725 Mount # 1
226
----- 0.6 = 5.5630E-01 uCi/L alpha
30

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No N 218.-6825	Sample Point C-111	RECEIVED Date 5- 4-94	Time Issued 16:38	Priority 20
Determination AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C6B	Returns 1
Sample Size .025 ML			Customer ID C59 S1	
Remarks Calculations Results COUNT AS uCi/L DEF 18.14.16 OR 16 1.25E-1 uCi/g Alte Lewis Analyst - 1 Analyst - 2 Analyst - 3 Analyst - 4 Analyst - 5 Date 6-2-94 Time Completed Lab. Unit 54-6800-061 (R-10-B3)				

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SOLIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	18	15
DUPLICATE	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	228	108
3578	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.6	0.7
AT	SAMPLE SIZE in mL (SS)	0.025	0.025
Test Code	DILUTION FACTOR (DF)	1	1
	DIGEST GRAMS OF SOLIDS/LITER (D g/L)	3.298	3.298
Matrix	EFFICIENCY FACTOR (EFF)	0.2095	0.2380
SOLID	Lc, Rmax, or Rs (Sample Rate) as Appropriate	7.000	2.900
Sample #	CONCENTRATION in uCi/g	1.83E-01	6.66E-02
K218-6825	AVG. uCi/L in DIGEST SOLUTION =	4.1079E-01	
Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG		
Analyst	ALPHA TOTAL uCi/g = Rs * 1000mL/L * DF * / (EFF * SS * D g/L * 2220000dpm/uCi)		
A LEWIS	Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT) * 1.96 * 100		
Date	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
06/02/94			
Time			
v RESULT v			
ALPHA TOTAL	in uCi/g (AVERAGE) =	1.25E-01	DETECTION LEVEL
			3.14E-02
			uCi/g
RELATIVE COUNTING ERROR	=	25.6%	
Date Entry by: <i>ABZ</i>	Date: 02-Jun-94		
Approved by: <i>ABZ</i>	Date: 2 Jun 94		

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079 REV C

18/2 6-2-94

15/2

K-218-6825

228
30

228
30
0.6 = 6.0203E-01 uCi/L alpha

Alpha Calculation
By: DH HILICIA, (CRPC CAL 2.0)
Det #18 2-inch mount on 06-02-1994 at 15:29:23
Sample size: .025 mL Alpha eff.: .2095
Dilution: 1
Sample # K-218-6825 Mount # 1

Alpha Calculation
By: DH HILICIA, (CRPC CAL 2.0)
Det #15 2-inch mount on 06-02-1994 at 15:29:03
Sample size: .025 mL Alpha eff.: .206
Dilution: 1
Sample # K-218-6825 Mount # 1
100
30
0.7 = 2.1965E-01 uCi/L alpha

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WHC-SD-WM-DP-079, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
K 218-6925	C-111	5-4-94	16:38	20
Determination	Method Standard	Result Units	Charge Code	Returns
AT	LA-508-101	% RECOVERY	N403E	0
Sample Size	Customer ID			
.025 ML	C59 S1			
Remains Calculations Results				
SAMPLE SPICED ID 5558 SPIKE VOLUME 0.025 ml 96.5% Alita Lewis				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Mrs.	Mrs.	Mrs.	Mrs.	Mrs.
Date	Time Completed	Lab Ltr. No.		
6-2-94				

54-6800-061 (R-10-83)

AT: LA-508-101 (D-0) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	18	15
SPIKE	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1304	1233
3578	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.6	0.7
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.025	0.025
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	1	1
	SPIKE VOLUME in mL (SVol)	10.000	10.000
Matrix	SPIKE DILUTION FACTOR (SDF)	1	1
SOLID	SPIKE VALUE in $\mu\text{Ci/L}$ (SVal)	0.007799	0.007799
Sample #	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2095	0.238
K218-6925	SAMPLE + SPIKE $\mu\text{Ci/L}$ (S+S)	3.69E+00	3.06E+00
Instrument Code	AVG. SAMPLE or DIGEST $\mu\text{Ci/L}$ from FORM #1	3.62E-01	
Analyst	R_s (Sample Count Rate) = $(TC / CT) - BKG$ $SAMPLE + SPIKE \mu\text{Ci/L} = R_s \cdot 1000 \text{ mL/L} \cdot DF / (EFF \cdot SS \cdot 2220000 \text{ dpm/pCi})$ $AVG. PERCENT SPIKE RECOVERY = (((S+S \mu\text{Ci/L (Spike)} + S+S \mu\text{Ci/L (Replicate)})/2) - Sample \mu\text{Ci/L}) \cdot ((SDF/SVol)/(DF/SS))$		
A LEWIS			
Date			
06/02/94			
Time			

RESULT AVG. PERCENT SPIKE RECOVERY = 96.5%

Date Entry by: <i>[Signature]</i>	Date: 02-Jun-94
Approved by: <i>[Signature]</i>	Date: 2 Jun 94

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

18/2 6-2-94

*

15/2

K218-6925

1304
80

1304
30
0.6 = 3.636E+00 uCi/L alpha

Alpha Calculation
By: LH HILICIA, / (CEPC CAL 2.0)
Det #18 2-inch count Alpha eff.: .2095
Sample size: .025 mL Dilution: 1

Sample # K-218-6925 Mount # 1

1233
30
0.7 = 3.636E+00 uCi/L alpha

Alpha Calculation
By: LH HILICIA, / (CEPC CAL 2.0)
Det #15 2-inch count Alpha eff.: .236
Sample size: .025 mL Dilution: 1

Sample # K-218-6925 Mount # 1

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WHC-SD-WM-DP-079, REV. 0

FUSION

Chemist: S. FITZGERALD

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

A-6000-881 (03/92)

i-2 *Batch 3500*

Serial No K 217.-5525	Sample Point C-111	Date 5- 4-94	Time Issued 16:36	Priority 20
Determination AT	Method-Standard LA-508-101	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size ? <i>10 ml</i>			Customer ID STD	
Remarks, Calculations, Results S510 EV-CRB STD# <i>5 B52</i> RESULT <i>7.4428</i> <i>E-3</i> STD VAL <i>7.793</i> <i>E-3</i> %REC <i>95.4%</i> <div style="text-align: center;">OUT FOR RERUN</div> <i>Alita Lewis</i>				
Analyst - 1	Analyst - 2 <i>D.H. Miller</i>	Analyst - 3 <i>W. Brown</i>	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date <i>5-27-94</i>	Time Completed	Lab/Unit Mo.		

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

		std	REPLICATE
Type	DETECTOR NUMBER	13	13
std	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	1151	1187
3500	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.6	0.6
AT	SAMPLE SIZE in mL (SS)	10.000	10
Test Code	DILUTION FACTOR (DF)	1	1
	INGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	37.767	38.967
Sample #	SAMPLE CONCENTRATION in $\mu\text{Ci/L}$	7.33E-03	7.56E-03
K217-5525	AVG. $\mu\text{Ci/L}$ in SAMPLE and REPLICATE =	7.4428E-03	

Instrument Code	Ps (Sample Count Rate) = $(TC / CT) - BKG$
Analyst	ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
A LEWIS	ALPHA TOTAL $\mu\text{Ci/mL}$ = $ALPHA\ TOTAL\ \mu\text{Ci/L} / 1000\text{mL/L}$
Date	Relative Counting Error = $(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT) * 1.96 * 100$
05/27/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Time	
0800	v RESULTS v

ALPHA TOTAL	in $\mu\text{Ci/L}$ (AVERAGE) =	7.44E-03	DETECTION LEVEL 2.34E-07 $\mu\text{Ci/mL}$
ALPHA TOTAL	in $\mu\text{Ci/mL}$ (AVERAGE) =	7.44E-06	
RELATIVE COUNTING ERROR	=	5.9%	

Data Entry by:	<i>Alita Lewis</i>	Date:	01-Jun-94
Approved by:	<i>D. Miller</i>	Date:	<i>6-1-94</i>

TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2

1151
30

Alpha Calculation (CHPC-CAL 2.0)
by: DE BALLEA, on 05-26-1994 at 17:19:17
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 10 mL Dilution : 1

K217-5525

1187
30

Sample # E-217 Mount # 1

1151

----- 0.6 = 7.3264E-03 uCi/L alpha
30

Sample # E-217 Mount # 2

1187

----- 0.6 = 7.5592E-03 uCi/L alpha
30

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7-8

Serial No K 219.-6625	Sample Point C-111	Date 5-18-94	Time Issued 13:33	Priority 20
Determination AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C3B	Reruns 0
Sample Size ? .025 ml			Customer ID BLANK	
Remarks, Calculations, Results COUNT AS uCi/L USE 13,14,15 OR 16 OUT FOR RERUN Alita Lewis <div style="text-align: right;"> $< 1.10^{E-2}$ uCi/g rec </div>				
Analyst - 1	Analyst - 2 D.H. Martin	Analyst - 3 In Bues	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-27-94	Time Completed	Lab Unit Mgr H. H. H.	Signature [Signature]	

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

AT: LA-508-101 (D-0) SOLIDS

Type	DETECTOR NUMBER	BLK	REPLICATE
BLK	DISH SIZE 1, 2, or 5 (MS)	13	13
Work List	TOTAL COUNTS (TC)	2	2
3500	COUNT TIME in MINUTES (CT)	9	4
AT in TB.2	BACKGROUND in cpm (BKG)	30	30
AT	SAMPLE SIZE in mL (SS)	0.6	0.6
Test Code	DILUTION FACTOR (DF)	0.025	0.025
	DIGEST GRAMS of SOLIDS/LITER (D g/L)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	3.298	3.298
SOLID	Lc, Rmax, or R _s (Sample Rate) as Appropriate	0.2322	0.2322
Sample #	CONCENTRATION in uCi/g	0.467	0.467
K219-6625	AVG. uCi/L in DIGEST SOLUTION =	1.10E-02	1.10E-02
Instrument Code		<	3.6214E-02
Analyst	R_s (Sample Count Rate) = $(TC / CT) - BKG$ ALPHA TOTAL uCi/g = $R_s \cdot 1000 \text{ mL/L} \cdot DF \cdot / (EFF \cdot SS \cdot D \text{ g/L} \cdot 2220000 \text{ dpm/uCi})$ Relative Counting Error = $1 \cdot (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$ Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Date	05/27/94		
Time			
0800	v RESULT v		
ALPHA TOTAL	in uCi/g (AVERAGE) =	< 1.10E-02	DETECTION LEVEL
LESS Than Value was Determined from Lc.			2.84E-02 uCi/g
RELATIVE COUNTING ERROR	=	113.2%	
Date Entry by:	[Signature]		Date: 01-Jun-94
Approved by:	[Signature]		Date: 6-1-94

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2

K219-6625

$\frac{9}{30}$

Alpha Calculation (CEPC_CAL 2.6)
 By: EG BAKULA, L. on 05-26-1994 at 17:54:41
 Det #13 2 -inch mount Alpha eff. : .2822
 Sample size : .025 mL Dilution : 1

$\frac{4}{30}$

Sample # K-219 Mount # 1

$\frac{9}{30}$ 0.6 < 2.5569E-02 uCi/L alpha

Sample # K-219 Mount # 2

$\frac{4}{30}$ 0.6 < 2.5569E-02 uCi/L alpha

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3-4

Serial No K 218.-6725	Sample Point C-111	Date 5- 4-94	Time Issued 16:38	Priority 20
Determination AT	Method Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C3B	Retuns 0
Sample Size ?, 0.025 ml			Customer ID C59 S1	
Remarks Calculations, Results COUNT AS uCi/L USE 13,14,15 OR 16 8.39E-2 uCi/g ALTS LEWIS OUT FOR RERUN				
Analyst - 1	Analyst - 2 D. H. Martin	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-27-94	Time Completed	Lab Unit Mgr		

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

AT: LA-508-101 (D-0) SOLIDS

	SAMPLE	REPLICATE
Type	DETECTOR NUMBER	13
SAMPLE	DISC SIZE 1, 2, or 5 (MS)	2
Work list	TOTAL COUNTS (TC)	130
3500	COUNT TIME in MINUTES (CT)	30
AT or TB?	BACKGROUND in cpm (BKG)	0.6
AT	SAMPLE SIZE in mL (SS)	0.025
Test Code	DILUTION FACTOR (DF)	1
	DIGEST GRAMS of SOLIDS/LITER (D g/L)	3.298
Matrix	EFFICIENCY FACTOR (EFF)	0.2322
SOLID	La, Rmax, or Ps (Sample Rate) as Appropriate	3.733
Sample #	CONCENTRATION in uCi/g	8.78E-02
K218-6725	AVG. uCi/L in DIGEST SOLUTION =	2.7676E-01

Instrument Code	Ps (Sample Count Rate) = (TC / CT) - BKG
Analyst	ALPHA TOTAL uCi/g = $Ps \cdot 1000 \text{ mL/L} \cdot DF \cdot / (EFF \cdot SS \cdot D \text{ g/L} \cdot 2220000 \text{ dpm/uCi})$
A LEWIS	Relative Counting Error = $1 \cdot (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$
Date	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
05/27/94	
Time	
0800	

ALPHA TOTAL	in uCi/g (AVERAGE) =	8.39E-02	DETECTION LEVEL
			2.84E-02
RELATIVE COUNTING ERROR	=	22.6%	uCi/g
Data Entry by:		Date: 01-Jun-94	
Approved by:		Date: 6-1-94	

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

WHC-SD-WM-DP-079

13/2

$\frac{130}{30}$

Alpha Calculation (CRFC CAL 2.0)
By: LE BAEILA, on 05-26-1994 at 17:18:52
Det #16 2-inch round Alpha eff. : .2822
Sample size : .025 mL Dilution : 1

K218-6725

$\frac{120}{30}$

Sample # L-218 Mount # 1

$\frac{130}{30} - 0.6 = 2.6970E-01 \text{ uCi/L alpha}$

Sample # L-218 Mount # 2

$\frac{120}{30} - 0.6 = 2.6553E-01 \text{ uCi/L alpha}$

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5-6

Serial No K 218.-6825	Sample Point C-111	Date 5- 4-94	Time Issued 16:38	Priority 20
Determination AT	Method-Standard LA-508-101	Result Units uCi/G Rec	Charge Code N4C3B	Reruns 0
Sample Size ? .025 ml			Customer ID C59 S1	
Remarks, Calculations, Results COUNT AS uCi/L USE 13,14,15 OR 16 <i>8.17E-2 uCi/g Rec</i> OUT FOR RERUN <i>Alita Lewis</i>				
Analyst - 1	Analyst - 2 <i>D.H. Miller</i>	Analyst - 3 <i>McDowell</i>	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-27-94	Time Completed	Lab Lm Mgr <i>[Signature]</i>	<i>[Signature]</i>	

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SOLIDS

AT: LA-508-101 (D-0) SOLIDS			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		13	13
DUP	DISH SIZE	1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)		128	119
3500	COUNT TIME in MINUTES (CT)		30	30
AT or TB?	BACKGROUND in cpm (BKG)		0.6	0.6
AT	SAMPLE SIZE in mL (SS)		0.025	0.025
Test Code	DILUTION FACTOR (DF)		1	1
	DIGEST GRAMS of SOLIDS/LITER (D g/L)		3.3404	3.3404
Matrix	EFFICIENCY FACTOR (EFF)		0.2322	0.2322
SOLID	Lc, Rmax, or Rs (Sample Rate) as Appropriate		3.667	3.367
Sample #	CONCENTRATION in $\mu\text{Ci/g}$		8.52E-02	7.82E-02
K218-6825	AVG. $\mu\text{Ci/L}$ in DIGEST SOLUTION =		2.7288E-01	
Instrument Code				
Analyst	R_s (Sample Count Rate) = $(TC / CT) - BKG$			
A LEWIS	ALPHA TOTAL $\mu\text{Ci/g}$ = $R_s \cdot 1000\text{mL/L} \cdot DF \cdot / (EFF \cdot SS \cdot D \text{ g/L} \cdot 2220000\text{dpm}/\mu\text{Ci})$			
Date	Relative Counting Error = $1 / (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$			
05/27/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
Time				
0800				
ALPHA TOTAL	in $\mu\text{Ci/g}$	(AVERAGE) =	8.17E-02	DETECTION LEVEL
				LEVEL

RELATIVE COUNTING ERROR

22.7%

Data Entry by:

Date: 01-Jun-94

Approved by:

Date: 6-1-94

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TOTAL ALPHA ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

13/2

128
30

119
30

K218-4825

Alpha Calculation (CEPC CAL 2.0)
By: EL LARREA, on 05-26-1994 at 17:20:16
Det #13 2-inch mount Alpha eff. : .2622
Sample size : .025 mL Dilution : 1

Sample # L-218 Mount # 1

128

30 0.6 = 2.8452E-01 uCi/L alpha

Sample # L-218 Mount # 2

119

30 0.6 = 2.6124E-01 uCi/L alpha

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WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS: LA-548-121 (D-0)

[illegible]

$$\mu_{Cl}/g = (\mu_{Cl}/L) / (g/L)$$

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Date Entry by: *[Signature]* Date: 20-Jul-94
Approved by: *[Signature]* Date: 4-Aug-94
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WHC-SD-WM-DP-079, REV. 0

2711

Serial No K 211.-6750	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination GEA	Method/Standard LA-548-121	Result Units uCi/G Rec	Charge Code N4C3B	Reruns 0
Sample Size ? .050m			Customer ID C58S1	
Remarks, Calculations Results COUNT AS uCi/L LASER PRINTOUT $(CS-137) \frac{2.57^{EO2} \text{ uCi/L}}{2.9036 \text{ g/L}} = 8.85^{EO1} \text{ uCi/g CS137}$				
Analyst - 1 <i>R. Meyer</i>	Analyst - 2 <i>A. Johnson</i>	Analyst - 3 <i>M. Baker</i>	Analyst - 4	Analyst - 5
Hrs	Hrs 6-27-94	Hrs	Hrs	Hrs
Date 6/27/94	Time Completed 0315	Lab Unit Mgr <i>D. Bachelor</i>		

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS: LA-548-121 (D-0)

Serial No.	ANALYTE	SAMPLE		N/A		COUNTING ERROR %	N/A	N/A	DET LIMIT (pCi/g)
		uCi/L	uCi/g						
K211-6730	CS137	257.0000	8.85E+01						
Batch ID			0.00E+00						
3819			0.00E+00						
Recon No.			0.00E+00						
D			0.00E+00						
Analyst			0.00E+00						
MEYERS			0.00E+00						
Date			0.00E+00						
06/27/94			0.00E+00						
g/L			0.00E+00						
2.9036			0.00E+00						
			0.00E+00						
			0.00E+00						
			0.00E+00						
			0.00E+00						
			0.00E+00						
			0.00E+00						
			0.00E+00						
			0.00E+00						

$$\text{pCi/g} = (\text{pCi/L}) / (\text{g/L})$$

BEST AVAILABLE COPY

Data Entry by:	<i>D. Bachelor</i>	Date:	20-Jul-94
Approved by:	<i>D. Bachelor</i>	Date:	4-Aug-94

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-079, REV. 0

WHC-SD-WM-DP-079, REV. 0

WHC-SD-WM-DP-079, REV. 0

2712

Serial No K 211.-6830	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination GEA	Method Standard LA-548-121	Result Units uCi/G Rec	Charge Code N4C3B	Reruns 0
Sample Size 0.050m			Customer ID C5881	
Remarks, Calculations, Results COUNT AS uCi/L LASER PRINTOUT $\frac{2.43^{E02} \text{ uCi/L}}{2.926 \text{ g/L}} = 8.30^{E01} \text{ uCi/g Cs-137}$				
Analyst - 1 <i>R. Meyer</i>	Analyst - 2 <i>[Signature]</i>	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 6/27/94	Time Completed 0315	Lab. Hrs. Mgr. <i>[Signature]</i>		

54-6800-061 (R-10-83)

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS: LA-548-121 (D-0)

Serial No.	ANALYTE	SAMPLE		DUPLICATE		COUNTING ERROR %	AVERAGE (uCi/g)	RPD	DET. LIMIT (uCi/g)
		uCi/L	uCi/g	uCi/L	uCi/g				
K211-6830	CS137	243.0000	8.30E+01		ERR		ERR	NA	
Batch ID			0.00E+00		ERR		ERR	NA	
3819			0.00E+00		ERR		ERR	ERR	
Plat. No.			0.00E+00		ERR		ERR	ERR	
0			0.00E+00		ERR		ERR	ERR	
Analyst			0.00E+00		ERR		ERR	ERR	
MEYERS			0.00E+00		ERR		ERR	ERR	
Date			0.00E+00		ERR		ERR	ERR	
06/27/94			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
2.826			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
DUP. g			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	
			0.00E+00		ERR		ERR	ERR	

$$\mu\text{Ci/g} = (\mu\text{Ci/L}) / (\text{g/L})$$

$$\text{AVERAGE } (\mu\text{Ci/g}) = (\text{SAMPLE} + \text{DUPLICATE}) / 2$$

$$\text{RPD} = (\text{SAMPLE} - \text{DUPLICATE}) / \text{AVERAGE} * 100$$

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Data Entry by: <i>[Signature]</i>	Date: 20-Jul-94
Approved by: <i>[Signature]</i>	Date: 4-Aug-94

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 * 222-S Laboratory Counting Room 27-JUN-1994 09:13:28.14 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
 Sample ID: K209-5530
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 2.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

MB

date: 6-27-94

>>>>>>> COUNT INFORMATION <<<<<<<<<<
 Detector ID: GEA2
 File Number: NI3AF:1.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:00.99 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
 Sample Count Time: 27-JUN-1994 05:17:51.62
 Decayed to: 27-JUN-1994 05:17:51.62
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: MB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration: 21-MAR-1994 09:31:55.15
 Date of last efficiency calibration: 21-MAR-1994 09:43:42.61

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	563.58	104	2.36	1127.21	1118	17	50.5		CS-134	25.6
0	569.50	108	1.01	1139.06	1135	10	33.9		CS-134	14.7
3	604.93	665	1.55	1209.90	1205	23	8.3	2.45E+00	CS-134	15.0
0	661.89*	866	1.51	1323.80	1316	17	9.2		CS-137	24.1
0	797.01	540	1.65	1594.00	1586	42	17.9		CS-134	17.5
0	1173.38	589	1.80	2346.81	2341	16	9.3		CO-60	23.1
0	1332.64	488	1.96	2665.43	2656	20	9.8		CO-60	21.3

Summary of Nuclide Activity
Sample ID : K209-5530

Page : 2
Acquisition date : 27-JUN-1994 05:17:51

Total number of lines in spectrum 7 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 0
Number of lines tentatively identified by NID 7 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	1925.30D	1.000	2.217E+01	2.217E+01	0.150E+01	6.77	
CS-134	753.10D	1.000	1.536E+01	1.536E+01	0.113E+01	7.33	
CS-137	11020.00D	1.000	2.409E+01	2.409E+01	0.220E+01	9.15	
Total Activity :			6.162E+01	6.162E+01			

Grand Total Activity : 6.162E+01 6.162E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI) WHC-SD-WM-DP-079, REV. 0
NA-22	10.	1274.55	6.1486E-01
NA-24	10.	1368.53	6.6708E-01
K-40	116.	1460.75	2.1878E+01
CR-51	149.	320.09	7.3928E+00
MN-54	40.	834.83	8.4928E-01
FE-59	53.	1099.25	2.2079E+00
ZN-65	29.	1115.55	1.8596E+00
SE-75	147.	264.66	1.0956E+00
SR-85	101.	513.99	9.1610E-01
Y-88	1.	1836.06	2.6336E-01
NB-95	45.	765.79	8.4117E-01
ZR-95	58.	756.73	1.7286E+00
RU-103	80.	497.08	8.5728E-01
RURH-106	67.	621.93	1.7209E+01
SN-113	105.	391.67	1.1263E+00
SB-125	116.	427.89	2.7782E+00
I-131	106.	364.48	8.5003E-01
BA-133	115.	356.02	1.1353E+00
BA-140	73.	537.31	3.2579E+00
LA-140	6.	1596.21	6.2225E-01
CEPR-144	154.	133.54	8.2840E+00
EU-152	9.	1408.01	3.0421E+00
EU-154	10.	1274.51	1.7933E+00
EU-155	174.	105.31	2.6225E+00
TL-208	96.	583.14	1.1302E+00
BI-212	40.	727.27	1.2100E+01
PB-212	183.	239.00	1.5692E+00
RA-224	180.	240.99	1.6920E+01
RA-226	172.	186.10	1.5306E+01
TH-228	165.	215.99	2.2469E+01
U-235	155.	143.76	4.2078E+00
NP-237	144.	86.50	5.4323E+00
PU-239	156.	129.30	7.2822E+03
AM-241	132.	59.54	5.0167E+00
PU-241	165.	148.57	2.5349E+05
AM-243	156.	74.67	1.4529E+00

* 222-S Laboratory Counting Room 27-JUN-1994 09:04:20.54 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K210-6630
Sample Size: 1.00000E-03 LI
Dilution Factor: 2.00000E+01
Conversion LI to LI: 1.00000E+00

Removed by:

date: 6-27-94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA2
File Number: NI3AF:1.cnf
Geometry: 42
Description:
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:50:00.49 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 27-JUN-1994 06:14:33.64
Decayed to: 27-JUN-1994 06:14:33.64
Standard Deviations: 2
Analysis Library: LABGEA
Analyst: MB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 21-MAR-1994 09:31:55.15
Date of last efficiency calibration: 21-MAR-1994 09:43:42.61

Post-NID Peak Search Report

***** No peaks found *****

Summary of Nuclide Activity
Sample ID : K210-6630

Page : 2
Acquisition date : 27-JUN-1994 06:14:33

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

WHC-SD-WM-DP-079, REV. 0

Minimum Detectable Activity Report
Sample ID : K210-6630

Page : 3
Acquisition date : 27-JUN-1994 06:14:33

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)
NA-22	8.	1274.55	5.5234E-01
NA-24	8.	1368.53	5.7716E-01
K-40	99.	1460.75	2.0205E+01
CR-51	50.	320.09	4.2690E+00
MN-54	19.	834.83	5.8706E-01
FE-59	15.	1099.25	1.1856E+00
CO-60	6.	1332.50	4.9568E-01
ZN-65	12.	1115.55	1.1708E+00
SE-75	63.	264.66	7.1551E-01
SR-85	39.	513.99	5.6891E-01
Y-88	2.	1836.06	3.7244E-01
NB-95	17.	765.79	5.2029E-01
ZR-95	19.	756.73	9.8316E-01
RU-103	31.	497.08	5.3118E-01
RURH-106	22.	621.93	9.8988E+00
SN-113	40.	391.67	6.9665E-01
SB-125	45.	427.89	1.7222E+00
I-131	38.	364.48	5.0957E-01
BA-133	44.	356.02	6.9922E-01
CS-134	33.	604.70	5.9849E-01
CS-137	153.	661.65	1.6015E+00
BA-140	32.	537.31	2.1429E+00
LA-140	4.	1596.21	4.7597E-01
CEPR-144	68.	133.54	5.5262E+00
EU-152	7.	1408.01	2.6828E+00
EU-154	8.	1274.51	1.6045E+00
EU-155	73.	105.31	1.7053E+00
TL-208	39.	583.14	7.2139E-01
BI-212	27.	727.27	1.0037E+01
PB-212	80.	239.00	1.0379E+00
RA-224	76.	240.99	1.0999E+01
RA-226	96.	186.10	1.1439E+01
TH-228	71.	215.99	1.4766E+01
U-235	69.	143.76	2.8158E+00
NP-237	76.	86.50	3.9382E+00
PU-239	66.	129.30	4.7408E+03
AM-241	48.	59.54	3.0339E+00
PU-241	89.	148.57	1.8687E+05
AM-243	46.	74.67	7.9102E-01

WHC-SD-WM-DP-079, REV.

 * 222-S Laboratory Counting Room 27-JUN-1994 10:04:37.91 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K211-6730
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 2.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

[Signature]

date: 6-27-94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA2
 File Number: dka300:[spec.GEA2]2g2711.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:03.05 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 27-JUN-1994 09:14:01.00
 Decayed to: 27-JUN-1994 09:14:01.00
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: MB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 21-MAR-1994 09:31:55.15
 Date of last efficiency calibration: 21-MAR-1994 09:43:42.61

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	86.57	327	0.94	173.62	171	8	48.1		NP-237	31.9
									EU-155	12.2
0	105.54	355	1.24	211.52	207	9	47.5		EU-155	15.2
0	123.01	533	1.01	246.44	241	10	32.8		EU-154	10.9
0	661.84*	9217	1.48	1323.70	1317	14	2.2		CS-137	256.
0	723.34	76	1.07	1446.69	1441	12	41.1		EU-154	9.70
0	873.04	54	0.81	1746.06	1740	11	44.7		EU-154	13.3
0	996.45	33	1.42	1992.90	1989	11	68.6		EU-154	10.7
0	1004.90	74	1.18	2009.80	2003	14	38.0		EU-154	14.2
0	1274.45	110	1.66	2549.02	2542	14	20.4		EU-154	13.4
									NA-22	4.60

Summary of Nuclide Activity
Sample ID : K211-6730

Page : 2
Acquisition date : 27-JUN-1994 09:14:01

Total number of lines in spectrum 9 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 0
Number of lines tentatively identified by NID 9 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	950.40D	1.000	4.601E+00	4.601E+00	0.940E+00	20.43	154Eu 6/28/94
CS-137	11020.00D	1.000	2.565E+02	2.565E+02	0.055E+02	2.15	
EU-154	3138.00D	1.000	1.134E+01	1.134E+01	0.212E+01	18.67	
EU-155	1710.00D	1.000	1.519E+01	1.519E+01	0.721E+01	47.48	comment on hpl uncertainty 6/28/94
NP-237	7.82E+08D	1.000	3.190E+01	3.190E+01	1.536E+01	48.14	155Eu 6/28/94
Total Activity :			3.195E+02	3.195E+02			

Grand Total Activity : 3.195E+02 3.195E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI) WHC-SD-WM-DP-079, REV.0
NA-24	14.	1368.53	7.8860E-01
K-40	104.	1460.75	2.0751E+01
CR-51	412.	320.09	1.2279E+01
MN-54	36.	834.83	8.0974E-01
FE-59	20.	1099.25	1.3668E+00
CO-60	10.	1332.50	6.5144E-01
ZN-65	18.	1115.55	1.4405E+00
SE-75	539.	264.66	2.0996E+00
SR-85	255.	513.99	1.4581E+00
Y-88	2.	1836.06	3.6748E-01
NB-95	38.	765.79	7.6522E-01
ZR-95	41.	756.73	1.4517E+00
RU-103	248.	497.08	1.5067E+00
RURH-106	110.	621.93	2.2084E+01
SN-113	356.	391.67	2.0751E+00
SB-125	406.	427.89	5.1957E+00
I-131	360.	364.48	1.5678E+00
BA-133	384.	356.02	2.0757E+00
CS-134	125.	604.70	1.1707E+00
BA-140	188.	537.31	5.2271E+00
LA-140	9.	1596.21	7.3066E-01
CEPR-144	1276.	133.54	2.3874E+01
EU-152	10.	1408.01	3.2274E+00
TL-208	145.	583.14	1.3904E+00
BI-212	50.	727.27	1.3525E+01
PB-212	652.	239.00	2.9572E+00
RA-224	669.	240.99	3.2647E+01
RA-226	887.	186.10	3.4746E+01
TH-228	712.	215.99	4.6623E+01
U-235	1184.	143.76	1.1631E+01
PU-239	1308.	129.30	2.1118E+04
AM-241	1295.	59.54	1.5736E+01
PU-241	1117.	148.57	6.6047E+05
AM-243	1434.	74.67	4.4109E+00

 * 222-S Laboratory Counting Room 27-JUN-1994 11:07:39.76 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K211-6830
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 2.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

[Signature]

date: 6-27-94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA2
 File Number: dka300:[spec.GEA2]2g2712.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:03.03 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 27-JUN-1994 10:17:02.36
 Decayed to: 27-JUN-1994 10:17:02.36
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: MB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 21-MAR-1994 09:31:55.15
 Date of last efficiency calibration: 21-MAR-1994 09:43:42.61

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	86.64	225	0.96	173.75	170	8	72.6		NE-237	22.0
									EU-155	8.43
0	105.33	376	1.48	211.10	207	10	48.9		EU-155	16.1
0	123.19	667	1.26	246.81	244	8	21.5		EU-154	13.6
0	661.81*	8735	1.51	1323.64	1315	18	2.3		CS-137	243.
0	723.43	106	1.06	1446.87	1441	12	28.4		EU-154	13.5
0	873.47	51	1.15	1746.92	1741	12	51.3		EU-154	12.6
0	996.09	47	1.24	1992.19	1986	12	46.2		EU-154	15.4
0	1004.96	66	1.69	2009.93	2003	13	40.2		EU-154	12.5
0	1274.68	118	1.72	2549.49	2541	18	26.3		EU-154	14.4
									NA-22	4.95

Total number of lines in spectrum 9 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 0
Number of lines tentatively identified by NID 9 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	950.40D	1.000	4.950E+00	4.950E+00	1.302E+00	26.30	154Eu Q25 6/28/94
CS-137	11020.00D	1.000	2.430E+02	2.430E+02	0.055E+02	2.26	
EU-154	3138.00D	1.000	1.345E+01	1.345E+01	0.193E+01	14.35	
EU-155	1710.00D	1.000	1.608E+01	1.608E+01	0.786E+01	48.88	comment on high uncertainty Q25
NP-237	7.82E+08D	1.000	2.197E+01	2.197E+01	1.594E+01	72.58	155Eu Q25 6/28/94
Total Activity :			2.995E+02	2.995E+02			

Grand Total Activity : 2.995E+02 2.995E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : K211-6830

Page : 3
Acquisition date : 27-JUN-1994 10:17:02

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV.
NA-24	6.	1368.53	5.1645E-01	
K-40	112.	1460.75	2.1547E+01	
CR-51	435.	320.09	1.2630E+01	
MN-54	33.	834.83	7.7042E-01	
FE-59	19.	1099.25	1.3180E+00	
CO-60	12.	1332.50	7.1153E-01	
ZN-65	17.	1115.55	1.4273E+00	
SE-75	541.	264.66	2.1033E+00	
SR-85	238.	513.99	1.4094E+00	
Y-88	1.	1836.06	2.6336E-01	
NB-95	44.	765.79	8.2786E-01	
ZR-95	56.	756.73	1.6865E+00	
RU-103	250.	497.08	1.5112E+00	
RURH-106	112.	621.93	2.2268E+01	
SN-113	390.	391.67	2.1722E+00	
SB-125	378.	427.89	5.0130E+00	
I-131	369.	364.48	1.5882E+00	
BA-133	369.	356.02	2.0358E+00	
CS-134	133.	604.70	1.2060E+00	
BA-140	148.	537.31	4.6346E+00	
LA-140	7.	1596.21	6.7158E-01	
CEPR-144	1293.	133.54	2.4029E+01	
EU-152	9.	1408.01	3.0551E+00	
TL-208	142.	583.14	1.3760E+00	
BI-212	35.	727.27	1.1408E+01	
PB-212	669.	239.00	2.9972E+00	
RA-224	662.	240.99	3.2488E+01	
RA-226	957.	186.10	3.6099E+01	
TH-228	748.	215.99	4.7771E+01	
U-235	1176.	143.76	1.1593E+01	
PU-239	1253.	129.30	2.0669E+04	
AM-241	1185.	59.54	1.5055E+01	
PU-241	1097.	148.57	6.5461E+05	
AM-243	1479.	74.67	4.4802E+00	

Q1-
19

WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No. K214	Customer ID: C58FB C11
Analysis: GEA	Sample Prep: Direct

GEA

Sample Prep: Direct

WB 57257-AD 5-25-94
WB 57263 WC 38931

LA-548-121/D-0

RD Meyers

5/2/94

0220

1475-24-94 NA

0250

~~Griffon~~ Paula Bachelor

[illegible]

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

3419 Batch 3276

Serial No	Sample Point	Date	Time Issued	Priority
K 212.-5530	C-111	4-27-94	10: 2	21
Determination	Method Standard	Result Units	Charge Code	Retuns
GEA	LA-548-121	% RECOVERY	N4C3B	0
Sample Size	Customer ID			
.100 ml	STD			
Remarks Calculations Results				
COLX STD# 131B51				
R901 STD VAL 2.51501				
RESULT 2.48501 % REC 98.6 CS137				
R905 STD VAL 2.10501				
RESULT 2.08501 % REC 98.9 Co60				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>R. Meyer</i>	<i>R. Meyer</i>			
Mrs	Mrs	Mrs	Mrs	Mrs
	5-2-94			
Date	Time Completed	Lat Unit Mgr		
5/2/94	0250	<i>R. Meyer</i>	<i>Jay Hammond</i>	

54-660C-061 (R-10-B3)

3420

Serial No	Sample Point	Date	Time Issued	Priority
K 213.-5630	C-111	4-27-94	10: 7	21
Determination	Method Standard	Result Units	Charge Code	Retuns
GEA	LA-548-121	uCi/ML	N4C3B	0
Sample Size	Customer ID			
1 ml	BLANK			
Remarks Calculations Results				
COUNT AS uCi/L 137Cs < 2.27 E-06 uCi/mL				
LASER PRINTOUT				
No Detectable Isotopes				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
<i>R. Meyer</i>	<i>R. Meyer</i>			
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lat Unit Mgr		
5/2/94	0250	<i>R. Meyer</i>	<i>Jay Hammond</i>	

54-660C-061 (R-10-B3)

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

3422

Serial No	Sample Point	Date	Time Issued	Priority
K 214.-5730	C-111	4-27-94	10:17	21
Determination	Method Standard	Result Units	Charge Code	Returns
GEA	LA-548-121	uCi/ML	N4C3B	0
Sample Size	Customer ID			
1 m	C58FB			
Remarks Calculations Results				
COUNT AS uCi/L LASER PRINTOUT				
$\frac{1.67 E-01}{1000} \text{ uCi/L}$ <p>High level of uncertainty = $1.67 E-04 \text{ uCi/L}$ CS137</p>				
Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
R. D. Benge	D. H. Benge			
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab (10-100)		
5/2/94	0750	Deletable Isotope 5.2694		

54-680C-061 (R-10-83)

2423

Serial No	Sample Point	Date	Time Issued	Priority
K 214.-5630	C-111	4-27-94	10:17	21
Determination	Method Standard	Result Units	Charge Code	Returns
GEA	LA-548-121	uCi/ML	N4C3B	0
Sample Size	Customer ID			
1 m	C58FB			
Remarks Calculations Results				
COUNT AS uCi/L LASER PRINTOUT				
$^{137}\text{Cs} = 1.63 E-04 \text{ uCi/mL}$ high uncertainty				
No Detectable Isotope 5.2694				
Analyst-1	Analyst-2	Analyst-3	Analyst-4	Analyst-5
R. D. Benge	D. H. Benge			
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab (10-100)		
5/2/94	0750	Deletable Isotope 5.2694		

54-680C-061 (R-10-83)

 * 222-S Laboratory Counting Room 2-MAY-1994 07:15:54.04 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
 Sample ID: K212-5530
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

date: 5/2/94

>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID:
 File Number: dka300:[spec.GEA3]3g3419.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:01.69 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 2-MAY-1994 06:25:18.44
 Decayed to: 2-MAY-1994 06:25:18.44
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: ALJ

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	563.40	190	1.89	1127.01	1122	12	29.7		CS-134	19.0
0	569.26	263	1.28	1138.72	1134	11	22.6		CS-134	14.5
0	604.75	1637	1.51	1209.69	1204	12	5.9		CS-134	15.0
0	661.65*	2191	1.65	1323.47	1317	15	4.9		CS-137	24.8
0	795.81	1203	1.72	1591.79	1584	15	6.9		CS-134	15.9
0	801.51	102	1.52	1603.19	1598	11	41.3		CS-134	13.3
0	1173.06	1355	1.87	2346.38	2340	15	5.9		CO-60	21.4
0	1332.27*	1154	2.00	2664.92	2655	20	6.6		CO-60	20.2
0	1364.85	39	2.57	2730.10	2722	16	32.0			
0	1400.70	21	1.71	2801.83	2795	13	67.7			
0	1460.44*	19	1.09	2921.36	2914	131	66.4		K-40	3.29

Summary of Nuclide Activity
Sample ID : K212-5530

Page : 2
Acquisition date : 2-MAY-1994 06:25:18

Total number of lines in spectrum 11
Number of unidentified lines 2
Number of lines tentatively identified by NID 9 81.82%
WHC-SD-WM-DP-079, REV. 0

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	3.292E+00	3.292E+00	5.479E+00	166.44	BK4 5/5/94
CO-60	1925.30D	1.000	2.082E+01	2.082E+01	0.092E+01	4.40	
CS-134	753.10D	1.000	1.531E+01	1.531E+01	0.066E+01	4.32	
CS-137	11020.00D	1.000	2.482E+01	2.482E+01	0.120E+01	4.85	

Total Activity : 6.425E+01 6.425E+01

Grand Total Activity : 6.425E+01 6.425E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI) WHC-SD-WM-DP-079, REV.0
BE-7	195.	477.59	4.6007E+00
NA-22	22.	1274.55	3.6945E-01
SC-46	100.	889.23	5.7694E-01
CR-51	241.	320.09	3.8455E+00
MN-54	100.	834.83	5.4757E-01
CO-56	89.	846.76	5.2243E-01
CO-57	247.	122.06	2.7192E-01
CO-58	74.	810.75	4.6189E-01
FE-59	76.	1099.25	1.0682E+00
ZN-65	66.	1115.55	1.1260E+00
SE-75	270.	264.66	6.0434E-01
KR-85	190.	513.99	1.1589E+02
SR-85	190.	513.99	5.0880E-01
Y-88	5.	1836.06	2.3042E-01
Y-91	35.	1204.90	1.4862E+02
NB-94	91.	871.10	5.4118E-01
NB-95	80.	765.79	4.5649E-01
ZR-95	74.	756.73	7.9141E-01
RU-103	167.	497.08	5.0085E-01
RURH-106	94.	621.93	8.3206E+00
AG-108M	210.	433.94	5.0587E-01
CD-109	235.	88.03	8.7878E+00
AG-110M	128.	657.76	5.3230E-01
SN-113	257.	391.67	7.2902E-01
TE-123M	285.	159.00	3.0218E-01
SB-124	1231.	602.73	1.4852E+00
SB-125	223.	427.89	1.5840E+00
TE-125M	210.	35.46	0.0000E+00
I-129	220.	39.60	0.0000E+00
I-131	211.	364.48	4.9516E-01
XE-131M	255.	163.98	1.2771E+01
BA-133	207.	356.02	6.2772E-01
CS-136	89.	818.51	5.0890E-01
CS-138	6.	1435.86	4.3592E-01
CE-139	261.	165.85	3.0830E-01
BA-140	265.	162.67	3.9698E+02
LA-140	3.	1596.20	1.8195E-01
CE-141	312.	145.44	5.3369E-01
CE-144	250.	133.51	2.0729E+00
CEPR-144	251.	133.54	4.1475E+00
EU-152	13.	1408.01	1.4583E+00
EU-154	22.	1274.51	1.0751E+00
EU-155	236.	105.31	1.1558E+00
HF-181	199.	482.20	6.0127E-01
TA-182	231.	67.75	1.4841E+00
HG-203	264.	279.19	4.5022E-01
BI-207	402.	569.70	8.0899E-01
TL-208	154.	583.14	5.7991E-01
PB-210	183.	46.50	0.0000E+00
BI-212	81.	727.27	7.0429E+00
PB-212	315.	239.00	8.3221E-01

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : K212-5530

Acquisition date : 2-MAY-1994 06:25:18

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV. 0
BI-214	180.	609.32	1.2505E+00	
PB-214	271.	351.92	1.6073E+00	
RA-224	310.	240.99	9.0288E+00	
RA-226	306.	186.10	8.1931E+00	
AC-228	113.	911.07	2.1601E+00	
TH-228	320.	215.99	1.2596E+01	
TH-229	238.	86.44	1.0984E+01	
U-232	271.	129.08	3.5166E+02	
PA-233	250.	311.98	1.0765E+00	
PA-234M	82.	1001.03	9.8064E-01	
TH-234	244.	92.80	2.9181E+00	
U-235	312.	143.76	2.3566E+00	
NP-237	236.	86.50	2.6018E+00	
U-237	313.	208.00	1.5035E+00	
NP-238	80.	984.45	2.0382E+00	
NP-239	242.	106.12	1.1128E+00	
PU-239	271.	129.30	3.7508E+03	
AM-241	224.	59.54	3.1362E+00	
AM-243	212.	43.60	0.0000E+00	

 * 222-S Laboratory Counting Room 2-MAY-1994 09:11:57.30 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
 Sample ID: K213-5630
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+00
 Conversion LI to LI: 1.00000E+00

Removed by:

date: 5/2/94

>>>>>>> COUNT INFORMATION <<<<<<<<<<
 Detector ID:
 File Number: NI3AC:1.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:00.46 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
 Sample Count Time: 2-MAY-1994 07:38:29.43
 Decayed to: 2-MAY-1994 06:25:18.44
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: MB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/LI
0	33.24	80	1.54	67.06	63	9 64.1			
0	511.40*	2	1.32	1023.01	1016	15*****			
0	609.80*	19	1.15	1219.78	1214	13162.2			
0	661.49*	2	1.64	1323.15	1317	11*****		CS-137	2.266E-03
0	969.64	18	3.95	1939.48	1935	13 84.4			
0	1215.31	20	3.03	2430.92	2427	11 65.0			
0	1460.73*	5	2.20	2921.95	2916	18670.7		K-40	8.096E-02

Summary of Nuclide Activity
Sample ID : K213-5630

Page : 2
Acquisition date : 2-MAY-1994 07:38:29

Total number of lines in spectrum 7 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 4
Number of lines tentatively identified by NID 3 42.86%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	8.096E-02	8.096E-02	54.30E-02	670.70	
CS-137	11020.00D	1.000	2.266E-03	2.266E-03	29.02E-03	1280.63	BK40285/5h
Total Activity :			8.322E-02	8.322E-02			

Grand Total Activity : 8.322E-02 8.322E-02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA	WHC-SD-WM-DP-079, REV. 0
			(uCi/LI)	
NA-22	11.	1274.55	2.6038E-02	
CR-51	39.	320.09	1.5530E-01	
MN-54	24.	834.83	2.7111E-02	
FE-59	13.	1099.25	4.4597E-02	
CO-60	10.	1332.50	2.6300E-02	
ZN-65	16.	1115.55	5.5817E-02	
SE-75	71.	264.66	3.1078E-02	
SR-85	45.	513.99	2.4778E-02	
Y-88	4.	1836.06	2.0923E-02	
NB-95	17.	765.79	2.0838E-02	
ZR-95	24.	756.73	4.5469E-02	
RU-103	22.	497.08	1.8053E-02	
RURH-106	17.	621.93	3.5682E-01	
SN-113	39.	391.67	2.8460E-02	
SB-125	24.	427.89	5.2091E-02	
I-131	34.	364.48	1.9838E-02	
BA-133	41.	356.02	2.7810E-02	
CS-134	17.	604.70	1.7635E-02	
BA-140	33.	537.31	8.8289E-02	
LA-140	2.	1596.21	1.4251E-02	
CEPR-144	78.	133.54	2.3127E-01	
EU-152	12.	1408.01	1.4054E-01	
EU-154	11.	1274.51	7.5633E-02	
EU-155	46.	105.31	5.1086E-02	
TL-208	44.	583.14	3.1170E-02	
BI-212	19.	727.27	3.4426E-01	
PB-212	86.	239.00	4.3461E-02	
RA-224	74.	240.99	4.4104E-01	
RA-226	72.	186.10	3.9631E-01	
TH-228	75.	215.99	6.0910E-01	
U-235	82.	143.76	1.2090E-01	
NP-237	90.	86.50	1.6096E-01	
PU-239	79.	129.30	2.0255E+02	
AM-241	49.	59.54	1.4741E-01	
PU-241	67.	148.57	6.4029E+03	
AM-243	68.	74.67	3.7053E-02	

```

*****
* 222-S Laboratory Counting Room    2-MAY-1994 10:04:25.95
*****
>>>>>>>> SAMPLE INFORMATION <<<<<<<<<
Sample ID:      K214-5730
Sample Size:    1.00000E-03 LI
Dilution Factor: 1.00000E+00
Conversion LI to LI: 1.00000E+00

Removed by:
D. H. M. L. L.
date: 5-2-94

>>>>>>>> COUNT INFORMATION <<<<<<<<<
Detector ID:
File Number:    dka300:[spec.GEA3]3g3422.cnf
Geometry:       42
Description:
Count Time:     0 00:50:00.00 sec
Real Time:      0 00:50:00.47 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<
Sample Count Time: 2-MAY-1994 09:13:48.86
Decayed to:        2-MAY-1994 06:25:18.44
Standard Deviations: 2
Analysis Library:  LABGEA
Analyst:           MB

>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<
Date of last energy calibration: 11-MAR-1994 11:47:01.11
Date of last efficiency calibration: 15-MAR-1994 10:28:40.20
*****

```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	583.93	50	1.13	1168.05	1162	13	43.6			
0	661.62*	147	1.48	1323.42	1318	11	25.2		CS-137	0.167
0	1460.59*	9	1.24	2921.66	2915	14	344.5		K-40	0.157

Summary of Nuclide Activity
Sample ID : K214-5730

Page : 2
Acquisition date : 2-MAY-1994 09:13:48

Total number of lines in spectrum 3
Number of unidentified lines 0
Number of lines tentatively identified by NID 3 100.00%

WHC-SD-WM-DP-079, REV. 0

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	1.566E-01	1.566E-01	5.396E-01	344.46	85588 5/2/94
CS-137	11020.00D	1.000	1.667E-01	1.667E-01	0.421E-01	25.24	comment on his uncertainty
Total Activity :			3.233E-01	3.233E-01			

Grand Total Activity : 3.233E-01 3.233E-01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : K214-5730

Page : 3
Acquisition date : 2-MAY-1994 09:13:48

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV. 0
NA-22	8.	1274.55	2.1872E-02	
CR-51	51.	320.09	1.7781E-01	
MN-54	26.	834.83	2.8000E-02	
FE-59	15.	1099.25	4.8131E-02	
CO-60	8.	1332.50	2.2719E-02	
ZN-65	10.	1115.55	4.3620E-02	
SE-75	68.	264.66	3.0298E-02	
SR-85	67.	513.99	3.0246E-02	
Y-88	3.	1836.06	1.7647E-02	
NB-95	17.	765.79	2.0904E-02	
ZR-95	16.	756.73	3.6681E-02	
RU-103	30.	497.08	2.1396E-02	
RURH-106	30.	621.93	4.7143E-01	
SN-113	38.	391.67	2.8017E-02	
SB-125	43.	427.89	6.9195E-02	
I-131	46.	364.48	2.3466E-02	
BA-133	44.	356.02	2.8863E-02	
CS-134	36.	604.70	2.5556E-02	
BA-140	29.	537.31	8.3596E-02	
LA-140	2.	1596.21	1.2955E-02	
CEPR-144	75.	133.54	2.2649E-01	
EU-152	8.	1408.01	1.1394E-01	
EU-154	8.	1274.51	6.3858E-02	
EU-155	62.	105.31	5.9387E-02	
TL-208	54.	583.14	3.4397E-02	
BI-212	19.	727.27	3.3902E-01	
PB-212	98.	239.00	4.6323E-02	
RA-224	75.	240.99	4.4364E-01	
RA-226	101.	186.10	4.7109E-01	
TH-228	68.	215.99	5.7909E-01	
U-235	86.	143.76	1.2341E-01	
NP-237	78.	86.50	1.4963E-01	
PU-239	87.	129.30	2.1257E+02	
AM-241	44.	59.54	1.3981E-01	
PU-241	88.	148.57	7.3285E+03	
AM-243	85.	74.67	4.1378E-02	

 * 222-S Laboratory Counting Room 2-MAY-1994 12:10:09.10 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K214-5830
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+00
 Conversion LI to LI: 1.00000E+00

Removed by:

date: 5/2/94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID:
 File Number: dka300:[spec.GEA3]3g2423.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:00.49 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 2-MAY-1994 11:19:32.51
 Decayed to: 2-MAY-1994 06:25:18.44
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: MB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	33.16	50	1.01	66.90	64	8	94.9			
0	609.90*	1	1.80	1219.99	1213	11	*****			
0	661.62*	144	1.36	1323.41	1315	14	26.4		CS-137	0.163
0	1240.35	13	3.90	2481.00	2474	14	134.1			
0	1460.26*	1	1.87	2921.00	2912	19	*****		K-40	1.542E-02

Summary of Nuclide Activity
Sample ID : K214-5830

Page : 2
Acquisition date : 2-MAY-1994 11:19:32

Total number of lines in spectrum 5 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 3
Number of lines tentatively identified by NID 2 40.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	1.542E-02	1.542E-02	57.37E-02	3720.25	BKG 5/5/94
CS-137	11020.00D	1.000	1.631E-01	1.631E-01	0.430E-01	26.38	comment on his uncertainty
Total Activity :			1.785E-01	1.785E-01			

Grand Total Activity : 1.785E-01 1.785E-01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : K214-5830

Page : 3
Acquisition date : 2-MAY-1994 11:19:32

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV.0
NA-22	17.	1274.55	3.2027E-02	
CR-51	60.	320.09	1.9292E-01	
MN-54	11.	834.83	1.8490E-02	
FE-59	18.	1099.25	5.1939E-02	
CO-60	9.	1332.50	2.3938E-02	
ZN-65	12.	1115.55	4.8551E-02	
SE-75	75.	264.66	3.1974E-02	
SR-85	45.	513.99	2.4818E-02	
Y-88	0.	1836.06	0.0000E+00	
NB-95	20.	765.79	2.2675E-02	
ZR-95	20.	756.73	4.0835E-02	
RU-103	38.	497.08	2.3828E-02	
RURH-106	27.	621.93	4.4562E-01	
SN-113	45.	391.67	3.0644E-02	
SB-125	39.	427.89	6.6534E-02	
I-131	54.	364.48	2.5482E-02	
BA-133	46.	356.02	2.9668E-02	
CS-134	20.	604.70	1.8891E-02	
BA-140	23.	537.31	7.4339E-02	
LA-140	3.	1596.21	1.8595E-02	
CEPR-144	77.	133.54	2.3032E-01	
EU-152	8.	1408.01	1.1515E-01	
EU-154	16.	1274.51	9.2575E-02	
EU-155	67.	105.31	6.1552E-02	
TL-208	49.	583.14	3.2709E-02	
BI-212	26.	727.27	4.0217E-01	
PB-212	89.	239.00	4.4160E-02	
RA-224	73.	240.99	4.3657E-01	
RA-226	105.	186.10	4.7944E-01	
TH-228	85.	215.99	6.4954E-01	
U-235	82.	143.76	1.2073E-01	
NP-237	70.	86.50	1.4144E-01	
PU-239	72.	129.30	1.9340E+02	
AM-241	54.	59.54	1.5423E-01	
PU-241	91.	148.57	7.4613E+03	
AM-243	85.	74.67	4.1346E-02	

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No.

K216

Customer ID:

C58HCB C111

Analysis:

GEA

Sample Prep:

Direct

Instrument: ~~WB 57237~~ ~~WB 57225~~ WC 38931

Procedure/ Rev: LA-548-12i/P-0

Technologist: RP Meyers

Date: 4/30/64

Starting Time: 07 00

Temperature NA

Ending Time: 03 00

Chemist: S Cinflo

Comments:

	Description	Lab ID
1	LMCS	K215.5530
2	Sample	K216.5730
3		
4		
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

[illegible]

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

3410

Batch 3343

Serial No K 215.-5530	Sample Point C-111	Date 4-28-94	Time Issued 11:14	Priority 21
Determination GEA	Method Standard LA-548-121	Result Units % RECOVERY	Charge Code N4C3B	Returns 0
Sample Size 100 ml			Customer ID STD	
Remarks Calculations Results COLX STD=13485 R901 STD VAL 2.5147 E+1 RESULT 2.503 E+1 % REC 99.5% R905 STD VAL RESULT 2.098 E+1 % REC 99.8%				
Analyst - 1 K. Drayman	Analyst - 2 J. Blane	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs 4-30-94	Mrs	Mrs	Mrs
Date 4/30/94	Time Completed 0300	Lab Unit Mgr B. Bachelor		

54-5500-061 (R-10-83)

3411

Serial No K 216.-5730	Sample Point C-111	Date 4-28-94	Time Issued 11:23	Priority 21
Determination GEA	Method Standard LA-548-121	Result Units uCi/ML	Charge Code N4C3B	Returns 0
Sample Size 100 ml			Customer ID C58HCB	
Remarks Calculations Results COUNT AS uCi/L LASER PRINTOUT $^{137}\text{Cs} < 2.65 \text{ E-04 } \mu\text{Ci/mL}$				
Analyst - 1 K. Drayman	Analyst - 2 J. Blane	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs 4-30-94	Mrs	Mrs	Mrs
Date 04/30/94	Time Completed 0300	Lab Unit Mgr B. Bachelor		

54-5500-061 (R-10-83)

 * 222-S Laboratory Counting Room 30-APR-1994 07:21:17.12 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K215-5530
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

[Signature]

date: 4-30-94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID:
 File Number: dka300:[spec.GEA3]3g3410.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:01.67 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 30-APR-1994 06:30:39.14
 Decayed to: 30-APR-1994 06:30:39.14
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: ALJ

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	563.35	138	1.25	1126.91	1121	12	42.3		CS-134	13.8
0	569.33	202	1.31	1138.86	1134	11	30.8		CS-134	11.1
0	604.72	1627	1.42	1209.64	1203	15	6.4		CS-134	14.9
0	661.70*	2209	1.41	1323.58	1316	15	4.9		CS-137	25.0
0	673.12	38	1.63	1346.41	1343	11	80.2			
4	795.88	1243	1.66	1591.93	1584	35	6.0	1.58E+00	CS-134	16.4
4	802.02	146	2.42	1604.21	1584	35	30.2		CS-134	18.9
0	1173.19	1329	1.99	2346.64	2339	18	6.3		CO-60	21.0
0	1332.41*	1200	1.92	2665.20	2657	16	6.0		CO-60	21.0
0	1364.48	44	1.73	2729.36	2721	14	30.2			
0	1460.56*	16	2.25	2921.62	2916	132	11.5		K-40	2.86

Summary of Nuclide Activity
Sample ID : K215-5530

Page : 2
Acquisition date : 30-APR-1994 06:30:39

Total number of lines in spectrum 11 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 2
Number of lines tentatively identified by NID 9 81.82%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd. Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	2.865E+00	2.865E+00	6.058E+00	211.45	BKG 5/1/94
CO-60	1925.30D	1.000	2.098E+01	2.098E+01	0.091E+01	4.36	
CS-134	753.10D	1.000	1.547E+01	1.547E+01	0.066E+01	4.30	
CS-137	11020.00D	1.000	2.503E+01	2.503E+01	0.123E+01	4.92	
Total Activity :			6.434E+01	6.434E+01			

Grand Total Activity : 6.434E+01 6.434E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : K215-5530

Page : 3
Acquisition date : 30-APR-1994 06:30:39

Nuclide	Bckgnd Sum	Energy (keV)	MDA
			(uCi/LI) WHC-SD-WM-DP-079, REV.0
NA-22	21.	1274.55	3.5808E-01
CR-51	220.	320.09	3.6774E+00
MN-54	79.	834.83	4.8715E-01
FE-59	71.	1099.25	1.0352E+00
ZN-65	65.	1115.55	1.1113E+00
SE-75	259.	264.66	5.9214E-01
SR-85	170.	513.99	4.8051E-01
Y-88	3.	1836.06	1.8096E-01
NB-95	77.	765.79	4.4576E-01
ZR-95	84.	756.73	8.4321E-01
RU-103	167.	497.08	5.0072E-01
RURH-106	101.	621.93	8.5967E+00
SN-113	232.	391.67	6.9267E-01
SB-125	213.	427.89	1.5450E+00
I-131	231.	364.48	5.1773E-01
BA-133	215.	356.02	6.4046E-01
BA-140	144.	537.31	1.8480E+00
LA-140	4.	1596.21	1.9735E-01
CEPR-144	262.	133.54	4.2375E+00
EU-152	16.	1408.01	1.6112E+00
EU-154	21.	1274.51	1.0501E+00
EU-155	254.	105.31	1.1995E+00
TL-208	135.	583.14	5.4303E-01
BI-212	65.	727.27	6.3124E+00
PB-212	327.	239.00	8.4779E-01
RA-224	317.	240.99	9.0990E+00
RA-226	305.	186.10	8.1767E+00
TH-228	337.	215.99	1.2928E+01
U-235	270.	143.76	2.1925E+00
NP-237	226.	86.50	2.5474E+00
PU-239	273.	129.30	3.7634E+03
AM-241	198.	59.54	2.9517E+00
PU-241	273.	148.57	1.2934E+05
AM-243	240.	74.67	6.9482E-01

 * 222-S Laboratory Counting Room 30-APR-1994 08:16:54.56 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K216-5730
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

MLB

date: 4/30/94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID:
 File Number: dka300:[spec.GEA3]3g3411.cnf
 Geometry: 42
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:00.47 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 30-APR-1994 07:26:16.19
 Decayed to: 30-APR-1994 07:26:16.19
 Standard Deviations: 2
 Analysis Library: LABGEA
 Analyst: ALJ

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	33.37	48	1.47	67.32	64	8	90.3			
0	608.98*	10	1.85	1218.16	1213	9242.2				
0	661.54*	23	1.58	1323.25	1319	9112.3			CS-137	0.265
0	1460.74*	22	1.70	2921.96	2914	16147.1			K-40	3.80

Summary of Nuclide Activity
Sample ID : K216-5730

Page : 2
Acquisition date : 30-APR-1994 07:26:16

Total number of lines in spectrum 4 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 2
Number of lines tentatively identified by NID 2 50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	3.796E+00	3.796E+00	5.584E+00	147.07	} BKG 0.5/1/94
CS-137	11020.00D	1.000	2.654E-01	2.654E-01	2.981E-01	112.32	
Total Activity :			4.062E+00	4.062E+00			

Grand Total Activity : 4.062E+00 4.062E+00

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : K216-5730

Page : 3
Acquisition date : 30-APR-1994 07:26:16

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV.
NA-22	12.	1274.55	2.7362E-01	
CR-51	51.	320.09	1.7779E+00	
MN-54	17.	834.83	2.2856E-01	
FE-59	17.	1099.25	5.1077E-01	
CO-60	14.	1332.50	3.0326E-01	
ZN-65	11.	1115.55	4.6366E-01	
SE-75	55.	264.66	2.7362E-01	
SR-85	36.	513.99	2.2270E-01	
Y-88	3.	1836.06	1.8165E-01	
NB-95	16.	765.79	2.0094E-01	
ZR-95	18.	756.73	3.8876E-01	
RU-103	23.	497.08	1.8463E-01	
RURH-106	24.	621.93	4.2273E+00	
SN-113	34.	391.67	2.6482E-01	
SB-125	45.	427.89	7.1405E-01	
I-131	49.	364.48	2.3912E-01	
BA-133	39.	356.02	2.7094E-01	
CS-134	25.	604.70	2.1154E-01	
BA-140	26.	537.31	7.8607E-01	
LA-140	4.	1596.21	1.8631E-01	
CEPR-144	81.	133.54	2.3560E+00	
EU-152	5.	1408.01	9.1032E-01	
EU-154	12.	1274.51	7.9744E-01	
EU-155	93.	105.31	7.2626E-01	
TL-208	41.	583.14	2.9870E-01	
BI-212	18.	727.27	3.2915E+00	
PB-212	84.	239.00	4.2894E-01	
RA-224	63.	240.99	4.0463E+00	
RA-226	91.	186.10	4.4748E+00	
TH-228	75.	215.99	6.0830E+00	
U-235	90.	143.76	1.2685E+00	
NP-237	58.	86.50	1.2889E+00	
PU-239	65.	129.30	1.8416E+03	
AM-241	51.	59.54	1.4954E+00	
PU-241	73.	148.57	6.6954E+04	
AM-243	70.	74.67	3.7572E-01	

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No. K 218 - 219	Customer ID: G59 SI C111
Analysis: GEA	Sample Prep: Fusion

Instrument: WB 57237 WB 57265 WC 38931	Procedure/ Rev: LA-548-121 / D-0
Technologist: <u>Sutton Boatright</u>	Date: 5-31-94
Starting Time: 1700	Temperature N/A
Ending Time: 1730	Chemist: ⁶⁻¹³⁻⁹⁴ S Fitzgerald ^{LAD} P Bachelor

Comments: _____

	Description	Lab ID		Description	Lab ID
1	Lmcs	K 217-5530	11		
2	sample	K 218-6730	12		
3	sample dup	K 218-6830	13		
4	blank	K 219-6630	14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

[illegible]

WHC-SD-WM-DP-079, REV. 0

DATE START:

16 June 1994

DATE COMPLETE:

16 June 1994

[illegible]

PPB

NO SPECIAL PROBLEM

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

GAMMA ENERGY ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

4346

Batch 3501

Serial No K 217.-5530	Sample Point C-111	Date 5- 4-94	Time Issued 16:36	Priority 20
Determination GEA	Method Standard LA-548-121	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size ? .100 ml			Customer ID STD	
Remarks, Calculations, Results COLX STD# 139851 R901 STD VAL 2,5082 E+1 RESULT 2,647 E+1 % REC 105.5% R905 STD VAL 2,0805 E+1 RESULT 2,188 E+1 % REC 105.2%				
Rec On Green SLHB Analyst - 1 5-31-94 Analyst - 2 Analyst - 3 Analyst - 4 Analyst - 5 SUTHERLAND BOUTWELL M. E. BOUTWELL Hrs Hrs Hrs Hrs Hrs 17:30 Date 31 Time Completed 17:30 Lab Unit Mgr J. Melchor 5-31-94 17:30 LAD 6-17-94				

54-6800-061 (R-10-83)

BEST AVAILABLE COPY

WHC-SD-WM-DP-079, REV. 0

54-6800-061 (R-10-83)

[illegible]

$$\mu\sigma/g = (\mu\sigma/L) / (g/L)$$

Data Entry by: [Signature] Date: 15-Jun-84
Approved by: [Signature] Date: 16-Jun-84
Form 1 Rev. 1 Page 1 of 1

WHC-SD-WM-DP-079, REV. 0

4347

Seria! No	Sample Point	Date	Time Issued	Priority			
K 218.-6830	C-111	5- 4-94	16:38	20			
Determination	Method-Standard	Result Units	Charge Code	Reruns			
GEA	LA-54B-121	uCi/G Rec	N4C3B	0			
Sample Size				Customer ID			
? .100 ml				C59 S1			
Remarks Calculations. Results							
COUNT AS uCI/L LASER PRINTOUT							
Dup							
7.36 E-1							
Sub Hard Bootright							
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5			
Hrs	Hrs	Hrs	Hrs	Hrs			
Date	Time Completed	Lab Unit Mgr					
5-31-94	1730	Machelor					

54-6800-061 (R-10-83)

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS: LA-548-121 (D-O)

[illegible][illegible]

$$\mu_{Cl}/g = (\mu_{Cl}/L) / (g/L)$$

$$\text{AVERAGE } (\mu\text{Ci/g}) = (\text{SAMPLE} + \text{DUPLICATE}) / 2$$

$$\text{RPD} = (\text{SAMPLE} - \text{DUPLICATE}) / \text{AVERAGE} \cdot 100$$

Data Entry by:	Date: 15-Jun-84
Approved by:	Date: 16-June-84
Form 1 Rev. 1	Page 1 of 1

WHC-SD-WM-DP-079, REV. 0

Serial No		Sample Point	Date	Time Issued	Priority
K 219.-6630		C-111	5-18-94	13:33	20
Determination	Method Standard	Result Units	Charge Code	Reruns	
GEA	LA-548-121	uCi/G Rec	N4C3B	0	
Sample Size				Customer ID	
? -100ml				BLANK	
Remarks, Calculations, Results COUNT AS uCi/L LASER PRINTOUT < 4.01 E-2 Self-Hard Bontrock					
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5	
	McLachlan				
Hrs	Hrs	Hrs	Hrs	Hrs	
Date	Time Completed	Lab Unit Mgr			
5-31-94	1730	McLachlan			

PREPARATION OF SAMPLE MOUNTS FOR GAMMA ENERGY ANALYSIS: LA-548-121 (D-0)

[illegible]

$$\mu_{\text{G}}/g = (\mu_{\text{G}}/L) / (g/L)$$

Data Entry by: <i>[Signature]</i>		Date: 15-Jun-94
Approved by: <i>[Signature]</i>		Date: 16-June-94
Form 1 Rev. 1		Page 1 of 1

 * 222-S Laboratory Counting Room 31-MAY-1994 19:04:11.73 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<<

Sample ID: K-217
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

Im Barlow

date: 5-31-94

>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4346.cnf
 Geometry: 41
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:06.59 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 31-MAY-1994 18:13:20.29
 Decayed to: 31-MAY-1994 18:13:20.29
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 18-APR-1994 11:17:09.37
 Date of last efficiency calibration: 18-APR-1994 11:18:36.88

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/LI
0	351.79*	0	1.35	703.51	700	8*****			
0	475.37	153	1.25	950.65	947	9 68.9			
0	563.09	527	1.42	1126.09	1119	13 23.5		CS-134	14.9
0	569.18	879	1.32	1138.26	1133	11 13.5		CS-134	13.6
0	604.56	5989	1.42	1209.02	1201	14 3.2		CS-134	15.1
0	609.26*	23	1.53	1218.42	1215	8347.2			
0	661.50*	8615	1.47	1322.91	1316	14 2.5		CS-137	26.5
0	795.69	4357	1.56	1591.28	1583	16 3.8		CS-134	16.2
0	801.78	428	1.67	1603.47	1599	12 20.8		CS-134	15.7
0	911.39*	77	1.47	1822.69	1819	10103.7			
0	1173.05	4973	1.72	2346.05	2339	16 3.2		CO-60	21.9
0	1332.28	4543	1.87	2664.56	2656	18 3.1		CO-60	21.8
0	1364.91	102	1.93	2729.83	2724	14 35.2			
0	1400.52	54	1.11	2801.06	2796	10 46.5			
0	1460.51*	29	1.84	2921.06	2911	20271.0		K-40	1.40
0	1592.04	14	1.44	3184.16	3182	8 93.8			
0	1763.63	45	1.02	3527.42	3519	21 78.8			

Summary of Nuclide Activity
Sample ID : K-217

Page : 2
Acquisition date : 31-MAY-1994 18:13:20

Total number of lines in spectrum 17
Number of unidentified lines 4
Number of lines tentatively identified by NID 13
WHC-SD-WM-DP-079, REV. 0
76.47%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	4.66E+11D	1.000	1.400E+00	1.400E+00	3.793E+00	270.98	Bkg 4/1/94
CO-60	1925.30D	1.000	2.188E+01	2.188E+01	0.049E+01	2.24	
CS-134	753.10D	1.000	1.543E+01	1.543E+01	0.037E+01	2.38	
CS-137	11020.00D	1.000	2.647E+01	2.647E+01	0.067E+01	2.51	
Total Activity :			6.518E+01	6.518E+01			

Grand Total Activity : 6.518E+01 6.518E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI) WHC-SD-WM-DP-079, REV.0
BE-7	733.	477.59	2.5263E+00
NA-22	62.	1274.55	1.7056E-01
NA-24	63.	1368.53	1.8417E-01
SC-46	350.	889.23	3.1111E-01
CR-51	864.	320.09	1.9855E+00
MN-54	288.	834.83	2.6442E-01
CO-56	318.	846.76	2.8178E-01
CO-57	810.	122.06	1.3437E-01
CO-58	293.	810.75	2.5931E-01
FE-59	287.	1099.25	5.8605E-01
ZN-65	288.	1115.55	6.6108E-01
SE-75	870.	264.66	2.9520E-01
KR-85	670.	513.99	6.2301E+01
SR-85	671.	513.99	2.7349E-01
Y-88	21.	1836.06	1.3490E-01
Y-91	118.	1204.90	7.5541E+01
NB-94	344.	871.10	3.0183E-01
NB-95	318.	765.79	2.5362E-01
ZR-95	316.	756.73	4.5700E-01
RU-103	596.	497.08	2.6988E-01
RURH-106	380.	621.93	4.5662E+00
AG-108M	767.	433.94	2.6734E-01
CD-109	726.	88.03	4.0946E+00
AG-110M	517.	657.76	2.9041E-01
SN-113	835.	391.67	3.5789E-01
TE-123M	871.	159.00	1.4392E-01
SB-124	4613.	602.73	7.9304E-01
SB-125	865.	427.89	8.6043E-01
TE-125M	677.	35.46	0.0000E+00
I-129	639.	39.60	0.0000E+00
I-131	878.	364.48	2.7469E-01
XE-131M	882.	163.98	6.4531E+00
BA-133	836.	356.02	3.4330E-01
CS-136	289.	818.51	2.5941E-01
CS-138	33.	1435.86	2.9454E-01
CE-139	885.	165.85	1.5436E-01
BA-140	875.	162.67	1.9625E+02
LA-140	22.	1596.20	1.2781E-01
CE-141	845.	145.44	2.3974E-01
CE-144	815.	133.51	1.0218E+00
CEPR-144	815.	133.54	2.0413E+00
EU-152	61.	1408.01	8.7417E-01
EU-154	62.	1274.51	4.9640E-01
EU-155	721.	105.31	5.4676E-01
HF-181	647.	482.20	3.0792E-01
TA-182	648.	67.75	6.1061E-01
HG-203	893.	279.19	2.2536E-01
BI-207	1415.	569.70	4.2641E-01
TL-208	675.	583.14	3.3883E-01
PB-210	609.	46.50	0.0000E+00
BI-212	349.	727.27	4.0444E+00

Minimum Detectable Activity Report (continued)
Sample ID : K-217

Page : 4
Acquisition date : 31-MAY-1994 18:13:20

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV. A
PB-212	1088.	239.00	4.2106E-01	
BI-214	606.	609.32	6.3088E-01	
PB-214	977.	351.92	8.3048E-01	
RA-224	1023.	240.99	4.4653E+00	
RA-226	1002.	186.10	4.0238E+00	
AC-228	452.	911.07	1.2463E+00	
TH-228	1055.	215.99	6.2251E+00	
TH-229	767.	86.44	5.2116E+00	
U-232	820.	129.08	1.6706E+02	
PA-233	875.	311.98	5.4813E-01	
PA-234M	316.	1001.03	5.4784E-01	
TH-234	802.	92.80	1.4119E+00	
U-235	864.	143.76	1.0703E+00	
NP-237	764.	86.50	1.2369E+00	
U-237	1001.	208.00	7.3068E-01	
NP-238	310.	984.45	1.1449E+00	
NP-239	728.	106.12	5.2205E-01	
PU-239	839.	129.30	1.8017E+03	
AM-241	658.	59.54	1.1750E+00	
AM-243	679.	43.60	0.0000E+00	

 * 222-S Laboratory Counting Room 31-MAY-1994 22:06:35.85 *

>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<

Sample ID: K-219-6630
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

Em Bauer

date: 5-31-94

>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4351.cnf
 Geometry: 41
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:02.42 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 31-MAY-1994 21:15:57.83
 Decayed to: 31-MAY-1994 21:15:57.83
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB

>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 18-APR-1994 11:17:09.37
 Date of last efficiency calibration: 18-APR-1994 11:18:36.88

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/LI
0	75.21*	22	0.75	150.41	147	7356.7		AM-243	5.532E-02
0	84.62*	14	0.69	169.22	166	7535.6			
0	92.67*	20	0.97	185.33	183	6367.1			
0	238.70*	33	0.96	477.34	474	7248.4		PB-212	9.092E-02
0	295.22*	14	1.33	590.37	587	9607.2		PB-214	0.134
0	351.86*	86	1.52	703.66	697	15124.0		PB-214	0.493
0	583.05*	52	1.16	1166.02	1160	12125.7			
0	609.28*	2	1.53	1218.47	1213	12*****		BI-214	1.373E-02
0	661.56*	43	1.23	1323.02	1318	11154.6		CS-137	0.132
0	768.32	41	0.87	1536.55	1530	16134.4		BI-214	2.66
0	911.35*	29	1.66	1822.62	1818	11192.3			
0	1120.21*	29	1.40	2240.36	2236	9171.2		BI-214	0.848
0	1377.88	29	1.63	2755.76	2750	15 90.3			
0	1764.41*	39	1.89	3528.97	3521	18 74.8		BI-214	1.56

Summary of Nuclide Activity
Sample ID : K-219-6630

Page : 2
Acquisition date : 31-MAY-1994 21:15:57

Total number of lines in spectrum 14
Number of unidentified lines 1
Number of lines tentatively identified by NID 13 92.86%
WHC-SD-WM-DP-079, REV. 0

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	11020.00D	1.000	1.323E-01	1.323E-01	2.046E-01	154.61	
PB-212	698.74D	1.000	9.092E-02	9.092E-02	22.58E-02	248.37	
BI-214	28700.00D	1.000	2.016E-01	2.016E-01	3.288E-01	163.05	
PB-214	0.04D	1.348	2.698E-01	3.637E-01	4.889E-01	134.44	
AM-243	2.69E+06D	1.000	5.532E-02	5.532E-02	19.73E-02	356.68	
Total Activity :			7.500E-01	8.439E-01			

OK 6/1/94

Grand Total Activity : 7.500E-01 8.439E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV. 0
BE-7	158.	477.59	1.1741E+00	
NA-22	48.	1274.55	1.4969E-01	
NA-24	42.	1368.53	1.5095E-01	
K-40	824.	1460.75	6.4735E+00	
SC-46	84.	889.23	1.5215E-01	
CR-51	286.	320.09	1.1412E+00	
MN-54	87.	834.83	1.4535E-01	
CO-56	58.	846.76	1.2071E-01	
CO-57	325.	122.06	8.5135E-02	
CO-58	91.	810.75	1.4430E-01	
FE-59	71.	1099.25	2.9205E-01	
CO-60	55.	1332.50	1.6528E-01	
ZN-65	69.	1115.55	3.2366E-01	
SE-75	330.	264.66	1.8169E-01	
KR-85	219.	513.99	3.5622E+01	
SR-85	220.	513.99	1.5646E-01	
Y-88	14.	1836.06	1.1152E-01	
Y-91	72.	1204.90	5.9147E+01	
NB-94	87.	871.10	1.5166E-01	
NB-95	89.	765.79	1.3418E-01	
ZR-95	84.	756.73	2.3589E-01	
RU-103	140.	497.08	1.3083E-01	
RURH-106	114.	621.93	2.5019E+00	
AG-108M	192.	433.94	1.3370E-01	
CD-109	281.	88.03	2.5453E+00	
AG-110M	105.	657.76	1.3107E-01	
SN-113	221.	391.67	1.8397E-01	
TE-123M	326.	159.00	8.7999E-02	
SB-124	116.	602.73	1.2575E-01	
SB-125	207.	427.89	4.2064E-01	
TE-125M	210.	35.46	0.0000E+00	
I-129	251.	39.60	0.0000E+00	
I-131	230.	364.48	1.4045E-01	
XE-131M	330.	163.98	3.9476E+00	
BA-133	209.	356.02	1.7185E-01	
CS-134	109.	795.84	1.8043E-01	
CS-136	100.	818.51	1.5269E-01	
CS-138	27.	1435.86	2.6221E-01	
CE-139	340.	165.85	9.5714E-02	
BA-140	352.	162.67	1.2453E+02	
LA-140	30.	1596.20	1.4978E-01	
CE-141	320.	145.44	1.4750E-01	
CE-144	333.	133.51	6.5317E-01	
CEPR-144	333.	133.54	1.3047E+00	
EU-152	35.	1408.01	6.6733E-01	
EU-154	48.	1274.51	4.3594E-01	
EU-155	295.	105.31	3.4977E-01	
HF-181	165.	482.20	1.5564E-01	
TA-182	275.	67.75	3.9771E-01	
HG-203	285.	279.19	1.2723E-01	
BI-207	129.	569.70	1.2882E-01	

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : K-219-6630

Acquisition date : 31-MAY-1994 21:15:57

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)
TL-208	252.	583.14	2.0698E-01
PB-210	253.	46.50	0.0000E+00
BI-212	122.	727.27	2.3904E+00
RA-224	351.	240.99	2.6147E+00
RA-226	395.	186.10	2.5276E+00
AC-228	177.	911.07	7.8087E-01
TH-228	356.	215.99	3.6133E+00
TH-229	317.	86.44	3.3517E+00
U-232	332.	129.08	1.0629E+02
PA-233	267.	311.98	3.0269E-01
PA-234M	70.	1001.03	2.5734E-01
TH-234	334.	92.80	9.1078E-01
U-235	312.	143.76	6.4264E-01
NP-237	314.	86.50	7.9285E-01
U-237	352.	208.00	4.3348E-01
NP-238	70.	984.45	5.4438E-01
NP-239	307.	106.12	3.3929E-01
PU-239	324.	129.30	1.1206E+03
AM-241	271.	59.54	7.5460E-01

 * 222-S Laboratory Counting Room 31-MAY-1994 20:02:02.32 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<<

Sample ID: K-218-6730
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

Im Bueh

date: 5-31-94

>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4347.cnf
 Geometry: 41
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:02.98 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 31-MAY-1994 19:11:25.92
 Decayed to: 31-MAY-1994 19:11:25.92
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 18-APR-1994 11:17:09.37
 Date of last efficiency calibration: 18-APR-1994 11:18:36.88

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/LI
0	92.54*	52	1.27	185.07	182	7211.7			
0	238.49*	11	1.37	476.93	473	8901.3			
0	351.79*	0	1.23	703.51	698	11*****		PB-212	3.026E-02
0	511.30*	100	2.33	1022.51	1015	20118.5			
0	661.55*	767	1.48	1323.00	1316	14 12.3		CS-137	2.36
0	910.93*	20	1.88	1821.77	1814	14321.9			
0	1119.89*	6	1.82	2239.72	2235	9904.7			
0	1764.32*	18	2.54	3528.79	3520	18145.9			

Summary of Nuclide Activity
Sample ID : K-218-6730

Page : 2
Acquisition date : 31-MAY-1994 19:11:25

Total number of lines in spectrum 8
Number of unidentified lines 0
Number of lines tentatively identified by NID 8 100.00%
WHC-SD-WM-DP-079, REV. 0

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	11020.00D	1.000	2.357E+00	2.357E+00	0.290E+00	12.33	
PB-212	698.74D	1.000	3.026E-02	3.026E-02	27.27E-02	901.25BKG	6/1/94
Total Activity :			2.387E+00	2.387E+00			

Grand Total Activity : 2.387E+00 2.387E+00

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : K-218-6730

Page : 3
Acquisition date : 31-MAY-1994 19:11:25

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV. 0
BE-7	198.	477.59	1.3147E+00	
NA-22	66.	1274.55	1.7558E-01	
NA-24	39.	1368.53	1.4547E-01	
K-40	791.	1460.75	6.3414E+00	
SC-46	73.	889.23	1.4248E-01	
CR-51	317.	320.09	1.2023E+00	
MN-54	97.	834.83	1.5319E-01	
CO-56	82.	846.76	1.4299E-01	
CO-57	724.	122.06	1.2705E-01	
CO-58	87.	810.75	1.4114E-01	
FE-59	67.	1099.25	2.8392E-01	
CO-60	51.	1332.50	1.5928E-01	
ZN-65	73.	1115.55	3.3228E-01	
SE-75	421.	264.66	2.0536E-01	
KR-85	240.	513.99	3.7281E+01	
SR-85	240.	513.99	1.6369E-01	
Y-88	17.	1836.06	1.2298E-01	
Y-91	73.	1204.90	5.9666E+01	
NB-94	98.	871.10	1.6109E-01	
NB-95	115.	765.79	1.5259E-01	
ZR-95	91.	756.73	2.4566E-01	
RU-103	177.	497.08	1.4688E-01	
RURH-106	115.	621.93	2.5180E+00	
AG-108M	214.	433.94	1.4140E-01	
CD-109	827.	88.03	4.3687E+00	
AG-110M	142.	657.76	1.5236E-01	
SN-113	273.	391.67	2.0476E-01	
TE-123M	562.	159.00	1.1560E-01	
SB-124	118.	602.73	1.2663E-01	
SB-125	225.	427.89	4.3911E-01	
TE-125M	476.	35.46	0.0000E+00	
I-129	492.	39.60	0.0000E+00	
I-131	268.	364.48	1.5187E-01	
XE-131M	609.	163.98	5.3601E+00	
BA-133	282.	356.02	1.9931E-01	
CS-134	132.	795.84	1.9826E-01	
CS-136	59.	818.51	1.1770E-01	
CS-138	25.	1435.86	2.5303E-01	
CE-139	572.	165.85	1.2415E-01	
BA-140	569.	162.67	1.5817E+02	
LA-140	15.	1596.20	1.0797E-01	
CE-141	598.	145.44	2.0177E-01	
CE-144	609.	133.51	8.8334E-01	
CEPR-144	610.	133.54	1.7658E+00	
EU-152	30.	1408.01	6.1630E-01	
EU-154	66.	1274.51	5.0972E-01	
EU-155	727.	105.31	5.4877E-01	
HF-181	207.	482.20	1.7394E-01	
TA-182	666.	67.75	6.1889E-01	
HG-203	401.	279.19	1.5107E-01	
BI-207	154.	569.70	1.4045E-01	

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)	WHC-SD-WM-DP-079, REV. 0
TL-208	248.	583.14	2.0555E-01	
PB-210	479.	46.50	0.0000E+00	
BI-212	116.	727.27	2.3314E+00	
BI-214	278.	609.32	4.2730E-01	
PB-214	421.	351.92	5.4502E-01	
RA-224	500.	240.99	3.1224E+00	
RA-226	609.	186.10	3.1369E+00	
AC-228	189.	911.07	8.0538E-01	
TH-228	504.	215.99	4.3022E+00	
TH-229	806.	86.44	5.3442E+00	
U-232	650.	129.08	1.4870E+02	
PA-233	300.	311.98	3.2096E-01	
PA-234M	88.	1001.03	2.8873E-01	
TH-234	797.	92.80	1.4073E+00	
U-235	590.	143.76	8.8445E-01	
NP-237	806.	86.50	1.2704E+00	
U-237	507.	208.00	5.2011E-01	
NP-238	76.	984.45	5.6695E-01	
NP-239	727.	106.12	5.2181E-01	
PU-239	657.	129.30	1.5950E+03	
AM-241	577.	59.54	1.1002E+00	
AM-243	455.	43.60	0.0000E+00	

 * 222-S Laboratory Counting Room 31-MAY-1994 21:07:55.01 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Sample ID: K-218-6830
 Sample Size: 1.00000E-03 LI
 Dilution Factor: 1.00000E+01
 Conversion LI to LI: 1.00000E+00

Removed by:

Em Durell

date: 5-31-94

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4350.cnf
 Geometry: 41
 Description:
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:02.98 sec

WHC-SD-WM-DP-079, REV. 0

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 31-MAY-1994 20:17:19.86
 Decayed to: 31-MAY-1994 20:17:19.86
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 18-APR-1994 11:17:09.37
 Date of last efficiency calibration: 18-APR-1994 11:18:36.88

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/LI
0	238.70*	24	1.07	477.34	474	9441.6		PB-212	6.491E-02
0	338.43*	40	1.15	676.80	673	8184.5		AC-228	0.505
0	352.20*	69	1.32	704.33	699	11139.8			
0	583.16*	41	1.42	1166.23	1160	14181.9			
0	661.56*	800	1.44	1323.02	1316	13 11.2		CS-137	2.46
0	726.80	48	1.29	1453.50	1450	12 94.6			
0	911.18*	13	1.93	1822.28	1818	10423.0		AC-228	0.164
0	1119.66*	1	1.31	2239.26	2233	14*****			
0	1587.70	20	1.83	3175.49	3173	8 72.3			
0	1764.45*	18	1.80	3529.05	3521	17162.2			
0	1829.24	15	0.68	3658.67	3654	11 51.6			

Summary of Nuclide Activity
Sample ID : K-218-6830

Page : 2
Acquisition date : 31-MAY-1994 20:17:19

Total number of lines in spectrum 11 WHC-SD-WM-DP-079, REV. 0
Number of unidentified lines 2
Number of lines tentatively identified by NID 9 81.82%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	11020.00D	1.000	2.457E+00	2.457E+00	0.276E+00	11.22	
PB-212	698.74D	1.000	6.490E-02	6.491E-02	28.66E-02	441.56	
AC-228	2444.44D	1.000	2.860E-01	2.860E-01	5.570E-01	194.74	
Total Activity :			2.808E+00	2.808E+00			

38K 6/1/94

Grand Total Activity : 2.808E+00 2.808E+00

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA	WHC-SD-WM-DP-079, REV.0
			(uCi/LI)	
BE-7	183.	477.59	1.2614E+00	
NA-22	73.	1274.55	1.8560E-01	
NA-24	25.	1368.53	1.1704E-01	
K-40	821.	1460.75	6.4630E+00	
SC-46	85.	889.23	1.5319E-01	
CR-51	326.	320.09	1.2187E+00	
MN-54	96.	834.83	1.5260E-01	
CO-56	86.	846.76	1.4673E-01	
CO-57	712.	122.06	1.2601E-01	
CO-58	92.	810.75	1.4512E-01	
FE-59	81.	1099.25	3.1036E-01	
CO-60	70.	1332.50	1.8656E-01	
ZN-65	79.	1115.55	3.4569E-01	
SE-75	392.	264.66	1.9829E-01	
KR-85	222.	513.99	3.5815E+01	
SR-85	222.	513.99	1.5731E-01	
Y-88	10.	1836.06	9.4575E-02	
Y-91	56.	1204.90	5.2263E+01	
NB-94	98.	871.10	1.6154E-01	
NB-95	113.	765.79	1.5123E-01	
ZR-95	104.	756.73	2.6188E-01	
RU-103	181.	497.08	1.4886E-01	
RURH-106	123.	621.93	2.6020E+00	
AG-108M	206.	433.94	1.3873E-01	
CD-109	729.	88.03	4.1011E+00	
AG-110M	127.	657.76	1.4371E-01	
SN-113	276.	391.67	2.0568E-01	
TE-123M	604.	159.00	1.1981E-01	
SB-124	124.	602.73	1.2996E-01	
SB-125	247.	427.89	4.6013E-01	
TE-125M	485.	35.46	0.0000E+00	
I-129	491.	39.60	0.0000E+00	
I-131	267.	364.48	1.5144E-01	
XE-131M	555.	163.98	5.1177E+00	
BA-133	256.	356.02	1.9008E-01	
CS-134	107.	795.84	1.7846E-01	
CS-136	85.	818.51	1.4114E-01	
CS-138	45.	1435.86	3.4216E-01	
CE-139	572.	165.85	1.2412E-01	
BA-140	550.	162.67	1.5552E+02	
LA-140	20.	1596.20	1.2297E-01	
CE-141	640.	145.44	2.0868E-01	
CE-144	657.	133.51	9.1690E-01	
CEPR-144	657.	133.54	1.8325E+00	
EU-152	51.	1408.01	8.0448E-01	
EU-154	73.	1274.51	5.3766E-01	
EU-155	762.	105.31	5.6191E-01	
HF-181	196.	482.20	1.6964E-01	
TA-182	657.	67.75	6.1468E-01	
HG-203	380.	279.19	1.4700E-01	
BI-207	139.	569.70	1.3389E-01	

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : K-218-6830

Acquisition date : 31-MAY-1994 20:17:19

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)
TL-208	268.	583.14	2.1354E-01
PB-210	480.	46.50	0.0000E+00
BI-212	137.	727.27	2.5370E+00
BI-214	307.	609.32	4.4901E-01
PB-214	441.	351.92	5.5768E-01
RA-224	497.	240.99	3.1114E+00
RA-226	562.	186.10	3.0137E+00
TH-228	490.	215.99	4.2428E+00
TH-229	781.	86.44	5.2589E+00
U-232	661.	129.08	1.4995E+02
PA-233	360.	311.98	3.5148E-01
PA-234M	80.	1001.03	2.7618E-01
TH-234	761.	92.80	1.3750E+00
U-235	631.	143.76	9.1443E-01
NP-237	780.	86.50	1.2501E+00
U-237	528.	208.00	5.3083E-01
NP-238	66.	984.45	5.2992E-01
NP-239	756.	106.12	5.3204E-01
PU-239	661.	129.30	1.6001E+03
AM-241	554.	59.54	1.0779E+00
AM-243	436.	43.60	0.0000E+00

DATE START:

JUNE 25, 1994

DATE COMPLETE:

JUNE 30, 1994

The results for the standard are in uCi/L.

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Batch 3818

Serial No. K 209-5586	Sample Point C-111	Date 4-25-94	Time Issued 14:54	Priority 23
Determination Sr90	Method-Standard LA-220-101	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size ?	Customer ID STD			
Remarks, Calculations, Results				
COUNT ON DETECTOR#11 S376 ITS				
SEPARATION DATE: 6/25/94 SEPARATION TIME: 17:45				
STD#136451 RESULT 1.38E00 GROSS: 8.1699 g STD VAL 1.38E00%REC 102.4 TARE: 8.0825 g NET: 0.0874 g				
Analyst-1 Nol King	Analyst-2 M. L. King	Analyst-3 Mrs	Analyst-4 Mrs	Analyst-5 Mrs
Date 6/25/94	Time Completed 20:30	Lab Unit Mgr R. King	64-6800-061 (R-10-83)	

WHC-SD-MM-DP-079, REV. 0

Sr-89/90 LA-220-101(D-0),102(E-0),104(D-0),105(E-1) LIQUIDS

Type	DETECTOR NUMBER	12	CARRIER ADDED in mL (CVA)	STANDARD
STANDARD	TOTAL COUNTS (TC)	11791	GROSS WEIGHT (W2)	1.000
WORKING	COUNT TIME in MINUTES (CT)	10	FARE WEIGHT (W1)	8.1699
3818	BACKGROUND in cpm (BKG)	15	NET WEIGHT (W3)	8.0825
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (hours) (DT)	0.0874
	DILUTION FACTOR (DF)	1		3.50
Media	DIGEST DILUTION FACTOR (DDF)	1		
LIQUID	SAMPLE COUNT RATE (Rs)	1164.10	Sr-90 EFFICIENCY FACTOR (C1)	0.4180
Sample #	CRITICAL LEVEL (Lc)	2.86	Sr-90 EFFICIENCY FACTOR (C2)	0.4660
K209-5586	SEPARATION TIME (ST)	17:45	Final	N/A
Instrument Code	SEPARATION DATE (SD)	06/25/94	DETECTION LIMIT (Ld)	5.99
	TIME OF COUNT (TUC)	21:15	Sr-89/90 CONC. in pCi/L =	1.3783E+00
Analyst	DATE OF COUNT (DOC)	06/25/94		
R. KING				

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
 $Sr-89/90 \text{ pCi/L} = Rs \times 1000 \text{ mL/L} \times DPF/DDF$
 $(C1 + C2 \times (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 \times DT))) \times SS \times Rec \times 2220000 \text{ dpm/pCi}$
 NOTE: 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA x 0.1000))
 $Sr-89/90 \text{ pCi/mL} = (Sr-89/90 \text{ pCi/L}) / 1000 \text{ mL/L}$
 Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))
 Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
 NOTE: Expected Weight = CVA * 0.1
 Detection Levels and Less Than Values are determined from Procedure LA-508-002.
 Delta Time (hours) = ((DOC - SD) * 24) + (TUC - ST) / 100

▼ RESULTS ▼

Sr-89/90 CONCENTRATION	=	1.38E+00	pCi/L
Sr-89/90 CONCENTRATION	=	1.38E-03	pCi/mL
RELATIVE COUNTING ERROR	=	0.9%	
PERCENT CARRIER RECOVERY	=	87.4%	

DETECTION
LEVEL

7.09E-06
pCi/mL

Date Entry by:	R. King	Date:	27-Jun-94
Approved by:	R. King	Date:	30-Jun-94

Form X1 Rev. 1.1 Page 1 of 1

STRONTIUM 90 ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

12/2 6-25-94 @ 2115 MB AT=3.50

Sr Calculation (CRPE, CAL 2.0) K209-5586
 By: MC KIEPMAN, on 06-25-1994 at 22:00:46
 11791 at 112.2 g/L count Sr eff : .418 Y eff : .466
 10 Sample size : 1 ml Dilution : 1 Method : 1

Sample # K209-5586
 Count # 1 Decay time = 3.50 hrs

11791
 ----- 15.0 = 1.2646E+00 dCi/L strontium
 10

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Form L2 Rev. 1.1

Date Entry by: *[Signature]*

Approved by: *[Signature]*

Date: 27-Jun-94

Page 1 of 1

PERCENT CARRIER RECOVERY = 87.3%

RELATIVE COUNTING ERROR = 1.5%

Sr-89/90 CONCENTRATION = 1.92E-01 $\mu\text{Ci/g}$

RESULTS

Delta Time (hours) = $((\text{DOC} - \text{SI}) \cdot 24) + (\text{TDC} - \text{SI}) / 100$

Detection Levels and Less Than Values are determined from Procedure LA-508-002

NOTE Expected weight = CVA $\cdot$ 0.1

Percent Carrier Recovery = $(\text{Net Weight} / \text{Expected weight}) \cdot 100$

Relative Counting Error = The Square Root of $((\text{TC} + \text{BS}) \cdot \text{CI}) / (\text{TC} - \text{BS}) \cdot \text{CI}$

NOTE 642 = Half Life for Y-90 and Rec = Fractional Carrier Recovery $((\text{W2-W1}) / (\text{CVA} \cdot 0.1000))$

DT / 642 = $\text{Rec} \cdot \text{Wg} / \text{L} \cdot 22200000 \text{ dpm}/\mu\text{Ci}$

Sr-89/90 $\mu\text{Ci/g}$ = $\text{Rec} \cdot 1000 \text{ mL} / \text{L} \cdot \text{Wg} / \text{CI} + \text{C2} (1 - e \text{ to the power of } ((-\text{natural log } 2) \cdot \text{Delta Time}))$

Sr-89/90 LA-220-101 (D-0) SOLIDS

DETECTOR NUMBER	12	CARRIER ADDED IN mL	(CVA)	1.000
TOTAL COUNTS	(TC)	4866	(W2)	7.8802
COUNT TIME IN MINUTES	(CT)	10	(W1)	7.7929
BACKGROUND IN cpm	(BS)	16	(W3)	0.0873
SAMPLE VOLUME IN mL	(SV)	1.000	(DT)	3.92
DILUTION FACTOR	(DF)	1		
DETECT G/L	(DG/L)	2.9036		
SAMPLE COUNT RATE	(RS)	471.50	(C1)	0.4180
CRITICAL LEVEL	(LC)	2.86	(C2)	0.4660
SEPARATION TIME	(ST)	17:45		N/A
SEPARATION DATE	(SD)	06/26/94		
DATE OF COUNT	(DOC)	06/25/94		
DATE OF COUNT	(DOC)	06/25/94		
DETECTION LIMIT	(LD)	21:40		1.9160E-01

DETAILED DATA:

DETECTOR NUMBER	12	CARRIER ADDED IN mL	(CVA)	1.000
TOTAL COUNTS	(TC)	4866	(W2)	7.8802
COUNT TIME IN MINUTES	(CT)	10	(W1)	7.7929
BACKGROUND IN cpm	(BS)	16	(W3)	0.0873
SAMPLE VOLUME IN mL	(SV)	1.000	(DT)	3.92
DILUTION FACTOR	(DF)	1		
DETECT G/L	(DG/L)	2.9036		
SAMPLE COUNT RATE	(RS)	471.50	(C1)	0.4180
CRITICAL LEVEL	(LC)	2.86	(C2)	0.4660
SEPARATION TIME	(ST)	17:45		N/A
SEPARATION DATE	(SD)	06/26/94		
DATE OF COUNT	(DOC)	06/25/94		
DATE OF COUNT	(DOC)	06/25/94		
DETECTION LIMIT	(LD)	21:40		1.9160E-01

WHC-SD-WM-DP-079, REV. 0

REAGENT BLANK

COUNT AS $\mu\text{Ci/L}$

1.92E-01 $\mu\text{Ci/g}$

SEPARATION DATE: 6/25/94

SEPARATION TIME: 17:45

GROSS: 7.8802

TARE: 7.7929

NET: 0.0873

ANALYST: 1, 2, 3, 4, 5

DATE: 6/25/94

TIME COMPLETED: 20:30

LAB: 101

Customer ID: N4C3B

Charge Code: 0

Result Units: $\mu\text{Ci/g}$

Method Standard: LA-220-101

Sample Point: 4-25-94

Time Issued: 14:55

Priority: 23

Sample Size: 1 mL

Remarks, Calculations, Results

54-6000-061 (R-10-83)

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

STRONTIUM 90 ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

12/2 6-25-94 @ 2140 MB

AT = 3.92

K210-6686

Sr Calculation (CPYC CAL 2.0)

By: M. J. JEFFERSON, i, on 06-25-1994 at 22:00:04

4865 12 2 -inst Sr eff = .418 Y eff = .466

10 Sample time = 1.5 Dilution = 1 Method = 1

Sample # K210-6686

Point # 1 Decay time = 3.92 hrs

4865

----- 15.0 = 4.8562E-01 uCi/l strontium

10

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-079, REV. 0

Serial No. K 211.-6786	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination Sr90	Method Standard LA-220-101	Result Units uCi/G	Charge Code N4C3B	Retuns 0
Sample Size ? <i>1mL BK</i>	Customer ID C56S1			
Remarks Calculations, Results COUNT AS uCi/L <i>4.13E03 uCi/g</i> SEPARATION DATE: <i>6/25/94</i> SEPARATION TIME: <i>17:45</i> GROSS: <i>7.8649 g</i> TARE: <i>7.7772 g</i> NET: <i>0.0877 g</i> <i>Not KMA</i>				
Analyst - 1 <i>Mrs</i>	Analyst - 2 <i>Mrs</i>	Analyst - 3 <i>Mrs</i>	Analyst - 4 <i>Mrs</i>	Analyst - 5 <i>Mrs</i>
Date <i>6/25/94</i>	Time Completed <i>20:30</i>	Lab <i>Sub</i>	Reprints <i>Reprints</i>	

Sr-89/90 LA-220-101 (D-0)

SOLIDS

SAMPLE

Type	DETECTOR NUMBER	12	CARRIER ADDED in mL (CVA)	1.000
SAMPLE	TOTAL COUNTS (TC)	101592	GROSS WEIGHT (W2)	7.8649
Work Start	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)	7.7772
3818	BACKGROUND in cpm (BEG)	15	NET WEIGHT (W3)	0.0877
Test Code	SAMPLE VOLUME in mL (SS)	0.100	DELTA TIME (HOURS) (DT)	4.17
	DILUTION FACTOR (DF)	101		
Memx	DIGEST g/L (Dg/L)	2.9036		
SOLID	SAMPLE COUNT RATE (Rs)	10144.20	Sr-90 EFFICIENCY FACTOR (C1)	0.4180
Sample #	CRITICAL LEVEL (Lc)	2.86	Y-90 EFFICIENCY FACTOR (C2)	0.4660
K211-6786	SEPARATION TIME (ST)	17:45	Rmax	N/A
Instrument Code	SEPARATION DATE (SD)	06/25/94	DETECTION LIMIT (LD)	5.99
WB27812/11	TIME OF COUNT (TOC)	21:55	Sr-89/90 CONC in uCi/g =	4.1332E+03
Analyst	DATE OF COUNT (DOC)	06/25/94		

R. KING
Date: 06/25/94
Time: 20:30
Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BEG)
Sr-89/90 uCi/g = Rs * 1000 mL / L * DF / (C1 + C2 (1 - e to the power of ((-natural log 2) * DT / 64.2))) * SS * Rec * Dg / 1.22200000 dpm/uCi
NOTE: 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BEG * CT) / (TC - BEG * CT))
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-505-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

▼ RESULTS ▼

Sr-89/90 CONCENTRATION	=	4.13E+03	uCi/g
RELATIVE COUNTING ERROR	=	0.3%	
PERCENT CARRIER RECOVERY	=	87.7%	

DETECTION
LEVEL

2.44E+00
uCi/g

Date Entry by: <i>R. King</i>	Date: 27-Jun-94
Approved by: <i>R. King</i>	Date: 30-Jun-94

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STRONTIUM 90 ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

146-25-94 @ 2155 MB AT = 4.17

K211-6786

101592 (APPCAL 2.0)
 by: RE BIERMAN, L. 06-23-1994 at 21:55:07
 Det: 112 2-inch NaI Sr eff: .418 Y eff: .466
 Sample size: .1 ml Dilution: 101 Method: 1

Sample # K211-6786
 Count # 1 Decay time = 4.17 hrs

101592
 ----- 15.0 = 1.0523E+04 cfi/L strontium
 16

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No. K 211.-6886	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination Sr90	Method: Standard LA-220-101	Result Units uCi/G Rec	Charge Code N4CSB	Reruns 0
Sample Size ? 100-10-100 + 1ml 5f Carrier			Customer ID C58S1	
Remarks, Calculations, Results DUPLICATE SAMPLE COUNT AS uCi/L 87.7% ^{6/25/94} _{6/25/94} 4.19E+3 uCi/L GROSS: 7.9239 g TARE: 7.8362 g NET: 0.0877 g 706-Rim Date: 6/25/94 Time Completed: 20:30 Analyst-1: [Signature] Analyst-2: [Signature] Analyst-3: [Signature] Analyst-4: [Signature] Analyst-5: [Signature] Lab Mgr: [Signature]				
54-6800-061 (R-10-83)				

WHC-SD-WM-DP-079, REV. 0

Sr-89/90 LA-220-101 (D-0)

SOLIDS

				DUPLICATE	
Type	DETECTOR NUMBER	12	CARRIER ADDED in mL (CVA)	1.000	
DUPLICATE	TOTAL COUNTS (TC)	104108	GROSS WEIGHT (W2)	7.9239	
Work List	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)	7.8362	
3818	BACKGROUND in cpm (BEG)	15	NET WEIGHT (W3)	0.0877	
Test Code	SAMPLE VOLUME in mL (SS)	0.100	DELTA TIME (HOURS) (DT)	4.42	
	DILUTION FACTOR (DF)	101			
Matrix	DIGEST g/L (Dg/L)	2.925			
SOLID	SAMPLE COUNT RATE (Rs)	10395.80	Sr-90 EFFICIENCY FACTOR (C1)	0.4180	
Sample #	CRITICAL LEVEL (Lc)	2.86	Y-90 EFFICIENCY FACTOR (C2)	0.4860	
K211-6886	SEPARATION TIME (ST)	17:45	max	N/A	
Instrument Code	SEPARATION DATE (SD)	06/25/94	DETECTION LIMIT (LD)	5.99	
WB27812#11	TIME OF COUNT (TUC)	22:10	Sr-89/90 CONC in pCi/g =	4.1918E+03	
Analyst	DATE OF COUNT (DOC)	06/25/94			
R. KING					
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BEG) Sr-89/90 pCi/g = Rs * 1000 mL / L * DF / (C1 + C2 (1 - e to the power of ((-natural log 2) * DT / 64.2)) * SS * Rec * Dg / 1.22200000 dpm/pCi) NOTE 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2 - W1) / (CVA * 0.1000)) Relative Counting Error = The Square Root of ((TC + BEG * CT) / (TC - BEG * CT)) Percent Carrier Recovery = (Net Weight / Expected weight) * 100 NOTE Expected weight = CVA * 0.1 Detection Levels and Less Than Values are determined from Procedure LA-508-002. Delta Time (hours) = ((DOC - SD) * 24) + (TUC - ST) / 100				
Time					
20:30					

▼ RESULTS ▼

Sr-89/90 CONCENTRATION	=	4.19E+03	pCi/g
RELATIVE COUNTING ERROR	=	0.3%	
PERCENT CARRIER RECOVERY	=	87.7%	

DETECTION
LEVEL

2.41E+00
pCi/g

Date Entry by:

Approved by:

Form L2 Rev. 1.1

Date: 27-Jun-94

Date: 28-Jun-94

Page 1 of 1

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STRONTIUM 90 ANALYSIS - FUSION

WHC-SD-WM-DP-079, REV. 0

12/2 6-25-91 @ 2210 MS AT = 4.42
 Sr Calculation - (CRPC CAL 2.0) K211-6886
 By: MC PIERMAN, on 06-25-1994 at 22:07:43
 10.2108 Count Sr eff : .418 Y eff : .466
 10.2108/15 Solution : 101 Method : 1
 Sample # K211-6886
 Count # 1 Decay time = 4.42 hrs

104108
 ----- 15.0 = 1.0755E+04 nCi/L strontium
 10

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QA
13

WHC-SD-WM-DP-079, REV. 0

Instrument: WB27812	Procedure/ Rev: UA-220-101 0-0
Technologist: A. Mallibaugh	Date: 5-3-94
Starting Time: 0003	Temperature NA
Ending Time: 0350	Chemist: S. Fitzgerald

Comments: _____

	Description	Lab ID
1	LIMES Std	1212-5586
2	Reagent Blank	1213-5686
3	Sample	1214-5786
4	Sample Dup	1214-5886
5		
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

[illegible]

ANALYTICAL BATCH SUMMARY SHEET WHC-SD-WM-DP-079, REV. 0

DATE START:

MAY 3, 1994

DATE COMPLETE:

MAY 6, 1994

[illegible]

X

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

1360

Batch 3279

Serial No K 212.-5586	Sample Point C-111	Date 4-27-94	Time Issued 10: 2	Priority 21
Determination Sr90	Method/Standard LA-220-101	Result Units % RECOVERY	Charge Code N4C3B	Returns 0
Sample Size 1ml + 1ml SP CARRIER			Customer ID STD	
Remarks, Calculations, Results COUNT ON DETECTOR#11 4. 7.8988 S376 ITS T. 7.8177 STD# 13651 RESULT 1.38 N. 0.0811 STD VAL 1.3522 %REC 12.1 SEP TIME 0110 SEP DATE 5-3-94				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	5-3-94			
Date 5-3-94	Time Completed 0350	Lab Unit Mgr		

WHC-SD-WM-DP-079, REV. 0

Sr-89/90 LA-220-101(D-0),102(E-0),104(D-0),105(E-1) LIQUIDS					STANDARD
Type	DETECTOR NUMBER	12	CARRIER ADDED in mL (CVA)		1.000
STANDARD	TOTAL COUNTS (TC)	11153	GROSS WEIGHT (W2)		7.8988
Work List	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)		7.8177
3279	BACKGROUND in cpm (BKG)	14	NET WEIGHT (W3)		0.0811
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (hours) (DT)		4.92
Sr90	DILUTION FACTOR (DF)	1			
Matrix	DIGEST DILUTION FACTOR (DDF)	1			
LIQUID	SAMPLE COUNT RATE (Rs)	1101.30	Sr-90 EFFICIENCY FACTOR (C1)		0.4180
Sample #	CITICAL LEVEL (Lc)	2.76	Y-90 EFFICIENCY FACTOR (C2)		0.4660
K212-5586	SEPARATION TIME (ST)	01:10	tmax		N/A
Instrument Code	SEPARATION DATE (SD)	05/03/94	DETECTION LIMIT (Ld)		5.79
WB27812	TIME OF COUNT (TOC)	06:05	Sr-89/90 CONC in pCi/L =		1.3836E+00
Analyst	DATE OF COUNT (DOC)	05/03/94			
A HOLLIBAUGH					
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)				
05/03/94	Sr-89/90 pCi/L = Rs * 1000 mL/L * DDF/DDF				
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) * SS * Rec * 2220000 dpm/pCi)				
03:50	NOTE 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))				
	Sr-89/90 pCi/mL = (Sr-89/90 pCi/L) / 1000 mL/L				
	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))				
	Percent Carrier Recovery = (Net Weight / Expected Weight) * 100				
	NOTE Expected Weight = CVA * 0.1				
	Detection Levels and Less Than Values are determined from Procedure LA-505-002.				
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100				

v RESULTS v

Sr-89/90 CONCENTRATION	=	1.38E+00	pCi/L
Sr-89/90 CONCENTRATION	=	1.38E-03	pCi/mL
RELATIVE COUNTING ERROR	=	1.0%	
PERCENT CARRIER RECOVERY	=	81.1%	

DETECTION
LEVEL7.28E-06
pCi/mL

Date Entry by:	Date:	07-May-94
Approved by:	Date:	9-May-94

STRONTIUM 89\90 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

12/2 5-3-94 AJ 06:05 $\Delta T = 4.92$
----- K212-5586 1ml

$\frac{11153}{10} - 14$

Sr Calculation (CRPC_CAL 2.0)
By: AL JOHANSEN, on 05-03-1994 at 06:46:36
Det #12 2 -inch mount Sr eff : .418 Y eff : .466
Sample size : 1 mL Dilution : 1 Method : 1

Sample # K212-5586
Mount # 1 Decay time = 4.92 hrs

11153
----- 14.0 = 1.1220E+00 uCi/L strontium
10

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-079, REV. 0

Serial No K 213.-5686	Sample Point C-111	Date 4-27-94	Time Issued 10: 7	Priority 21
Determination Sr90	Method/Standard LA-220-101	Result Units uCi/ML	Charge Code N4C3B	Retruns 0
Sample Size 1 ml + 1 ml SR CARRIER			Customer ID BLANK	
Remarks, Calculations Results REAGENT BLANK COUNT AS uCi/L $< 3.42 \text{ E-06 uCi/ml}$ G. 7. 9354 T. 7.8504 N. 0.0850 SEP TIME 0110 SEP DATE 5-3-94 1000.0000				
Analyst - 1 Hrs	Analyst - 2 Hrs 5-3-94	Analyst - 3 Hrs Lakda	Analyst - 4 Hrs	Analyst - 5 Hrs
Date 5-3-94	Time Completed 0350	Lab Unit Mgr J. H. H. H.	J. H. H. H.	

Sr-89/90 LA-220-101(D-0),102(E-0),104(D-0),105(E-1) LIQUIDS

Type	DETECTOR NUMBER	12	CARRIER ADDED in mL (CVA)	1.000
BLANK	TOTAL COUNTS (TC)	141	GROSS WEIGHT (W2)	7.9354
Work List	COUNT TIME in MINUTES (CT)	10	FARE WEIGHT (W1)	7.8504
3278	BACKGROUND in cpm (BKG)	14	NET WEIGHT (W3)	0.0850
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (hours) (DT)	5.25
Sr90	DILUTION FACTOR (DF)	1		
Matrix	DIGEST DILUTION FACTOR (DDF)	1		
LIQUID	SAMPLE COUNT RATE (Rs)	0.10	SR-90 EFFICIENCY FACTOR (C1)	0.4180
Sample #	CRITICAL LEVEL (Lc)	2.76	Y-90 EFFICIENCY FACTOR (C2)	0.4660
K213-5686	SEPARATION TIME (ST)	01:10	Rmax	2.87
Instrument Code	SEPARATION DATE (SD)	05/03/94	DETECTION LIMIT (Ld)	5.79
WB27812	TIME OF COUNT (TOC)	06:25	Sr-89/90 CONC in uCi/L =	< 3.4231E-03
Analyst	DATE OF COUNT (DOC)	05/03/94		
A HOLLIBAUGH				
Date				
05/03/94				
Time				
03:50				

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 uCi/L = Rs * 1000 mL / L * DF * DDF /
(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) * SS * Rec * 2220000 dpm / uCi)
NOTE: 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Sr-89/90 uCi/mL = (Sr-89/90 uCi/L) / 1000 mL/L
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))
Percent Carrier Recovery = (Net Weight / Expected Weight) * 100
NOTE: Expected Weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	< 3.42E-03	uCi/L
Sr-89/90 CONCENTRATION	=	< 3.42E-06	uCi/mL
LESS THAN Value was Determined from Rmax.			
RELATIVE COUNTING ERROR	=	500.0%	
PERCENT CARRIER RECOVERY	=	85.0%	

DETECTION
LEVEL

6.92E-06
uCi/mL

Data Entry by: <i>[Signature]</i>	Date: 07-May-94
Approved by: <i>[Signature]</i>	Date: 9-May-94

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STRONTIUM 89\90 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

12/2 ~~5-3-94~~ 5-3-94 ~~0625~~ 0625 $\Delta T = 5.25$

$\frac{141}{10} - 14$ K213-5686 1ml

Sr Calculation (CRPC_CAL 2.0)
By: AL JOHANSEN, on 05-03-1994 at 06:48:06
Det #12 2 -inch mount Sr eff : .418 Y eff : .466
Sample size : 1 mL Dilution : 1 Method : 1

Sample # K213-5686
Mount # 1 Decay time = 5.25 hrs

141
----- 14.0 $\pm$ 2.9093E-03 uCi/L strontium
10

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 214.-5786	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination Sr90	Method-Standard LA-220-101	Result Units uCi/ML	Charge Code N4C3B	Retuns 0
Sample Size 1 ml + 1 ml SR CARRIER			Customer ID C58FB	
Remarks, Calculations, Results COUNT AS uCi/L 2.22E+03 uCi/ml G. 7.8665 T. 7.7811 N. 0.0854 SEP TIME 0110 SEP DATE 5-3-94 Hollibaugh 5-3-94 Date 5-3-94 Time Completed 0350 Lab. Mgr. [Signature] [Signature] 54-5500-061 (R-10-93)				

WHCSD-WM-DP-079, REV. 0

Sr-89/90 LA-220-101(D-0),102(E-0),104(D-0),105(E-1) LIQUIDS

Type	DETECTOR NUMBER	12	CARRIER ADDED in mL	(CVA)	SAMPLE
SAMPLE	TOTAL COUNTS (TC)	18863	GROSS WEIGHT (W2)		1.000
Work List	COUNT TIME in MINUTES (CT)	10	FARE WEIGHT (W1)		7.8665
3278	BACKGROUND in cpm (BKG)	14	NET WEIGHT (W3)		7.7811
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (hours) (DT)		0.0854
Sr90	DILUTION FACTOR (DF)	1			5.58
Matrix	DIGEST DILUTION FACTOR (DDF)	1			
LIQUID	SAMPLE COUNT RATE (Rs)	1872.30	Sr-90 EFFICIENCY FACTOR (C1)		0.4180
Sample #	CRITICAL LEVEL (Lc)	2.76	Y-90 EFFICIENCY FACTOR (C2)		0.4660
K214-5786	SEPARATION TIME (ST)	01:10	Rmax		N/A
Instrument Code	SEPARATION DATE (SD)	05/03/94	DETECTION LIMIT (Ld)		5.79
WB27812	TIME OF COUNT (TDC)	06:45	Sr-89/90 CONC in pCi/L =		2.2179E+00
Analyst	DATE OF COUNT (DOC)	05/03/94			
A HOLLIBAUGH					
Date					
05/03/94					
Time					
03:50					

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 pCi/L = Rs * 1000 mL/L * DF * DDF /

(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) * SS * Rec * 2220000 dpm/pCi)

NOTE: 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Sr-89/90 pCi/mL = (Sr-89/90 pCi/L) / 1000 mL/L

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))

Percent Carrier Recovery = (Net Weight / Expected Weight) * 100

NOTE: Expected Weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TDC - ST) / 100

v RESULTS v

Sr-89/90 CONCENTRATION	=	2.22E+00	pCi/L
Sr-89/90 CONCENTRATION	=	2.22E-03	pCi/mL
RELATIVE COUNTING ERROR	=	0.7%	
PERCENT CARRIER RECOVERY	=	85.4%	

DETECTION
LEVEL

6.86E-06
pCi/mL

Data Entry by: [Signature]	Date: 07-May-94
Approved by: [Signature]	Date: 9-May-94

Form X1 Rev. 1.1

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STRONTIUM 89\90 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

12/2 5-3-94 AD 0645 $\Delta T = 5.58$
 $\frac{18863}{10} - 14$ K214-5786 1ml

Sr Calculation - (CRPC_CAL 2.0)
 By: AL JOHANSEN, on 05-03-1994 at 07:05:40
 Det #12 2 -inch mount Sr eff : .418 Y eff : .466
 Sample size : 1 mL Dilution : 1 Method : 1

Sample # K214-5786
 Mount # 1 Decay time = 5.58 hrs

$\frac{18863}{10} - 14.0 = 1.8939 \times 10^3$ mCi/L strontium

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WHC-SD-MM-DP-079, REV. 0

Serial No K 214.-5886	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination Sr90	Method/Standard LA-220-101	Result Units uCi/ML	Charge Code N4C3B	Reruns 0
Sample Size 1ml + 1ml SR CARRIER			Customer ID C58FB	
Remarks, Calculations, Results DUPLICATE SAMPLE G. 7.7801 COUNT AS uCi/L T. 7.6957 2.19E-03 uCi/ml. N. 0.0844 53.94 SEP TIME 0116 SEP DATE 5:3-94				
Analyst - 1	ACTIVITY 5-3-94	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date 53.94	Time Completed 0.350	Latent Mgr	94	

Sr-89/90 LA-220-101(D-0),102(E-0),104(D-0),105(E-1) LIQUIDS				DUPLICATE	
Type	DETECTOR NUMBER	12	CARRIER ADDED in mL	(CVA)	1.000
DUPLICATE	TOTAL COUNTS (TC)	18438	GROSS WEIGHT	(W2)	7.7801
Work List	COUNT TIME in MINUTES (CT)	10	TAKE WEIGHT	(W1)	7.8957
3279	BACKGROUND in cpm (BKG)	14	NET WEIGHT	(W3)	0.0844
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (hours)	(DT)	5.75
Sr-90	DILUTION FACTOR (DF)	1			
Matrix	DIGEST DILUTION FACTOR (DDF)	1			
LIQUID	SAMPLE COUNT RATE (Rs)	1829.80	Sr-90 EFFICIENCY FACTOR (C1)		0.4180
Sample #	CRITICAL LEVEL (Lc)	2.76	Y-90 EFFICIENCY FACTOR (C2)		0.4860
K214-5886	SEPARATION TIME (ST)	01:10	tmax		N/A
Instrument Code	SEPARATION DATE (SD)	05/03/94	DETECTION LIMIT (Ld)		5.79
WB27812	TIME OF COUNT (TOC)	06:55	Sr-89/90 CONC in $\mu\text{Ci/L}$ =	2.1894E+00	
Analyst	DATE OF COUNT (DOC)	05/03/94			
A HOLLIBAUGH					
Date	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)				
05/03/94	Sr-89/90 $\mu\text{Ci/L}$ = $R_s \times 1000 \text{ mL/L} \times \text{DDF} /$				
Time	$(C1 + C2 \times (1 - e^{\text{to the power of } ((-\text{natural log } 2) / 64.2 \times \text{DT}))) \times \text{SS} \times \text{Rec} \times 2220000 \text{ dpm}/\mu\text{Ci})$				
03:50	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA \times 0.1000))$				

Sr-89/90 CONCENTRATION	=	2.19E+00	μCi/L
Sr-89/90 CONCENTRATION	=	2.19E-03	μCi/mL
RELATIVE COUNTING ERROR	=	0.7%	
PERCENT CARRIER RECOVERY	=	84.4%	

**DETECTION
LEVEL**
6.93E-06
µCi/mL

Data Entry by: <i>[Signature]</i>	Date: 07-May-94
Approved by: <i>[Signature]</i>	Date: 9-May-94
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STRONTIUM 89\90 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-079, REV. 0

12/2 5-3-94 06:55

$\Delta T = 5.75$

18438
10 - 14

K214-5886

124

Sr Calculation (CRPC_CAL 2.0)

By: AL JOHANSEN, I, on 05-03-1994 at 07:06:43

Det #12 2-inch mount Sr eff : .418 Y eff : .466

Sample size : 1 mL Dilution : 1 Method : 1

Sample # K214-5886

Mount # 1 Decay time = 5.75 hrs

18438

----- 14.0 = 1.8476E+00 uCi/L strontium

10

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WHC-SD-WM-DP-079, REV 0

Sample Prep:
ACID DIGEST

Chemist: STANLY CATLOW

Comments: BATCH #4152

[illegible]

WHC-SD-WM-DP-079, REV. 0

DATE START:

AUGUST 3, 1994

DATE COMPLETE:

致

8.19.94 AUGUST 9, 1994

[illegible]

X

 $\overline{x}$

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

REPLIN BATCH # 4152

Serial No K 209.-5586	Sample Point C-111	Date 4-25-94	Time Issued 14:54	Priority 23															
Determination Sr90	Method Standard LA-220-101	Result Units % RECOVERY	Charge Code N4CSB	Returns 1															
Sample Size ? 1ml + 1ml Sr Carrier #30N6	Customer ID STD																		
Remarks Calculations Results COUNT ON DETECTOR=11 5676 ITS STD# 136B51 RESULT 1.34 STD VAL 1.3441 %REC 99.70%			SEPARATION DATE: 8-3-94 SEPARATION TIME: 2120 GROSS: 8.0139 TARE: 7.9209 NET: 0.0930																
<p><i>Dirol C Dunham</i></p> <table border="1"> <tr> <td>Analyst - 1</td> <td>Analyst - 2</td> <td>Analyst - 3</td> <td>Analyst - 4</td> <td>Analyst - 5</td> </tr> <tr> <td></td> <td><i>Dirol C Dunham</i></td> <td><i>Robert</i></td> <td></td> <td><i>Adonaher</i></td> </tr> <tr> <td>Mrs</td> <td>Mrs</td> <td>Mrs</td> <td>Mrs</td> <td>Mrs</td> </tr> </table>					Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5		<i>Dirol C Dunham</i>	<i>Robert</i>		<i>Adonaher</i>	Mrs	Mrs	Mrs	Mrs	Mrs
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5															
	<i>Dirol C Dunham</i>	<i>Robert</i>		<i>Adonaher</i>															
Mrs	Mrs	Mrs	Mrs	Mrs															
Date 8-3-94	Time Completed 2300	Lab. Mgr. <i>JPV</i>	<i>JPV</i>																

54-5500-061 (R-10-83)

Sr-89/90 LA-220-101(D-0),102(E-0),104(D-0),105(E-1) LIQUIDS

					STANDARD	
Type	DETECTOR NUMBER	10	CARRIER ADDED in mL	(CVA)	1.000	
STANDARD	TOTAL COUNTS (TC)	11631	GROSS WEIGHT (W2)		8.0139	
Work List	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)		7.9209	
4152	BACKGROUND in cpm (BEG)	12	NET WEIGHT (W3)		0.0930	
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (hours) (DT)		1.90	
Sr90	DILUTION FACTOR (DF)	1				
Matrix	DIGEST DILUTION FACTOR (DDF)	1				
LIQUID	SAMPLE COUNT RATE (Rc)	1151.10	Sr-90 EFFICIENCY FACTOR (C1)		0.4051	
Sample #	CRITICAL LEVEL (Lc)	2.66	Sr-90 EFFICIENCY FACTOR (C2)		0.4503	
K209-5586	SEPARATION TIME (ST)	21:20	Rmax		N/A	
Instrument Code	SEPARATION DATE (SD)	08/03/94	DETECTION LIMIT (Ld)		5.38	
WB26870	TIME OF COUNT (TOC)	23:14	Sr-89/90 CONC in pCi/L =		1.3459E+00	
Analyst	DATE OF COUNT (DOC)	08/03/94				
D.C.DUNHAM						
Date	Sample Count Rate (Rc) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BEG)					
08/03/94	Sr-89/90 pCi/L = Rc/1000mL/L * DDF/DDF/					
Time	(C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT)) * SS * Rec * 2220000 dpm/pCi)					
2300	NOTE 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
	Sr-89/90 pCi/mL = (Sr-89/90 pCi/L) / 1000mL/L					
	Relative Counting Error = The Square Root of ((TC + BEG * CT) / (TC - BEG * CT))					
	Percent Carrier Recovery = (Net Weight / Expected Weight) * 100					
	NOTE Expected Weight = CVA * 0.1					
	Detection Levels and Less Than Values are determined from Procedure LA-505-002.					
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					

▼ RESULTS ▼

Sr-89/90 CONCENTRATION	=	1.35E+00	pCi/L
Sr-89/90 CONCENTRATION	=	1.35E-03	pCi/mL
RELATIVE COUNTING ERROR	=	0.9%	
PERCENT CARRIER RECOVERY	=	93.0%	

DETECTION
LEVEL6.30E-06
pCi/mL

Date Entry by:	<i>JPV</i>	Date:	06-Aug-94
Approved by:	<i>JPV</i>	Date:	7-Aug-94

Form X1 Rev. 1.1

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STRONTIUM 90 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

10/2 8-3440 2314 gm

$\Delta T = 1.90$

$\frac{11631}{10} - 12$

K209-5586

Sr Calculation (CEPC_CAL 2.0)
By: EM MILLER, on 06-04-1994 at 09:28:17
Det #10 2-inch mount Sr eff : .4951 Y eff : .4503
Sample size : 1 ml Dilution : 1 Method : 1

Sample # K-209
Mount # 1 Decay time = 1.90 hrs

$\frac{11631}{10} - 12.0 = 1.25171 \pm 0.00 \text{ uCi/L strontium}$

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 210.-8688		Sample Point C-111		Date 4-25-94	Time Issued 14:55	Priority 23
Determination Sr90	Method Standard LA-220-101	Result Units uCi/G Rec		Charge Code R4C3B	Returns 1	
Sample Size ? .050 ml - 10 ml - .050 ml + 1 ml Sr Carrier				Customer ID ELANK		
Remarks Calculations Results REAGENT BLANK				SEPARATION DATE: 8-3-94 SEPARATION TIME: 2120		
1.17 uCi/g				GROSS: 8.0396 g TARE: 7.9456 g NET: 0.0940 g		
<div style="text-align: center;"> </div>						
Analyst - 1 Mrs	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs		
Date 8-3-94	Time Completed 2300	Lab Supv [Signature]	[Signature]			

WHC-SD-MM-DP-079, REV. 0

Sr-89/90 LA-220-101 (D-0)

SOLIDS

Type	DETECTOR NUMBER	10	CARRIER ADDED in mL	(CVA)	1.000
BLANK	TOTAL COUNTS (TC)	148	GROSS WEIGHT (W2)		8.0396
Work List	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)		7.9456
4152	BACKGROUND in cpm (BKG)	12	NET WEIGHT (W3)		0.0940
Test Code	SAMPLE VOLUME in mL (SS)	0.050	DELTA TIME (HOURS) (DT)		2.08
Sr90	DILUTION FACTOR (DF)	201			
Metric	DIGEST g/L (Dg/L)	11.072			
SOLID	SAMPLE COUNT RATE (Rs)	2.80	Sr-90 EFFICIENCY FACTOR (C1)		0.4051
Sample #	CRITICAL LEVEL (Lc)	2.56	Y-90 EFFICIENCY FACTOR (C2)		0.4503
K210-8688	SEPARATION TIME (ST)	21:20	Pmax		N/A
Instrument Code	SEPARATION DATE (SD)	08/03/94	DETECTION LIMIT (Ld)		5.38
WB26870	TIME OF COUNT (TOC)	23:25	Sr-89/90 CONC in pCi/g =		1.1736E+00
Analyst	DATE OF COUNT (DOC)	08/03/94			

D.C. DUNHAM
Date: 08/03/94
Time: 2300

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
 $Sr-89/90 \text{ pCi/g} = R_s \cdot 1000 \text{ mL/L} \cdot DF / (C1 + C2 (1 - e \text{ to the power of } ((-\text{natural log } 2) \cdot DT / 64.2))) \cdot SS \cdot Rec \cdot Dg / 122200000 \text{ dpm/pCi}$
 NOTE: 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
 Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))
 Percent Carrier Recovery = (Net Weight / Expected weight) * 100
 NOTE: Expected weight = CVA * 0.1
 Detection Levels and Less Than Values are determined from Procedure LA-508-002.
 Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

▼ RESULTS ▼

Sr-89/90 CONCENTRATION	=	1.17E+00	pCi/g
RELATIVE COUNTING ERROR	=	58.5%	
PERCENT CARRIER RECOVERY	=	94.0%	

DETECTION
LEVEL

2.26E+00
pCi/g

Date Entry by:	[Signature]	Date:	06-Aug-94
Approved by:	[Signature]	Date:	9-Aug-94

Form L2 Rev. 1.1

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STRONTIUM 90 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

10/2 8-5-94 @ 2325 D94

$\frac{148}{10} - 12$

K210-8486 DT=2.08
4020

Sr Calculation (CEPC_CAL 2.0)
By: EN BUREAU, as 05-04-1994 at 00:28:58
Det #10 2-inch mount Sr eff: .4051 Y eff: .4503
Sample size: 1 mL Dilution: 4020 Method: 1

Sample # 1-210
Mount # 1 Decay time: 2.08 hrs

$\frac{148}{10} - 12.0 = 1.22148 \pm 0.1 \text{ uCi/L strontium}$

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

RERUN				
Serial No K 211.-8756	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination Er90	Method/Standard LA-220-101	Result Units pCi/g Rec	Charge Code N4C3B	Returns 1
Sample Size ? .050 ml - 10 ml - .050 ml + 1 ml Sr carrier			Customer ID C5881	
Remarks Calculations, Results 4.22 ^{Er90} pCi/g			SEPARATION DATE: 8-3-94 SEPARATION TIME: 2120 GROSS: 7.9237g TARE: 7.8293g NET: 0.0944g	
Analyst - 1 Mrs	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs
Date 8-3-94	Time Completed 2300	Laboratory N4C3B	Signature D.C. Dunham	

WHC-SD-WM-DP-079, REV. 0

Sr-89/90 LA-220-101 (D-0)

SOLIDS

DUPLICATE

Type	DETECTOR NUMBER		10	CARRIER ADDED in mL (CVA)	1.000
DUPLICATE	TOTAL COUNTS (TC)		102744	GROSS WEIGHT (W2)	8.0429
Work List	COUNT TIME in MINUTES (CT)		10	TARE WEIGHT (W1)	7.9477
4152	BACKGROUND in cpm (BKG)		12	NET WEIGHT (W3)	0.0952
Test Code	SAMPLE VOLUME in mL (SS)		0.050	DELTA TIME (HOURS) (DT)	2.83
Sr90	DILUTION FACTOR (DF)		201		
Matrix	DIGEST g/L (Dg/L)		10.828		
SOLID	SAMPLE COUNT RATE (Rs)		10262.40	Sr-90 EFFICIENCY FACTOR (C1)	0.4051
Sample #	CRITICAL LEVEL (Lc)		2.56	Y-90 EFFICIENCY FACTOR (C2)	0.4503
K211-8886	SEPARATION TIME (ST)		21:20	Rmax	N/A
Instrument Code	SEPARATION DATE (SD)		08/03/94	DETECTION LIMIT (Ld)	5.38
WB26870	TIME OF COUNT (TOC)		00:10	Sr-89/90 CONC in pCi/g =	4.3059E+03
Analyst	DATE OF COUNT (DOC)		08/04/94		

D.C. DUNHAM
Date: 08/03/94
Time: 2300
Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 pCi/g = Rs * 1000 mL / L * DF / (C1 + C2 (1 - e to the power of ((-natural log 2) * DT / 64.2)) * SS * Rec * Dg / L * 22200000 dpm / pCi)
NOTE 64.2 = Half Life for Y-90 and Rec = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

RESULTS

Sr-89/90 CONCENTRATION	=	4.31E+03	pCi/g
RELATIVE COUNTING ERROR	=	0.3%	
PERCENT CARRIER RECOVERY	=	95.2%	

DETECTION LEVEL

2.26E+00
pCi/g

Date Entry by:	<i>[Signature]</i>	Date:	06-Aug-94
Approved by:	<i>[Signature]</i>	Date:	4-Aug-94

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STRONTIUM 90 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

10/2 8-4-94 00000 K211-8786 DT= 2.67

101801
10 -12

Sr Calculation : (CEPC_CAL 2.0)
By: RA KAPPLA, on 08-04-1994 at 09:29:47
Det #10 2-inch mount Sr eff : .4051 T eff : .4503
Sample size : 1 mL Dilution : 4920 Method : 1

Sample # I-211
Count # 1 Decay time = 2.67 hrs

101801
10 - 12.0 = 4.4037E+04 pCi/L strontium

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 211-8888	Sample Point C-111	Date 4-25-94	Time Issued 14:57	Priority 23
Determination Sr90	Method Standard LA-220-101	Result Units uCi/g Rec	Charge Code N4C8B	Returns 1
Sample Size ? .050 ml - 10 ml - .050 ml + 1 ml Sr Carrier			Customer ID 05351	
Remarks Calculations, Results DUPLICATE SAMPLE				
SEPARATION DATE: R-3-94			SEPARATION TIME: 2120	
4.31 ⁵⁰³ uCi/g			GROSS: 8.0429 g TARE: 7.9477 g NET: 0.0952 g	
Analyst - 1 Mrs	Analyst - 2 Mrs	Analyst - 3 Mrs	Analyst - 4 Mrs	Analyst - 5 Mrs
Date 8-3-94	Time Completed 2300	Lab. In. Mgr. [Signature]	[Signature]	

Sr-89/90 LA-220-101 (D-0)

SOLIDS

Type	DETECTOR NUMBER	10	CARRIER ADDED in mL (CVA)	SAMPLE
SAMPLE	TOTAL COUNTS (TC)	101801	GROSS WEIGHT (W2)	1.000
Work List	COUNT TIME in MINUTES (CT)	10	FARE WEIGHT (W1)	7.9237
4152	BACKGROUND in cpm (BKG)	12	NET WEIGHT (W3)	0.0944
Test Code	SAMPLE VOLUME in mL (SS)	0.050	DELTA TIME (HOURS) (DT)	2.67
Sr90	DILUTION FACTOR (DF)	201		
Metric	DIGEST g/L (Dg/L)	11.072		
SOLID	SAMPLE COUNT RATE (Rs)	10168.10	Sr-90 EFFICIENCY FACTOR (C1)	0.4051
Sample #	CRITICAL LEVEL (Lc)	2.56	Sr-90 EFFICIENCY FACTOR (C2)	0.4503
K211-8786	SEPARATION TIME (ST)	21:20	Pmax	N/A
Instrument Code	SEPARATION DATE (SD)	08/03/94	DETECTION LIMIT (LA)	5.38
WB26870	TIME OF COUNT (TOC)	00:00	Sr-89/90 CONC in uCi/g =	4.2156E+03
Analyst	DATE OF COUNT (DOC)	08/04/94		
D.C.DUNHAM				
Date				
08/03/94				
Time				
2300				

▼ RESULTS ▼

Sr-89/90 CONCENTRATION	=	4.22E+03	uCi/g
RELATIVE COUNTING ERROR	=	0.3%	
PERCENT CARRIER RECOVERY	=	84.4%	

DETECTION
LEVEL2.23E+00
uCi/g

Date Entry by:	[Signature]	Date:	06-Aug-94
Approved by:	[Signature]	Date:	9-Aug-94

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STRONTIUM 90 ANALYSIS - ACID DIGESTION

WHC-SD-WM-DP-079, REV. 0

10/2 8-4-94 00010K 211-8886 DT = 2.83

$\frac{102744}{10} - 12$

Sr Calculation (CRPC, CAL 2.0)
By: ES BEEHLE, on 05-04-1994 at 06:29:24
Det #10 2-inch mount Sr eff : .4051 Y eff : .4503
Sample size : 1 mL Dilution : 4020 Method : 1

Sample # I-211
Mount # 1 Decay time = 2.83 hrs

$\frac{102744}{10} - 12.0 = 4.43251 \times 10^4$ nCi/L strontium

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WHC-SD-WM-DP-079, REV. 0

**THE FOLLOWING ANALYSES ARE INCLUDED IN THE
DATA PACKAGE BUT THE RESULTS HAVE NOT BEEN
REPORTED IN THE FINAL SUMMARY REPORTS.**

STRONTIUM 90 ANALYSIS - ACID DIGESTION

Batch 3822

Serial No K 208.-5586	Sample Point C-111	Date 4-25-84	Time Issued 14:54	Priority 23
Determination Sr-90	Method Standard LA-220-101	Result Units % RECOVERY	Charge Code N403E	Retuns 0
Sample Size ? m	OUT FOR RERUN			
Remarks: Calculations: Results COUNT ON DETECTOR#11 8876 ITS STD# 136651 RESULT STD VAL %REC Septime 0530 Date 7/27/84 G T 7.8547				
Analyst - 1 K. D. Wynn	Analyst - 2 P. W. Wynn	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 7/27/84	Time Completed 0630	Lab U Mpr	Lab U Mpr	

54-6800-061 (R-10-83)

Serial No K 210.-6658	Sample Point C-111	Date 4-25-84	Time Issued 14:55	Priority 23
Determination Sr-90	Method Standard LA-220-101	Result Units %G Rec	Charge Code N403E	Retuns 0
Sample Size ? .100m	OUT FOR RERUN			
Remarks: Calculations: Results REAGENT BLANK Septime 0530 Date 7/27/84 G T 7.8760				
Analyst - 1 K. D. Wynn	Analyst - 2 P. W. Wynn	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 7/27/84	Time Completed 0630	Lab U Mpr	Lab U Mpr	

54-6800-061 (R-10-83)

STRONTIUM 90 ANALYSIS - ACID DIGESTION

Serial No N 211.-E786	Sample Point C-111	Date 4-25-84	Time Issued 14:57	Priority CS
Determination Sr-90	Method Standard LA-220-101	Result Units uCi/G Rec	Charge Code N4CEB	Reruns 0
Sample Size ? 100-10-100ml		OUT FOR RERUN		
Remarks, Calculations Results Septime 0530 Date 7/27/84 G T7.9441				
Analyst - 1 R. Wright	Analyst - 2 P. White	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 7/27/84	Time Completed 0630	Lab Unit Mgr R. White	Re Jones	

54-6800-061 (R-10-83)

Serial No N 211.-6880	Sample Point C-111	Date 4-25-84	Time Issued 14:57	Priority CS
Determination Sr-90	Method Standard LA-220-101	Result Units uCi/G Rec	Charge Code N4CEB	Reruns 0
Sample Size ? 100-10-100ml		OUT FOR RERUN		
Remarks, Calculations Results DUPLICATE SAMPLE Septime 0530 Date 7/27/84 G T7.9470				
Analyst - 1 R. Wright	Analyst - 2 P. White	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 7/27/84	Time Completed 0630	Lab Unit Mgr R. White	Re Jones	

54-6800-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No. K212-214	Customer ID: 5-18-99 LAD C-111 FB C58FB
Analysis: AT	Sample Prep: DIRECT

Instrument:	Procedure/ Rev: LA-508-101
Technologist: ALETA K LEWIS	Date: 05/05/94
Starting Time: 12:00	Temperature 25 C
Ending Time: 14:30	Chemist: S. FITZGERALD

Comments: BATCH# 3274

OUT FOR SERVICE

	Description	Lab ID		Description	Lab ID
1	LMCS	K212-5525	11		
2	BLANK	K213-5625	12		
3	SAMPLE	K214-5725	13		
4	SAMPLE DUP	K214-5825	14		
5	SAMPLE SPIKE	K214-5925	15		
6			16		
7			17		
8			18		
9			19		
10			20		

[illegible]

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 212.-5525		Sample Point C-111		Date 4-27-94	Time Issued 10: 2	Priority 21
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY		Charge Code N4C3B	Retuns 0	
Sample Size 500 ml 10 ml				Customer ID STD		
Remarks Calculations Results S510 EV-CRE STD# 142 B5 RESULT 9.91E-03 STD VAL 1.0398E-02 %REC. 95.3 OUT FOR RERUN Alda Lewis						
Analyst - 1 Hrs	Analyst - 2 D.H. Milian Hrs	Analyst - 3 Hrs	Analyst - 4 Hrs	Analyst - 5 Hrs		
Date	Time Completed	Lab 1 Mgr Robert	J. Hammitt			

54-680C-061 (R-10-83)

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

		STANDARD	REPLICATE
Type	DETECTOR NUMBER	13	N/A
STANDARD	DISH SIZE 1, 2, or 5 (MS)	2	N/A
Work List	TOTAL COUNTS (TC)	1544	N/A
3274	COUNT TIME in MINUTES (CT)	30	N/A
AT or TB?	BACKGROUND in cpm (BKG)	0.4	N/A
AT	SAMPLE SIZE in mL (SS)	10.000	N/A
Test Code	DILUTION FACTOR (DF)	1	N/A
AT	DIGEST DILUTION FACTOR (DDF)	1	N/A
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	N/A
LIQUID	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	51.067	N/A
Sample #	SAMPLE CONCENTRATION in pCi/L	9.91E-03	N/A
K212-5525	pCi/L in SAMPLE =	9.9065E-03	

Instrument Code	Ps (Sample Count Rate) = (TC / CT) - BKG
Analyst	ALPHA TOTAL pCi/L = $R_s \cdot 1000 \text{ mL/L} \cdot DF \cdot DDF / (EFF \cdot SS \cdot 2220000 \text{ dpm/pCi})$
A LEWIS	ALPHA TOTAL pCi/mL = ALPHA TOTAL pCi/L / 1000 mL/L
Date	Relative Counting Error = $1 \cdot (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$
05/05/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Time	

ALPHA TOTAL	in pCi/L	=	9.91E-03	DETECTION LEVEL 2.01E-07 pCi/mL
ALPHA TOTAL	in pCi/mL	=	9.91E-06	
RELATIVE COUNTING ERROR	=	5.0%		

Date Entry by: J. Hammitt	Date: 07-May-94
Approved by: [Signature]	Date: 9-May-94

2

Serial No Y. 213.-5625	Sample Point C-111	Date 4-27-94	Time Issued 10: 7	Priority 21
Determination AT	Method Standard LA-508-101	Result Units uCi/ML	Charge Code N4C3B	Reruns 0
Sample Size 500 ml			Customer ID BLANK	
Remarks Calculations, Results COUNT AS uCi/L USE 13,14,15 OR 16 $< 1.48E-06$ uCi/ml OUT FOR RERUN <i>Alta Lewis</i>				
Analyst - 1	Analyst - 2 <i>D.H. Milton</i>	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab A-1 M-2 <i>Secret</i>	<i>Greg Kimmatt</i> 54-6800-061 (R-10-83)	

WHCSD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	13	N/A
SAMPLE	DISH SIZE 1, 2, or 5 (MS)	2	N/A
Work List	TOTAL COUNTS (TC)	6	N/A
3274	COUNT TIME in MINUTES (CT)	30	N/A
AT or TB?	BACKGROUND in cpm (BKG)	0.4	N/A
AT	SAMPLE SIZE in mL (SS)	0.500	N/A
Test Code	DILUTION FACTOR (DF)	1	N/A
AT	DIGEST DILUTION FACTOR (DDF)	1	N/A
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	N/A
LIQUID	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	0.381	N/A
Sample #	SAMPLE CONCENTRATION in uCi/L	1.48E-03	N/A
K213-5625	uCi/L in SAMPLE =	<	1.4784E-03

Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG
Analyst	ALPHA TOTAL uCi/L = $Rs \cdot 1000 \text{ mL/L} \cdot DF \cdot DDF / (EFF \cdot SS \cdot 2220000 \text{ dpm/uCi})$
A LEWIS	ALPHA TOTAL uCi/mL = ALPHA TOTAL uCi/L / 1000 mL/L
Date	Relative Counting Error = $(\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 1.96 \cdot 100$
05/05/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Time	
14:30	

14.50				DETECTION LEVEL 4.01E-06 pCi/mL
ALPHA TOTAL	in pCi/L	=	< 1.48E-03	
ALPHA TOTAL	in pCi/mL	=	< 1.48E-06	
LESS Than Value was Determined from Lc.				
RELATIVE COUNTING ERROR	=	138.6%		

Data Entry by: <i>Alta Lewis</i>	Date: 07-May-94
Approved by: <i>Greg Kimmatt</i>	Date: 9-May-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

3

Serial No K 214.-5725	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination AT	Method Standard LA-508-101	Result Units uCi/ML	Charge Code N4C3B	Reruns 0
Sample Size 500 ml			Customer ID C58FB	
Remarks Calculations Results COUNT AS uCi/L USE 13,14,15 OR 16 <div style="text-align: right;"> $< 1.48 \text{E-06}$ <u>uCi/ml</u> </div> <div style="text-align: right;"> OUT FOR RERUN </div>				
Analyst - 1	Analyst - 2 D.H. Millican	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Unit Mgr R. White	<div style="text-align: right;"> <i>Greg Hammond</i> <small>54-6800-061 (R-10-83)</small> </div>	

WHC-SD-MM-DP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	13	N/A
SAMPLE	DISH SIZE 1, 2, or 5 (MS)	2	N/A
Work List	TOTAL COUNTS (TC)	7	N/A
3274	COUNT TIME in MINUTES (CT)	30	N/A
AT or TB?	BACKGROUND in cpm (BKG)	0.4	N/A
AT	SAMPLE SIZE in mL (SS)	0.500	N/A
Test Code	DILUTION FACTOR (DF)	1	N/A
AT	DIGEST DILUTION FACTOR (DDF)	1	N/A
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	N/A
LIQUID	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	0.381	N/A
Sample #	SAMPLE CONCENTRATION in uCi/L	1.48E-03	N/A
K214-5725	uCi/L in SAMPLE =	<	1.4784E-03
Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG		
Analyst	ALPHA TOTAL uCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/uCi)		
A LEWIS	ALPHA TOTAL uCi/mL = ALPHA TOTAL uCi/L / 1000mL/L		
Date	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
05/05/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Time	v RESULTS v		
14:30	ALPHA TOTAL in uCi/L	=	< 1.48E-03
	ALPHA TOTAL in uCi/mL	=	< 1.48E-06
	LESS Than Value was Determined from Lc.		4.01E-06 uCi/mL
	RELATIVE COUNTING ERROR	=	170.9%

Date Entry by: <i>Greg Hammond</i>	Date: 07-May-94
Approved by: <i>R. White</i>	Date: 11-MAY-94

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PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

4

Serial No K 214.-5825	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination AT	Method Standard LA-508-101	Result Units uCi/ML	Charge Code N4C3B	Retuns 0
Sample Size 500 ml			Customer ID C58FB	
Remarks Calculations Results COUNT AS uCi/L USE 13,14,15 OR 16 $< 3.06 \text{ E-06 uCi/ml}$ OUT FOR RERUN Aito Lewis				
Analyst - 1	Analyst - 2 D.H. Miller	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab # 1 Mgr	<i>[Signature]</i> 54-6800-061 (R-10-83)	

WHC-SD-WM-BP-079, REV. 0

AT: LA-508-101 (D-0) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	13	N/A
DUPLICATE	DISH SIZE 1, 2, or 5 (MS)	2	N/A
Work List	TOTAL COUNTS (TC)	23	N/A
3274	COUNT TIME in MINUTES (CT)	30	N/A
AT or TB?	BACKGROUND in cpm (BKG)	0.4	N/A
AT	SAMPLE SIZE in mL (SS)	0.500	N/A
Test Code	DILUTION FACTOR (DF)	1	N/A
AT	DIGEST DILUTION FACTOR (DDF)	1	N/A
Matrix	EFFICIENCY FACTOR (EFF)	0.2322	N/A
LIQUID	L, Pmax, or Rs (SAMPLE RATE) as APPROPRIATE	0.789	N/A
Sample #	SAMPLE CONCENTRATION in uCi/L	3.06E-03	N/A
K214-5825	uCi/L in SAMPLE =	<	3.0617E-03

Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG
Analyst	ALPHA TOTAL uCi/L = $R_s \cdot 1000 \text{ mL/L} \cdot DF \cdot DDF / (EFF \cdot SS \cdot 2220000 \text{ dpm/uCi})$
A LEWIS	ALPHA TOTAL uCi/mL = ALPHA TOTAL uCi/L / 1000 mL/L
Date	Relative Counting Error = $1 \cdot (\text{The Square Root of } TC + BKG \cdot CT) / (TC - BKG \cdot CT) \cdot 100$
05/05/94	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Time	
14:30	

ALPHA TOTAL	in uCi/L	=	< 3.06E-03	DETECTION LEVEL 4.01E-06 uCi/mL
ALPHA TOTAL	in uCi/mL	=	< 3.06E-06	
LESS THAN Value was Determined from Rmax.				
RELATIVE COUNTING ERROR	=	105.4%		

Date Entry by: <i>[Signature]</i>	Date: 07-May-94
Approved by: <i>[Signature]</i>	Date: 9-May-94

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5

Serial No K 214.-5925	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination AT	Method Standard LA-508-101	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size 500 ml			Customer ID C58FB	
Remarks Calculations, Results SAMPLE SPIKED ID SPIKE ID 102 B51 SPIKE VOLUME 10 ml SPIKE VALUE 1.04E-02 uCi/L 96.5% Rec. OUT FOR RERUN Alita Lewis				
Analyst - 1	Analyst - 2 D.H. Lewis	Analyst - 3	Analyst - 4	Analyst - 5
Mrs	Mrs	Mrs	Mrs	Mrs
Date	Time Completed	Lab Unit Mgr	54-6800-061 (R-10-83) Guy Hammond	

WHC-SD-WM-DP-079, REV. 0

AT: LA-508-101 (D-0) SPIKED SAMPLE

			SPIKE	REPLICATE
Type	DETECTOR NUMBER		13	N/A
SPIKE	DISH SIZE 1, 2, or 5 (MS)		2	N/A
Work List	TOTAL COUNTS (TC)		1564	N/A
3274	COUNT TIME in MINUTES (CT)		30	N/A
AT or TB 7	BACKGROUND in cpm (BKG)		0.4	N/A
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)		0.500	N/A
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)		1	N/A
AT	SPIKE VOLUME in mL (SVol)		10.000	N/A
Matrix	SPIKE DILUTION FACTOR (SDF)		1	N/A
LIQUID	SPIKE VALUE in pCi/L (SVal)		0.0104	N/A
Sample #	INSTRUMENT EFFICIENCY FACTOR (EFF)		0.2322	N/A
K214-5925	SAMPLE + SPIKE pCi/L (S+S)		2.01E-01	N/A
Instrument Code	SAMPLE or DIGEST pCi/L from FORM #1		< 1.48E-03	
Analyst	Rs (Sample Count Rate) = (TC / CT) - BKG			
A LEWIS	SAMPLE + SPIKE pCi/L = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/pCi)			
Date	PERCENT SPIKE RECOVERY = (((S+S pCi/L - SAMPLE pCi/L) * ((SDF/SVol)/(DF/SS)))/(SVal)*100			
05/05/94				
Time	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for percent recovery calculation.			
14:30				

RESULT PERCENT SPIKE RECOVERY = 96.5%

Date Entry by: <i>[Signature]</i>	Date: 07-May-94
Approved by: <i>[Signature]</i>	Date: 9-May-94

Form L3 Rev. 2.1 Page 1 of 1

13/2

1544
30 - .4

K212-5525

K214-5925

Alpha Calculation (CEPC_CAL 2.0)
By: DE MILICIA, on 05-05-1994 at 02:22:59
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 10 mL Dilution : 1

Sample # K-212 Mount # 1

1544

0.4 = 9.9355E-03 uCi/L alpha

30

13/2

7
30 - .4

K214-5725

Alpha Calculation (CEPC_CAL 2.0)
By: DE MILICIA, on 05-05-1994 at 02:24:10
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : .5 mL Dilution : 1

Sample # K-214-5725 Mount # 1

7

0.4 < 1.0435E-03 uCi/L alpha

30

13/2

23
30 - .4

K214-5825

Alpha Calculation (CEPC_CAL 2.0)
By: DE MILICIA, on 05-05-1994 at 02:24:46
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : .5 mL Dilution : 1

Sample # K-214-5825 Mount # 1

23

0.4 = 1.4226E-03 uCi/L alpha

30

13/2

6
30 - .4

K213-5625

Alpha Calculation (CEPC_CAL 2.0)
By: DE MILICIA, on 05-05-1994 at 02:23:39
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : .5 mL Dilution : 1

Sample # K-213 Mount # 1

6

0.4 < 1.0439E-03 uCi/L alpha

30

Alpha Calculation (CEPC_CAL 2.0)
By: DE MILICIA, on 05-06-1994 at 02:25:10
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : .5 mL Dilution : 1

Sample # K-214-5925 Mount # 1

1564

0.4 = 2.0072E-01 uCi/L alpha

30

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-079, REV. 0

Lab Segment Serial No. K-214	Customer ID: C58FB <i>C111</i>
Analysis: TOTAL ORGANIC CARBON	Sample Prep: DIRECT

Instrument: WC16130	Procedure/ Rev: LA-344-105 B-2
Technologist: E.H. COLVIN <i>E.H. Colvin</i>	Date: 05/03/94
Starting Time: 0630	Temperature 25C OUT FOR RERUN
Ending Time: 1500	Chemist: R.W. SCHROEDER

Comments: Rerun, Blank value is too high and need to run a separate blank for standard and one for reagent blank request.

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	K-212-5526	11		
2	REAGENT BLANK	K-213-5626	12		
3	SAMPLE	K-214-5726	13		
4	SAMPLE DUPLICATE	K-214-5826	14		
5	SAMPLE + SPIKE	K-214-5926	15		
6			16		
7			17		
8			18		
9			19		
10			20		

[illegible]

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Batch 3275

Serial No K 212.-5526	Sample Point C-111	Date 4-27-94	Time Issued 10: 2	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size <i>200ml - 2ml - 200ml</i>			Customer ID STD	
Remarks, Calculations, Results S356 CO3TOC STD# 10N12C RESULT 3.11 STD VAL 3.00g/L %REC 103.7 <div style="text-align: right; font-size: 1.2em; font-weight: bold;">OUT FOR RERUN</div>				
Analyst - 1 <i>E.H. Ehm</i>		Analyst - 2		Analyst - 3
Analyst - 4		Analyst - 5		
Hrs		Hrs		Hrs
Date 5-3-94		Time Completed 1500		Lab Unit Mgr <i>[Signature]</i>

WR# 5669

54-6800-061 (R-10-83)

WHC-SD-MM-DF-079, REV. 0

TOC: LA-344-105 (B-2)

LIQUIDS

		STANDARD
Type	Sample Volume in mL (SS)	0.200
STANDARD	H2SO4 Volume in mL (VR)	2.000
Work List	Volume Injected in mL (VI)	0.200
3275	Dilution Factor (DF)	11
Test Code	Digest Dilution Factor (DDF)	1
TOC	µg of Carbon in Sample (C1)	64.9
Matrix	µg of Carbon in Blank (C2)	8.4
LIQUID	g of Carbon/L =	3.11E+00
Sample #	$\text{g of Carbon/L} = \frac{(C1 - C2) \cdot DF \cdot DDF}{VI \cdot 1000}$	
K212-5526		
Instrument Code	$\mu\text{g of Carbon/mL} = \text{g of Carbon/L} \cdot 1000000 \mu\text{g/g} / 1000 \text{ mL/L}$	
WC16130		
Analyst	$\text{Detection Level } (\mu\text{g/mL}) = \frac{1 \mu\text{g C} \cdot DF \cdot DDF}{VI}$	
E COLVIN		
Date		
05/03/94		
Time		
15:00		

$\mu\text{g Carbon/mL} = 3.11\text{E}+03$	DETECTION LEVEL in µg/mL 5.50E+01
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Data Entry by: <i>[Signature]</i>	Date: 07-May-94
Approved by: <i>[Signature]</i>	Date: 11-MAY-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No		K 213.-5626		Sample Point		C-111		Date		4-27-94		Time Issued		10: 7		Priority		21	
Determination		TOC		Method Standard		LA-344-105		Result Units		ug C/ML		Charge Code		N4C3B		Returns		0	
Sample Size		200 mL		Customer ID		BLANK		Remarks Calculations Results		REAGENT BLANK		OUT FOR RERUN		Analyst - 1		Analyst - 2		Analyst - 3	
Analyst - 4		Analyst - 5		Analyst - 6		Analyst - 7		Analyst - 8		Analyst - 9		Analyst - 10		Analyst - 11		Analyst - 12		Analyst - 13	
Date		5-3-94		Time Completed		1500		Lab Unit Mgr		Date		5-3-94		Time Issued		10: 7		Priority	

WHC-SD-WM-DP-079, REV. 0

Type		BLANK		Work List		3275		Test Code		TOC		Matrix		LIQUID		Sample #		K213-5626	
Assignment Code		WC16130		Analyst		E COLVIN		Date		05/03/94		Time		15:00		TOC: LA-344-105 (B-2)		LIQUIDS	
Sample Volume in mL		0.200		H2SO4 Volume in mL		1.000		Volume Injected in mL		0.200		Dilution Factor		1		Digest Dilution Factor		1	
ug of Carbon in Sample		8.4		ug of Carbon in Blank		7		g of Carbon/L		7.00E-03		g of Carbon/mL		=		(C1-C2) * DF * DDF		VI * 1000	
g of Carbon/mL		=		1 ug C * DF * DDF		VI		Detection Level (ug/mL)		=		1 ug C * DF * DDF		VI		g of Carbon/L * 1000000 ug/g / 1000 mL/L			

pg Carbon/mL =		7.00E+00		DETECTION LEVEL		in ug/mL		5.00E+00	
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Data Entry by:		Date:		07-May-94		Approved by:		Date:		11-May-94	
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WHC-SD-WM-DP-079, REV. 0

56-6800-061 (B-10-A3)

$\mu\text{g Carbon/mL} =$	$1.60\text{E}+01$	DETECTION LEVEL
		in $\mu\text{g/mL}$ $5.50\text{E}+00$

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 214.-5826	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination TOC	Method Standard LA-344-105	Result Units uG C/ML	Charge Code N4C3B	Reruns 0
Sample Size <i>2ml + 200ml 5m H₂SO₄ - 200ml</i>			Customer ID C58FB	
Remarks Calculations Results DUPLICATE SAMPLE				
OUT FOR RERUN				
Analyst - 1 <i>E.H. Colvin</i>	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-3-94	Time Completed 1500	Lab Unit Mgr <i>R. Cheta</i>	<i>PhD</i>	

54-6800-061 (R-10-83)

WHC-SD-WM-DF-079, REV. 0

TOC: LA-344-105 (B-2)		LIQUIDS		DULPICATE
Type	Sample Volume in mL	(SS)		2.000
DULPICATE	H ₂ SO ₄ Volume in mL	(VR)		0.200
Work List	Volume Injected in mL	(VI)		0.200
3275	Dilution Factor	(DF)		1.1
Test Code	Digest Dilution Factor	(DDF)		1
TOC	µg of Carbon in Sample	(C1)		11.2
Matrix	µg of Carbon in Blank	(C2)		8.4
LIQUID	g of Carbon/L	=		1.54E-02
Sample #	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$			
K214-5826				
Instrument Code				
WC16130				
Analyst	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L			
E COLVIN				
Date	Detection Level (µg/mL) = $\frac{1 \mu\text{g C} \cdot DF \cdot DDF}{VI}$			
05/03/94				
Time				
15:00				

µg Carbon/mL = 1.54E+01	DETECTION LEVEL
	in µg/mL
	5.50E+00

Data Entry by: <i>Jay Humm</i>	Date: 07-May-94
Approved by: <i>R. Cheta</i>	Date: 11-MAY-94

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

Serial No K 214.-5926	Sample Point C-111	Date 4-27-94	Time Issued 10:17	Priority 21
Determination TOC	Method-Standard LA-344-105	Result Units % RECOVERY	Charge Code N4C3B	Reruns 0
Sample Size 1.200 ml, 1.100 ml, 5 ml, 50 µl, 2.00 ml			Customer ID C58FB	
Remarks, Calculations, Results SAMPLE SPIKED ID SPIKE ID 11172C SPIKE VOLUME .200 ml OUT FOR RERUN P. Nd. Pch				
Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date 5-3-93	Time Completed 1500	Lab Unit Mgr P. Nd. Pch	Signature P. Nd. Pch	

54-6800-061 (R-10-83)

WHC-SD-MM-DP-079, REV. 0

TOC: LA-344-105

SPIKED SAMPLE

SPIKE

Type	>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	2.000	Sample Size in mL (SS)	0.200
Work List	H2SO4 Volume in mL	0.200	Spike Volume in mL	0.200
3275	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.100
Test Code	µg of Carbon in Sample	11.3	Volume Injected in mL	0.200
TOC	µg of Carbon in Blank	8.4	Sample Dilution Factor (DF) **	1
Matrix	** NOTE: Sample Dilution Factor does not include amount sample is diluted in Spiked Vial.		Spike Value (µg/mL)	750
LIQUID			µg C in Sample + Spike	68.6
Sample #			µg C in Blank	8.4
K214-5926				
Instrument Code	PERCENT SPIKE RECOVERY = $\frac{\mu\text{g Carbon Recovered from Spike} \times 100}{\mu\text{g Carbon in Spike}}$			
WC16130	WHERE: $\mu\text{g Carbon Recovered from Spike} = [(\mu\text{gC in sample} + \mu\text{gC in blank}) \times (\text{Spike Correction Factor})] - [(\mu\text{gC sample} - \mu\text{gC blank}) \times (\text{Sample Correction Factor}) \times (\text{Sample Size Correction Factor})]$			
Analyst	Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$			
E COLVIN	Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$			
Date	Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample} \times \text{Spiked Vial DF}}$			
05/03/94				
Time				
15:00				

Percent Spike Recovery = 98.2%

Data Entry by: <i>P. Nd. Pch</i>	Date: 07-May-94
Approved by: <i>P. Nd. Pch</i>	Date: 11-MAY-94

Form 2 Rev. 1.0

TUC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sampler: K-213 BLANK

Date: 05/03/94

Time: 08:27:26

Sample Size = 200 uL

Analyst : EH COLVIN

Dil Factor = 1

Min Readings = 14

Blank ID # = K-213 BLANK

Max Readings = 14

Blank Value = N/A

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	1.00	0.00
2	1.01	1.40	28.17
3	1.51	1.90	26.32
4	2.01	2.30	17.39
5	2.51	3.20	28.17
6	3.01	3.60	11.71
7	3.51	4.00	10.00
8	4.01	4.90	38.37
9	4.50	5.50	10.91
10	5.01	6.20	11.29
11	5.51	6.20	0.00
12	6.01	6.70	1.14
13	6.51	7.40	5.43
14	7.00	8.40	11.70

BLANK VALUE = 8.4 micrograms carbon

BLANK FACTOR = 8.4 / 7.004852 =

+1.2E+00 ug/min Carbon

Sample Run By:

EH COLVIN

00000

3397

TUC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: K-214

Date: 03/03/94

Time: 09:10:36

Sample Size = 200 uL

Dil Factor = 1.1

Blank ID # = K-213 BLANK

Blank Value = 1.199169 ug/minute C

Analyst : EH COLVIN

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	1.00	0.00
2	1.01	2.50	60.00
3	1.51	3.90	35.90
4	2.01	4.50	13.33
5	2.51	5.70	21.05
6	3.01	6.40	10.94
7	3.50	6.80	5.08
8	4.00	7.40	8.11
9	4.50	8.10	8.64
10	5.00	8.80	7.95
11	5.50	9.50	7.57
12	6.00	10.10	7.94
13	6.50	10.50	3.81
14	7.00	11.30	7.06

BLANK VALUE = 8.4 micrograms carbon

BLANK FACTOR = 8.4 / 7.004852 =

+1.2E+00 ug/min Carbon

SAMPLE RESULTS:

(11.3 - 8.398792) (1.1) / (200) =

+1.60E-02 g/L Carbon

(11.3 - 8.398792) (1.1) / (200) (12) =

+1.33E-03 Molar Carbon

Sample Run By:

EH COLVIN

00000

WHC-SD-WM-DP-079, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT TICTOC REV 2.0

Sample: K-214 DUF

Date: 05/03/94

Time: 09:18:13

Sample Size = 200 uL

Dil Factor = 1.1

Blank ID # = K-213 BLANK

Blank Value = 1.199169 ug/minute C

Analyst : EH COLVIN

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.40	0.00
2	1.01	2.40	83.33
3	1.51	3.40	29.41
4	2.01	4.80	23.17
5	2.51	5.40	11.11
6	3.01	6.00	10.00
7	3.51	6.80	11.76
8	4.01	7.70	11.69
9	4.51	8.20	6.10
10	5.01	9.10	9.39
11	5.51	9.60	5.21
12	6.01	10.30	6.80
13	6.50	11.00	3.36
14	7.00	11.20	1.79

BLANK VALUE = 8.4 micrograms carbon

BLANK FACTOR = 8.4 / 7.004852 =

+1.2E+00 ug/min Carbon

SAMPLE RESULTS:

(11.2 - 8.399962) (1.1) / (200) =

+1.54E-02 g/L Carbon

(11.2 - 8.399962) (1.1) / (200) (12) =

+1.28E-03 Molar Carbon

Sample Run By:

EH COLVIN

00000

WHC-SD-WM-DP-079, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: K-214 + SP

Date: 05/03/94

Time: 09:41:22

Sample Size = 200 uL

Dil Factor = 2.5

Blank ID # = K-213 BLANK

Blank Value = 1.199169 ug/minute C

Analyst : EH COLVIN

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.60	0.00
2	1.01	35.30	98.30
3	1.51	52.60	32.89
4	2.01	58.40	9.93
5	2.51	61.40	4.89
6	3.01	63.00	2.54
7	3.51	63.70	1.10
8	4.01	64.90	1.85
9	4.51	65.50	0.92
10	5.01	66.00	0.76
11	5.51	66.50	0.75
12	6.01	67.00	0.75
13	6.51	67.70	1.03
14	7.00	68.60	1.31

BLANK VALUE = 8.4 micrograms carbon

BLANK FACTOR = 8.4 / 7.004852 =

+1.2E+00 ug/min Carbon

SAMPLE RESULTS:

(68.6 - 8.399962) (2.5) / (200) =

+7.53E-01 g/L Carbon

(68.6 - 8.399962) (2.5) / (200) (12) =

+6.27E-02 Molar Carbon

Sample Run By:

E.H. Colvin 5-3-94
EH COLVIN 00000

400

WHC-SD-WM-DP-079, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT TICTOC REV 2.0

Sample: K-212 STD

Date: 05/03/94

Time: 08:41:08

Sample Size = 200 uL

Dil Factor = 11

Blank ID # = K-213 BLANK

Blank Value = 1.199169 ug/minute C

Analyst : EH COLVIN

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.50	0.00
2	1.01	35.30	98.55
3	1.51	51.40	51.52
4	2.00	55.40	7.22
5	2.50	57.50	3.65
6	3.01	59.00	2.54
7	3.51	60.50	2.16
8	4.01	61.10	1.31
9	4.50	61.70	0.97
10	5.00	62.20	0.80
11	5.50	62.90	1.11
12	6.00	63.60	1.10
13	6.50	64.30	1.09
14	7.00	64.90	0.72

BLANK VALUE = 8.4 micrograms carbon

BLANK FACTOR = 8.4 / 7.004852 =

+1.2E+00

ug/min Carbon

SAMPLE RESULTS:

(64.9 - 8.398138) (11) / (200) =

+3.11E+00

g/L Carbon

(64.9 - 8.398138) (11) / (200) (10) =

+2.59E-01

Molar Carbon

Sample Run By:

EH Colvin 5-3-94
EH COLVIN

401

0.0000