Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

222-S Analytical Laboratory

Project: 242-A EVAPORATOR FEED CHARACTERIZATION

Tank: 102AW

Customer Id. Number: 2291-1-2, 2291-2-2, 2291-3-2, 2291-4-2

Report Revision: 0

Date Printed: May 26, 1992

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This report consists of pages 1 through 182, plus page 5.1-5.21 and 6.1-6.3.

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S I G N A T U R E P A G E

I have reviewed the Inorganic and Radiochemistry results reported in this data package (when applicable). The results meet the requirements of "242-A Evaporator Feed Characterization Project - Statement of Work" - WHC-SOW-91-0002. This data is an accurate representation of the data generated for the requested laboratory analyses performed.

J. H. Tillman
242-A Evaporator Project Manager

9/5/92
Date

I have reviewed the compiled report and certify that this data package meets the document standards of the RCRA Data Packaging Procedure LO-150-151. This data package is complete and contains the data generated from the requested laboratory analysis performed on this sample.

L. R. Webb
Records Management Specialist
Data Coordinator

9/05/92
Date

I have reviewed this report and certify that this data package meets the requirements of "Quality Assurance Project Plan for the Chemical Analysis of Highly Radioactive Samples in Support of Environmental Activities on the Hanford Site" - WHC-SD-CP-QAPP-002, unless superseded by the Statement of Work or Waste Characterization Plan. This data package is a complete and accurate representation of the data generated from the requested laboratory analyses performed on this sample based on the QA Review Process.

L. P. Markel
Laboratory Q.A. Officer

9/12/92
Date

The data contained in this hardcopy data package has been approved and authorized for release by the Laboratory Manager or Manager's designee as verified by the following signature.

M. A. Bell
Manager
Processing and Analytical Laboratories

9-14-92
Date

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NARRATIVE

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P.O. Box 1970 Richland, WA 99352

242-EVAPORATOR FEED CHARACTERIZATION

INORGANIC CASE NARRATIVE

Introduction

The analysis of samples in support of the 242-A Evaporator Feed Characterization Project for Fiscal Year 1991, was performed by the 222-S Laboratory during the last quarter of 1991 and completed during the first quarter of 1992. Samples received and analyzed for the inorganic and conventional parameters were performed using methods specified in the Statement of Work (SOW), WHC-SOW-91-0002 Westinghouse Hanford Company, 242-A Evaporator Feed Characterization Project Fiscal Year 1991, September 1991.

Samples submitted to the laboratory were identified as:

1. TK-102-AW (referred to as 102AW in the remainder of this report) the feed tank prior to the evaporator.

2. TK-106-AW (referred to as 106AW in the remainder of this report) one of the candidate feed tanks into 102AW.

3. TK-103-AP (referred to as 103AP in the remainder of this report) the other candidate feed tank into 102AW.

The inorganic constituents requested for analysis on the three tanks were divided into the following categories; metals by Inductively Coupled Plasma (ICP), metals by Atomic Absorption Spectroscopy (AAS), and conventional parameters by specified methods. The results were obtained using approved methods as specified in Table I of the SOW. Quality analyses, including number and frequency, were performed in accordance to guidance found in Table 2 of the SOW. The parameters analyzed for from the three tanks are:

Metals by ICP

Silver	Ag
Aluminum	Al
Barium	Ba
Cadmium	Cd
Chromium	Cr
Iron	Fe
Magnesium	Mg
Manganese	Mn
Sodium	Na
Lead	Pb
Zinc	Zn

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Metals (AAS)

Arsenic	As
Selenium	Se
Mercury	Hg

Conventionals (IC)

Fluoride	F
Chloride	Cl
Nitrite	NO2
Nitrate	NO3
Phosphate	PO4
Sulfate	SO4

Conventional (Specified Methods)

Total Organic Carbon	TOC
Total Inorganic Carbon	TIC
Cyanide	CN
Hydroxide	OH
Ph	
Specific Gravity	SpG
Differential Scanning Calorimetry	DSC

The analysis of the samples for Cyanide, Total Ammonia, Total Inorganic Carbon (TIC), Specific Gravity, and Differential Scanning Calorimetry (DSC) were performed using methods traceable to ASTM or EPA. All other analytes were determined based on EPA SW-846 methods or current approved WHC golden rod procedures.

The Quality Objectives and requirements for this work effort were set to achieve the highest quality data. Factors relevant to sample matrix and the applicability of the methods to these complex matrices of samples from the evaporator candidate and feed tanks may have lead to biased results for some analytes of concern. The Quality Objectives were:

1. Matrix Spike and Matrix Spike Duplicate per batch or for no more than 20 samples which ever is less. The calculated Percent Recovery for these analyses to be within 75 to 125% and the Relative Percent Difference (RPD) must not exceed ± 20%.

2. One sample in twenty was to be analyzed in duplicate where specified. The duplicate results must agree with an RPD of ± 20%.

3. A blank must be run for each batch or for every 20 samples.

John H. Tillman 9/5/92

J. H. Tillman, Manager
Inorganic Chemistry PAL

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242-EVAPORATOR FEED CHARACTERIZATION

INORGANICS CASE NARRATIVE

Problems encountered:

Samples from the two candidate and one feed tank into the evaporator were received into the 222-S laboratory during the laboratory's transition period from process to environmental analysis. This transition period signaled a change in the analytical protocols required to meet different, and in some cases, more stringent conditions. Most of the problems encountered during this work effort can be attributed to the response of the laboratory to these changing requirements. Nevertheless, the data generated for these samples was obtained using the best available laboratory practice at the time of sample analysis. The following problems were observed to have occurred throughout the samples submitted from tanks 102AW, 103AP, and 106AW:

(1) In a few cases, the analytical data cards are not corrected with one line, an initial and a date. Also, due to insufficient training, the chemists signed the analytical data card in the incorrect location. Though the analytical data cards were signed by the cognizant chemists, they were often signed in the inappropriate location on the card. This indicated the need for appropriate training to address this problem. This training effort has begun.

The Extension "1621" on the data cards represent an old extension which specifically denotes "TOC" analysis.

(2) Instrument Detection Limits (IDL). Detection limits for the parameters determined were obtained using the method prescribed by the US EPA. The instrument detection limits for the metals determined by Inductively Coupled Plasma (ICP), Atomic Absorption (AA), Ion Chromatograph (IC) and classical methods are obtained from an aqueous matrix. The instrument detection limits for the analytes on actual evaporator feed or candidate tanks would probably be higher due to matrix efforts. The standards used to prepare the solutions for the detection limit determinations were obtained from bonifide and reliable sources. The procedure basically requires the analysis of seven replicates of the analyte at a concentration two times the noise level for the instrument. Following this protocol, the instrument detection limits were met or exceeded when compared to the IDC's in the Request for Special Analyses (RSA). Typical instrument detection limits obtained during this work effort are listed below:

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Analyte	Detection Limit (ppm) Required	Actual
Arsenic (As)	5	.005
Cyanide (CN)	.10	.010
Mercury (Hg)	.20	.002
Ammonia (NH4)	500	.100
Hydroxide (OH-)	1700	17.000
Selenium (Se)	1	.005
Total Inorganic Carbon (TIC)	5000	5.000
Total Organic Carbon (TOC)	500	5.500
Fluoride (F)	6000	.090
Nitrate (NO3)	5000	.240
Chloride (Cl)	4000	.040
Nitrite (NO2)	5000	.180
Phosphate (PO4)	10000	.130
Sulfate (SO4)	10000	.130
Aluminum (Al)	50	.075
Barium (Ba)	2	.003
Cadmium (Cd)	1	.004
Chromium (Cr)	5	.004
Iron (Fe)	10	.007
Lead (Pb)	5	.030
Magnesium (Mg)	1	.0001
Manganese (Mn)	2	.001
Silver (Ag)	5	.018
Sodium (Na)	60	.048
Zinc (Zn)	2	.002

Detection limits for the analytes required in the Statement of Work are listed for each set of samples. These instrument detection limits vary according to the analyte and instrument and were generated in accordance with the Request for Special Analysis (RSA), the internal memo, "Recommendations for Tank Farm Waste Analysis" by T. D. Blankenship, dated November 26, 1990, and references the document, "Detection Limit Package, Appendix B" for the 241-U-110 Single Shell Tank Waste Characterization data package, dated August 9, 1991. The detection limit study performed for Core 5 followed recommended EPA protocol.

J. H. Tillman 9/5/92

J. H. Tillman, Manager
Inorganic Chemistry PAL

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Detection Limits of Radionuclides

Listed below are the detection limits for indicated radionuclides for samples R9401, R9402, R9403, and R9404.

Radionuclide	DL uCi/L
Am-241	1.2×10^{-2}

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242-EVAPORATOR FEED CHARACTERIZATION

INORGANICS CASE NARRATIVE

TANK: 102AW

Metals, anion, inorganic, and radionuclides data review for the 242-A Evaporator Feed Characterization Project Fiscal Year 1991.

Tank: 102AW (referred to as 102AW in the remainder of this report)

These samples appeared aqueous with no visible organic layer. All samples had a light yellow tint and 2291-4-3 (R9411) had solids present. Most check standards were within control limits except for some metals; i.e., aluminum, iron, and sodium. Also some of the radionuclides in the check standards were outside the control limits.

Ion Chromatography (IC) Anions and Conventional Parameters

Customer Sample #	Lab. I.D. #
2291-1-3	R9408
2291-2-3	R9409
2291-3-3	R9410
2291-4-3	R9411

Anions are determined on the undigested samples that are diluted if necessary. IC is used to determine fluoride, chloride, nitrate, nitrite, phosphate, and sulfate anions. All duplicates were within the control limits of 20% relative percent difference (RPD). The results were consistent over all samples analyzed for this batch of samples. The sulfate spike recovery data was biased high due to matrix interferences and the high ion content of the sample. The spike recovery data was bracketed by check standards that were within the limits. Some of the parameters for sample 2291-1-3 (R9408) were run in duplicate as a quality check of the method. The RPD for sulfate, phosphate, nitrate, and nitrite were within the defined control limits.

Duplicate cyanide analyses were run on sample 2291-1-3 (R9408). The RPD for this sample was within the control limit and the spike recovery value was about 95%. The results of the check standards run before and after the sample were 100.5 and 99.1% respectively. The check standards run before and after Total Inorganic Carbon (TIC) and Total Organic Carbon (TOC) indicate good accuracy for these analytes. No exotherm was detected for this batch of

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samples. The check standards run for this batch of samples for the Differential Scanning Calorimetry (DSC) indicate good reproducibility.

Radiochemical Analysis

Customer Sample#	Lab I.D.#
2291-1-4	R9415
2291-2-4	R9416
2291-3-4	R9417
2291-4-4	R9418

Radiochemical analysis was run on the above samples. Insufficient sample was found for the analysis of americium 241 for all of these samples. The americium 241 was analyzed on the riser sample submitted later during this work effort (see results for samples 2AW-BD-1 (R332) and 2AW-BD-2 (R333)). Duplicates were run on sample 2291-1-4 (R9415) and selected radionuclides were run in duplicate for samples 2291-2-4 (R416) and 2291-3-4 (R9417). The samplers, in an attempt to get the smallest sample possible, failed to get enough sample to perform all radiochemical analyses. Check standards results for cesium 137 on 2291-1-4 (R9415) were 101.1 and 102.5%. The RPD for the duplicates were within the limits. The spike recovery values for cesium 137 was 105.7%, Total Beta was 97.1% and Total Alpha was 94.8%. These values imply good precision and accuracy of the method.

Metals Analysis

Customer Sample #	Lab I.D. #
2291-1-1	R9394
2291-2-1	R9395
2291-3-1	R9396
2291-4-1	R3997

Inductively Coupled Plasma (ICP) was used to analyze for eleven metals in the above samples. Sample 2291-1-1 (R9394) was run in duplicate. The RPD for magnesium was 143%. The check standards were 110 and 111% respectively. This could imply matrix interference or contamination problems. The RPD for iron was 122% with check standard results at 150 and 162%. The high bias of the check standards imply contamination or spectral problems. Also, aluminum and sodium produced data showing extremely high check standard results, before and after sample analysis. These high values appear for all samples within this batch and imply contamination problems.

	Check Standard #1	Check Standard #2
aluminum	141.2%	139.8%
sodium	194.4%	196.5%

Riser #22A Radiochemical Analysis

Customer I.D. #	Lab I.D.#
2AW-BD-1 (R332)	R1626
2AW-BD-2 (R333)	R1627

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These samples were used to determine americium 241 and several other radionuclides because of concern for criticality. Isotopic analysis for uranium was accomplished using Alpha Total/Alpha Energy Analysis.

The sample was run in duplicate except for the isotopic uranium. The precision and accuracy data were within the limits of control. An additive of the isotopic uranium data agrees well with the total uranium results.

For no apparent reason, the spikes were not run for Tritium with this batch of samples.

John H. Tillman 9/9/92

John H. Tillman, Manager
Inorganic Chemistry PAL

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Hanford Company

Internal
Memo

From: Office of Sample Management
Phone: 3-3869 MO-346/200W T6-08
Date: November 26, 1990
Subject: RECOMMENDATIONS FOR TANK FARM WASTE ANALYSES

16500-90-090

To: T. D. Blankenship R1-62

cc: J. D. Briggs T6-14
J. A. Eacker R1-51
D. L. Halgren R1-51
J. H. Kessner T6-08
E. J. Kosiancic SO-61
C. R. Stroup T6-07
RLW File/LB

Reference: Internal Memo, T. D. Blankenship to E. J. Kosiancic, "Tank Farm Waste Analysis Requirements," dated September 10, 1990.

The referenced Internal Memo requests information regarding laboratory analytical capacity for a variety of analytes to support Tank Farm and Evaporator operations. Specific comments and suggestions for each have been prepared along with information on suggested minimum quantitation limits (MQLs) for the needed analyses and recommended reporting formats. With the exception of Nb^{94}, all requested analyses are currently performed on-site. Laboratory capacity exists to support these programs if sufficient prescheduling of activities is done to coordinate with times of high sample throughput in the laboratory (e.g., single shell tank sampling).

The discussions that follow are based on the assumption that the laboratory will be performing "standard" regulatory type analysis. Analysis MQLs are based on proven laboratory experience, turnaround times are based on requirements in the Tri-Party agreement, and reporting/validation formats based on WHC-CM-5-3, Section 2.0, "Data Validation for RCRA Analyses." This information is summarized in the following attached tables:

Table 1	MQLs for Inorganic Analysis
Table 2	MQLs for Radionuclide Analysis
Table 3	MQLs for Organic Analysis (these are CLP requirements but will form the basis for all organic analysis)
Table 4	Sample Turnaround Times
Table 5	Result Reporting/Validation
Table 6	Validation Criteria - Generic Data Quality Objectives (DQOs)

If specific needs different from this standard are required for a given program, these needs must be defined in the program's Waste Analysis Plan (WAP) or equivalent documentation and negotiated with the laboratory to assure

compliance. While it is expected that in most cases specific needs will be more stringent, if less stringent requirements are appropriate, these should also be defined in the WAP. This could significantly reduce analytical costs and turnaround times.

Characterization of Waste Streams Discharged to Double Shell Tanks (DSTs):

These streams are from ongoing operations of the site and will need analysis for two requirements; verification of compliance to tank farm storage specifications (processing parameters), and determination of composition for regulatory based designation of the waste (hazardous waste designation). Processing parameter based analysis will be equivalent to current practice and should be predefined using laboratory "routine set" analysis. The analysis will be performed under the quality assurance requirements of NQA-1 with typical result turnarounds of 1 to 5 days. Results will be available via the laboratory reporting system (LCCS).

Analysis of the samples to meet the needs for hazardous waste designation will require more stringent quality assurance than for processing parameters. Those components that fall under both needs will likely be required to be analyzed by both protocols. Unfortunately, analysis turnaround times for designation will likely exceed needs for normal processing parameters. If processing parameter analysis results show a component to significantly exceed a hazardous waste designation limit (e.g., a sample is sufficiently caustic to qualify as a extremely hazardous waste based on corrosiveness) reanalysis of the sample under the more stringent protocols would not be necessary. In no case will analysis performed to processing parameter protocols be suitable for designation as an intermediate level or as nonhazardous waste.

DST Characterization Analysis:

All of these analyses will be required to be performed to hazardous waste designation protocols. Currently, no analytical capacity exists to perform Nb^{94} analysis. This long lived ($2x10^4$ y) beta emitter is not expected to be present in significant quantities and will require development efforts to analyze for. Addition of total beta (TB) analysis to the analysis request should allow for screening for significant levels of unaccounted for beta activity and assessment of the needs for additional specific beta emitting radionuclide component quantification.

Analysis for Pu^{238} at the 222-S Laboratory is complicated by the presence of this isotope in the spike (Pu^{236}) added to the analysis to allow correction for overall yield in the procedure. For most expected samples, Pu^{238} activity will be only a small fraction of the $Pu^{239/240}$ activity and may be approximated using isotopic ratios based on historical irradiated uranium processing.

Samples having greater than normal Pu^{238} (e.g., associated with previous irradiated thorium processing) activity will be detectable using the current procedures. In these cases, Pu^{238} activity can be quantified either using a special analysis or through determination of isotopic ratios based on mass spectral analysis.

Analysis of Samples for the 242-A Evaporator:

All analyses identified in the Internal Memo appear to be for hazardous waste designation needs. It should be noted that analysis of the vent stack will require the installation of specialized gas sampling equipment.

General Comments:

Analysis of two major hazardous waste designation groups were not requested for any of the streams; semivolatile organics and Toxicity Characteristic Leaching Procedure (TCLP). If these analyses have not been assessed for inclusion in the requested analysis, it is recommended that they are reviewed for inclusion.

The current schedule for implementation of organic analysis capacity at 222-S Laboratory is for early in 1991, most probably after March 1, 1991. Until capacity becomes available at 222-S Laboratory, organic analyses (VOA and TOX) will be performed by the Pacific Northwest Laboratories (PNL). This will require transhipping of samples sent to 222-S Laboratory, but should not seriously affect result turnaround or quality.

Estimated cost information for the requested analyses is shown in Table 7. These costs are based on analysis of organic components at PNL. When organic capability is available at 222-S Laboratory, costs will be reduced slightly. Addition of semivolatile organic analysis to the lists would increase costs $2000 per analysis. Addition of TCLP to the list would increase analysis costs $1500 for those samples containing greater than 1% solids. For liquid only samples, no additional preparation is required for TCLP and the analytes of concern are already included in the analysis requests.

16500-90-090

If you need any additional information or have any questions, please call me on 3-3869.

Richard L. Weiss

R. L. Weiss, Principal Scientist
Office of Sample Management

jmd

Attachments - 7

CONCURRENCE:

Curtis R. Stroup Date 11/28/90
C. R. Stroup, Manager
Analytical Laboratories

J. D. Briggs for Date 11/29/90
J. D. Briggs, Manager
222-S Analytical Laboratory Complex

TABLE 1
RECOMMENDED ANALYSIS MINIMUM QUANTITATION LEVELS
for TANK FARM WASTE ANALYSES

Analyte	High Salt Liquid or Solid/Slurry	Low Salt Liquid	Analyte	High Salt Liquid or Solid/Slurry	Low Salt Liquid
Analyzed by Inductively Coupled Plasma Spectroscopy (ICP)					
Al	50	0.5	As	20	0.2
Ba	2	0.02	Bi	100	0.5
B	20	0.05	Cd	2	0.02
Ca	0.2	0.002	Ce	100	1
Cr	5	0.05	Co	20	0.2
Cu	20	0.2	Eu	2	0.02
Fe	10	0.01	La	20	0.2
Pb	30	0.3	Li	3	0.03
Mg	0.1	0.001	Mn	2	0.02
Hg	5	0.05	Mo	5	0.05
Nd	250	2.5	Ni	20	0.2
P	50	0.5	K	250	2.5
Sm	200	2	Se	100	1
Si	100	0.5	Ag	30	0.3
Na	60	0.6	Sr	2	0.02
S	60	0.6	Ta	50	0.5
Th	20	0.2	Sn	2	0.02
Ti	30	0.06	W	200	0.5
U	1500	15	Zn	2	0.02
Zr	80	0.1			
Analyzed by Specific Atomic Absorption Techniques					
As	5	0.05	Hg	3	0.03
Se	5	0.05			
Anion Analysis by DIONEX					
F	6000	10	Cl	4000	5
NO_3	20000	10	NO_2	20000	10
PO_4	10000	10	SO_4	10000	10
Specific Analysis					
CO_3	5000	50	TOC(carbon)	5000	50
CN	0.1	0.01	NH_4	5000	50
U	100	1	TOX(chlorine)	100	10
OH	0.2	0.002	DSC	*	*

Values for solids are as ug/g
Values for liquids are as ug/ml
*DSC will be used to screen for the presence of exothermic reactions.
Specific quantitation limits are not required for this screening

TABLE 2
RECOMMENDED ANALYSIS MINIMUM QUANTITATION LEVELS
for TANK FARM WASTE ANALYSES

Analyte	Solid/Slurry	High Salt Liquid	Low Salt Liquid
Alpha Total	100	1	0.01
Beta Total	350	3.5	0.035
Radionuclides Analyzed by Gamma Energy Analysis			
Co^{60}	4	4	0.04
Cs^{137}	5	5	0.05
$RuRh^{106}$	50	50	0.5
Radionuclides Analyzed by Separation with Beta Counting			
H^{3}	75	1.5	1.5
C^{14}	50	0.5	0.25
Nb^{94}	*	*	*
Se^{79}	50	0.5	0.25
Sr^{90}	150	1.5	0.015
Tc^{99}	250	2.5	0.025
I^{129}	900	9	0.09
Radionuclides Analyzed by Separation with Alpha Counting/Alpha Energy Analysis			
Pu^{238}	200[1]	2[1]	0.02[1]
$Pu^{239/240}$	50	0.5	0.005
Am^{241}	100	1	0.01
Cm^{244}	100	1	0.01

Values for solids are as pCi/g
Values for liquids are as pCi/ml

* No current analysis capacity for Nb^{94}
[1]Potential interferrence on Pu^{238} analysis from contamination in Pu^{236} spike added to the analysis

TABLE 3

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Pesticides/Aroclors	CAS Number	Quantitation Limits* Water ug/L	Soil ug/Kg	On Column (pg)
98. alpha-BHC	319-84-6	0.05	1.7	5
99. beta-BHC	319-85-7	0.05	1.7	5
100. delta-BHC	319-86-8	0.05	1.7	5
101. gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102. Heptachlor	76-44-8	0.05	1.7	5
103. Aldrin	309-00-2	0.05	1.7	5
104. Heptachlor epoxide	1024-57-3	0.05	1.7	5
105. Endosulfan I	959-98-8	0.05	1.7	5
106. Dieldrin	60-57-1	0.10	3.3	10
107. 4,4'-DDE	72-55-9	0.10	3.3	10
108. Endrin	72-20-8	0.10	3.3	10
109. Endosulfan II	33213-65-9	0.10	3.3	10
110. 4,4'-DDD	72-54-8	0.10	3.3	10
111. Endosulfan sulfate	1031-07-8	0.10	3.3	10
112. 4,4'-DDT	50-29-3	0.10	3.3	10
113. Methoxychlor	72-43-5	0.50	17.0	50
114. Endrin ketone	53494-70-5	0.10	3.3	10
115. Endrin aldehyde	7421-36-3	0.10	3.3	10
116. alpha-Chlordane	5103-71-9	0.05	1.7	5
117. gamma-Chlordane	5103-74-2	0.05	1.7	5
118. Toxaphene	8001-35-2	5.0	170.0	500
119. Aroclor-1016	12674-11-2	1.0	33.0	100
120. Aroclor-1221	11104-28-2	1.0	33.0	100
121. Aroclor-1232	11141-16-5	2.0	67.0	200
122. Aroclor-1242	53469-21-9	1.0	33.0	100
123. Aroclor-1248	12672-29-6	1.0	33.0	100
124. Aroclor-1254	11097-69-1	1.0	33.0	100
125. Aroclor-1260	11096-82-5	1.0	33.0	100

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Pesticides/Aroclors.

TABLE 3 (cont)

(continued)

Semivolatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
69. Dibenzofuran	132-64-9	10	330	10000	(20)
70. 2,4-Dinitrotoluene	121-14-2	10	330	10000	(20)
71. Diethylphthalate	84-66-2	10	330	10000	(20)
72. 4-Chlorophenyl-phenyl ether	7005-72-3	10	330	10000	(20)
73. Fluorene	86-73-7	10	330	10000	(20)
74. 4-Nitroaniline	100-01-6	50	1700	50000	(100)
75. 4,6-Dinitro-2-methylphenol	534-52-1	50	1700	50000	(100)
76. N-nitrosodiphenylamine	86-30-6	10	330	10000	(20)
77. 4-Bromophenyl-phenylether	101-55-3	10	330	10000	(20)
78. Hexachlorobenzene	118-74-1	10	330	10000	(20)
79. Pentachlorophenol	87-86-5	50	1700	50000	(100)
80. Phenanthrene	85-01-8	10	330	10000	(20)
81. Anthracene	120-12-7	10	330	10000	(20)
82. Carbazole	86-74-8	10	330	10000	(20)
83. Di-n-butylphthalate	84-74-2	10	330	10000	(20)
84. Fluoranthene	206-44-0	10	330	10000	(20)
85. Pyrene	129-00-0	10	330	10000	(20)
86. Butylbenzylphthalate	85-68-7	10	330	10000	(20)
87. 3,3'-Dichlorobenzidine	91-94-1	10	330	10000	(20)
88. Benzo(a)anthracene	56-55-3	10	330	10000	(20)
89. Chrysene	218-01-9	10	330	10000	(20)
90. bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10000	(20)
91. Di-n-octylphthalate	117-84-0	10	330	10000	(20)
92. Benzo(b)fluoranthene	205-99-2	10	330	10000	(20)
93. Benzo(k)fluoranthene	207-08-9	10	330	10000	(20)
94. Benzo(a)pyrene	50-32-8	10	330	10000	(20)
95. Indeno(1,2,3-cd)pyrene	193-39-5	10	330	10000	(20)
96. Dibenz(a,h)anthracene	53-70-3	10	330	10000	(20)
97. Benzo(g,h,i)perylene	191-24-2	10	330	10000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 3 (cont)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
34. Phenol	108-95-2	10	330	10000	(20)
35. bis(2-Chloroethyl) ether	111-44-4	10	330	10000	(20)
36. 2-Chlorophenol	95-57-8	10	330	10000	(20)
37. 1,3-Dichlorobenzene	541-73-1	10	330	10000	(20)
38. 1,4-Dichlorobenzene	106-46-7	10	330	10000	(20)
39. 1,2-Dichlorobenzene	95-50-1	10	330	10000	(20)
40. 2-Methylphenol	95-48-7	10	330	10000	(20)
41. 2,2'-oxybis (1-Chloropropane)#	108-60-1	10	330	10000	(20)
42. 4-Methylphenol	106-44-5	10	330	10000	(20)
43. N-Nitroso-di-n-dipropylamine	621-64-7	10	330	10000	(20)
44. Hexachloroethane	67-72-1	10	330	10000	(20)
45. Nitrobenzene	98-95-3	10	330	10000	(20)
46. Isophorone	78-59-1	10	330	10000	(20)
47. 2-Nitrophenol	88-75-5	10	330	10000	(20)
48. 2,4-Dimethylphenol	105-67-9	10	330	10000	(20)
49. bis(2-Chloroethoxy) methane	111-91-1	10	330	10000	(20)
50 2,4-Dichlorophenol	120-83-2	10	330	10000	(20)
51. 1,2,4-Trichlorobenzene	120-82-1	10	330	10000	(20)
52. Naphthalene	91-20-3	10	330	10000	(20)
53. 4-Chloroaniline	106-47-8	10	330	10000	(20)
54. Hexachlorobutadiene	87-68-3	10	330	10000	(20)
55. 4-Chloro-3-methylphenol	59-50-7	10	330	10000	(20)
56. 2-Methylnaphthalene	91-57-6	10	330	10000	(20)
57. Hexachlorocyclopentadiene	77-47-4	10	330	10000	(20)
58. 2,4,6-Trichlorophenol	88-06-2	10	330	10000	(20)
59. 2,4,5-Trichlorophenol	95-95-4	50	1700	50000	(100)
60. 2-Chloronaphthalene	91-58-7	10	330	10000	(20)
61. 2-Nitroaniline	88-74-4	50	1700	50000	(100)
62. Dimethylphthalate	131-11-3	10	330	10000	(20)
63. Acenaphthylene	208-96-8	10	330	10000	(20)
64. 2,6-Dinitrotoluene	606-20-2	10	330	10000	(20)
65. 3-Nitroaniline	99-09-2	50	1700	50000	(100)
66. Acenaphthene	83-32-9	10	330	10000	(20)
67. 2,4-Dinitrophenol	51-28-5	50	1700	50000	(100)
68. 4-Nitrophenol	100-02-7	50	1700	50000	(100)

Previously known by the name bis(2-Chloroisopropyl) ether

TABLE 3 (cont)

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Volatiles	CAS Number	Quantitation Limits* Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
1. Chloromethane	74-87-3	10	10	1200	(50)
2. Bromomethane	74-83-9	10	10	1200	(50)
3. Vinyl Chloride	75-01-4	10	10	1200	(50)
4. Chloroethane	75-00-3	10	10	1200	(50)
5. Methylene Chloride	75-09-2	10	10	1200	(50)
6. Acetone	67-64-1	10	10	1200	(50)
7. Carbon Disulfide	75-15-0	10	10	1200	(50)
8. 1,1-Dichloroethene	75-35-4	10	10	1200	(50)
9. 1,1-Dichloroethane	75-34-3	10	10	1200	(50)
10. 1,2-Dichloroethene (total)	540-59-0	10	10	1200	(50)
11. Chloroform	67-66-3	10	10	1200	(50)
12. 1,2-Dichloroethane	107-06-2	10	10	1200	(50)
13. 2-Butanone	78-93-3	10	10	1200	(50)
14. 1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
15. Carbon Tetrachloride	56-23-5	10	10	1200	(50)
16. Bromodichloromethane	75-27-4	10	10	1200	(50)
17. 1,2-Dichloropropane	78-87-5	10	10	1200	(50)
18. cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
19. Trichloroethene	79-01-6	10	10	1200	(50)
20. Dibromochloromethane	124-48-1	10	10	1200	(50)
21. 1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
22. Benzene	71-43-2	10	10	1200	(50)
23. trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
24. Bromoform	75-25-2	10	10	1200	(50)
25. 4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
26. 2-Hexanone	591-78-6	10	10	1200	(50)
27. Tetrachloroethene	127-18-4	10	10	1200	(50)
28. Toluene	108-88-3	10	10	1200	(50)
29. 1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
30. Chlorobenzene	108-90-7	10	10	1200	(50)
31. Ethyl Benzene	100-41-4	10	10	1200	(50)
32. Styrene	100-42-5	10	10	1200	(50)
33. Xylenes (Total)	1330-20-7	10	10	1200	(50)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 4
SAMPLE RESULT TURNAROUND TIMES

Laboratory analysis and quality assurance documentation, excluding validation, shall be limited to the following schedule:

Transuranic and hot cell analyses - 100 days annual average, but not to exceed 140 days

Low-level and mixed waste (up to 100 mr/hr) analyses - 75 days annual average, but not to exceed 90 days

Nonradioactive waste analyses - 50 days

Validated data packages will be issued within 21 days of receipt of the results by the Office of Sample Management.

TABLE 5
RESULT REPORTING/VALIDATION

The RCRA validation documentation package consists of the Office of Sample Management Data Validation cover sheet (different sheets for Level A, B, or C validation), supplemental Quality Control (QC) attachment pages, a copy of the Chain of Custody, and all sample data. One documentation package is completed for each sample or delivery group.

Three levels of validation are offered:

Level A The minimum requirement for all RCRA data. The primary application is for data used in waste designation/disposal. The additional QC required by SW-846 will be assessed through laboratory audits and Performance Evaluation (PE) samples.

- Review Requirements:

  - o Requested Versus Reported Analyses
  - o Analysis Holding Times

Level B Provides a more in-depth review for programs whose data are compiled for use in later reports.

Review Requirements in Addition to Those Listed for Level A:

- o Matrix Spike/Matrix Spike Duplicate Analysis
- o Surrogate Recoveries
- o Duplicate Analysis
- o Analytical Blank Analysis

Level C Requires that the data be reported in Sample Delivery Group (SDG) data packages and is applicable to RCRA governed programs requiring Contract Laboratory Program (CLP) quality data from analytical work done in non-CLP laboratories

Review Requirements in Addition to Those Above:

- o Initial and Continuing Instrument Calibrations
- o Gas Chromatography - Mass Spectrograph (GC/MS) Tune Criteria
- o Internal Standards for Gas Chromatograph Analysis
- o Laboratory Control Samples
- o Interference Check Samples (for ICP analysis)
- o Any Other QC Checks Performed or Required by the Methods of Analysis

TABLE 6
VALIDATION CRITERIA - GENERIC DATA QUALITY OBJECTIVES

1. REQUESTED VERSUS REPORTED ANALYSES

   All requested analyses shall be reported of accounted for.

2. HOLDING TIMES

   Holding times shall be equivalent to RCRA defined times. If no RCRA holding time exists, holding times will be 6 months unless specifically defined in project specific documentation.

3. SURROGATE RECOVERY

   Sample and blank surrogate recoveries must be between 80 and 120%.

4. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

   A matrix spike or matrix spike duplicate must be analyzed with every analytical batch of every 20 samples, whichever is more frequent. Control limits will be between 75 and 125% with ±20% relative percent differences.

5. DUPLICATE ANALYSIS

   Duplicate analysis must be performed with every analytical batch or every 20 samples, whichever is more frequent. Control limits will be ±20%. If both sample and duplicate results are below the method detection limit of sample quantitation limit, then no control limit applies.

6. ANALYTICAL BLANKS

   A minimum of one analytical blank must be analyzed for every batch or every 20 samples, whichever is more frequent. No contaminants should be detected in the blanks.

7. INITIAL AND CONTINUING CALIBRATION

   Analytical instrumentation shall be calibrated in accordance with requirements specific to the instrumentation and methods of procedures employed.

8. GC/MS TUNE

   Ion abundance results and tuning frequency requirements must be as specified in the method employed for analysis.

9. INTERNAL STANDARDS

   Internal Standard area counts and retention time differences from the associated calibration standard must be within the control limits specified by the methods or procedure used.

TABLE 6 (cont)

10. LABORATORY CONTROL SAMPLE

All Laboratory Control Sample recoveries must be within 80-120% for all sample matrices.

11. INTERFERENCE CHECK SAMPLE

Frequency of analysis and all Interference Check Sample solution results must meet the requirements specified in the procedure used.

12. OTHER QUALITY CONTROL CHECKS

As specified in project specific documentation.

TABLE 7
ESTIMATED COSTS

CHARACTERIZATION OF WASTE STREAMS DICHSRGED TO DOUBLE SHELL TANKS	
Analysis for processing parameters	$500/sample
Analysis for hazwaste designation	$5000/sample
DOUBLE SHELL TANK CHARACTERIZATION	
Analysis for hazewaste designation	$10000/sample
ANALYSIS OF SAMPLES FROM 242-A EVAPORTOR	
Analysis of feed tank	$5000/sample
Analysis of Process Condensate	$2500/sample
Analysis of Slurry Product	$5000/sample
Analysis of Steam Condensate	$4000/sample
Analysis of Cooling Water	$4000/sample
Analysis of Vent Gases	$2000/sample

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SINGLE SHELL TANK PROJECT
Analytical Detection Limits
October 12, 1990

The following detection limits are derived on ideal matrices. These values were derived by using either calibration standards or pure matrix standards. Detection limits on actual single shell tank samples are likely to be much higher. No information regarding procedure detection limits is available for procedures not listed in this report.

Procedure LA-355-131
Arsenic Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

Procedure LA-325-102
Mercury Analysis by Atomic Absorption Manual Cold Vapor Technique

Detection Limit = 0.002 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.
Solids were analyzed directly.

Procedure LA-362-131
Selenium Analysis by Hydride Generation Atomic Absorption

Detection Limit = 0.005 ppm in solution
Typical sample dilution for the Fusion Dissolution was 0.0025g/mL.
Typical sample dilution for the Water Digestion was 0.010g/mL.
Typical sample dilution for the acid Digestion was 0.010g/mL.

Procedure LA-533-105
Anion Analysis on Dionex Model 4000i

Typical sample dilution was 0.000099g/mL

Fluoride
Detection Limit in solution = 0.09 ppm.

Chloride
Detection Limit in solution = 0.04 ppm.

Nitrate
Detection Limit in solution = 0.24 ppm.

Phosphate
Detection Limit in solution = 0.13 ppm.

Sulfate
Detection Limit in solution = 0.13 ppm.

Procedure LA-622-102
Determination of Carbonate in Solutions by Coulometry

Detection Limit = 5 ppm in solution
Typical sample dilution was 0.01g/mL

Procedure LA-344-105
Total Organic Carbon
Determination of Carbon Insolation by Combustion and Coulometry

Detection Limit = 5.5 ppm in solution
Typical sample dilution was 0.01 g/mL

Procedure LA-695-101
Cyanide = 0.1 ppm CN in solution
Spectrophotometric Determination of Cyanide

Procedure LA-634-102
Ammonia = 0.1 ppm NH_4^+ in solution
Ammonia by Kjeldahl

Procedure LA-645-001
Nitrite = 0.184 ppm NO_2 in solution
Spectrophotometric Determination of Nitrite

Procedure LA-265-101
Chromium VI = 0.1004 ppm Cr^{6+} in solution
Spectrophotometric Determination of Hexavalent Chromium

Procedure: LA-505-151 (Nominal Detection Limits)

Inductively Coupled Plasma (ICP) Emission Spectrometer Operations and Analysis.

Typical sample dilution for the Fusion Dissolution was 0.00019 g/mL.

Typical sample dilution for the Water Digestion was 0.000476 g/mL.

Typical sample dilution for the Acid Digestion was 0.000476 g/mL

Instrument Detection Limit ppm.

Aluminum	0.0745	Antimony	0.1424
Arsenic	0.0223	Barium	0.0026
Beryllium	0.0006	Bismuth	0.0839
Boron	0.0083	Cadmium	0.0039
Calcium	0.0002	Cerium	0.1359
Chromium	0.0039	Cobalt	0.0246
Copper	0.0158	Europium	0.0024
Iron	0.0073	Lanthanum	0.0141
Lead	0.0273	Lithium	0.0032
Magnesium	0.0001	Manganese	0.0011
Mercury	0.0036	Molybdenum	0.0049
Neodymium	0.2130	Nickel	0.0147
Phosphorous	0.0308	Potassium	0.2122
Samarium	0.1525	Selenium	0.0631
Silicon	0.0314	Silver	0.0183
Sodium	0.0483	Strontium	0.0010
Sulfur	0.0163	Tantalum	0.0273
Thallium	0.0646	Thorium	0.0122
Tin	0.0144	Titanium	0.0035
Tungsten	0.0273	Uranium	1.1405
Vanadium	0.0186	Zinc	0.0017
Zirconium	0.0141		

SAMPLING AND CUSTODY DATA

CHAIN OF CUSTODY

Company Contact	Paul Haigh	Telephone	373-4655
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	B-Plant Sample Truck		
Shipped to	222-S Lab		

SAMPLING INFORMATION

Sample Collected by	Rick Lemos	Date	11-13-91	Time	2140
Sample Locations	TK 102-AW, Riser #22A		Custody Seal #	4246	
Remarks	NA				
Ice Chest or Sample Pig No.	B-18	Field Logbook and Page No.	N/A		

SUPERVISION REVIEW: [signature] DATE: 11-13-91

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW-BD-1 R-332	242-A Statement of Work WHC-SOW-91-0002

CHAIN OF POSSESSION

Relinquished by: [signature]	Received by: [signature]	Date/Time: 11-16-91/0050
Relinquished by: [signature]	Received by: R. AKITA Raymond Akita	Date/Time: 11-16/91/0140
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

SAMPLE CHECK IN LIST

Date/Time Received 11-16-91 0140 Sample ID 2AW-BD-1

Project TK102AW Client TANK SAMS

Shipping Container ID# B-18 Shipping # R337

1. Condition of Shipping container? Good
2. Custody Seals on container intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [ ] No [ ]
4. Custody Seals ID # 4246
5. Condition of Samples: ✓ in good condition
   ____ broken
   ____ leaking
6. Samples have: ____ custody seals
   ✓ appropriate sample labels
7. The following paperwork should be accounted for (N/A if not applicable):
   Chain of Custody #(s) Yes
   Request for Special Analysis #(s) no
8. Have any anomalies been identified? Yes [ ] No [X]
9. Memos have been initiated for all anomalies identified? Yes [ ]

Printed Name Vida Johansen

Signature Vida Johansen

Date/Time 11-18-91 - 1050

Please send copy to Office of Sample Management Data Administrator, T6-08

TANK FARM PLANT OPERATING PROCEDURE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

CHAIN OF CUSTODY

Company Contact	Paul Haigh	Telephone	373-4655
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	B-Plant Sample Truck		
Shipped to	222-S Lab		

SAMPLING INFORMATION

Sample Collected by	Rich Lemos	Date	11-13-91	Time	2120
Sample Locations	TK 102-AW, Riser #22A		Custody Seal #	4247	
Remarks	NA				
Ice Chest or Sample Pig No.	G-6	Field Logbook and Page No.	N/A		

SUPERVISION REVIEW: [signature] DATE: 11-13-91

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW-BO-2 R333	242-A Statement of Work WHC-SOW-91-0002

CHAIN OF POSSESSION

Relinquished by: [signature]	Received by: [signature]	Date/Time: 11-16-91 / 0050
Relinquished by: [signature]	Received by: R. Akizuki Raymond Akizuki	Date/Time: 11-16-91 / 0140
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

SAMPLE CHECK IN LIST

Date/Time Received 11-16-91 0140 Sample ID 2AW-BD-2

Project TK 102AW Client Tank Farms

Shipping Container ID# G-16 Shipping # R 333

1. Condition of Shipping container? Good
2. Custody Seals on container intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Custody Seals ID # 4247
5. Condition of Samples: ✓ in good condition
   ____ broken
   ____ leaking
6. Samples have: ____ custody seals
   ✓ appropriate sample labels
7. The following paperwork should be accounted for (N/A if not applicable):
   Chain of Custody #(s) few
   Request for Special Analysis #(s) ____
8. Have any anomalies been identified? Yes [ ] No [X]
9. Memos have been initiated for all anomalies identified? Yes [ ]

Printed Name VIDA JOHANSEN

Signature Vida Johansen

Date/Time 11-18-91 1050

Please send copy to Office of Sample Management Data Administrator, T6-08

DON'T SAY IT --- *Write It!*

DATE 6/10/91

TO

FROM Vicki Johansen

Received 2 pig overpacks @ 1500 hrs on 6/10/91. The paper work for sample # 2AW52291-2 was correct. The paper work for sample # 2AW52291-3 was correct, but the inside pig was labeled 2AW52291-3. I contacted Carol Pittkoff after putting the sample on a 24 hr holding time according to procedure 20-090-101. I notified Dan Thornton of the discrepancy and his attorney. This will invalidate the sample chain of custody. Because of the late time of day I couldn't locate QSR.

(000-10119-89)

DON'T SAY IT --- *Write It!*

DATE 6/11/91

TO

FROM Vicki Johansen

Contacted Carol Pittkoff at 0750 hrs to remind her of the problem. She is contacted the field personnel to prevent a similar problem with the next sample.
Rick Wein informed of mishap

6/11/91 0900 Customer requested sample disposal. They will resample

WHC-SD-WM-DP-025
Addendum 2 Rev 0

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by:	C. Clearwater	Date 6-5-91		Time	1615
Sample Locations	241-AW-TANK 102-AW, RISER # 22-A				
Remarks	N/A				
Ice Chest or Sample Pig No.	TF-5	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number: 2AW52291-4

Sample Schedule Number: FSS-T-630-00001, FD-A, Routine 2

* Sample in pig marked 2AW52291-3

CHAIN OF POSSESSION

Relinquished by: [signature]	Received by: T. L. Bacon	Date/Time: 6/10/91 / 1405
Relinquished by: Troy L. Bacon	Received by: [signature]	Date/Time: 6/10/91 / 15:05
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship. # R9228

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

242-A Evaporator

Date/Time Received 6/10/91 1445 Client Name Hanford Farm

Project/Client # 241-AW- 102AW Batch or Case # 102-AW RISER 22-A

Cooler ID (if noted on outside of cooler) TF-5 Seal # 4212

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - ____ tape
   - X custody seals
   - NO appropriate sample labels
   - ____ hazard labels
   - Sample & paperwork do not agree
9. Samples are:
   - ____ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Samples received at N/A °C. Coolant type N/A
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) Non -
    Request for Analysis #(s) ____
    Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [X] No [ ]
13. Memos have been initiated for all anomalies identified above? Yes [X] attached

Printed Name/Signature VIDA JOHANSEN / Vida Johansen Date/Time 6/10/91 1530

Page 1 of 2

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	C SC ~~PNL ID~~ NUMBER	AGREEMENT OF INFORMATION?
R 9228	2AW52291-3 VJ	2AW52291-4	NO —

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	B.C. Wyer	Date 6-12-91		Time	0930
Sample Locations	241-AW, Tank 102-AW, Riser # 22A				
Remarks	Seal #4215				
Ice Chest or Sample Pig No.	TF-1	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW61191-3	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
BC Wyer	[illegible]	6-12-91 / 1310
[illegible]	[illegible]	6-12-91 / 1410
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

9396, 9403, 9410, 9417
R9424, 9425 LABORATORY ID

Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 22
2AW52291-3 (R9371) 102AW	6/13/91	1315

Delivered by (Signature)	RPT Release (Signature)	Dose Rate
[illegible]	J. Valdez	200 mR/hr

Custodian (Signature)	Date Analysis Complete	Disposal Date
Vida Johnson		

Comments: Stored in ref. 1,2.

Payroll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9396		
	2	R9403		
	3	R9410		
	4	R9417		
	SVOA 1	R9424		
	2			
	VOA 1	R9425		
	2			

BD-6000-347P

(1 Per Shipping Container)

WHC-SD-WM-DP-025 Rev 0
Addendum 2 Rev 0

Date/Time Received 6/12/91 1100 Client Name Hart Jenn

2AW61191-3

Project/Client # 241-102-AW Batch or Case # RISER 22A

Cooler ID (if noted on outside of cooler) TF-1

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [✓] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - ____ tape
   - X custody seals
   - X appropriate sample labels
   - ____ hazard labels
9. Samples are:
   - ____ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Samples received at N/A °C. Coolant type ____
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) yes
    Request for Analysis #(s) yes
    Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Kim Johansen / Kim Johansen Date/Time 6/12/91 1445

Page 1 of 2

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC-SD-WM-DP-025
Addendum 2 Rev 0

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R9371	2AW6119/-3		yes
INORGANIC 1	R9396		
2	9403		
3	9410		
4	9417		
SEMI-VOA			
1 AND 2	R9424		
VOA			
1 and 2	R9425		

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CLGearing	Date	6-5-91	Time	1545
Sample Locations	241-AW - TANK 102-AW RISER # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	B-18 ~~2AW5229-1~~	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW5229-1	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: Chris Winkler	Received by: John J. Throne	Date/Time: 6-7-91/0115
Relinquished by: John J. Throne	Received by: M. Dunn	Date/Time: 6/7/91 0215
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship # R9227

9394, 9401, 9408 9415
9420, 9421

WHC-SD-WM-DP-025
Addendum 2 Rev 0

LABORATORY ID	Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 222-S
ORGANIC (R9227) INORGANIC (2AW52291-1 02AW)	6/13/91	1315

Delivered by (Signature)	RPT Release (Signature)	Dose Rate
[illegible]	[illegible]	200 mR/hr

Custodian (Signature)	Date Analysis Complete	Disposal Date
[illegible]		

Comments: Stored in 2B Refr. #1, 2.

Payroll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9394		
	" 2	R9401		
	" 3	R9408		
	" 4	R9415		
	SEMI VOA OR 1	R9420		
	2			
	VOA 1	R942		
	2			

000591

BD-6000-347

R 4

Date/Time Received 6-7-91 / 0210 hrs Client Name C.C. Pitkoff

Project/Client # 241-AW-TANK Batch or Case # 102-AW RISER # 22A

Company Contact: C.C. Pitkoff Sample No. 2AW52291-1

Cooler ID (if noted on outside of cooler) PIG B-18

1. Condition of shipping container? Good
2. Custody Seals on ~~cooler~~ Pig intact? Yes [ ] No [ ] none
3. Custody Seals dated and signed? Yes [ ] No [ ] none
4. Chain of Custody record is ~~taped on inside of cooler lid~~ hand carried Yes [✓] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - NA clips (in cans)
   - NA tape
   - NO custody seals
   - ✓ appropriate sample labels
   - ✓ hazard labels
9. Samples are:
   - ✓ in good condition
   - NO leaking
   - NA broken
   - NA have air bubbles
   - NA other
10. Samples received at NA °C. Coolant type NA
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) C of C present
    Request for Analysis #(s) yes
    Airbill # NA Carrier Truck
12. Have any anomalies been identified above? Yes [ ] No [✓]
13. Memos have been initiated for all anomalies identified above? Yes [NA]

Printed Name/Signature DOT HONAKER / Dot Honaker for J.A. Zuerin Date/Time 6-7-91

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
~~RADIO~~ORGANIC 1	R9394		
2	R9401		
3	R9408		
4	R9415		
Semi VOA ORGANIC			
1, AND 2	R9420		
VOA -			
1 and 2	R9421		

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TANK FARM PLANT OPERATING PROCEDURE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CLGarrung	Date 6-5-91		Time	1545
Sample Locations	241-AW - TANK 102-AW Riser # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	B-18 ~~2AW5229-1~~	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW5229-1	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: Chris Winkler	Received by: John J. Thoie	Date/Time: 6-7-91/0115
Relinquished by: John J. Thoie	Received by: J. A. Thoie	Date/Time: 6/7/91 0215
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship# 9277
DyB 7/11/91

Document No.	Rev/Mod	Page
TO-080-030	C-1	15

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SAMPLE CHECK-IN LIST
(1 Per Shipping Container)

Date/Time Received 6-7-91 / 0210 hrs Client Name C.C. Pitkoff

Project/Client # 241-AW-TANK Batch or Case # 102-AW RISER # 22A

Company Contact: C.C. Pitkoff Sample No. 2AW522 91-1

~~Cooler~~ PIG ID (if noted on outside of cooler) B-18

1. Condition of shipping container? Good
2. Custody Seals on ~~cooler~~ PIG intact? Yes [ ] No [ ] none
3. Custody Seals dated and signed? Yes [ ] No [ ] none
4. Chain of Custody record is ~~taped on inside of cooler lid~~? hand carried Yes [✓] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - NA clips (in cans)
   - NA tape
   - NO custody seals
   - ✓ appropriate sample labels
   - ✓ hazard labels
9. Samples are:
   - ✓ in good condition
   - NO leaking
   - NA broken
   - NA have air bubbles
   - NA other
10. Samples received at NA °C. Coolant type NA
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) C of C present
    Request for Analysis #(s) yes
    Airbill # NA Carrier Truck
12. Have any anomalies been identified above? Yes [ ] No [✓]
13. Memos have been initiated for all anomalies identified above? Yes [NA]

Printed Name/Signature DOT HONAKER / Dot Honaker for J.A. Zuerin Date/Time 6-7-91

Page 1 of 2

SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R 9227 DLB 7/11/91	2AW 52291-1 DLB 7/11/91		

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CCPitkoff	Date 6-5-91		Time	1555
Sample Locations	241-AW -TANK 102-AW RISER # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	G	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW52291-2	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: [signature]	Received by: T.L. Bacon	Date/Time: 6/10/91 1405
Relinquished by: Troy L. Bacon	Received by: [signature]	Date/Time: 6/10/91 15:05
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship #19229

9395, 9402, 9409, 9416, 9422, 9423 LABORATORY ID		Date Sampled	Time Sampled
Sample Site or Sampling ID: 2AW52291-2 (R9229)	102-AW	Date Received at 222-S: 6/13/91	Time Received at 222-S: 1315
Delivered by (Signature): [signature]	RPT Release (Signature): [signature]		Dose Rate: 200 mrem/hr
Validation (Signature): Vida Johansen		Date Analysis Complete	Disposal Date
Comments: Stored in QA Ref. #1,2,3			

Sample No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9395		
	2	R9402		
	3	R9409		
	4	R9416		
	SVOA 1	R9423		
	2	R		
	VOA 1	~~R9423~~ KJ		
	2	R9422		

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147 (10/89)

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BD-6000-347 (10/89)

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(1 Per Shipping Container)
WHC-SD-WM-DP-025
Addendum 2 Rev 0

R90

Date/Time Received 6/10/91 Client Name 242-A Evaporator Hard Jam

Project/Client # 241-AW -102AW Batch or Case # Rlsw 22-A 102 -AW

Cooler ID (if noted on outside of cooler) G Seal 4210

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - ____ tape
   - X custody seals
   - X appropriate sample labels
   - ____ hazard labels
9. Samples are:
   - ____ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Samples received at N/A °C. Coolant type ____
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) Ø Yes —
    Request for Analysis #(s) —
    Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Vicki Johansen Date/Time 6/10/91 1530

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC-SD-WM-DP-025
Addendum 2 Rev 0

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R 9229	2AW52291-2		yes
INORGANIC 1	R9395		
2	9402		
3	9409		
4	9416		
SEMI VOA			
1 and 2	R 9423		
VOA			
1 and	R9422		

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TANK FARM PLANT OPERATING PROCEDURE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CCPitkoff	Date 6-5-91		Time	1555
Sample Locations	241-AW -TANK 102-AW RISER # 22A				
Remarks	N/A				
Ice Chest or Sample Pig No.	G	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW5229/-2	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
[signature]	T.L. Bacon	6/10/91 1405
Troy L. Bacon	[signature]	6/10/91 15:05
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Slip #19229

WHC-SD-WM-DP-025 (1 Per Shipping Container)
Addendum 2 Rev 0

242-A Evaporator

Date/Time Received 6/10/91 Client Name Hard Jam

Project/Client # 241-AW -102AW Batch or Case # RISW 22-A 102-AW

Cooler ID (if noted on outside of cooler) G Seal 4210

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - ____ tape
   - X custody seals
   - X appropriate sample labels
   - ____ hazard labels
9. Samples are:
   - ____ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Samples received at N/A °C. Coolant type ____
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) Ice Yes —
    Request for Analysis #(s) —
    Airbill # N/A Carrier Hand Carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Vicki Johansen Date/Time 6/10/91 1530

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
A 9229	2AW52291-2		Yes

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	CKearney	Date 6-5-91		Time	1615
Sample Locations	241-AW-TANK 102-AW, RISER # 22-A				
Remarks	N/A				
Ice Chest or Sample Pig No.	TF-5	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW52291-4	FSS-T-630-00001, FD-A, Routine 2

* Sample in pig marked 2AW52291-3

CHAIN OF POSSESSION

Relinquished by: B. C. Kearney	Received by: T. L. Bacon	Date/Time: 6/10/91 / 1405
Relinquished by: Troy L. Bacon	Received by: Vida Johanson	Date/Time: 6/10/91 / 15:05
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Ship. # R9228

Per customer request:
Sample disposed of 6/11/91 1030

WHC-SD-WM-DP-025
WHC-SD-WM-DP-025
Addendum 2 Rev 0

242-A Evaporator

Date/Time Received 6/10/91 1445 Client Name Hanford Farm

Project/Client # 241-AW-102AW Batch or Case # 102-AW RISER 22-A

Cooler ID (if noted on outside of cooler) TF-5 Seal # 4212

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] NA
6. Each sample is in a plastic bag? Yes [ ] No [ ] NA
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - ____ tape
   - X custody seals
   - NO appropriate sample labels
   - ____ hazard labels
   - Sample & paperwork do not agree
9. Samples are:
   - ____ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Samples received at N/A °C. Coolant type N/A
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) Yes
    Request for Analysis #(s) ____
    Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [X] No [ ]
13. Memos have been initiated for all anomalies identified above? Yes [X] attached

Printed Name/Signature VIDO JOHANSEN Date/Time 6/10/91 1530

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC-SD-WM-DP-025
Addendum 2 Rev 0

WHC ID NUMBER	SAMPLE LABEL NUMBER	C SC ~~PNL ID~~ NUMBER	AGREEMENT OF INFORMATION?
R 9228	2AW52291-3 WJ	2AW52291-4	NO —

Customer wants sample disposal — will resample
6/11/91
Johnson

CHAIN OF CUSTODY

Company Contact	C. C. Pitkoff	Telephone	3-2408
Bill of Lading No.	N/A	Offsite Property No.	N/A
Method of Shipment	Sample Truck		
Shipped to	222-S		

SAMPLING INFORMATION

Sample Collected by	BCWyn	Date 6-12-91		Time	0745
Sample Locations	241-AW, 102-AW, Riser # 22A				
Remarks			seal #4314		
Ice Chest or Sample Pig No.	TF-11	Field Logbook and Page No.	N/A		

SAMPLE IDENTIFICATION

Sample Number	Sample Schedule Number
2AW61191-4	FSS-T-630-00001, FD-A, Routine 2

CHAIN OF POSSESSION

Relinquished by: BCWyn	Received by: [illegible]	Date/Time: 6-12-91 / 1310
Relinquished by: [illegible]	Received by: [illegible]	Date/Time: 6-12-91 / 1410
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

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9397, 9404, 9411, 9418
R9426, 9427 LABORATORY ID

Date Sampled	Time Sampled

Sample Site or Sampling ID	Date Received at 222-S	Time Received at 222-S
241 SY 291-9 (R 9371) 102 AW	6/13/91	13:15

Delivered by (Signature)	RPT Release (Signature)	Dose Rate
[signature]	[signature]	200 mrem/hr

Custodian (Signature)	Date Analysis Complete	Disposal Date
[signature]		

Comments: Filtered in lab 1,2,3

Payroll No.	Tech/Receiver (Signature)	Date	Entry Code	Comments
	INORGANIC 1	R9397		
	" 2	R9404		
	3	R9411		
	4	R9418		
			R9427	
	SVOA 1		~~R9423~~	
	" 2			
	VOA 1		~~R9422~~	
	" 2		R9426	

BD-6000-347 (10/89)

Date/Time Received 6/12/91 1400 Client Name Hart Jaime

2AW61191-4

Project/Client # 241-102 AW Batch or Case # RISER 22A

Cooler ID (if noted on outside of cooler) TF-11 seal 4214

1. Condition of shipping container? Good
2. Custody Seals on ~~cooler~~ intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [ ] No [ ] NA
5. Vermiculite/packing material is: Wet [ ] Dry [ ] N/A
6. Each sample is in a plastic bag? Yes [ ] No [ ] N/A
7. Number of sample containers in cooler: 1
8. Samples have:
   - ____ clips (in cans)
   - ____ tape
   - X custody seals
   - ____ appropriate sample labels
   - ____ hazard labels
9. Samples are:
   - ____ in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Samples received at N/A °C. Coolant type ____
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) yes
    Request for Analysis #(s) yes
    Airbill # N/A Carrier hand carried
12. Have any anomalies been identified above? Yes [ ] No [X]
13. Memos have been initiated for all anomalies identified above? Yes [ ]

Printed Name/Signature Nora Johnsen Nora Johnsen Date/Time 6/12/91 1445

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SAMPLE CHECK-IN LIST
SAMPLE NUMBER MATRIX

WHC ID NUMBER	SAMPLE LABEL NUMBER	PNL ID NUMBER	AGREEMENT OF INFORMATION?
R9372	2AW 61191-4		yes
INORGANIC 1	R9397		
2	9404		
3	9411		
4	9418		
SEMI VOA			
1 and 2	R9427		
2			
VOA			
1 and 2	R9426		

WHC-SD-WM-DP-025
Addendum 2 Rev 0

10 LHW

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SAMPLE CHECKOUT LIST

Sample ID	Tech.sign./pyrl	Sample out	Sample in	Date/Time	Custodian/ date time
R9415, 11, 18, 16, 09 R9410, 17, 06,	Mary 6C269 Franey	1100	1115	6-18-91	6/18/91 1115 Vida Johansen
9394 - 9401 9395 - 9402 9397 - 9404 9396 - 9403	MG Franey 6C559	1100	1115	6/18/91	6/18/91 1115 Vida Johansen
R9415, 16, 17, 18	6C269 Mary Franey	115	1350	6/18-91	6/18/91 1350 Vida Johansen
R9417	6C275 Dave R Jackson	14:10	14:30	6-18-91	6/19/91 0830 Vida Johansen
R-9408 - 11	80028 Ed Cole	0830	1330	6-19-91	6/19/91 1345 Vida Johansen

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SAMPLE DATA SUMMARY

SUMMARY DATA REPORT

Project: 242-A EVAPORATOR FEED CHARACTERIZATION
Tank: 102AW
Customer ID: 2291-1-2, 2291-2-2, 2291-3-2, 2291-4-2

Undigested Sample Results

	Sample R9401		Sample Duplicate NA	
Am 241	<2.31E-2	uCi/L	NA	
As	1.45E+0	ppm	NA	
Hg	<5.00E-3	ppm	NA	
Se	<5.00E-3	ppm	NA	

	Sample R9402		Sample Duplicate NA	
Am 241	<2.37E-2	uCi/L	NA	
As	1.56E+0	ppm	NA	
Hg	<5.00E-3	ppm	NA	
Se	<5.00E-3	ppm	NA	

	Sample R9403		Sample Duplicate R9403	
Am 241	8.50E-1	uCi/L	7.67E-1	uCi/L
As	1.45E+0	ppm	1.36E+0	ppm
Hg	<5.00E-3	ppm	<5.00E-3	ppm
Se	<5.00E-3	ppm	<5.00E-3	ppm

	Sample R9404		Sample Duplicate NA	
Am 241	1.75E-1	uCi/L	NA	
As	1.61E+0	ppm	NA	
Hg	<5.00E-3	ppm	NA	
Se	<5.00E-3	ppm	NA	

UNDIGESTED SAMPLE ANALYSIS RESULTS

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Sample No.: R9401
Customer ID: 2291-1-2

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:					R9401							
Appearance of R9401 (06-14-91): Clear; light yellow; aqueous. No visible organic. Some solids settled on bottom of vial.												
Lab ID:	R9413		R9414		R9401		NA		NA		R9419	
Americium 241 (11-25-91)	119.1	%	<1.17E-2	uCi/L	<2.31E-2	uCi/L					112.41	%
Lab ID:	R9399		R9400		R9401		NA		NA		R9405	
Arsenic (07-08-91)	99.9	%	<5.00E-3	ppm	1.45E+0	ppm					111.8	%
Lab ID:	R9399		R9400		R9401		NA		NA		R9405	
Mercury (07-29-91)	109	%	<5.00E-3	ug/g	<5.00E-3	ppm					107	%
Lab ID:	R9399		R9400		R9401		NA		NA		R9405	
Selenium (09-17-91)	98.2	%	<5.00E-3	ug/g	<5.00E-3	ppm					89.1	%

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Sample No.: R9402
Customer ID: 2291-2-2

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:					R9402							
Appearance of R9402 (06-14-91): Clear; light yellow; aqueous. No visible organic. No solids present.												
Lab ID:	R9413		R9414		R9402		NA		NA		R9419	
Americium 241 (11-25-91)	119.1	%	<1.17E-2	uCi/L	<2.37E-2	uCi/L					112.41	%
Lab ID:	R9399		R9400		R9402		NA		NA		R9405	
Arsenic (07-08-91)	99.9	%	<5.00E-3	ppm	1.56E+0	ppm					111.8	%
Lab ID:	R9399		R9400		R9402		NA		NA		R9405	
Mercury (07-29-91)	109	%	<5.00E-3	ug/g	<5.00E-3	ppm					107	%
Lab ID:	R9399		R9400		R9402		NA		NA		R9405	
Selenium (09-17-91)	98.2	%	<5.00E-3	ug/g	<5.00E-3	ppm					89.1	%

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Sample No.: R9403
Customer ID: 2291-3-2

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:					R9403							
Appearance of R9403 (06-14-91): Clear, light yellow, aqueous. No visible organic. Some solids scattered on vial bottom.												
Lab ID:	R9413		R9414		R9403-5782		R9403-5882		NA		R9419	
Americium 241 (11-25-91)	119.1	%	<1.17E-2	uCi/L	8.50E-1	uCi/L	7.67E-1	uci/L			112.41	%
Lab ID:	R9399		R9400		R9403-5795		R9403-5895		NA		R9405	
Arsenic (07-08-91)	99.9	%	<5.00E-3	ppm	1.45E+0	ppm	1.36E+0	ppm			111.8	%
Lab ID:	R9399		R9400		R9403-5797		R9403-5897		NA		R9405	
Mercury (07-29-91)	109	%	<5.00E-3	ppm	<5.00E-3	ppm	<5.00E-3	ppm			107	%
Lab ID:	R9399		R9400		R9403-5796		R9403-5896		NA		R9405	
Selenium (09-17-91)	98.2	%	<5.00E-3	ppm	<5.00E-3	ppm	<5.00E-3	ppm			89.1	%

UNDIGESTED SAMPLE RESULTS

Tank: 102AW
Core: NA
Sample No.: R9404
Customer ID: 2291-4-2

	Check Standard		Blank		Sample		Duplicate Sample		Spike of Sample		Check Standard	
Lab ID:					R9404-5000							
Appearance of R9404 (06-14-91): Clear; light yellow; aqueous. No visible organic. Solids present.												
Lab ID:	R9413		R9414		R9404-5782		NA		NA		R9419	
Americium 241 (11-25-91)	119.1	%	<1.17E-2	uCi/L	1.75E-1	uCi/L					112.41	%
Lab ID:	R9399		R9400		R9404-5795		NA		R9404-5995		R9405	
Arsenic (07-08-91)	99.9	%	<5.00E-3	ppm	1.61E+0	ppm			105.8	%	111.8	%
Lab ID:	R9399		R9400		R9404-5797		NA		R9404-5997		R9405	
Mercury (07-29-91)	109	%	<5.00E-3	ppm	<5.00E-3	ppm			98.7	%	107	%
Lab ID:	R9399		R9400		R9404-5796		NA		R9404-5996		R9405	
Selenium (09-17-91)	98.2	%	<5.00E-3	ppm	<5.00E-3	ppm			*20.4	%	89.1	%

* MATRIX INTERFERENCE DUE TO SAMPLE SIZE.

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9401	Customer ID: 2291-1-2
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 6-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID
1	SAMPLE 1-2	R9401-5000
2	SAMPLE 2-2	R9402-5000
3	SAMPLE 3-2	R9403-5000
4	SAMPLE 4-2	R9404-5000
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
N/A				N/A

A-6000-881 (03/92)

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9401.-5000	102AW	6-14-91	11:4	26

Determination	Method Summary	Result Units	Charge Code	Returns
APPEAR	IA-371-01		WIDEO	0

Sample Size: 7

Customer ID: 2291-1-2

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-Dm
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs
Date: 6/14/91	Time Completed			

Sample No	Sample Point	Date	Time Issued	Priority
R 9402.-5000	102AW	6-14-91	11:5	26

Determination	Method Summary	Result Units	Charge Code	Returns
APPEAR	IA-371-01 5-11-91		WIDEO	0

Sample Size: 7

Customer ID: 2291-1-2

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-Dm
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity - clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs
Date: 6/14/91	Time Completed			

Sample No	Sample Point	Date	Time Issued	Priority
R 9403.-5000	102AW	6-14-91	11:11	26

Determination	Method Summary	Result Units	Charge Code	Returns
APPEAR	IA-371-01 5-11-91		WIDEO	0

Sample Size: 7

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-Dm
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity clear
some solids settled
on vial bottom

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs
Date: 6/14/91	Time Completed			

Sample No	Sample Point	Date	Time Issued	Priority
R 9404.-5000	102AW	6-14-91	11:14	26

Determination	Method Summary	Result Units	Charge Code	Returns
APPEAR	IA-371-01		WIDEO	0

Sample Size: 7

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-Dm
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity - clear
solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs
Date: 6/14/91	Time Completed			

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9401	Customer ID: 2291-1-2
Analysis: AMERICIUM 241	Sample Prep: UNDIGESTED

Instrument: WB57237	Procedure/Rev: LA-503-156/C-3
Technologist: M. BIERMAN	Date: 11-25-91
Starting Time: NA	Temperature: 25degC
Ending Time: NA	Chemist: S. CATLOW

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9413-5582	11		
2	REAGENT BLANK	R9414-5682	12		
3	SAMPLE 2291-1-2	R9401-5782	13		
4	FINAL LMCS CHECK STD	R9419-5582	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
LMCS CHECK STD	43B43/0.1 mL			NA
SAMPLES RERUN.				

A-6000-881 (03/92)

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

4.2 .6146

Sample No	Sample Point	Date	Time Issued	Priority
R 9413.-5582	102AW	6-14-91	13: 8	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AM241	LA-503-156	% RECOVERY	W1MEO	4

Sample Size: .100-10-1 ml — RERUN — Customer ID: STD

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

EDP R201 AR001

STD#43843 RESULT 3.74E'

STD VAL 3.74E' %REC 119.140

Am243(18843) .100 ml

0.1 ml in 8M HNO3 (over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69549			
MB				

Date 11/25/91 Time Completed Lab Unit Mgr

#3 11-27-91 AJ R9413-5582

$\frac{2302}{5} - 10$

$$\frac{(6123)(2.274E^{-3})(.1)(1000)(101)}{.3759} =$$

4.3 7766

Sample No	Sample Point	Date	Time Issued	Priority
R 9414.-5682	102AW	6-14-91	13:11	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AM241	LA-503-156	uCI/G	W1MEO	4

Sample Size: ? 0-1 — RERUN — Customer ID: REG. BL

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

REAGENT BLANK

COUNT AS uCI/L

Am243(18843) .100 ml

1 ml 8M HNO3

<1.17E^{-2} uci/g (over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69549			
MB				

Date 11/25/91 Time Completed Lab Unit Mgr

#1 11-27-91 AJ R9414-5682

$\frac{810}{5} - 8$

$$\frac{(<.05)(2.274E^{-3})(.1)(1000)(1)}{.9719} =$$

4.4 8956 Data entered under R9415

Sample No	Sample Point	Date	Time Issued	Priority
R 9401.-5782	102AW	6-14-91	11: 4	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AM241	LA-503-156	uCI/L	W1BIC	1

Sample Size: ? .500 ml — RERUN — Customer ID: 2291-1-2

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

COUNT AS uCI/L

Am243(18843) .100 ml

.500 ml Con HNO3

$$\frac{(<.05)(2.274E^{-3})(.1)(1000)(2)}{.9857} = <2.31E^{-2} \text{ uci/l}$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69549			
MB				

Date 11/25/91 Time Completed Lab Unit Mgr

#3 11-27-91 AJ R9401-5782

$\frac{810}{5} - 10$

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

RERUN

"AEA" - 480MIN
ATTACH PRINTOUT

#1 11-27-91 #9 R9419-5582

$\frac{359}{5}$ -8

$$\frac{(5953)(2.274E^{-3})(.1)(1000)(101)}{.3872}$$

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9413-3382
File ID: 3D6146.SPC

Counted on: 11/27/91 @13: 0
Detector/Geometry number: [illegible]
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	7.1	6.8	360.363	360.363	24.000	17.203	12.000	0.000
2	4084.1	4131.6	300.280	300.280	24.000	18.223	10.000	3.397
3	2517.1	2561.1	255.520	255.520	20.000	12.302	10.000	2.19[illegible]

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ml
1	Pu236	0.0118	5.756	5.764	-0.008	0.06	2.49	13.41	0.604E-05
2	Pu238	0.6123	5.499	5.481	0.018	0.09	129.67	717.37	0.428E-[illegible]
	Am241		5.480	5.481	-0.001				0.318E-[illegible]
3	Am243	0.3709	5.234	5.271	-0.037	0.06	79.60	3814.83	0.172E-02

DETECTOR CALIBRATION
Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.1897 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	107229.0	100.000
Smoothed	107229.0	100.000
Composite fit	105883.3	98.743
Residuals	1341.6	1.254

Analyzed by: _____
[illegible]

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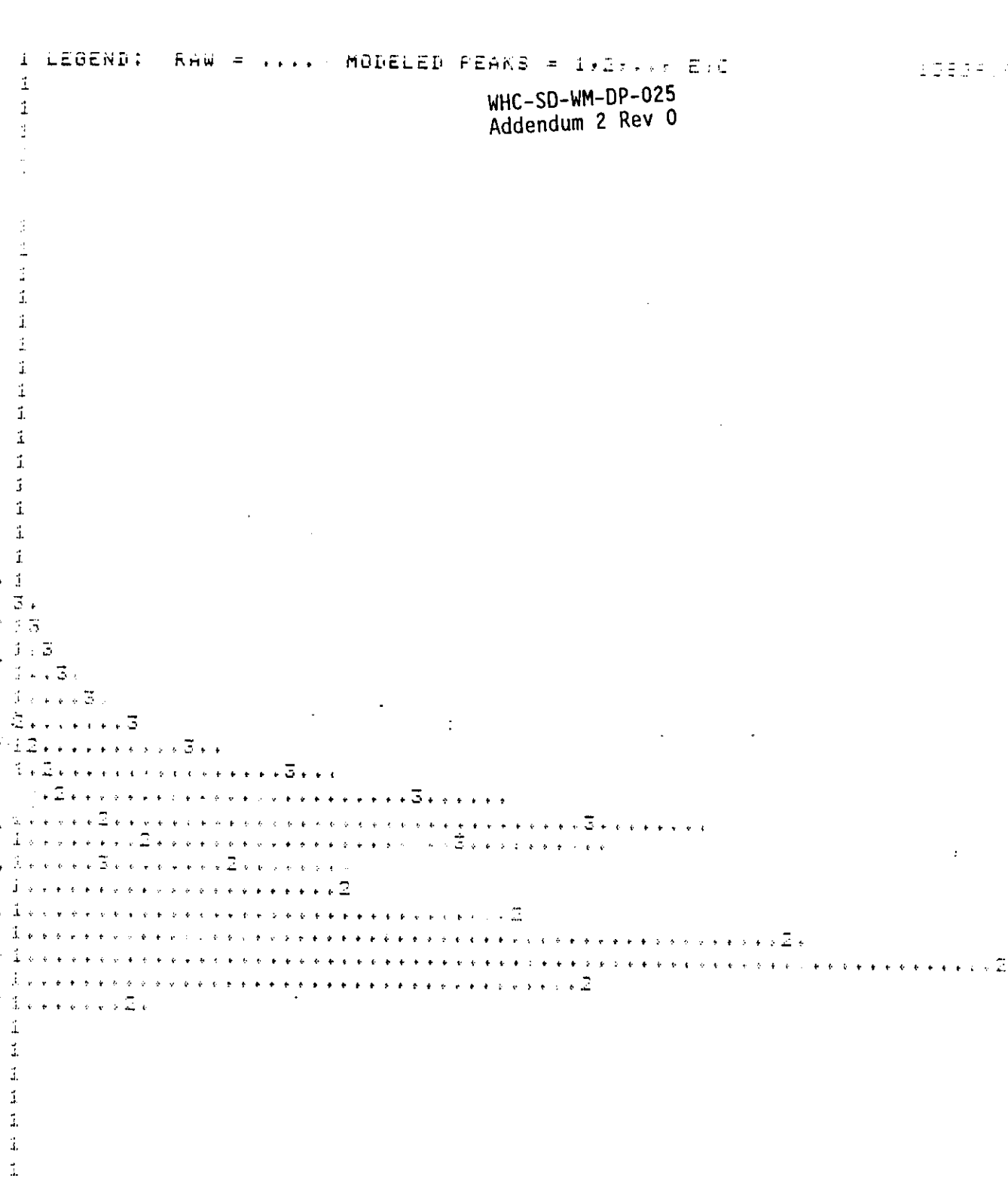

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Raw Data Dump for AEA Spectrum: SP:3D6146.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	7.	2.	1.	1.	1.
21	2.	5.	2.	1.	3.	3.	3.	1.	3.	3.
31	2.	2.	3.	6.	3.	4.	2.	1.	3.	3.
41	4.	2.	5.	1.	10.	2.	2.	3.	2.	3.
51	5.	7.	3.	5.	6.	5.	4.	6.	5.	4.
61	5.	5.	3.	8.	7.	12.	6.	2.	6.	5.
71	3.	6.	8.	7.	10.	2.	4.	12.	7.	4.
81	7.	11.	6.	8.	8.	9.	7.	3.	3.	12.
91	9.	10.	13.	14.	12.	10.	11.	8.	9.	11.
101	13.	14.	13.	4.	12.	9.	10.	9.	13.	9.
111	15.	17.	18.	10.	17.	22.	10.	21.	21.	12.
121	14.	11.	6.	23.	17.	30.	22.	15.	15.	17.
131	16.	17.	21.	13.	21.	23.	14.	24.	14.	27.
141	10.	26.	25.	25.	23.	44.	24.	38.	25.	42.
151	36.	31.	33.	35.	45.	34.	33.	32.	51.	50.
161	47.	39.	43.	38.	37.	54.	44.	32.	38.	51.
171	50.	44.	57.	60.	68.	64.	62.	62.	66.	82.
181	92.	66.	73.	78.	82.	97.	76.	87.	74.	91.
191	91.	93.	100.	106.	130.	105.	109.	131.	116.	121.
201	135.	168.	154.	170.	175.	169.	176.	171.	178.	197.
211	228.	216.	210.	230.	242.	253.	246.	271.	294.	327.
221	322.	369.	331.	371.	394.	405.	420.	447.	474.	496.
231	511.	574.	587.	646.	697.	720.	707.	786.	846.	872.
241	914.	959.	1027.	1074.	1128.	1166.	1210.	1234.	1331.	1421.
251	1466.	1413.	1639.	1381.	1656.	1386.	1360.	1383.	1267.	1113.
261	982.	878.	751.	666.	577.	594.	638.	633.	582.	562.
271	552.	562.	627.	647.	693.	687.	729.	743.	793.	884.
281	923.	996.	998.	1041.	1142.	1201.	1285.	1392.	1478.	1517.
291	1592.	1735.	1719.	1889.	1970.	2042.	2124.	2251.	2176.	2180.
301	2158.	2129.	1842.	1766.	1534.	1307.	1035.	899.	714.	580.
311	440.	320.	234.	201.	163.	96.	63.	64.	31.	31.
321	13.	3.	5.	3.	3.	1.	0.	2.	0.	4.
331	1.	0.	1.	1.	2.	0.	2.	4.	1.	1.
341	3.	0.	3.	3.	3.	3.	3.	5.	3.	4.
351	4.	4.	1.	7.	2.	3.	2.	3.	5.	3.
361	5.	4.	2.	3.	5.	1.	1.	2.	1.	2.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	2.	0.	0.	0.	0.	0.	0.	0.	2.
481	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9414-D682
File ID: SD7766.SPC

Counted on: 11/27/91 @15:0
Detector/Geometry number: 7/ 1
Count time: 50000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	[illegible] Initial	[illegible] Final
1	4.6	4.2	339.872	339.872	28.000	30.848	14.000	7.14E
2	72.2	29.8	300.284	300.284	12.000	2.000	6.000	0.200
3	1473.3	1493.2	203.597	203.597	28.000	30.281	14.000	5.02[illegible]

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/[illegible]
1	Pu236	0.0029	5.756	5.767	-0.011	0.15	0.14	1.00	0.451E-06
	Cm243		5.786	5.767	0.019				0.505E-06
2	Pu238	0.0252	5.499	5.487	0.012	0.01	1.19	11.88	0.335E-05
	Am241		5.480	5.487	-0.007				0.410E-05
3	Am243	0.9719	5.234	5.268	-0.034	0.14	45.85	3003.19	0.130E-02

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.462
Efficiency = 0.1338 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23417.0	100.000
Smoothed	23417.0	100.000
Composite fit	23588.2	100.731
Residuals	-171.2	-0.731

Analyzed by: _____
69049

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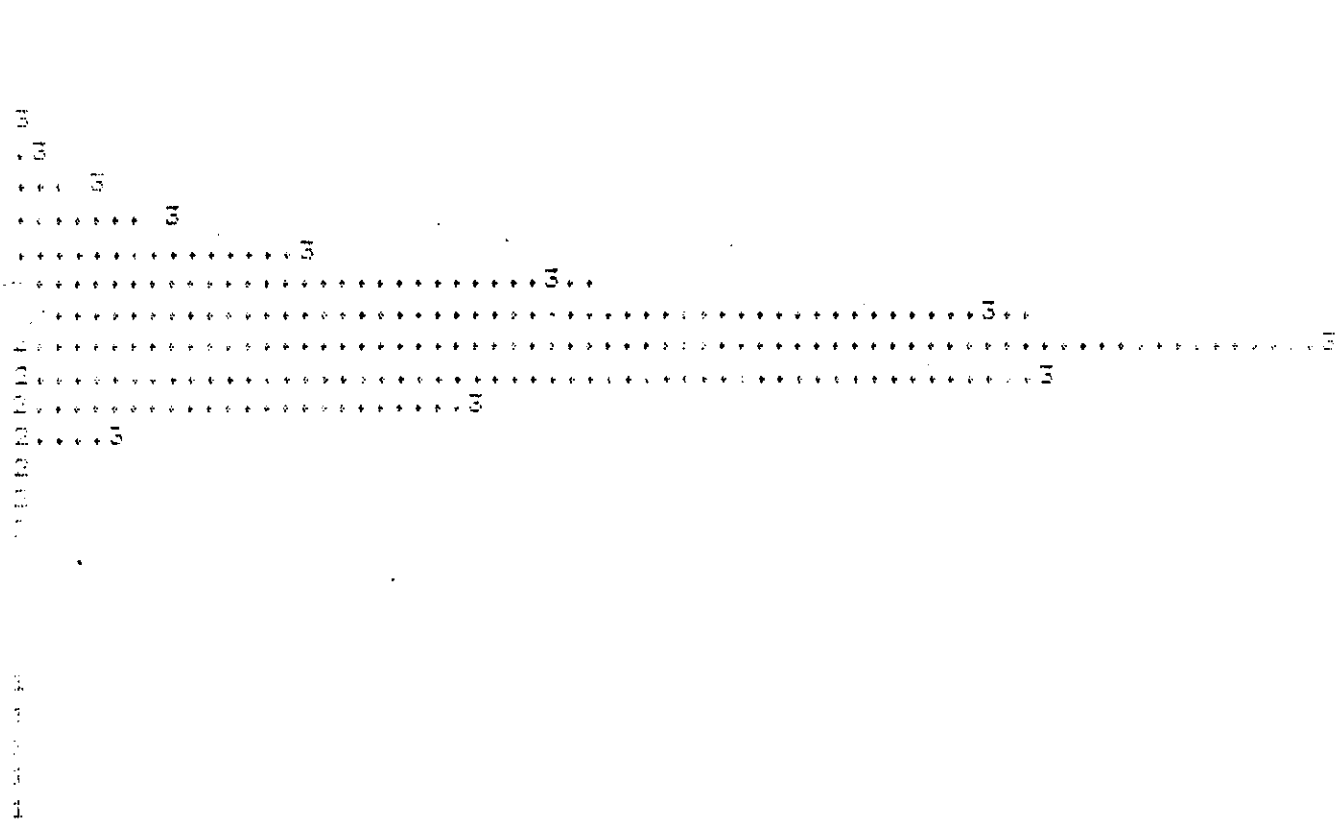

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Raw Data Dump for MEA Spectrum: 6F:SD77ee.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
11	0.	0.	0.	0.	1.	1.	1.	0.	3.	[illegible]
21	1.	0.	0.	3.	0.	1.	1.	0.	0.	[illegible]
31	1.	1.	2.	1.	1.	0.	0.	1.	1.	[illegible]
41	0.	0.	2.	0.	3.	3.	0.	0.	1.	[illegible]
51	1.	0.	0.	1.	1.	3.	1.	2.	0.	[illegible]
61	1.	0.	1.	0.	0.	2.	0.	0.	1.	[illegible]
71	1.	0.	1.	0.	2.	2.	1.	1.	0.	[illegible]
81	1.	0.	1.	2.	0.	0.	0.	1.	3.	0.
91	1.	0.	0.	0.	2.	0.	0.	1.	0.	2.
101	1.	1.	2.	1.	0.	1.	0.	1.	1.	2.
111	2.	2.	2.	0.	1.	2.	2.	2.	0.	[illegible]
121	2.	1.	1.	0.	1.	2.	2.	1.	2.	[illegible]
131	1.	0.	2.	1.	2.	0.	1.	3.	0.	[illegible]
141	2.	2.	0.	0.	1.	1.	2.	3.	3.	[illegible]
151	1.	3.	1.	0.	2.	1.	2.	3.	2.	[illegible]
161	3.	3.	1.	3.	5.	5.	3.	4.	1.	[illegible]
171	3.	5.	6.	6.	9.	6.	1.	6.	2.	10.
181	8.	10.	7.	6.	8.	12.	6.	5.	5.	5.
191	12.	4.	15.	13.	10.	23.	12.	23.	19.	18.
201	17.	23.	28.	22.	25.	23.	29.	34.	33.	46.
211	30.	36.	46.	51.	65.	62.	66.	71.	85.	83.
221	103.	93.	96.	115.	134.	158.	150.	190.	192.	231.
231	249.	259.	255.	297.	356.	333.	387.	433.	433.	471.
241	536.	537.	579.	618.	640.	689.	689.	680.	753.	795.
251	809.	728.	827.	755.	747.	701.	635.	610.	600.	716.
261	493.	464.	389.	330.	311.	252.	209.	183.	146.	171.
271	108.	82.	56.	46.	32.	48.	27.	24.	17.	9.
281	16.	13.	9.	13.	4.	7.	6.	10.	7.	3.
291	4.	6.	4.	7.	3.	4.	10.	11.	6.	10.
301	4.	4.	8.	9.	6.	6.	2.	7.	4.	2.
311	4.	2.	2.	2.	0.	1.	0.	4.	1.	0.
321	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	1.	0.	1.	1.	1.	0.	1.	2.
341	1.	2.	1.	1.	0.	1.	1.	1.	2.	2.
351	1.	3.	1.	2.	1.	3.	3.	1.	2.	6.
361	1.	0.	3.	0.	3.	2.	2.	1.	1.	1.
371	1.	0.	0.	0.	2.	1.	0.	0.	0.	1.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9401-5782
File ID: SD8956.SPC

Counted on: 11/27/91 @15: 0
Detector/Geometry number: 8/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	8.0	7.9	365.291	365.291	20.000	12.910	10.000	3.978
2	44.4	37.0	306.616	306.616	12.000	10.719	6.000	3.578
3	4326.1	4181.5	260.507	260.507	20.000	12.211	10.000	3.486
4	7.7	10.1	111.840	111.840	224.000	2.000	112.000	0.201
5	3.3	2.7	99.437	99.437	240.000	2.000	120.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/g
1	Pu238	0.0018	5.756	5.767	-0.011	0.06	0.18	0.32	0.233E
	Cm243		5.786	5.767	0.019				0.312E-06
2	Pu238	0.0075	5.499	5.491	0.008	0.05	0.72	2.88	0.130E-03
	Am241		5.480	5.491	-0.011				0.994E-06
3		0.9857		5.274		0.06	95.33	273.39	0.123E-03
4		0.0040		4.576		0.01	0.38	1.10	0.497E-06
5		0.0011		4.317		0.01	0.10	0.29	0.131E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.050 + (0.0047)*Channel
Energy range (MeV): 4.050 TO 6.456
Efficiency = 0.3467 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	50318.0	100.000
Smoothed	50318.0	100.000
Composite fit	48359.2	96.107
Residuals	1908.8	3.893

Analyzed by: _____
89049

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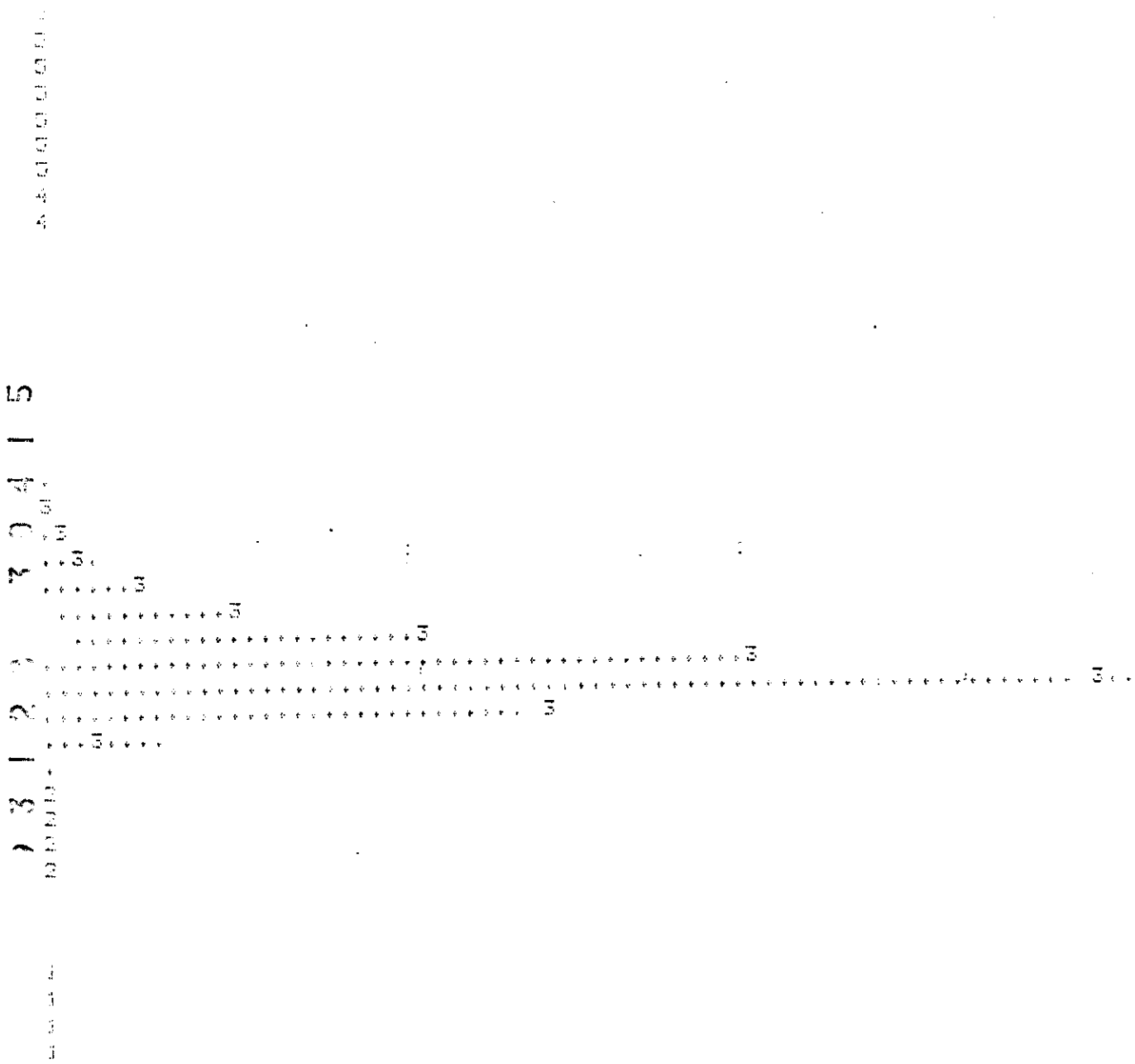

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Raw Data Dump for AEA Spectrum: SF:SD8956.SPC

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	1.	0.	0.
21	1.	0.	1.	0.	1.	0.	0.	1.	0.	0.
31	0.	1.	2.	0.	0.	2.	1.	0.	0.	2.
41	0.	1.	0.	1.	1.	0.	1.	0.	1.	0.
51	2.	1.	0.	1.	3.	2.	0.	0.	1.	1.
61	0.	2.	0.	0.	1.	0.	0.	0.	0.	1.
71	1.	0.	2.	2.	1.	1.	1.	0.	3.	1.
81	4.	1.	2.	0.	0.	1.	0.	2.	0.	2.
91	1.	1.	3.	4.	1.	2.	5.	4.	4.	2.
101	2.	1.	3.	2.	1.	3.	2.	2.	5.	1.
111	5.	3.	0.	3.	4.	3.	1.	0.	3.	1.
121	1.	6.	3.	2.	4.	5.	6.	2.	3.	4.
131	3.	3.	4.	4.	4.	8.	4.	3.	8.	7.
141	4.	4.	13.	7.	8.	7.	4.	10.	5.	5.
151	8.	7.	9.	8.	5.	8.	10.	6.	12.	11.
161	7.	6.	13.	11.	13.	14.	10.	14.	14.	17.
171	19.	11.	15.	18.	19.	14.	15.	16.	17.	27.
181	23.	15.	22.	26.	25.	24.	24.	33.	26.	35.
191	37.	26.	39.	31.	24.	39.	44.	39.	33.	56.
201	43.	57.	41.	51.	72.	64.	77.	59.	65.	65.
211	77.	85.	87.	87.	85.	103.	102.	141.	121.	139.
221	135.	157.	159.	198.	175.	168.	184.	233.	249.	276.
231	240.	296.	345.	371.	374.	411.	398.	450.	574.	531.
241	550.	630.	689.	755.	824.	870.	955.	1020.	1148.	1233.
251	1331.	1427.	1575.	1621.	1746.	1920.	2137.	2364.	2543.	2712.
261	2513.	2307.	1887.	1414.	982.	666.	503.	371.	368.	317.
271	297.	258.	232.	207.	175.	134.	91.	64.	21.	14.
281	6.	6.	3.	3.	3.	4.	1.	4.	4.	4.
291	10.	7.	7.	14.	10.	5.	10.	10.	8.	23.
301	17.	8.	20.	14.	24.	20.	23.	17.	13.	12.
311	7.	13.	4.	3.	1.	4.	2.	1.	2.	0.
321	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	0.	1.	1.	1.	1.	0.	2.	0.
341	1.	2.	2.	0.	1.	0.	0.	0.	0.	0.
351	2.	2.	0.	4.	4.	5.	4.	2.	4.	3.
361	4.	4.	4.	3.	4.	4.	7.	4.	3.	0.
371	2.	0.	1.	0.	1.	1.	1.	1.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
431	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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Raw Data Dump for AEA Spectrum: SP13D41E7.SPC

1	0.	0.	0.	0.	0.	1.	0.	0.	1.	1.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
21	0.	1.	1.	0.	0.	0.	0.	1.	1.	1.
31	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.
41	0.	0.	0.	0.	1.	0.	1.	1.	1.	
51	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
61	0.	0.	2.	0.	0.	0.	0.	0.	0.	
71	1.	0.	2.	1.	0.	2.	0.	0.	0.	1.
81	1.	0.	0.	1.	1.	0.	0.	1.	1.	1.
91	0.	2.	2.	1.	3.	2.	1.	2.	1.	0.
101	1.	2.	0.	2.	1.	3.	1.	0.	2.	2.
111	1.	0.	0.	4.	0.	4.	1.	2.	0.	1.
121	1.	0.	3.	1.	2.	1.	1.	2.	0.	3.
131	3.	3.	2.	1.	3.	2.	3.	3.	3.	1.
141	1.	1.	0.	3.	3.	5.	4.	3.	1.	0.
151	1.	4.	4.	1.	0.	0.	2.	3.	3.	1.
161	3.	3.	3.	3.	3.	0.	2.	3.	4.	3.
171	3.	3.	2.	2.	2.	5.	4.	3.	2.	1.
181	3.	3.	5.	4.	6.	3.	5.	7.	2.	4.
191	4.	6.	3.	9.	8.	9.	7.	7.	3.	3.
201	9.	8.	13.	9.	7.	8.	11.	9.	7.	5.
211	12.	11.	12.	11.	15.	3.	15.	23.	11.	22.
221	17.	19.	13.	14.	18.	25.	15.	19.	17.	20.
231	23.	31.	30.	28.	29.	31.	29.	30.	31.	33.
241	45.	48.	58.	53.	50.	67.	60.	83.	67.	73.
251	96.	91.	102.	117.	111.	127.	136.	124.	104.	147.
261	159.	139.	116.	83.	42.	52.	42.	40.	33.	41.
271	31.	39.	32.	30.	43.	26.	38.	46.	39.	32.
281	44.	48.	40.	41.	63.	73.	62.	57.	79.	82.
291	86.	106.	116.	116.	130.	136.	151.	167.	183.	193.
301	192.	223.	232.	218.	232.	194.	172.	145.	102.	84.
311	90.	45.	34.	34.	31.	21.	7.	8.	9.	1.
321	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	1.	1.	1.	0.	2.	2.	1.
351	2.	3.	0.	2.	3.	3.	2.	3.	1.	3.
361	2.	3.	3.	0.	0.	0.	2.	0.	1.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	1.	1.	1.	1.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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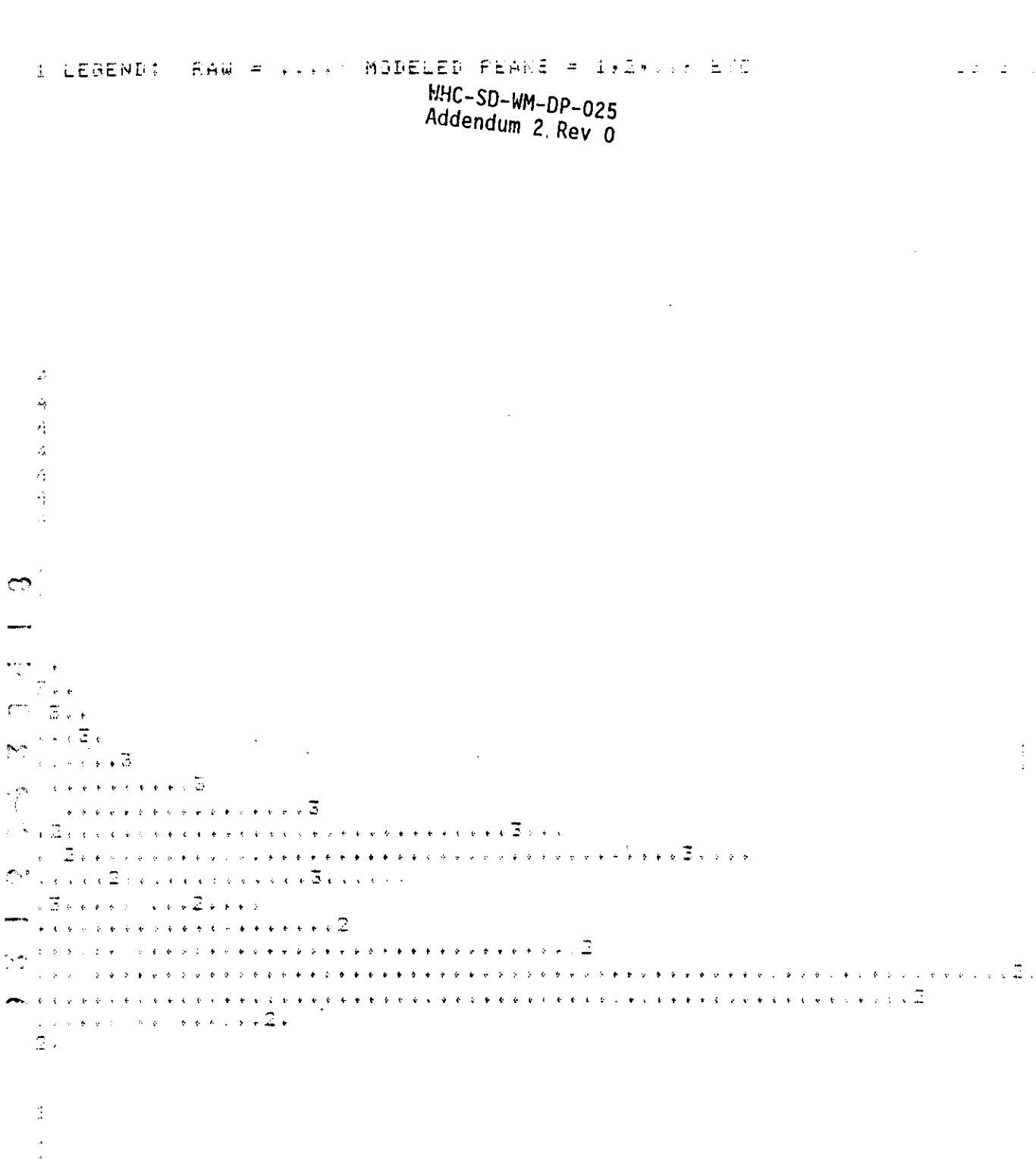

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G E N E R A L A L F H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
[illegible]
File ID: 3D4167.SPC

Counted on: 11/27/91 @191 0
Detector/Geometry number: 4/ 1
Count time: 40000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.5	4.5	359.207	359.207	80.000	13.017	10.000	4.316
2	396.0	391.3	304.327	304.327	24.000	13.687	12.000	3.688
3	247.1	242.4	260.133	260.133	90.000	11.626	10.000	[illegible]
4	5.6	4.7	147.046	147.046	180.000	2.000	90.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	c/m	Activity pCi/ml
1	Pu236	0.0060	5.706	5.749	0.007	0.06	0.10	0.77	0.347E-04
2	Pu238	0.3952	5.499	5.491	0.008	0.06	9.42	103.48	0.466E-04
	Am241		5.480	5.491	-0.011				0.337E-04
3		0.3872		5.283		0.03	6.13	48.[illegible]	0.218E-04
4		0.0115		4.751		0.01	0.18	1.44	0.648E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.060 + (0.0047)*Channel
Energy range (MeV): 1.060 TO 6.467
Efficiency = 0.1044 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8216.0	100.000
Smoothed	8215.3	99.992
Composite fit	7910.7	96.284
Residuals	304.6	3.708

Analyzed by: _____
MAC

BEST AVAILABLE COPY

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9403-5882
File ID: SD2389.SPC

Counted on: 11/28/91 @ 4: 0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	134.8	130.0	301.421	301.421	24.000	17.432	12.000	7.255
2	80.5	78.0	256.078	256.078	24.000	15.958	12.000	6.199

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ea
1	Pu238	0.6279	5.499	5.502	-0.003	0.08	2.87	17.77	0.800E-05
	Am241		5.480	5.502	-0.022				0.613E-05
2		0.3721		5.288		0.08	1.70	7.58	0.341E-05

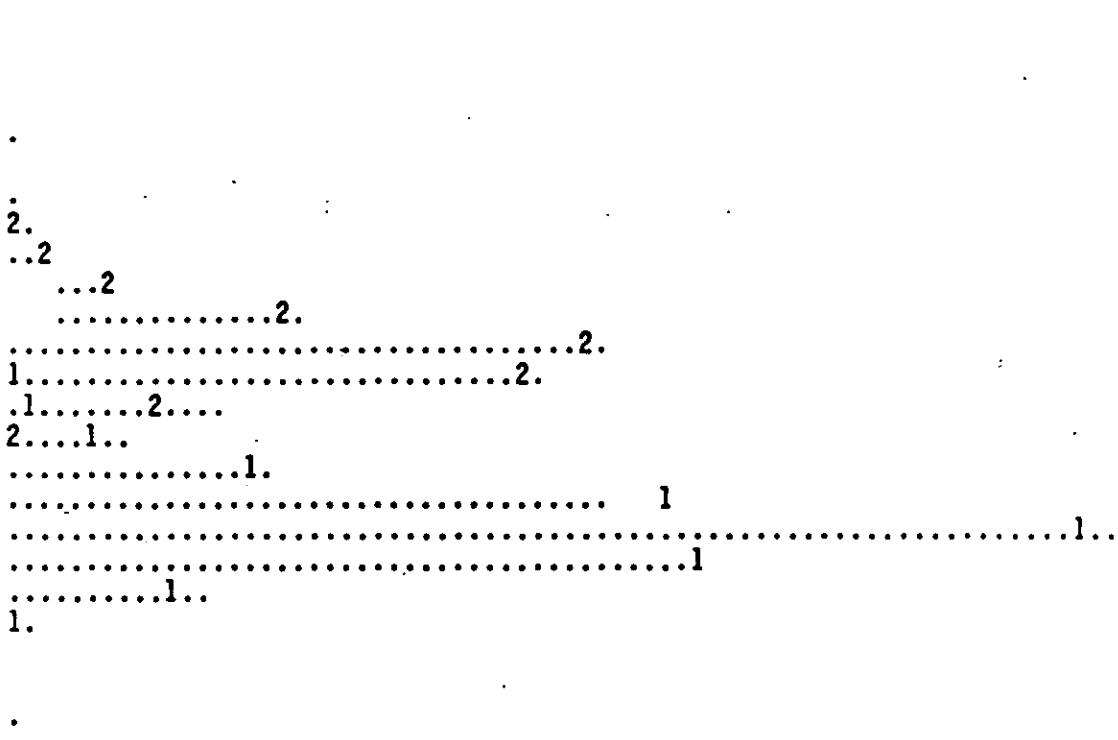
DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0047)*Channel
Energy range (MeV): 4.085 TO 6.491
Efficiency = 0.2247 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	2445.0	100.000
Smoothed	2444.9	99.996
Composite fit	2288.9	93.617
Residuals	156.0	6.379

Analyzed by: _____
62820



Data Dump for AEA Spectrum: SP:SD2389.SPC

1	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	2.	0.
91	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
101	1.	1.	1.	0.	0.	0.	1.	0.	0.	1.
111	0.	0.	0.	1.	0.	1.	1.	0.	0.	1.
121	3.	0.	1.	1.	0.	0.	0.	1.	1.	1.
131	1.	0.	0.	0.	0.	0.	1.	2.	0.	1.
141	0.	0.	0.	2.	0.	1.	0.	1.	1.	1.
151	0.	0.	2.	0.	2.	1.	0.	0.	0.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
171	0.	0.	0.	0.	0.	0.	3.	3.	0.	2.
181	0.	0.	0.	2.	1.	0.	0.	1.	1.	0.
191	2.	1.	2.	0.	3.	1.	0.	1.	0.	1.
201	1.	3.	0.	0.	1.	0.	1.	1.	1.	0.
211	1.	4.	0.	1.	4.	1.	4.	0.	3.	4.
221	1.	3.	1.	2.	2.	4.	3.	1.	5.	6.
231	2.	5.	4.	7.	7.	6.	4.	7.	13.	10.
[illegible]	16.	11.	22.	20.	18.	23.	29.	32.	30.	35.
[illegible]	33.	31.	52.	54.	47.	47.	43.	28.	36.	30.
261	21.	22.	20.	13.	21.	9.	6.	4.	9.	7.
271	7.	6.	8.	4.	7.	6.	6.	6.	11.	8.
281	11.	11.	14.	23.	22.	23.	20.	25.	32.	32.
291	29.	37.	42.	44.	58.	46.	74.	82.	76.	92.
301	75.	67.	63.	63.	38.	42.	48.	28.	32.	24.
311	18.	20.	8.	8.	9.	4.	4.	3.	2.	4.
321	4.	0.	1.	0.	0.	0.	0.	3.	0.	0.
331	0.	0.	2.	0.	0.	0.	0.	1.	0.	0.
341	0.	3.	0.	0.	2.	0.	3.	0.	2.	2.
351	0.	1.	0.	1.	2.	0.	1.	1.	0.	1.
361	1.	0.	1.	0.	0.	1.	0.	0.	1.	0.
371	0.	0.	1.	1.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	1.	0.	0.	1.	0.	1.
431	1.	1.	1.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	1.	0.	1.
461	0.	0.	0.	1.	0.	0.	0.	0.	1.	2.
471	0.	0.	1.	3.	1.	0.	0.	0.	0.	1.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.								

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9401	Customer ID: 2291-1-2
Analysis: ARSENIC	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-355-131/B-0
Technologist: D. R. JACKSON	Date: 7-08-91
Starting Time: 7:45	Temperature: N/A
Ending Time: 11:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5595	11		
2	REAGENT BLANK	R9400-5695	12		
3	SAMPLE 2291-1-2	R9401-5795	13		
4	FINAL LMCS CHECK STD	R9405-5595	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
LMCS CHECK STD	119B38-E/0.5 mL			N/A
SPIKE	119B38-E/0.25 mL			N/A

A-6000-881 (03/92)

ARSENIC ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

Sample No	Sample Point	Date	Time Issued	Priority
R 9399-5595	102AW	6-14-91	11:1	26

Determination	Method/Standard	Result Units	Charge Code	Results
As	LA-355-131	% RECOVERY	WIHED	0

Sample Size: 50 ng (.500 ml)
Customer ID: BID

Remarks, Calculations, Results:
EDP R741 AS/HYDRD
STDN 119838-C RESULT
STD VAL %REC
1.016
99.9%
49.928 / .500 = .9.99e-2 / 100e-1

Analyst-1: 6C275
Date: 7-8-91

Sample No	Sample Point	Date	Time Issued	Priority
R 9400-5695	102AW	6-14-91	11:2	26

Determination	Method/Standard	Result Units	Charge Code	Results
As	LA-355-131	UG/G	WIHED	0

Sample Size: 1 ml
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
0.000
<5ng / 1000 = <5.00 e-3 ppm

Analyst-1: 6C275
Date: 7-8-91

Sample No	Sample Point	Date	Time Issued	Priority
R 9401-5795	102AW	6-14-91	11:3	26

Determination	Method/Standard	Result Units	Charge Code	Results
As	LA-355-131	UG/G	WIHED	0

Sample Size: .025 ml
Customer ID: 2791-1-2

Remarks, Calculations, Results:
0.742
36.224ng / 25 ml = 1.45 ppm

Analyst-1: 6C275
Date: 7-8-91

Sample No	Sample Point	Date	Time Issued	Priority
R 9405-5895	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Results
As	LA-355-131	% RECOVERY	WIHED	0

Sample Size: 50 ng (.500 ml)
Customer ID: BID

Remarks, Calculations, Results:
EDP R741 AS/HYDRD
STDN 119838-C RESULT
STD VAL %REC
1.195
111.8%
58.88 ng / 500 ml = 1.118e-1 / 100e-1

Analyst-1: 6C275
Date: 7-8-91

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte: As

Procedure:	LA-355-131	Revision:	B-0		
Instrument:	PERKIN-ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	7-08-91

Calibration Standard: 118B38-E
Analyte Concentration: .1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.0000	0.00	0.000
2	0.2000 mL	20.00 ng	0.438
3	0.4000 mL	40.00 ng	0.820
4	0.1000 mL	100.00 ng	2.012
5			
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Comments:

A-6000-882 (03/92)

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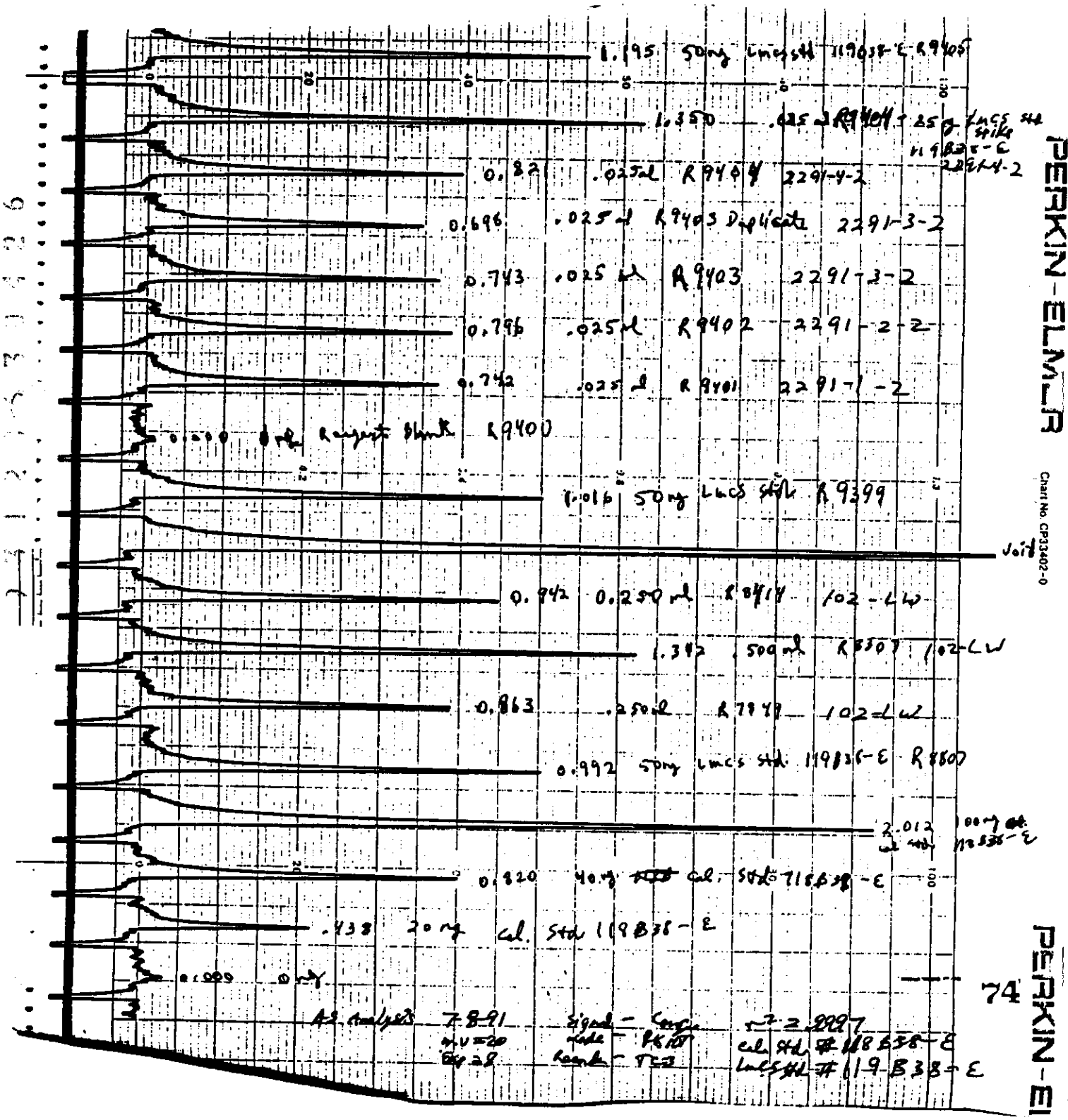

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9401	Customer ID: 2291-1-2
Analysis: MERCURY	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-325-102/A-2
Technologist: D. R. JACKSON	Date: 7-29-91
Starting Time: 7:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5597	11		
2	REAGENT BLANK	R9400-5697	12		
3	SAMPLE 2291-1-2	R9401-5797	13		
4	FINAL LMCS CHECK STD	R9405-5597	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
LMCS CHECK STD	123B38-B/2.0 mL			2.0 mL
SPIKE	123B38-B/1.0 mL			N/A

A-6000-881 (03/92)

MERCURY ANALYSIS - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9399.-559	102AW	6-14-91	11: 1	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 2.0 ml
Customer ID: SID.

Remarks, Calculations, Results:
EDP R/16 HG/HYDRD
STDN 123838-B RESULT 1.09E-1
STD VAL 1.00E-1 %REC 109.070
0.538
217.49 / 2000 =

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed	Laboratory Mgr		

Sample No	Sample Point	Date	Time Issued	Priority
R 9400.-569	102AW	6-14-91	11: 2	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
0.010
<5 / 1000 = <5.00E-3 PPM

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed	Laboratory Mgr		

Sample No	Sample Point	Date	Time Issued	Priority
R 9401.-579	102AW	6-14-91	11: 3	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: 2291-1-2

Remarks, Calculations, Results:
0.002
<5 / 1000 = <5.00E-3 PPM

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed	Laboratory Mgr		

Sample No	Sample Point	Date	Time Issued	Priority
R 9405.-599	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 2.0 ml
Customer ID: SID

Remarks, Calculations, Results:
EDP R/16 HG/HYDRD
STDN 123838-B RESULT 1.07E-1
STD VAL 1.00E-1 %REC 107.070
0.530
214.08 / 2000

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed	Laboratory Mgr		

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Hg				
Procedure:	LA-325-102	Revision:	A-2		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	7-29-91

Calibration Standard: 122B38-C
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.00	0.00	0.000
2	1.00 mL	100.00 ng	0.270
3	2.00 mL	200.00 ng	0.540
4	4.00 mL	400.00 ng	0.943
5			
6			
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Comments:

A-6000-882 (03/92)

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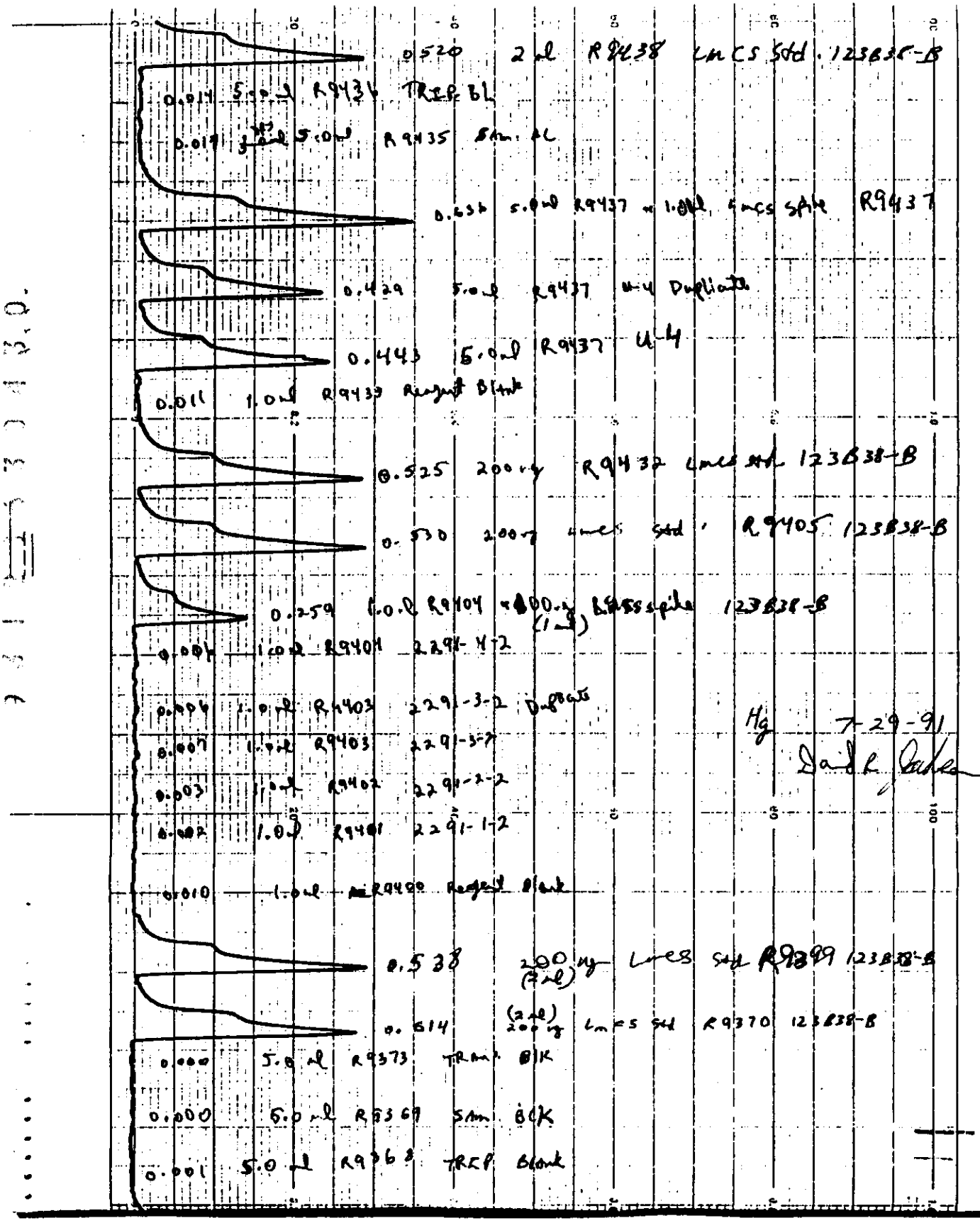

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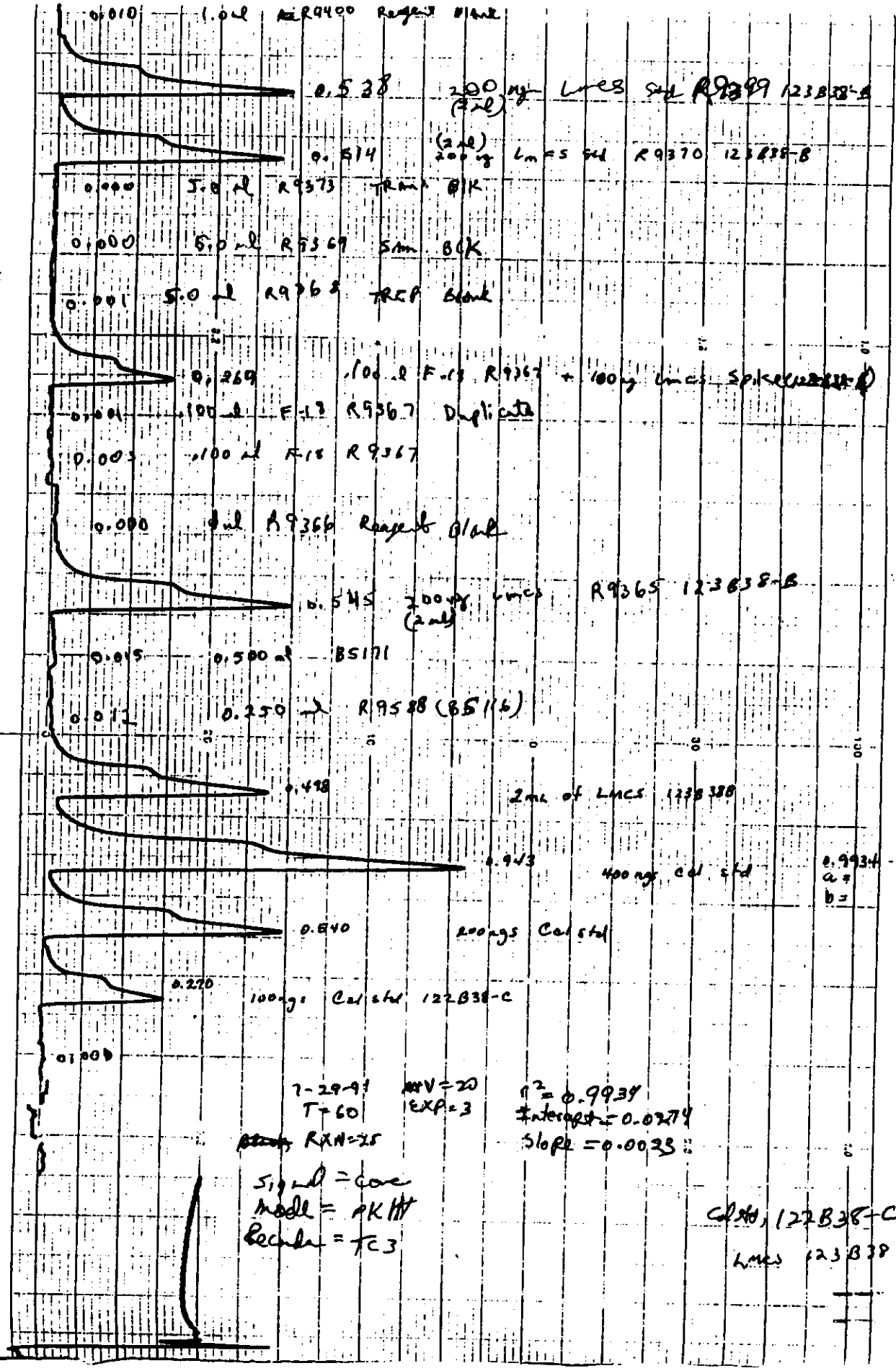

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9401	Customer ID: 2291-1-2
Analysis: SELENIUM	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-365-131/B-0
Technologist: D. R. JACKSON	Date: 9-17-91
Starting Time: 13:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5596	11		
2	REAGENT BLANK	R9400-5696	12		
3	SAMPLE 2291-1-2	R9401-5796	13		
4	FINAL LMCS CHECK STD	R9405-5596	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
LMCS CHECK STD	125B38-A/0.5 mL			N/A
SPIKE	125B38-A/0.5 mL			N/A

A-6000-881 (03/92)

SELENIUM ANALYSIS - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9399.-5596	102AW	6-14-91	11: 1	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	W1DEO	0

Sample Size: ? .500 ml (50 µg) — Customer ID: STD

Remarks, Calculations, Results:
EDF R/43 SE/HYDRD
STDH/25818-A RESULT 9.82E-2
STD VAL %REC 98.240
0.9000 49.099 / 500

Analyst-1: 6C275 — Analyst-2: — Analyst-3: — Analyst-4: RKFuller
Date: 9-17-91 — Time Completed: — Lab Director:

Sample No	Sample Point	Date	Time Issued	Priority
R 9400.-5696	102AW	6-14-91	11: 2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	W1DEO	0

Sample Size: ? 1.0 ml — Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
-0.023
<5 / 1000 = <5.00E-3 ppm

Analyst-1: 6C275 — Analyst-2: — Analyst-3: — Analyst-4: RKFuller
Date: 9-17-91 — Time Completed: — Lab Director:

Sample No	Sample Point	Date	Time Issued	Priority
R 9401.-5796	102AW	6-14-91	11: 3	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	W1DEO	0

Sample Size: ? 1.0 ml 100 ml 9-17-91 — Customer ID: 2291-1-2

Remarks, Calculations, Results:
-0.012
<5 / 1000 = <5.00E-3 ppm

Analyst-1: 6C275 — Analyst-2: — Analyst-3: — Analyst-4: RKFuller
Date: 9-17-91 — Time Completed: — Lab Director:

Sample No	Sample Point	Date	Time Issued	Priority
R 9405.-5596	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	W1DEO	0

Sample Size: ? .500 ml (50 µg) — Customer ID: STD

Remarks, Calculations, Results:
EDF R/43 SE/HYDRD
STDH/25818-A RESULT 8.91E-2
STD VAL %REC 89.170
0.820 44.54 / 500 =

Analyst-1: 6C275 — Analyst-2: — Analyst-3: — Analyst-4: — Analyst-5:
Date: 9-17-91 — Time Completed: — Lab Director:

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Se		
Procedure:	LA-365-131	Revision:	B-0
Instrument:	PERKIN ELMER	Property No.:	WA77479
Technologist:	D. R. JACKSON	Payroll No.:	6C275
Date:	9-17-91		

Calibration Standard: 124B38A
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.000	0.00	0.000
2	0.200 mL	20.00 ng	0.394
3	0.400 mL	40.00 ng	0.790
4	1.000 mL	100.00 ng	1.775
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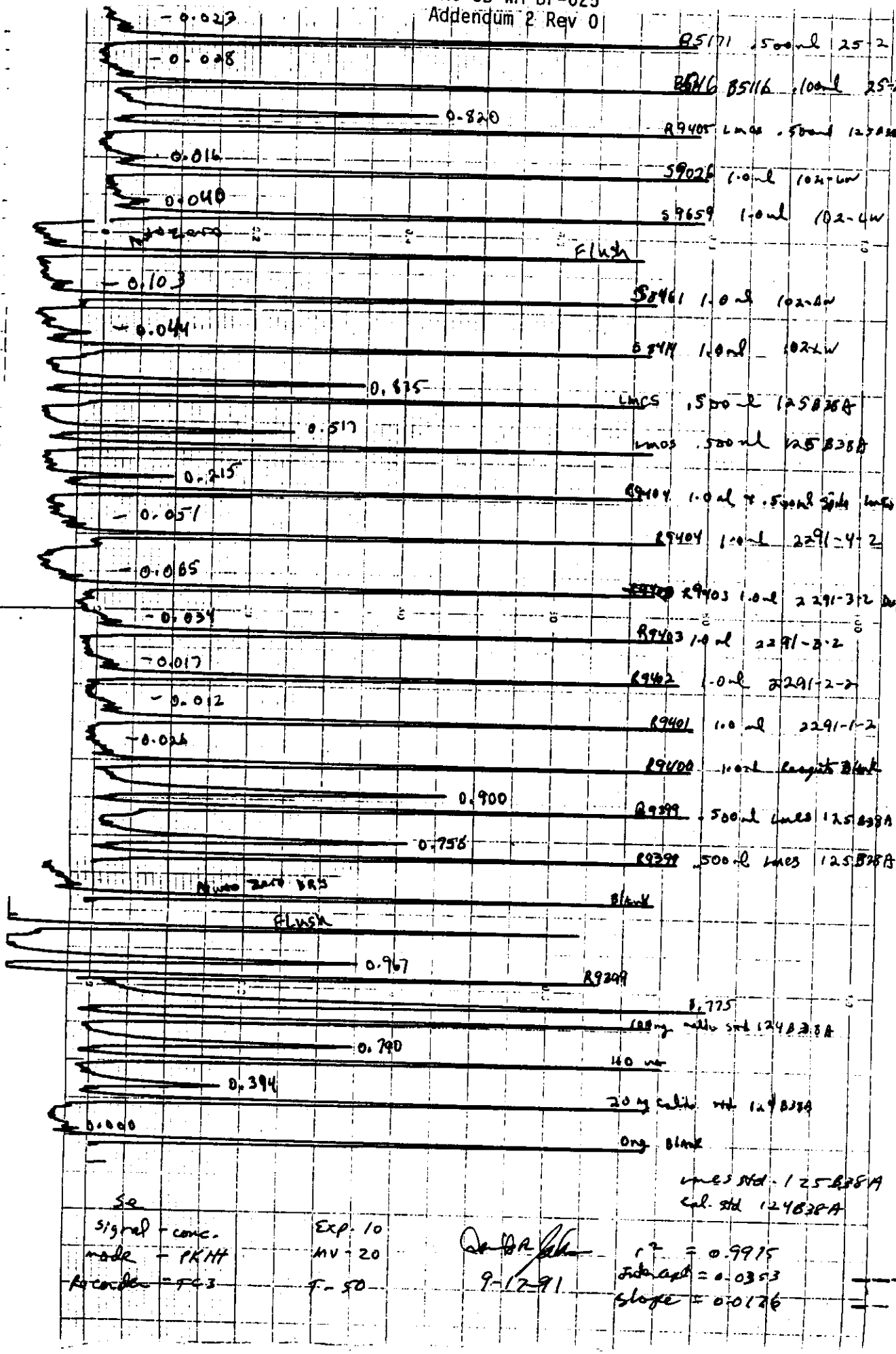
Comments:

A-6000-882 (03/9



PERKIN-ELMER
PERKIN-ELMER

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9402	Customer ID: 2291-2-2
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 6-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-2	R9401-5000	11		
2	SAMPLE 2-2	R9402-5000	12		
3	SAMPLE 3-2	R9403-5000	13		
4	SAMPLE 4-2	R9404-5000	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
N/A				N/A

A-6000-881 (03/92)

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Issued	Priority
R 9401:-5000	102AW	6-14-91	11:4	26

Determination	Method Reagent	Result Units	Charge Code	Results
APPEAR	12-3/4-01		WIDEO	0

Sample Size: Y

Customer ID: 2291-1-2

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Initials	Initials	Initials	Initials	Initials
Date 6/14/91	Time Completed	Lab Chief		

Sample No	Sample Point	Date	Time Issued	Priority
R 9402:-5000	102AW	6-14-91	11:5	26

Determination	Method Reagent	Result Units	Charge Code	Results
APPEAR	12-3/4-01 5-11-91		WIDEO	0

Sample Size: Y

Customer ID: 2291-1-2

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Initials	Initials	Initials	Initials	Initials
Date 6/14/91	Time Completed	Lab Chief		

Sample No	Sample Point	Date	Time Issued	Priority
R 9403:-5000	102AW	6-14-91	11:11	26

Determination	Method Reagent	Result Units	Charge Code	Results
APPEAR	12-3/4-01 5-11-91		WIDEO	0

Sample Size: Y

Customer ID: 2291

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity clear
some solids settled
on vial bottom

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Initials	Initials	Initials	Initials	Initials
Date 6/14/91	Time Completed	Lab Chief		

Sample No	Sample Point	Date	Time Issued	Priority
R 9404:-5000	102AW	6-14-91	11:11	26

Determination	Method Reagent	Result Units	Charge Code	Results
APPEAR	12-3/4-01 5/11		WIDEO	0

Sample Size: Y

Customer ID: 2291

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-1m
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity clear
solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Initials	Initials	Initials	Initials	Initials
Date 6/14/91	Time Completed	Lab Chief		

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9402	Customer ID: 2291-2-2
Analysis: AMERICIUM 241	Sample Prep: UNDIGESTED

Instrument: WB57237	Procedure/Rev: LA-503-156/C-3
Technologist: M. BIERMAN	Date: 11-25-91
Starting Time: N/A	Temperature: 25degC
Ending Time: N/A	Chemist: S. CATLOW

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9413-5582	11		
2	REAGENT BLANK	R9414-5682	12		
3	SAMPLE 2291-2-2	R9402-5782	13		
4	FINAL LMCS CHECK STD	R9419-5582	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
LMCS CHECK STD	43B43/0.1 mL			N/A
SAMPLES RERUN.				

A-6000-881 (03/92)

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

4.2 .6146

Serial No	Sample Point	Date	Time Issued	Priority
R 9413.-5582	102AW	6-14-91	13: 8	26
Determination	Method/Standard	Result Units	Charge Code	Remarks
AM241	LA-503-156	% RECOVERY	W1BEU	4
Sample Size			Customer ID	
.100-10-1 ml	RERUN		STD	

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

EDF R201 AK001

STD#43843 RESULT 3.74E'

STD VAL 3.14E' %REC 119.140

Am243(18843) .100 ml

0.1 ml in 8M HNO3 (over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69549			
Hrs	Hrs	Hrs	Hrs	Hrs
1.5				
Date	Time Completed	Date Entered		
11/25/91				

#3 11-27-91 AJ R9413-5582

$\frac{2302}{5} - 10$

$\frac{(6123)(2.274E^{-3})(.1)(1000)(101)}{.3759} =$

4.3 7766

Serial No	Sample Point	Date	Time Issued	Priority
R 9414.-5682	102AW	6-14-91	13:11	26
Determination	Method/Standard	Result Units	Charge Code	Remarks
AM241	LA-503-156	uCi/G	W1BEU	4
Sample Size			Customer ID	
? 0 - 1	RERUN		REG. BL	

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

REAGENT BLANK

COUNT AS uCI/L

Am243(18843) .100 ml

1 ml 8M HNO3

<1.17E^{-2} uci/g (over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69549			
Hrs	Hrs	Hrs	Hrs	Hrs
1.5				
Date	Time Completed	Date Entered		
11/25/91				

#1 11-27-91 AJ R9414-5682

$\frac{810}{5} - 8$

$\frac{(<.05)(2.274E^{-3})(.1)(1000)(1)}{.9719} =$

3.2 2367 Entered computer R9402

Serial No	Sample Point	Date	Time Issued	Priority
R 9402.-5782	102AW	6-14-91	11: 5	26
Determination	Method/Standard	Result Units	Charge Code	Remarks
AM241	LA-503-156	uCi/L	W1BIC	1
Sample Size			Customer ID	
? .500 ml	RERUN		2291-2-2	

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

COUNT AS uCI/L

Am243(18843) .100 ml

.500 ml HNO3

<2.37E uci/L

$\frac{(<.05)(2.274E^{-3})(.1)(1000)(2)}{.9614} =$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69549			
Hrs	Hrs	Hrs	Hrs	Hrs
1.5				
Date	Time Completed	Date Entered		
11/25/91				

#2 11-27-91 AJ R9402-5782

$\frac{577}{5} - 14$

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

6-14-91				
		RECOVERY		
100-10-1-1	RERUN			

"AEA" - 480MIN
ATTACH PRINTOUT

WIUM 43845 RESULT 3.53E1
WTD VAL 3.14E1 DATE 112.4190
Am242(16845) 100-1

Solution FAHNO

66559				
MCB				
11/25/91				

#1 11-27-91 #9 R9419-5582

$\frac{359}{5}$ -8

$$\frac{(5953)(2.274E^{-3})(.1)(1000)(101)}{.3872}$$

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

WHC-SD-WM-DP-025
Addendum 2 Rev 0

DATA REDUCTION REPORT

SAMPLE
R9413-3582
File ID: SD6146.SPC

Counted on: 11/27/91 @15: 0
Detector/Geometry number: 6/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	7.1	6.8	360.363	360.363	24.000	17.233	12.000	0.000
2	4084.1	4131.6	300.280	300.280	24.000	18.223	12.000	3.397
3	2517.1	2581.1	255.520	255.520	20.000	12.802	10.000	2.196

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ml
1	Pu236	0.0118	5.756	5.764	-0.008	0.08	2.49	13.41	0.604E-05
2	Pu238	0.6123	5.499	5.481	0.018	0.09	129.67	919.37	0.426E-03
	Am241		5.480	5.481	-0.001				0.328E-03
3	Am243	0.3759	5.234	5.271	-0.037	0.06	79.60	3814.83	0.172E-02

DETECTOR CALIBRATION
Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.1877 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	107229.0	100.000
Smoothed	107229.0	100.000
Composite fit	105863.3	98.745
Residuals	1341.8	1.254

Analyzed by: _____
69549

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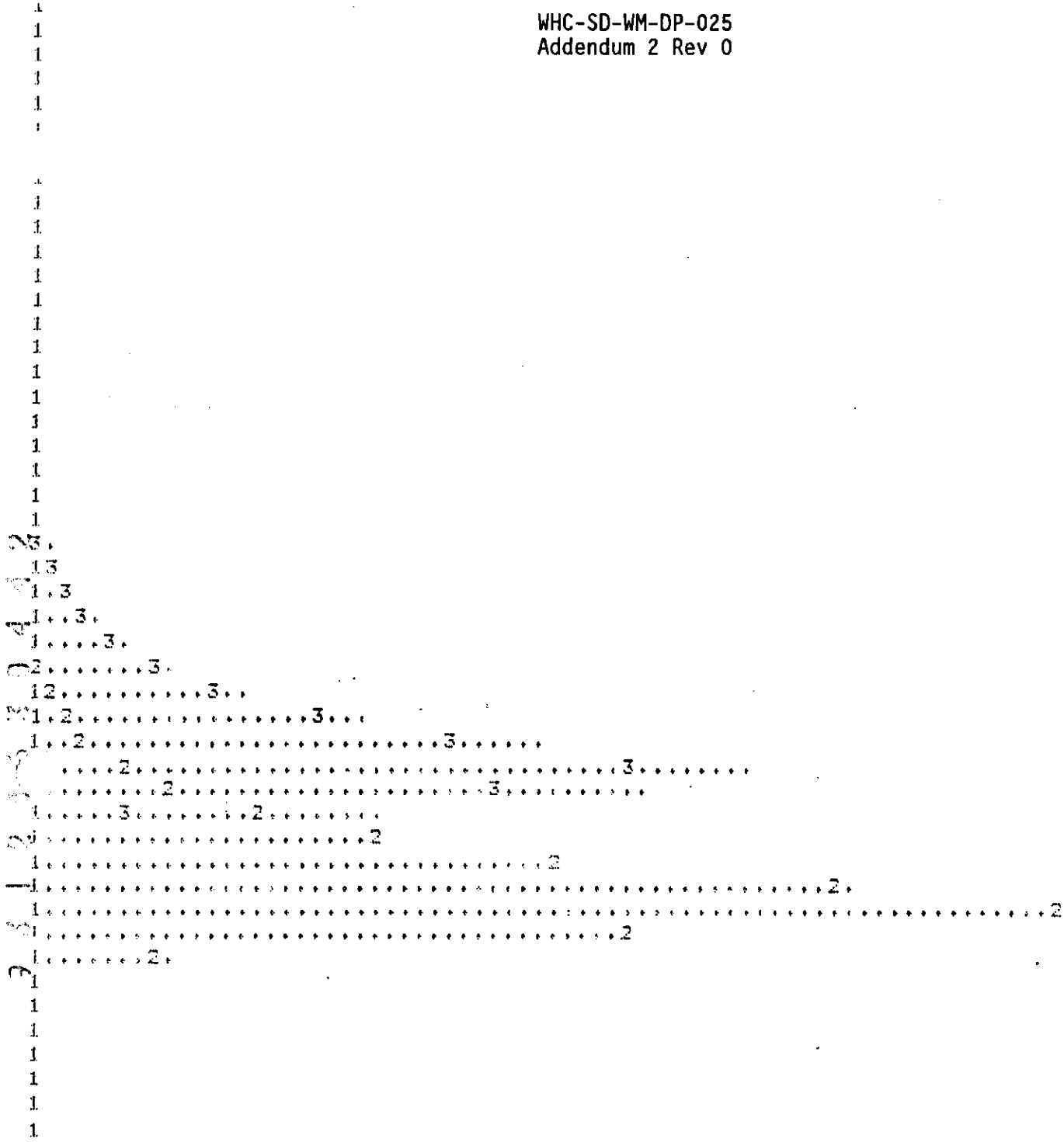

BEST AVAILABLE COPY

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	2.	2.	1.	2.
21	2.	5.	2.	1.	3.	3.	3.	2.	3.	6.
31	3.	2.	3.	6.	3.	4.	2.	2.	3.	3.
41	4.	2.	5.	1.	10.	2.	2.	3.	2.	3.
51	5.	7.	3.	5.	6.	6.	4.	6.	9.	4.
61	6.	5.	3.	8.	7.	12.	6.	2.	6.	5.
71	3.	6.	8.	7.	10.	3.	4.	12.	7.	4.
81	7.	11.	6.	8.	8.	9.	7.	5.	3.	12.
91	9.	10.	13.	14.	12.	10.	11.	8.	9.	11.
101	13.	14.	13.	4.	12.	9.	10.	9.	13.	9.
111	13.	17.	18.	10.	17.	22.	10.	21.	21.	12.
121	14.	11.	8.	23.	17.	30.	22.	13.	15.	17.
131	16.	17.	21.	13.	21.	23.	14.	24.	14.	27.
141	10.	26.	25.	25.	23.	44.	24.	38.	26.	42.
151	36.	31.	33.	35.	45.	34.	33.	32.	51.	50.
161	47.	39.	43.	38.	37.	54.	44.	52.	56.	51.
171	50.	44.	57.	60.	68.	64.	62.	62.	66.	62.
181	92.	66.	73.	78.	82.	97.	76.	87.	74.	91.
191	91.	93.	100.	106.	130.	105.	109.	131.	116.	121.
201	135.	188.	154.	170.	175.	169.	176.	171.	198.	197.
211	228.	216.	215.	235.	242.	253.	246.	271.	294.	327.
221	322.	369.	351.	371.	394.	405.	420.	447.	474.	496.
231	511.	574.	587.	646.	697.	720.	707.	786.	846.	892.
241	914.	959.	1027.	1074.	1128.	1166.	1215.	1234.	1331.	1431.
251	1466.	1418.	1659.	1381.	1656.	1586.	1560.	1383.	1267.	1113.
261	982.	878.	751.	688.	577.	594.	538.	533.	582.	562.
271	552.	583.	627.	647.	683.	687.	729.	743.	793.	884.
281	923.	996.	998.	1041.	1142.	1201.	1285.	1392.	1498.	1517.
291	1592.	1735.	1719.	1889.	1970.	2042.	2124.	2251.	2176.	2189.
301	2158.	2129.	1842.	1766.	1534.	1307.	1035.	899.	714.	580.
1	440.	320.	234.	201.	163.	96.	65.	64.	31.	21.
321	13.	3.	5.	3.	3.	1.	0.	2.	0.	4.
331	1.	0.	1.	1.	2.	0.	2.	4.	1.	1.
341	5.	0.	3.	5.	3.	3.	3.	5.	3.	4.
351	4.	4.	1.	7.	2.	3.	2.	3.	5.	3.
361	5.	4.	2.	3.	5.	1.	1.	2.	1.	2.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	2.	0.	0.	0.	0.	0.	0.	0.	2.
481	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

WHC-SD-WM-DP-025
Addendum 2 Rev 0

DATA REDUCTION REPORT

SAMPLE
R9414-3682
File ID: SD7766.SPC

Counted on: 11/27/91 @13: 0
Detector/Geometry number: 7/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.6	4.2	359.872	359.872	28.000	30.848	14.000	7.145
2	72.2	29.8	300.284	300.284	12.000	2.000	6.000	0.200
3	1473.3	1493.2	233.597	233.597	28.000	30.281	14.000	8.021

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/cc
1	Pu236	0.0029	5.756	5.767	-0.011	0.15	0.14	1.00	0.451E-06
	Cm243		5.786	5.767	0.019				0.603E-06
2	Pu238	0.0252	5.499	5.487	0.012	0.01	1.19	11.88	0.535E-[illegible]
	Am241		5.480	5.487	-0.007				0.410E [illegible]
3	Am243	0.9719	5.234	5.268	-0.034	0.14	45.85	3003.19	0.135E-02

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.482
Efficiency = 0.1308 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23417.0	100.000
Smoothed	23417.0	100.000
Composite fit	23588.2	100.731
Residuals	-171.2	-0.731

Analyzed by: _____
69549

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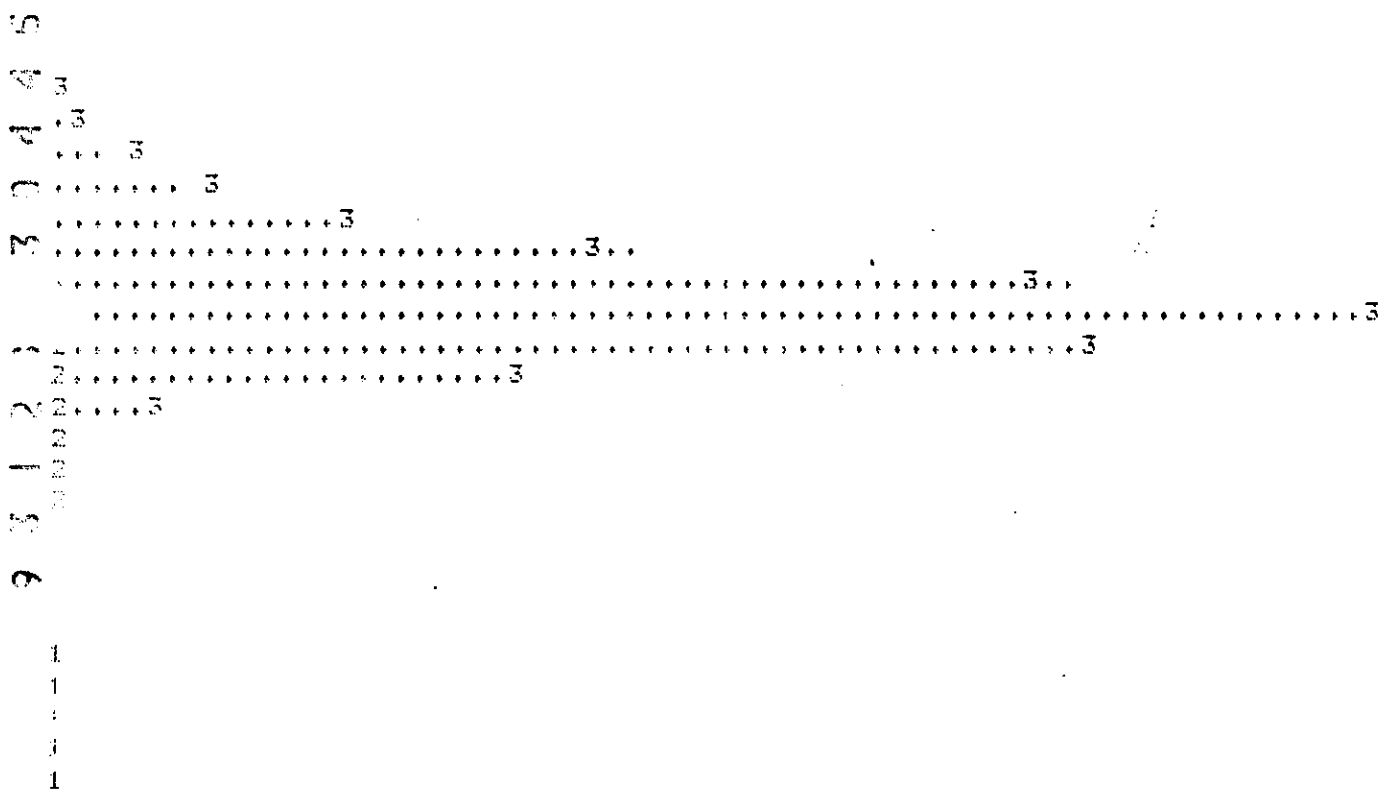

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1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
21	1.	0.	0.	3.	0.	0.	0.	1.	3.	1.
31	1.	1.	2.	1.	1.	1.	0.	0.	0.	0.
41	0.	0.	2.	0.	3.	3.	0.	0.	1.	0.
51	1.	0.	0.	1.	1.	3.	1.	2.	0.	0.
61	1.	0.	1.	0.	0.	2.	0.	0.	1.	1.
71	1.	0.	1.	0.	2.	2.	1.	1.	0.	2.
81	1.	0.	1.	2.	0.	0.	0.	1.	3.	0.
91	1.	0.	0.	0.	2.	0.	0.	1.	0.	2.
101	1.	1.	2.	1.	0.	1.	0.	1.	1.	2.
111	2.	2.	2.	0.	1.	2.	2.	2.	0.	5.
121	2.	1.	1.	0.	1.	2.	2.	1.	2.	2.
131	1.	0.	2.	1.	2.	0.	1.	3.	0.	3.
141	2.	2.	0.	0.	1.	1.	2.	3.	3.	2.
151	1.	3.	1.	0.	2.	1.	2.	3.	2.	2.
161	3.	3.	1.	3.	5.	3.	3.	4.	2.	8.
171	3.	5.	6.	6.	9.	6.	1.	6.	2.	10.
181	8.	10.	7.	6.	8.	12.	6.	5.	5.	5.
191	12.	4.	15.	13.	10.	23.	12.	25.	19.	16.
201	17.	23.	28.	22.	25.	23.	29.	34.	35.	46.
211	30.	36.	46.	51.	65.	62.	66.	71.	85.	83.
221	103.	93.	96.	115.	134.	158.	150.	190.	192.	231.
231	249.	259.	255.	297.	356.	333.	387.	433.	463.	451.
241	536.	537.	579.	618.	645.	689.	689.	680.	753.	795.
251	809.	728.	827.	755.	747.	701.	633.	640.	600.	516.
261	493.	464.	389.	330.	311.	252.	209.	185.	146.	121.
271	108.	82.	56.	46.	32.	48.	27.	24.	17.	9.
281	6.	13.	9.	13.	4.	7.	6.	10.	7.	3.
291	4.	6.	4.	7.	3.	4.	10.	11.	6.	10.
301	4.	4.	8.	9.	6.	6.	2.	7.	4.	2.
1	4.	2.	2.	2.	0.	1.	0.	4.	1.	0.
321	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	1.	0.	1.	1.	1.	0.	1.	2.
341	1.	2.	1.	1.	0.	1.	1.	1.	2.	2.
351	1.	3.	1.	2.	1.	3.	3.	1.	2.	6.
361	1.	0.	3.	0.	3.	2.	2.	1.	1.	1.
371	1.	0.	0.	0.	2.	1.	0.	0.	0.	1.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
RF402-0783
File ID: 930387.SPC

Counted on: 11/27/91 @19:0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	89.4	60.3	256.434	256.454	12.000	2.000	6.000	0.200
2	1413.0	1450.4	254.668	254.668	24.000	16.881	12.000	[illegible]
3	6.1	6.2	154.480	154.480	36.000	72.635	18.000	[illegible]

PEAK RESULTS

Peak ID	Isotope	AREA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	c/m	Activity uCi/cc
1	Am241	0.0301	0.480	0.478	0.002	0.01	1.21	0.71	0.257E-0[illegible]
2		0.9614		5.252		0.09	38.52	171.44	0.772E-0[illegible]
3	Np237	0.0086	4.761	4.811	-0.050	0.34	0.34	1.[illegible]5	0.790E-0[illegible]

DETECTOR CALIBRATION
Energy(MEV) = 4.085 + (0.0047)*Channel
Energy range (MeV): 4.085 TO 6.491
Efficiency = 0.2217 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	20072.0	100.000
Smoothed	20071.4	99.997
Composite fit	20033.3	99.817
Residuals	38.1	0.190

Analyzed by: .....
MAC

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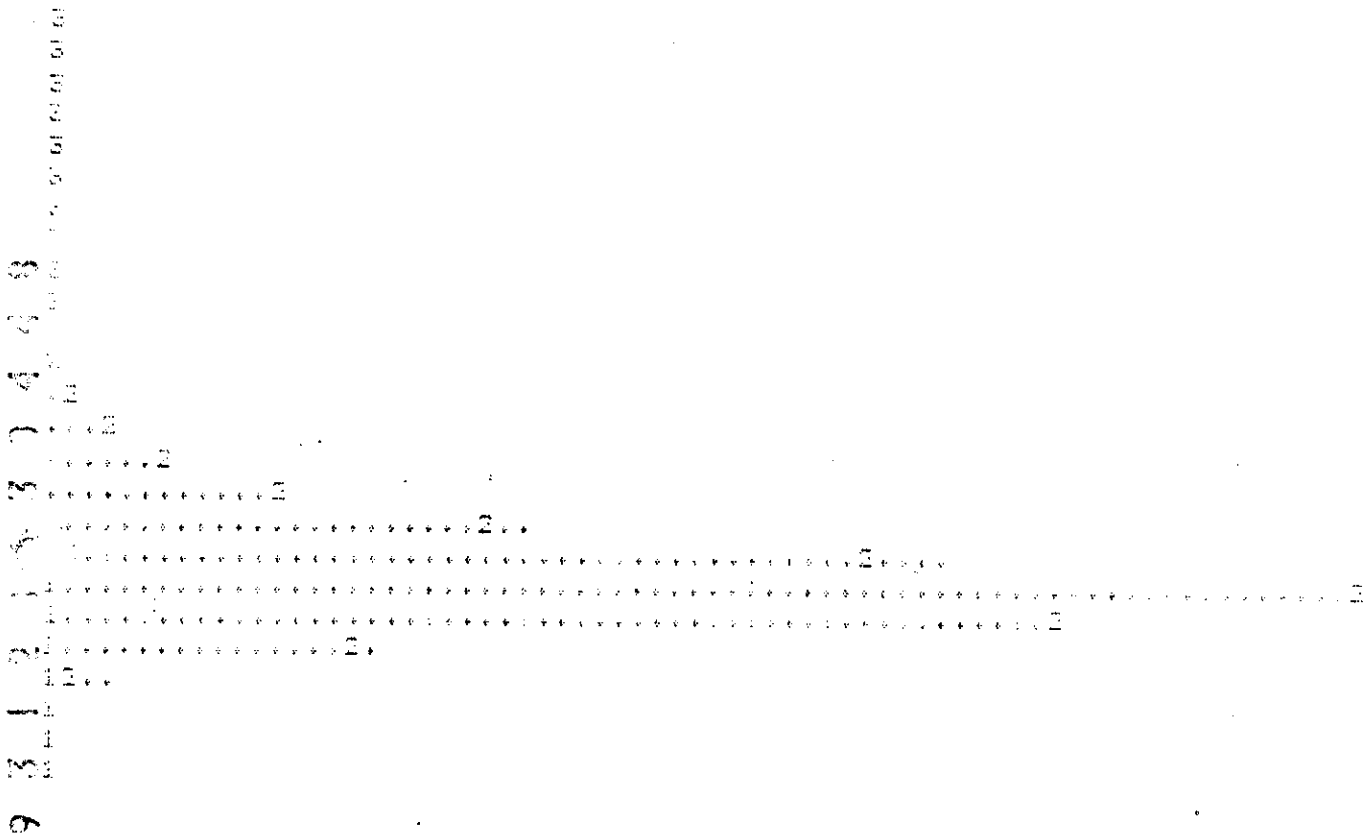
1 LEGEND: RAW = ... MODELED FRAME = 1,2,... ETC



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Raw Data Dump for AEA Spectrum: SP:SD2387.SPC

1	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
11	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
21	1.	1.	1.	0.	0.	0.	1.	0.	0.	0.
31	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
41	1.	0.	1.	1.	1.	0.	0.	0.	1.	0.
51	0.	1.	0.	0.	1.	1.	1.	1.	0.	0.
61	1.	2.	0.	0.	0.	0.	1.	1.	2.	0.
71	1.	1.	1.	0.	0.	1.	0.	0.	1.	1.
81	0.	0.	1.	1.	0.	0.	2.	2.	0.	0.
91	1.	1.	0.	0.	0.	0.	1.	0.	3.	1.
101	1.	2.	2.	0.	0.	2.	0.	1.	1.	3.
111	2.	2.	1.	1.	3.	1.	0.	1.	1.	1.
121	2.	0.	1.	1.	1.	1.	2.	2.	2.	3.
131	2.	3.	3.	2.	1.	1.	1.	2.	0.	1.
141	2.	5.	2.	3.	4.	6.	2.	3.	7.	7.
151	1.	6.	5.	9.	2.	7.	1.	4.	2.	4.
161	6.	2.	4.	4.	2.	6.	1.	7.	5.	1.
171	4.	3.	4.	6.	8.	3.	4.	8.	6.	2.
181	6.	5.	7.	5.	7.	6.	6.	18.	11.	16.
191	13.	9.	11.	13.	17.	14.	11.	16.	13.	23.
201	17.	17.	24.	21.	28.	24.	28.	25.	38.	38.
211	45.	42.	39.	39.	57.	56.	59.	52.	63.	63.
221	77.	80.	77.	94.	108.	114.	103.	135.	150.	125.
231	172.	201.	197.	239.	255.	280.	308.	310.	390.	340.
241	399.	411.	482.	506.	564.	597.	622.	677.	633.	730.
251	702.	772.	748.	753.	806.	716.	687.	658.	510.	508.
261	392.	329.	283.	229.	175.	154.	109.	90.	72.	58.
271	45.	30.	31.	33.	22.	18.	16.	12.	10.	3.
281	11.	7.	4.	6.	6.	7.	11.	7.	3.	8.
291	14.	13.	5.	10.	8.	9.	12.	12.	5.	13.
1	3.	8.	8.	8.	14.	9.	8.	6.	4.	4.
311	2.	3.	1.	2.	0.	0.	1.	0.	0.	0.
321	2.	1.	0.	1.	0.	0.	1.	0.	0.	0.
331	0.	1.	0.	2.	0.	1.	0.	1.	0.	1.
341	1.	2.	2.	0.	0.	2.	0.	0.	2.	2.
351	2.	1.	0.	5.	6.	3.	0.	2.	1.	3.
361	0.	5.	2.	1.	1.	2.	1.	1.	0.	1.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	1.	0.	0.	0.	1.	1.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
421	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	1.	0.	2.	0.
471	0.	0.	1.	0.	0.	1.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
F9417-5382
File ID: SD4167.SPC

Counted on: 11/27/91 @19: 0
Detector/Geometry number: 4/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.5	4.5	359.257	359.257	20.000	13.017	10.000	4.510
2	396.0	391.3	304.327	304.327	24.000	13.627	12.000	3.68[illegible]
3	247.1	242.4	260.133	260.133	20.000	11.626	10.000	[illegible]
4	5.6	4.7	147.046	147.046	180.000	2.000	90.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Peak Centroid Obs.	Peak Centroid Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/[illegible]
1	Pu236	0.0060	5.756	5.749	0.007	0.06	0.10	0.77	0.347E
2	Pu238	0.5952	5.499	5.491	0.008	0.06	9.42	103.48	0.46[illegible]E-[illegible]
	Am241		5.480	5.491	-0.011				0.337E-[illegible]
3		0.3872		5.283		0.03	6.13	46.47	0.218E-[illegible]
4		0.0113		4.751		0.01	0.18	1.44	0.648E-[illegible]

DETECTOR CALIBRATION

Energy(MEV) = 4.060 + (0.0047)*Channel
Energy range (MeV): 1.060 TO 6.467
Efficiency: 0.1944 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8216.0	100.000
Smoothed	8215.3	99.992
Composite fit	7910.7	96.284
Residuals	304.6	3.708

Analyzed by: _____
MAC

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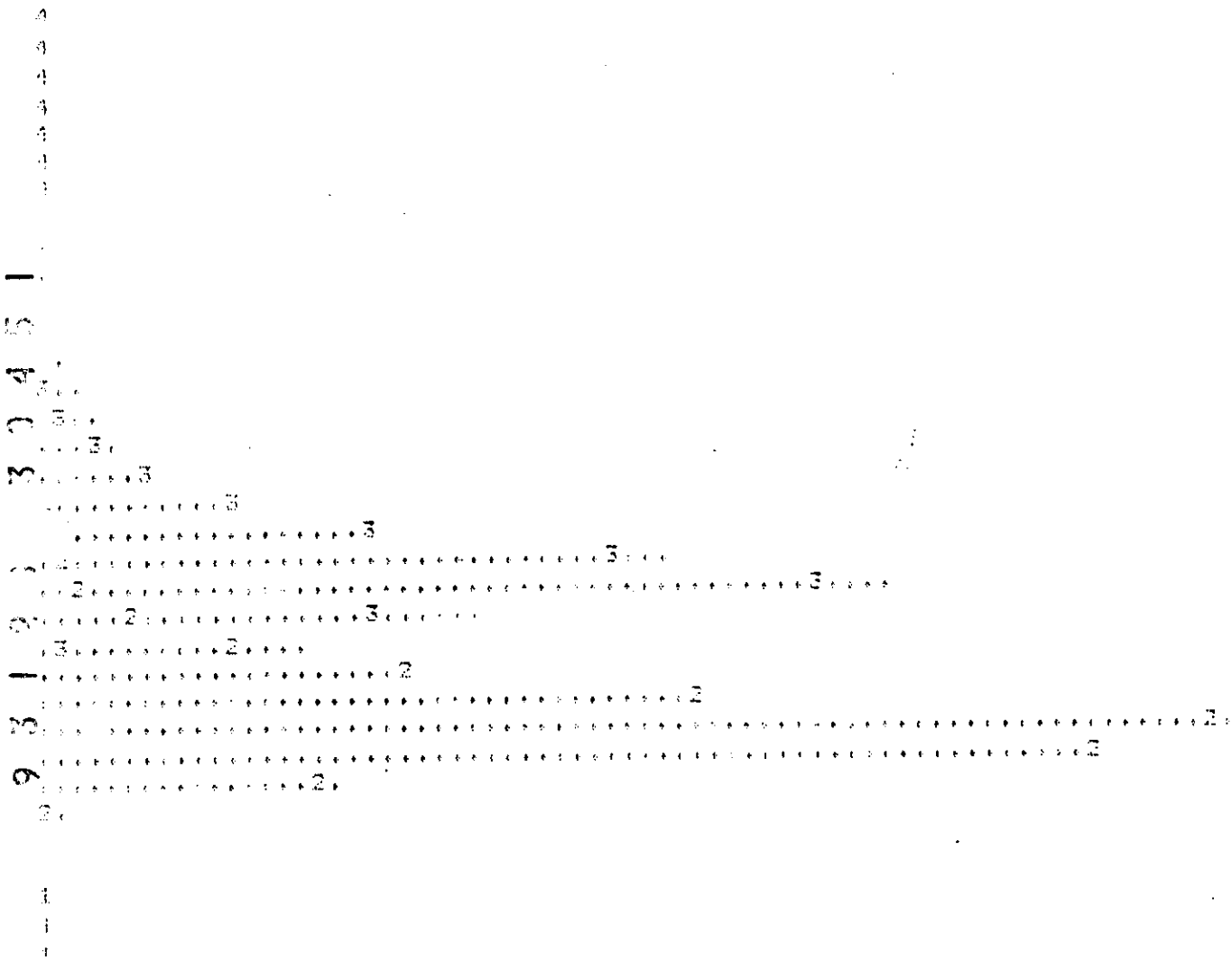

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Raw Data Dump for AEA Spectrum: SP:SD4167.SPC

1	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	0.	2.
21	0.	1.	1.	0.	0.	0.	0.	1.	1.	1.
31	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
51	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
61	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
71	1.	0.	2.	1.	0.	2.	0.	0.	0.	3.
81	1.	0.	0.	1.	1.	0.	0.	1.	1.	1.
91	0.	2.	2.	1.	3.	2.	1.	2.	1.	0.
101	1.	2.	0.	2.	1.	3.	1.	4.	2.	3.
111	1.	0.	0.	4.	0.	4.	1.	2.	0.	0.
121	1.	0.	3.	1.	2.	1.	1.	2.	0.	3.
131	3.	3.	2.	1.	3.	2.	3.	3.	3.	1.
141	1.	1.	0.	3.	3.	5.	4.	3.	1.	0.
151	1.	4.	4.	1.	0.	0.	2.	3.	3.	1.
161	5.	3.	3.	5.	3.	0.	2.	3.	4.	6.
171	6.	3.	2.	2.	2.	5.	4.	6.	3.	7.
181	5.	5.	5.	6.	6.	3.	5.	7.	2.	4.
191	4.	6.	5.	9.	8.	9.	7.	7.	3.	8.
201	9.	8.	13.	9.	7.	8.	11.	9.	7.	9.
211	12.	11.	12.	11.	13.	3.	13.	23.	11.	13.
221	17.	19.	13.	14.	18.	25.	15.	19.	17.	20.
231	23.	31.	30.	28.	29.	31.	29.	35.	31.	38.
241	45.	48.	58.	53.	50.	67.	60.	63.	69.	98.
251	96.	91.	102.	117.	111.	127.	136.	124.	146.	147.
261	159.	139.	116.	83.	62.	52.	42.	40.	33.	41.
271	31.	38.	38.	30.	43.	26.	38.	46.	35.	33.
281	44.	48.	40.	41.	83.	73.	62.	97.	79.	82.
291	86.	108.	116.	116.	130.	136.	151.	167.	153.	198.
	192.	223.	233.	218.	232.	194.	172.	143.	108.	84.
311	90.	48.	34.	34.	31.	21.	7.	8.	9.	1.
321	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	1.	1.	1.	0.	2.	2.	1.
351	2.	3.	0.	2.	3.	3.	2.	3.	1.	3.
361	2.	3.	3.	0.	0.	0.	2.	0.	1.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	1.	1.	1.	1.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9403-5882
File ID: SD2389.SPC

Counted on: 11/28/91 @ 4: 0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	134.8	130.0	301.421	301.421	24.000	17.432	12.000	7.255
2	80.5	78.0	256.078	256.078	24.000	15.958	12.000	6.199

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ea
1	Pu238	0.6279	5.499	5.502	-0.003	0.08	2.87	17.77	0.800E-05
	Am241		5.480	5.502	-0.022				0.613E-05
2		0.3721		5.288		0.08	1.70	7.58	0.341E-05

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0047)*Channel
Energy range (MeV): 4.085 TO 6.491
Efficiency = 0.2247 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	2445.0	100.000
Smoothed	2444.9	99.996
Composite fit	2288.9	93.617
Residuals	156.0	6.379

Analyzed by: _____
62820

SPECTRUM SD2389.SPC

1 LEGEND: RAW = ... MODELED PEAKS = 1,2,.., ETC 512.4

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1..............................2.
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Raw Data Dump for AEA Spectrum: SP:SD2389.SPC

1	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	2.	0.
91	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
101	1.	1.	1.	0.	0.	0.	1.	0.	0.	1.
111	0.	0.	0.	1.	0.	1.	1.	0.	0.	1.
121	3.	0.	1.	1.	0.	0.	0.	1.	1.	1.
131	1.	0.	0.	0.	0.	0.	1.	2.	0.	1.
141	0.	0.	0.	2.	0.	1.	0.	1.	1.	1.
151	0.	0.	2.	0.	2.	1.	0.	0.	0.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
171	0.	0.	0.	0.	0.	0.	3.	3.	0.	2.
181	0.	0.	0.	2.	1.	0.	0.	1.	1.	0.
191	2.	1.	2.	0.	3.	1.	0.	1.	0.	1.
201	1.	3.	0.	0.	1.	0.	1.	1.	1.	0.
211	1.	4.	0.	1.	4.	1.	4.	0.	3.	4.
221	1.	3.	1.	2.	2.	4.	3.	1.	5.	6.
231	2.	5.	4.	7.	7.	6.	4.	7.	13.	10.
241	16.	11.	22.	20.	18.	23.	29.	32.	30.	35.
251	33.	31.	52.	54.	47.	47.	43.	28.	36.	30.
261	21.	22.	20.	13.	21.	9.	6.	4.	9.	7.
271	7.	6.	8.	4.	7.	6.	6.	6.	11.	8.
281	11.	11.	14.	23.	22.	23.	20.	25.	32.	32.
291	29.	37.	42.	44.	58.	46.	74.	82.	76.	92.
301	75.	67.	63.	63.	38.	42.	48.	28.	32.	24.
311	18.	20.	8.	8.	9.	4.	4.	3.	2.	4.
321	4.	0.	1.	0.	0.	0.	0.	3.	0.	0.
331	0.	0.	2.	0.	0.	0.	0.	1.	0.	0.
341	0.	3.	0.	0.	2.	0.	3.	0.	2.	2.
351	0.	1.	0.	1.	2.	0.	1.	1.	0.	1.
361	1.	0.	1.	0.	0.	1.	0.	0.	1.	0.
371	0.	0.	1.	1.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	1.	0.	0.	1.	0.	1.
431	1.	1.	1.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	1.	0.	1.
461	0.	0.	0.	1.	0.	0.	0.	0.	1.	2.
471	0.	0.	1.	3.	1.	0.	0.	0.	0.	1.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9402	Customer ID: 2291-2-2
Analysis: ARSENIC	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-355-131/B-0
Technologist: D. R. JACKSON	Date: 7-08-91
Starting Time: 7:45	Temperature: N/A
Ending Time: 11:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5595	11		
2	REAGENT BLANK	R9400-5695	12		
3	SAMPLE 2291-2-2	R9402-5795	13		
4	FINAL LMCS CHECK STD	R9405-5595	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
LMCS CHECK STD	119B38-E/0.5 mL			N/A

A-6000-881 (03/92)

ARSENIC ANALYSIS - UNDIGESTED SAMPLE

EDP K/91 AS/HYDRID
STDN/M238-C REGULT
STD VOL SHED
1.016

99.9%

49.928 / .500 = 9.99e-2 / 1.00e-1

6C275
7-9-91

REGRESS BLANK
0.000

< 5ng / 1000 = < 5.00 E-3 ppm

6C275
7-9-91

0.796

38.925ng / 25 ml = 1.557 ppm

6C275
7-9-91

EDP K/91 AS/HYDRID
STDN/M238-C REGULT
STD VOL SHED
1.195

111.8%

58.88ng / 500 ml = 1.118e-1 / 1.00e-1

6C275
7-9-91

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	As		
Procedure:	LA-355-131	Revision:	B-0
Instrument:	PERKIN-ELMER	Property No.:	WA77479
Technologist:	D. R. JACKSON	Payroll No.: 6C275	Date: 7-08-91

Calibration Standard: 118B38-E
Analyte Concentration: .1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.0000	0.00	0.000
2	0.2000 mL	20.00 ng	0.438
3	0.4000 mL	40.00 ng	0.820
4	0.1000 mL	100.00 ng	2.012
5			
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Comments:

A-6000-882 (03/92)

WHC-SD-WM-DP-025
Addendum 2 Rev 0

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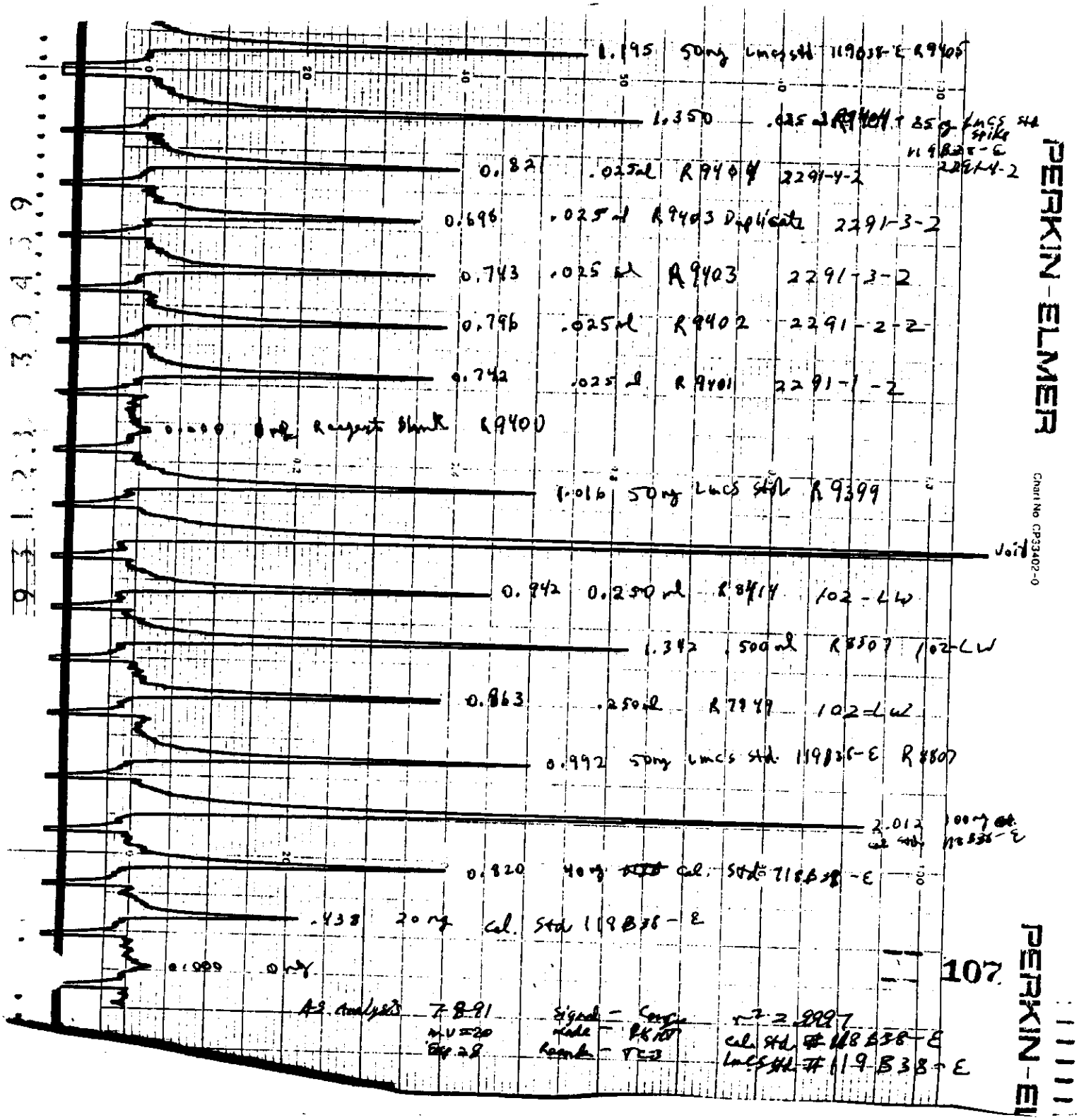

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9402	Customer ID: 2291-2-2
Analysis: MERCURY	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-325-102/A-2
Technologist: D. R. JACKSON	Date: 7-29-91
Starting Time: 7:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5597	11		
2	REAGENT BLANK	R9400-5697	12		
3	SAMPLE 2291-2-2	R9402-5797	13		
4	FINAL LMCS CHECK STD	R9405-5597	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
LMCS CHECK STD	123B38-B/2.0 mL			2.0 mL

A-6000-881 (03/92)

9 3 1 2 3 3 3 0 4 5 0

MERCURY ANALYSIS - UNDIGESTED SAMPLE

Sample No	Sample Point	Date	Time Sampled	Priority
K 9399.-5SV	102HM	6-14-91	11:1	26

Determination	Method/Standard	Result Units	Charge Code	Results
Hg	LA-325-102	% RECOVERY	W1BEU	0

Sample Size: 2.0 g
Customer ID: STD.

Remarks, Calculations, Results:
EDF K/16 Hg/HYDRD
STDN 123638-B REGULT 1.096E-1
STD VOL 200E-1 %REC 109.070
0.538
217.49 / 2000

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C225				
Date: 7-29-91	Time Completed			

Sample No	Sample Point	Date	Time Sampled	Priority
K 9400.-5SV	102HM	6-14-91	11:2	26

Determination	Method/Standard	Result Units	Charge Code	Results
Hg	LA-325-102	UG/G	W1BEU	0

Sample Size: 1.0 g
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
0.010
<5 / 1000 = <5.00E-3 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C225				
Date: 7-29-91	Time Completed			

Sample No	Sample Point	Date	Time Sampled	Priority
K 9402.-5SV	102HM	6-14-91	11:4	26

Determination	Method/Standard	Result Units	Charge Code	Results
Hg	LA-325-102	UG/G	W1BEU	0

Sample Size: 1.0 g
Customer ID: 2291-2-2

Remarks, Calculations, Results:
0.003
<5 / 1000 = <5.00E-3 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C225				
Date: 7-29-91	Time Completed			

Sample No	Sample Point	Date	Time Sampled	Priority
K 9403.-5SV	102HM	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Results
Hg	LA-325-102	% RECOVERY	W1BEU	0

Sample Size: 2.0 g
Customer ID: STD

Remarks, Calculations, Results:
EDF K/16 Hg/HYDRD
STDN 123638-B REGULT 1.076E-1
STD VOL 200E-1 %REC 107.070
0.530
211.08 / 2000

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C225				
Date: 7-29-91	Time Completed			

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Hg				
Procedure:	LA-325-102	Revision:	A-2		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	7-29-91

Calibration Standard: 122B38-C
Analyte Concentration: 0.1000 ppb
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.00	0.00	0.000
2	1.00 mL	100.00 ng	0.270
3	2.00 mL	200.00 ng	0.540
4	4.00 mL	400.00 ng	0.943
5			
6			
7			
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Comments:

A-6000-882 (03/9

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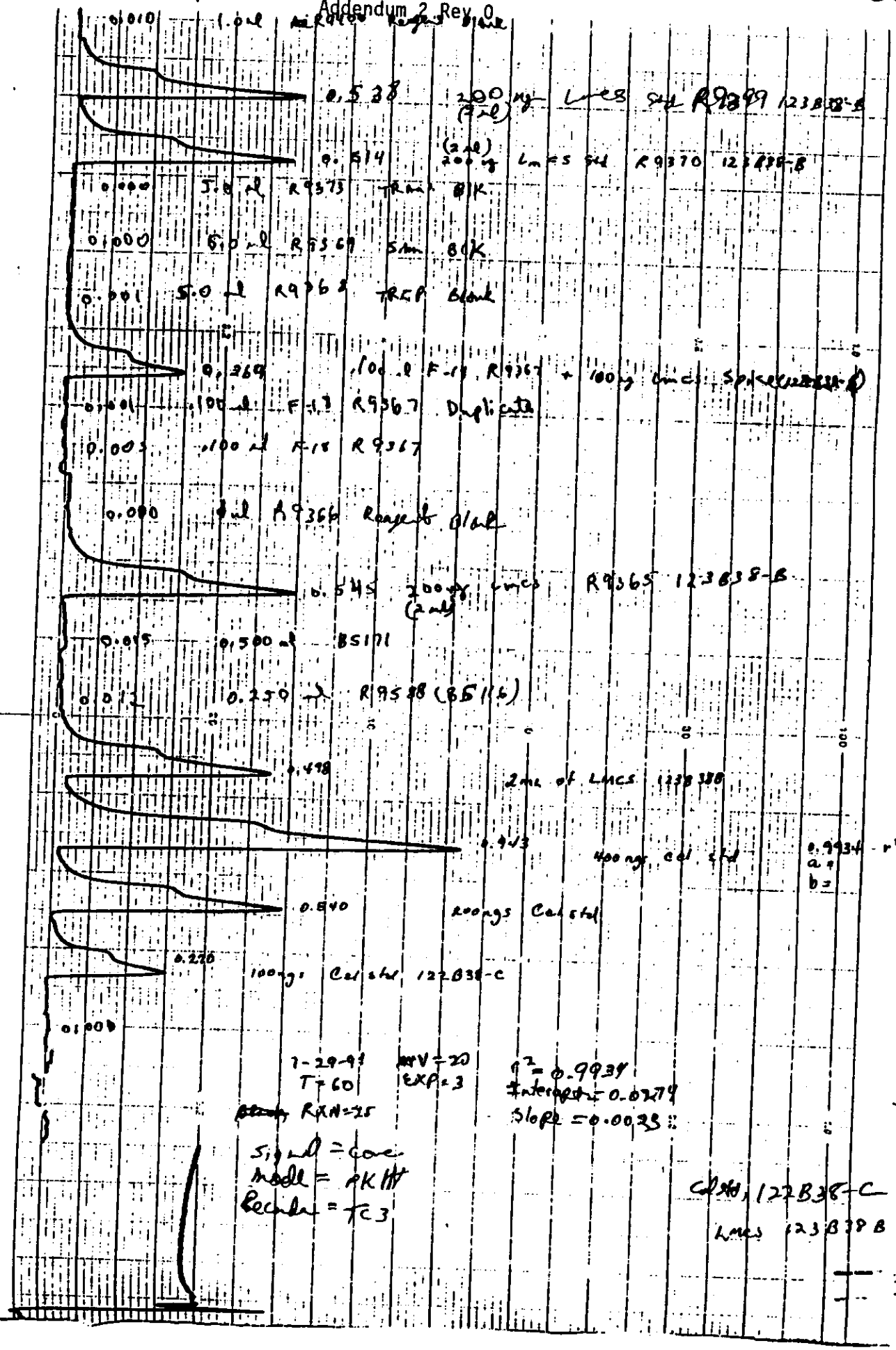

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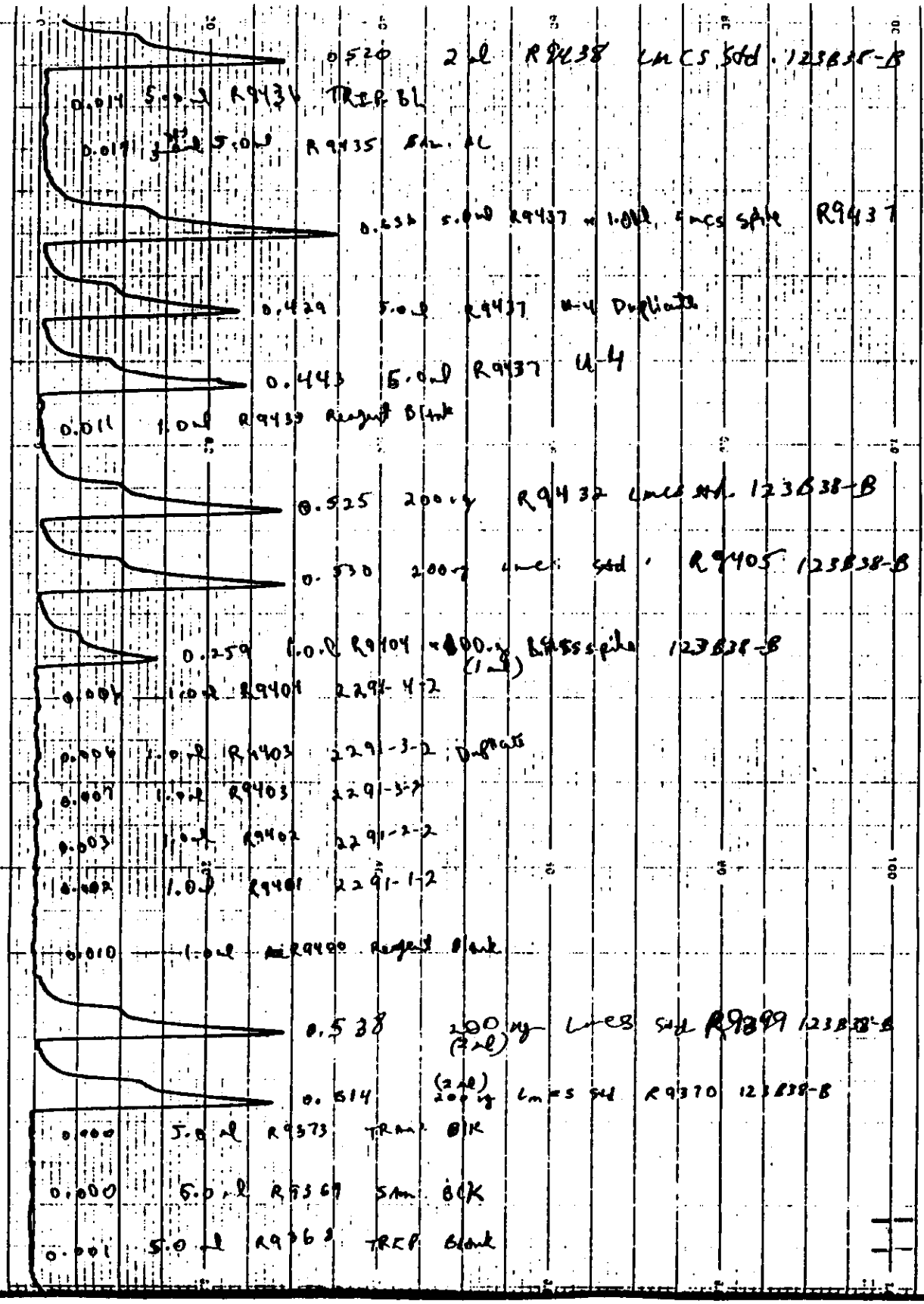

PERKIN-ELMER

PERKIN-ELMER

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9402	Customer ID: 2291-2-2
Analysis: SELENIUM	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-365-131/B-0
Technologist: D. R. JACKSON	Date: 9-17-91
Starting Time: 13:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5596	11		
2	REAGENT BLANK	R9400-5696	12		
3	SAMPLE 2291-2-2	R9402-5796	13		
4	FINAL LMCS CHECK STD	R9405-5596	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
LMCS CHECK STD	125B38-A/0.5 mL			N/A

A-6000-881 (03/92)

9 3 1 2 3 3 3 4 6 5

SELENIUM ANALYSIS - UNDIGESTED SAMPLE

K 9399.-5594 | 102AW | 6-14-91 | 11:1 | 26
Bio | LA-365-131 | % RECOVERY | W1DEU | 0
1 .5000 (50g) | BID
SE/HYDRID
BIDW/2SAM-A NEBAL: 9.82E-2
BID VOL SMLC 98.270
0.9000 49.099/500
6C275 | RKTuller
9-17-91

K 9400.-5594 | 102AW | 6-14-91 | 11:2 | 26
Bio | LA-365-131 | UG/G | W1DEU | 0
1 1.0 ml | REG. BL
REAGENT BLANK
-0.022
<5/1000 = 25.00E-3 mm
6C275 | RKTuller
9-17-91

K 9402.-5594 | 102AW | 6-14-91 | 11:4 | 26
Bio | LA-365-131 | UG/G | W1DEU | 0
1 1.0 ml 9-17-91
-0.017
<5/1000 = 25.00E-3 mm
6C275 | RKTuller
9-17-91

K 9403.-5594 | 102AW | 6-14-91 | 11:1 | 26
Bio | LA-365-131 | % RECOVERY | W1DEU | 0
1 .5000 (50g) | BID
SE/HYDRID
BIDW/2SAM-A NEBAL: 8.91E-2
BID VOL SMLC 89.170
0.8920 44.56/500 =
6C275
9-17-91

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Se				
Procedure:	LA-365-131	Revision:	B-0		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	9-17-91

Calibration Standard: 124B38A
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.000	0.00	0.000
2	0.200 mL	20.00 ng	0.394
3	0.400 mL	40.00 ng	0.790
4	1.000 mL	100.00 ng	1.775
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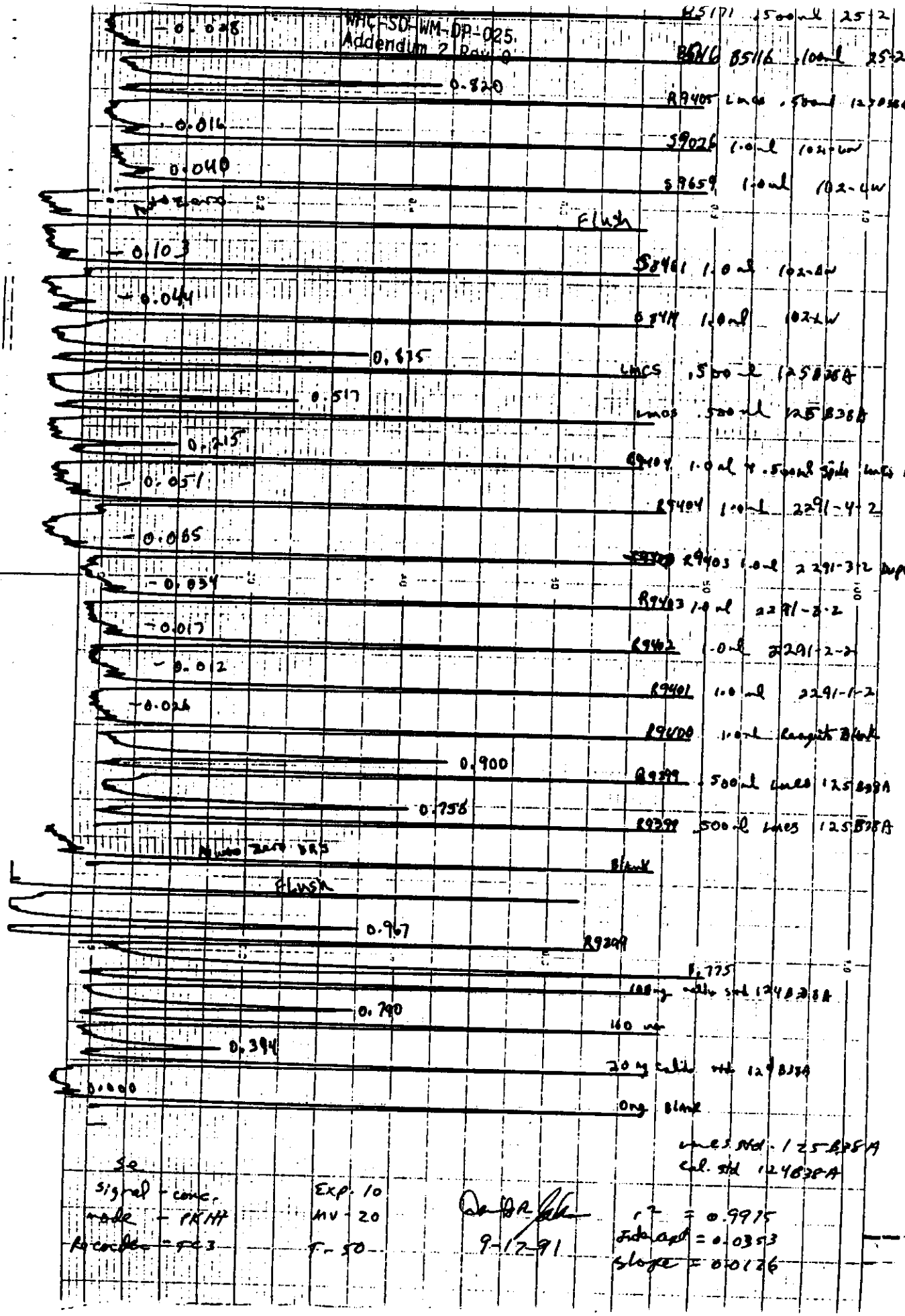
Comments:

A-6000-882 (03/92)



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PERKIN-ELMER

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9403	Customer ID: 2291-3-2
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 6-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-2	R9401-5000	11		
2	SAMPLE 2-2	R9402-5000	12		
3	SAMPLE 3-2	R9403-5000	13		
4	SAMPLE 4-2	R9404-5000	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
N/A				N/A

A-6000-881 (03/92)

9 3 1 2 9 3 3 4 6 9

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9401.-5000	102AW	6-14-91	11:4	26

Determination	Method Number	Result Units	Charge Code	Results
APPEAR	16-376-01		WIRED	0

Sample Size: 7

Customer ID: 2291-1-2

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs

Date: 6/14/91 Time Completed:

Serial No	Sample Point	Date	Time Issued	Priority
R 9402.-5000	102AW	6-14-91	11:5	26

Determination	Method Number	Result Units	Charge Code	Results
APPEAR	16-376-01		WIRED	0

Sample Size: 7

Customer ID: 2291-[illegible]

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs

Date: 6/14/91 Time Completed:

Serial No	Sample Point	Date	Time Issued	Priority
R 9403.-5000	102AW	6-14-91	11:11	26

Determination	Method Number	Result Units	Charge Code	Results
APPEAR	16-376-01		WIRED	0

Sample Size: 7

Customer ID: 2291-[illegible]

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity clear
some solids settled
on vial bottom

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs

Date: 6/14/91 Time Completed:

Serial No	Sample Point	Date	Time Issued	Priority
R 9404.-5000	102AW	6-14-91	11:14	26

Determination	Method Number	Result Units	Charge Code	Results
APPEAR	16-376-01		WIRED	0

Sample Size: 7

Customer ID: 2291-[illegible]

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-D=
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity - clear
solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
WCS59				
	Hrs	Hrs	Hrs	Hrs

Date: 6/14/91 Time Completed:

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9403	Customer ID: 2291-3-2
Analysis: AMERICIUM 241	Sample Prep: UNDIGESTED

Instrument: WB57237	Procedure/Rev: LA-503-156/C-3
Technologist: M. BIERMAN	Date: 11-25-91
Starting Time: N/A	Temperature: 25degC
Ending Time: N/A	Chemist: S. CATLOW

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9413-5582	11		
2	REAGENT BLANK	R9414-5682	12		
3	SAMPLE 2291-3-2	R9403-5782	13		
4	SAM DUP OF 2291-3-2	R9403-5882	14		
5	FINAL LMCS CHECK STD	R9419-5582	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 CHECK STD	43B43/.1 mL			N/A
SPIKE	18B43/0.1 mL			N/A
THESE SAMPLES WERE RERUN.				

A-6000-881 (03/92)

9.5 .6176

Serial No	Sample Point	Date	Time Issued	Priority
R 9413.-5582	102AW	6-14-91	13:11	26

Determination	Method Standard	Result Units	Charge Code	Results
AM241	LA-503-156	% RECOVERY	W1BEU	4

Sample Size: .100-10-1ml — RERUN — Customer ID: BID

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

EDP R201 AR001

STDW43 843 RESULT 3.74E'

STD VAL 3.14E' %REC 119.140

Am243(1843) .100ml

0.1ml in 8M HNO3 (over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69547			
	Res	Res	Res	Res

Date 11/25/91 — Time Completed — Laboratory Supervisor

#3 11-27-91 AB R9413 · 5582

$\frac{2302}{5} - 10$

$$\frac{(6123)(2.274E^{-3})(.1)(1000)(101)}{.3759} =$$

4.3 7766

Serial No	Sample Point	Date	Time Issued	Priority
R 9414.-5682	102AW	6-14-91	13:11	26

Determination	Method Standard	Result Units	Charge Code	Results
AM241	LA-503-156	uCi/L	W1BEU	4

Sample Size: 1 ml — RERUN — Customer ID: REG. BL.

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

REAGENT BLANK

COUNT AS uCi/L

Am243(1843) .100ml

1ml 8M HNO3

<1.17E-2 uci/g (over)

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69547			
	Res	Res	Res	Res

Date 11/25/91 — Time Completed — Laboratory Supervisor

#1 11-27-91 AB R9414·5682

$\frac{810}{5} - 8$

$$\frac{(<.05)(2.274E^{-3})(.1)(1000)(1)}{.9719} =$$

3.3 3068 Enter comments R9410

Serial No	Sample Point	Date	Time Issued	Priority
R 9403.-5782	102AW	6-14-91	11:11	26

Determination	Method Standard	Result Units	Charge Code	Results
AM241	LA-503-156	uCi/L	W1BEU	1

Sample Size: .500 ml — RERUN — Customer ID: 11/25/91

Remarks, Calculations, Results: "AEA" - 480MIN ATTACH PRINTOUT

COUNT AS uCi/L

Am 243 (1843) .100ml

.500ml Cm HNO3

8.50E-1 uci/g

$$\frac{(.6451)(2.274E^{-3})(.1)(1000)(2)}{.3453} =$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6559	69547			
	Res	Res	Res	Res

Date 11/25/91 — Time Completed — Laboratory Supervisor

#1 11-27-91 AB R9403-5782

$\frac{2183}{5} - 8$

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

3.2 2387 Colored Compound R9449

Event No.	Sample Point	Date	Time Issued	Priority
R 9403.-5882	102AW	6-14-91	11:14	26

Determination	Method Summary	Result Units	Charge Code	Repeats
AM241	LA-503-156	UCi/L	WIGIE	1

RERUN

Sample Size: .500 l

Customer ID: 11/25/91

Remarks, Calculations, Results:
DUPLICATE SAMPLE
COUNT AS WELL
A-243(18643) .100 ml
.500 Con HNO3

2291-2-2 5449
"AEA" - 480MIN
ATTACH PRINTOUT

7.62E-1 uCi/ml

$\frac{(4.279)(2.274E^{-3})(.1)(1000)(2)}{.3721}$ =

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
66559	69549			
MGB				

Date: 11/25/91

#2 11-27-91 R9403-5882

$\frac{157}{5}$ = 14

3.4 4167

Event No.	Sample Point	Date	Time Issued	Priority
R 9419.-5582	102AW	6-14-91	13:23	26

Determination	Method Summary	Result Units	Charge Code	Repeats
AM241	LA-503-156	% RECOVERY	WIGIE	1

RERUN

Sample Size: ? .100-10 ml 1

Customer ID: STD

Remarks, Calculations, Results:
EDP R201 AR001
STDN 43643 RESULT 3.53E1
STD VAL 3.14E1 %REC 112.4140
A-243(18643) .100 ml

"AEA" - 480MIN
ATTACH PRINTOUT

Dilution 8 ml HNO3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
66559	69549			
MGB				

Date: 11/25/91

#1 11-27-91 R9419-5582

$\frac{359}{5}$ = 8

$\frac{(5953)(2.274E^{-3})(.1)(1000)(101)}{.3822}$ =

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

WHC-SD-WM-DP-025
Addendum 2 Rev 0

SAMPLE
R9413-3382
File ID: SD6146.SPC

Counted on: 11/27/91 @15: 0
Detector/Geometry number: 6/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	7.1	6.8	360.363	360.363	24.000	17.253	12.000	0.000
2	4084.1	4131.6	300.280	300.280	24.000	18.223	12.000	3.387
3	2517.1	2581.1	255.520	255.520	20.000	12.802	10.000	2.19[illegible]

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/[illegible]
1	Pu236	0.0118	5.756	5.764	-0.008	0.08	2.49	13.41	0.604E-0[illegible]
2	Pu238	0.6123	5.499	5.481	0.018	0.09	129.67	919.37	0.428E-0[illegible]
	Am241		5.480	5.481	-0.001				0.326E-0[illegible]
3	Am243	0.3759	5.234	5.271	-0.037	0.06	79.60	3814.83	0.172E-[illegible]

DETECTOR CALIBRATION
Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.1897 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	107229.0	100.000
Smoothed	107229.0	100.000
Composite fit	105863.3	98.745
Residuals	1341.6	1.254

Analyzed by: _____
69549

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1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	7.	2.	2.	1.	2.
21	2.	5.	2.	1.	3.	3.	3.	2.	3.	6.
31	3.	2.	3.	6.	3.	[illegible]	2.	2.	3.	3.
41	4.	2.	5.	1.	10.	[illegible]	2.	3.	2.	3.
51	5.	7.	3.	5.	6.	6.	4.	6.	9.	4.
1	6.	5.	3.	8.	7.	12.	6.	2.	6.	5.
71	3.	6.	8.	7.	10.	3.	4.	12.	7.	4.
81	7.	11.	6.	8.	8.	9.	7.	3.	3.	12.
91	9.	10.	13.	14.	12.	10.	11.	8.	9.	11.
101	13.	14.	13.	4.	12.	9.	10.	9.	13.	9.
111	13.	17.	18.	10.	17.	22.	10.	21.	21.	12.
121	14.	11.	8.	23.	17.	30.	22.	13.	15.	17.
131	16.	17.	21.	13.	21.	23.	14.	24.	14.	27.
141	10.	26.	25.	25.	23.	44.	24.	38.	26.	42.
151	36.	31.	33.	35.	45.	34.	33.	32.	51.	30.
161	47.	39.	43.	38.	37.	54.	44.	32.	36.	51.
171	50.	44.	57.	60.	68.	64.	62.	62.	66.	62.
181	92.	66.	73.	78.	82.	97.	76.	87.	74.	91.
191	91.	93.	100.	106.	130.	105.	109.	131.	116.	121.
201	135.	188.	154.	170.	175.	169.	176.	171.	198.	197.
211	228.	216.	215.	235.	242.	253.	246.	271.	294.	327.
221	322.	369.	351.	371.	394.	405.	420.	447.	474.	496.
231	511.	574.	587.	646.	697.	720.	707.	786.	846.	892.
241	914.	959.	1027.	1074.	1128.	1166.	1215.	1234.	1331.	1431.
251	1466.	1418.	1659.	1381.	1656.	1586.	1560.	1383.	1267.	1113.
261	982.	878.	751.	688.	577.	594.	538.	533.	582.	562.
271	552.	585.	627.	647.	683.	687.	729.	743.	793.	884.
281	923.	996.	998.	1041.	1142.	1201.	1285.	1392.	1498.	1517.
291	1592.	1735.	1719.	1889.	1970.	2042.	2124.	2251.	2176.	2185.
301	2158.	2129.	1842.	1766.	1534.	1307.	1035.	899.	714.	580.
1	440.	320.	234.	201.	163.	96.	65.	64.	31.	21.
321	13.	3.	5.	3.	3.	1.	0.	2.	0.	4.
331	1.	0.	1.	1.	2.	0.	2.	4.	1.	1.
341	3.	0.	3.	5.	3.	3.	3.	5.	3.	4.
351	4.	4.	1.	7.	2.	3.	2.	3.	5.	3.
361	5.	4.	2.	3.	5.	1.	1.	2.	1.	2.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	2.	0.	0.	0.	0.	0.	0.	0.	2.
481	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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1
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13
1.3
1..3.
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2.......3.
12..........3..
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  ....2.....................................3........
  .......2.......................3..........
..1.....3........2.......
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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

WHC-SD-WM-DP-025
Addendum 2 Rev 0

DATA REDUCTION REPORT

SAMPLE
R9414-3683
File ID: 9D7766.SPC

Counted on: 11/27/91 @13: 0
Detector/Geometry number: 7/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.6	4.2	339.872	339.872	28.000	30.868	14.000	7.145
2	72.2	29.8	300.284	300.284	12.000	2.000	6.000	0.200
3	1473.3	1493.2	233.597	233.597	28.000	30.281	14.000	8.021

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ml
1	Pu236	0.0029	5.756	5.767	-0.011	0.15	0.14	1.00	0.451E-06
	Cm243		5.786	5.767	0.019				0.603E-06
2	Pu238	0.0252	5.499	5.487	0.012	0.01	1.19	11.88	0.535E-05
	Am241		5.480	5.487	-0.007				0.410E-05
3	Am243	0.9719	5.234	5.268	-0.034	0.14	45.85	3003.19	0.135E-02

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.482
Efficiency = 0.1388 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23417.0	100.000
Smoothed	23417.0	100.000
Composite fit	23588.2	100.731
Residuals	-171.2	-0.731

Analyzed by: _____
69349

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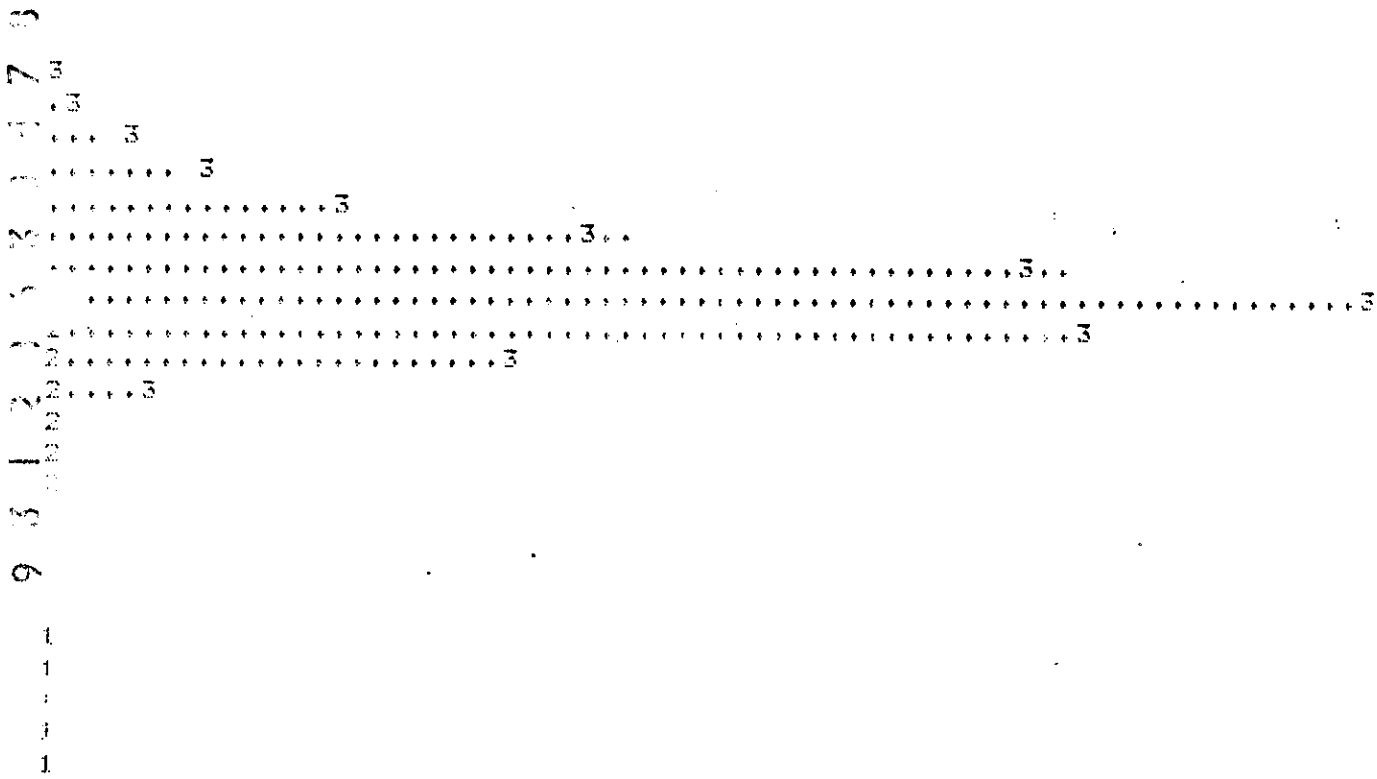

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1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	1.	1.	0.	3.	1.
21	1.	0.	0.	3.	0.	1.	1.	0.	0.	0.
31	1.	1.	2.	1.	1.	0.	0.	1.	1.	0.
41	0.	0.	2.	0.	3.	3.	0.	0.	1.	0.
51	1.	0.	0.	1.	1.	3.	1.	2.	0.	0.
1	1.	0.	1.	0.	0.	2.	0.	0.	1.	1.
71	1.	0.	1.	0.	2.	2.	1.	1.	0.	2.
81	1.	0.	1.	2.	0.	0.	0.	1.	3.	0.
91	1.	0.	0.	0.	2.	0.	0.	1.	0.	2.
101	1.	1.	2.	1.	0.	1.	0.	1.	1.	2.
111	2.	2.	2.	0.	1.	2.	2.	2.	0.	5.
121	2.	1.	1.	0.	1.	2.	2.	1.	2.	2.
131	1.	0.	2.	1.	2.	0.	1.	3.	0.	3.
141	2.	2.	0.	0.	1.	1.	2.	3.	3.	2.
151	1.	3.	1.	0.	2.	1.	2.	3.	2.	2.
161	3.	3.	1.	3.	5.	3.	3.	4.	2.	8.
171	3.	5.	6.	6.	9.	6.	1.	6.	2.	10.
181	8.	10.	7.	6.	8.	12.	6.	5.	5.	5.
191	12.	4.	15.	13.	10.	23.	12.	25.	19.	16.
201	17.	23.	28.	22.	25.	23.	29.	34.	35.	46.
211	30.	36.	46.	51.	65.	62.	66.	71.	85.	83.
221	103.	93.	96.	115.	134.	158.	150.	190.	192.	231.
231	249.	259.	255.	297.	356.	333.	387.	433.	463.	451.
241	536.	537.	579.	618.	645.	689.	689.	680.	753.	795.
251	809.	728.	827.	755.	747.	701.	655.	640.	600.	516.
261	493.	464.	389.	330.	311.	252.	209.	185.	146.	171.
271	108.	82.	56.	46.	32.	48.	27.	24.	17.	9.
281	6.	13.	9.	13.	4.	7.	6.	10.	7.	3.
291	4.	6.	4.	7.	3.	4.	10.	11.	6.	10.
301	4.	4.	8.	9.	6.	6.	2.	7.	4.	2.
1	4.	2.	2.	2.	0.	1.	0.	4.	1.	0.
321	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	1.	0.	1.	1.	1.	0.	1.	2.
341	1.	2.	1.	1.	0.	1.	1.	1.	2.	2.
351	1.	3.	1.	2.	1.	3.	3.	1.	2.	6.
361	1.	0.	3.	0.	3.	2.	2.	1.	1.	1.
371	1.	0.	0.	0.	2.	1.	0.	0.	0.	1.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9403-5782
File ID: BD3063.SPC

Counted on: 11/27/91 @19:0
Detector/Geometry number: 3/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.8	4.6	433.139	433.139	24.000	14.537	12.000	[illegible]
2	36.4	35.6	367.472	367.472	20.000	13.413	10.000	[illegible]
3	4960.9	4960.6	300.685	300.685	20.000	16.668	10.000	[illegible]
4	2731.7	2762.4	254.722	254.722	24.000	14.720	12.000	[illegible]

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	c/m	Activity uCi/ml
1	Cm242	0.0008	6.115	6.109	0.006	0.07	0.12	0.33	0.374E
2	Cm244	0.0089	5.796	5.784	0.012	0.07	1.43	7.22	0.335E-[illegible]
	Cm243		5.786	5.784	0.002				0.403E-03
3	Th228	0.6431	5.430	5.464	-0.034	0.08	105.11	733.06	0.331E-03
	Am241		5.480	5.461	0.018				0.250E-03
4	Am243	0.3403	5.234	5.243	-0.009	0.07	36.26	4339.14	0.114E-02

DETECTOR CALIBRATION

Energy(MEV) = 4.020 + (0.0048)*Channel
Energy range (MeV): 4.020 TO 6.477
Efficiency = 0.2014 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	31753.0	100.000
Smoothed	31753.0	99.998
Composite fit	31474.2	99.207
Residuals	278.8	0.841

Analyzed by _____ ____
MAC

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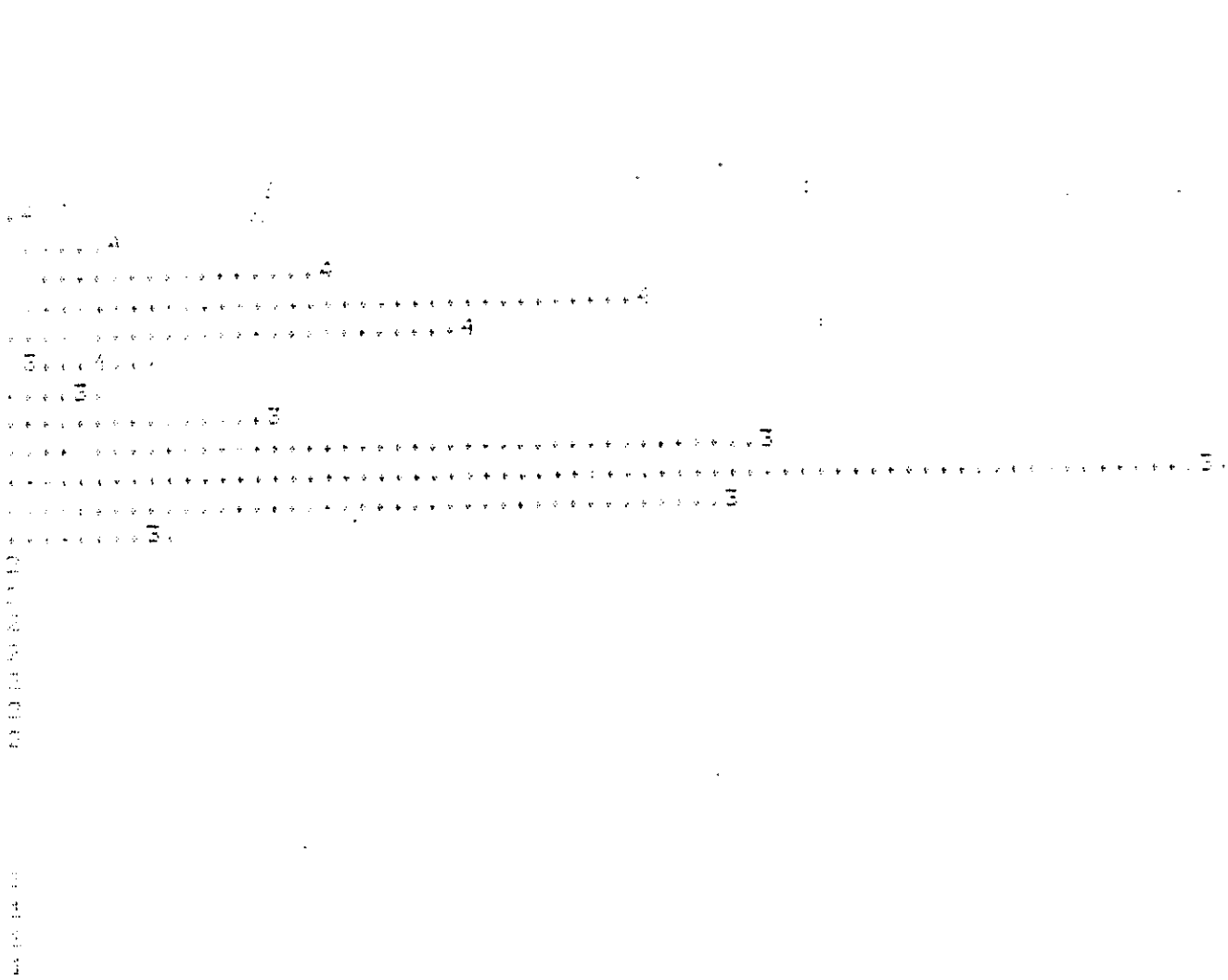

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Raw Data Dump for AEA Spectrum: SP:SD3056-FFC

1	0.	0.	0.	0.	0.	1	1	0.	1	1
11	0.	0.	0.	0.	0.	1	0	0.	1	1
21	3.	1.	0.	3.	1.	1	0	1.	1	1
31	0.	2.	2.	1.	2.	1.	0.	1.	1	1
41	0.	1.	1.	0.	1.	0.	2.	0.	1	1
51	0.	1.	1.	2.	2.	1.	1	0.	1	1
61	0.	1.	2.	1.	0.	1.	2.	1.	1	1
71	1.	1.	0.	3.	0.	1.	0.	0.	1.	1
81	1.	1.	0.	2.	1.	1.	1.	0.	0.	0
91	1.	0.	1.	2.	1.	3.	1.	1.	1.	0
101	1.	3.	0.	2.	1.	0.	2.	0.	0.	1.
111	1.	1.	1.	2.	0.	1.	0.	0.	1	1
121	0.	1.	2.	1.	4.	0.	1.	0.	1.	1
131	0.	2.	3.	0.	0.	3.	0.	1.	1.	1
141	0.	2.	4.	3.	2.	0.	0.	1.	1.	2
151	0.	1.	2.	5.	1.	0.	1.	3.	1.	1
161	1.	1.	0.	2.	1.	0.	0.	1.	0.	1
171	1.	1.	3.	0.	1.	0.	0.	1.	1.	1
181	0.	1.	2.	1.	3.	5.	3.	1.	1.	1
191	1.	3.	3.	4.	2.	3.	1.	3.	3	3
201	3.	1.	3.	1.	3.	6.	3.	5.	3.	5
211	5.	6.	14.	13.	16.	14.	19.	25.	18.	23.
221	32.	35.	53.	37.	39.	61.	71.	109.	107.	86.
231	103.	147.	169.	193.	210.	240.	278.	436.	967.	423.
241	526.	559.	662.	736.	843.	1024.	1011.	1179.	1306.	1363.
251	1480.	1372.	1626.	1526.	1309.	1409.	1290.	1078.	1018.	801.
261	240.	491.	423.	313.	268.	231.	174.	147.	139.	149.
271	135.	147.	137.	103.	131.	194.	190.	237.	253.	326.
281	366.	406.	491.	607.	697.	788.	921.	1052.	1137.	1306.
291	1522.	1736.	1870.	2190.	2314.	2211.	2660.	2694.	2812.	2776.
301	2740.	2597.	2400.	2049.	1822.	1562.	1255.	1046.	823.	677.
311	513.	427.	292.	221.	188.	135.	93.	69.	49.	38.
321	27.	16.	12.	16.	10.	8.	13.	6.	8.	4.
331	2.	5.	8.	3.	5.	6.	4.	10.	10.	8.
341	5.	3.	5.	5.	7.	6.	6.	11.	17.	8.
351	10.	8.	16.	16.	12.	14.	16.	17.	17.	12.
361	8.	12.	24.	16.	17.	15.	16.	27.	19.	14.
371	19.	11.	10.	7.	5.	3.	2.	7.	2.	1.
381	1.	1.	0.	0.	0.	0.	1.	0.	0.	1.
391	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
401	2.	0.	1.	2.	0.	2.	3.	0.	1.	1.
411	0.	0.	0.	1.	0.	0.	0.	0.	3.	0.
421	2.	2.	1.	0.	1.	3.	2.	1.	0.	1.
431	3.	2.	3.	3.	3.	2.	1.	2.	3.	2.
441	1.	2.	0.	0.	0.	0.	0.	0.	0.	0.
451	1.	0.	0.	0.	0.	1.	0.	0.	1.	0.
461	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	1.	0.	1.	0.	1	1.	1.	1.
481	0.	1.	2.	0.	0.	0.	0.	0.	0.	0.
491	1	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	1.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9403-5882
File ID: SD2389.SPC

Counted on: 11/28/91 @ 4: 0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	134.8	130.0	301.421	301.421	24.000	17.432	12.000	7.255
2	80.5	78.0	256.078	256.078	24.000	15.958	12.000	6.199

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ea
1	Pu238	0.6279	5.499	5.502	-0.003	0.08	2.87	17.77	0.800E-05
	Am241		5.480	5.502	-0.022				0.613E-05
2		0.3721		5.288		0.08	1.70	7.58	0.341E-05

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0047)*Channel
Energy range (MeV): 4.085 TO 6.491
Efficiency = 0.2247 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	2445.0	100.000
Smoothed	2444.9	99.996
Composite fit	2288.9	93.617
Residuals	156.0	6.379

Analyzed by: _____
62820

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Raw Data Dump for AEA Spectrum: SP:SD2389.SPC

1	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	2.	0.
91	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
101	1.	1.	1.	0.	0.	0.	1.	0.	0.	1.
111	0.	0.	0.	1.	0.	1.	1.	0.	0.	1.
121	3.	0.	1.	1.	0.	0.	0.	1.	1.	1.
131	1.	0.	0.	0.	0.	0.	1.	2.	0.	1.
141	0.	0.	0.	2.	0.	1.	0.	1.	1.	1.
151	0.	0.	2.	0.	2.	1.	0.	0.	0.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
171	0.	0.	0.	0.	0.	0.	3.	3.	0.	2.
181	0.	0.	0.	2.	1.	0.	0.	1.	1.	0.
191	2.	1.	2.	0.	3.	1.	0.	1.	0.	1.
201	1.	3.	0.	0.	1.	0.	1.	1.	1.	0.
211	1.	4.	0.	1.	4.	1.	4.	0.	3.	4.
221	1.	3.	1.	2.	2.	4.	3.	1.	5.	6.
231	2.	5.	4.	7.	7.	6.	4.	7.	13.	10.
241	16.	11.	22.	20.	18.	23.	29.	32.	30.	35.
251	33.	31.	52.	54.	47.	47.	43.	28.	36.	30.
261	21.	22.	20.	13.	21.	9.	6.	4.	9.	7.
271	7.	6.	8.	4.	7.	6.	6.	6.	11.	8.
281	11.	11.	14.	23.	22.	23.	20.	25.	32.	32.
291	29.	37.	42.	44.	58.	46.	74.	82.	76.	92.
301	75.	67.	63.	63.	38.	42.	48.	28.	32.	24.
311	18.	20.	8.	8.	9.	4.	4.	3.	2.	4.
321	4.	0.	1.	0.	0.	0.	0.	3.	0.	0.
331	0.	0.	2.	0.	0.	0.	0.	1.	0.	0.
341	0.	3.	0.	0.	2.	0.	3.	0.	2.	2.
351	0.	1.	0.	1.	2.	0.	1.	1.	0.	1.
361	1.	0.	1.	0.	0.	1.	0.	0.	1.	0.
371	0.	0.	1.	1.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	1.	0.	0.	1.	0.	1.
431	1.	1.	1.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	1.	0.	1.
461	0.	0.	0.	1.	0.	0.	0.	0.	1.	2.
471	0.	0.	1.	3.	1.	0.	0.	0.	0.	1.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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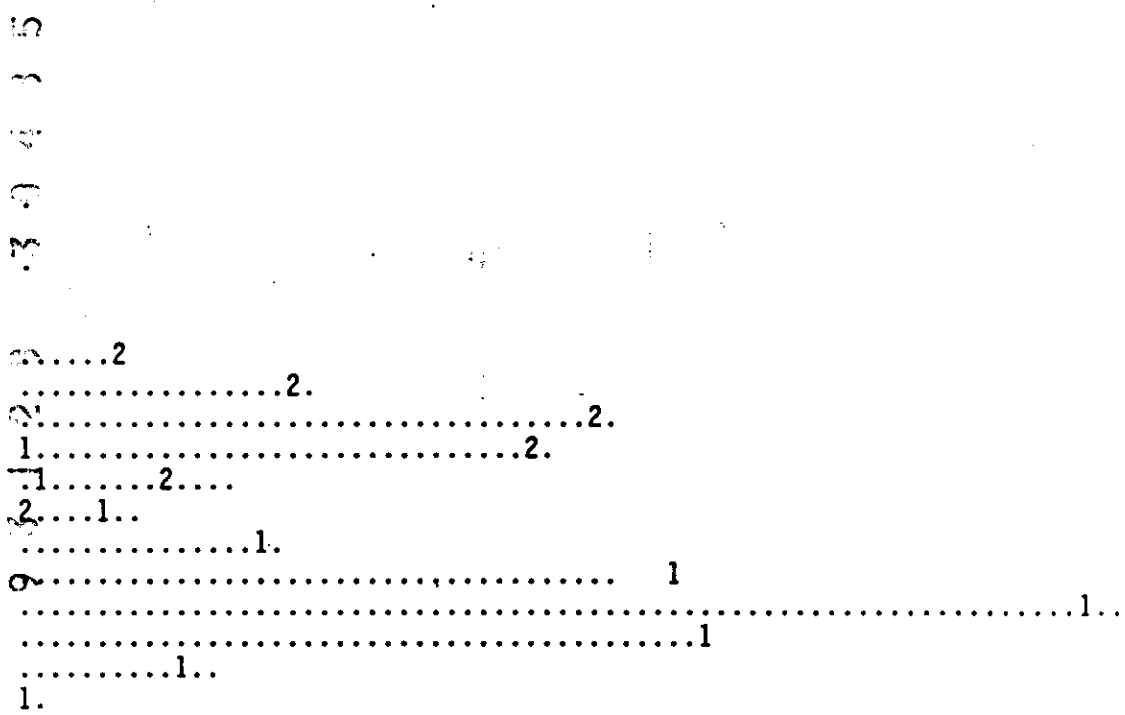
SPECTRUM SD2389.SPC

1 LEGEND: RAW = ... MODELED PEAKS = 1,2,.., ETC 512.4



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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9419-5582
File ID: SD4167.SPC

Counted on: 11/27/91 @19: 0
Detector/Geometry number: 4/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.5	4.5	359.257	359.257	20.000	13.017	10.000	4.510
2	396.0	391.5	304.327	304.327	24.000	13.627	12.000	3.689
3	247.1	242.4	260.155	260.155	20.000	11.626	10.000	3.673
4	5.6	4.7	147.046	147.046	180.000	2.000	90.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Peak Centroid Obs.	Peak Centroid Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ea
1	Pu236	0.0060	5.756	5.749	0.007	0.06	0.10	0.77	0.347E-[illegible]
2	Pu238	0.5952	5.499	5.491	0.008	0.06	9.42	103.48	0.466E[illegible]
	Am241		5.480	5.491	-0.011				0.357E-[illegible]
3		0.3872		5.283		0.05	6.13	48.47	0.218E-[illegible]
4		0.0115		4.751		0.01	0.18	1.44	0.649E-06

DETECTOR CALIBRATION

Energy(MEV) = 4.060 + (0.0047)*Channel
Energy range (MeV): 4.060 TO 6.467
Efficiency = 0.1264 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8216.0	100.000
Smoothed	8215.3	99.992
Composite fit	7910.7	96.284
Residuals	304.6	3.708

Analyzed by: _____
MAC

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SPECTRUM SW4187.SPC
1 LEGEND:  RAW = ....  MODELED PEAKS = 1,2,..., ETC                    1373.0

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Raw Data Dump for AEA Spectrum: SP:SD4167.SPC

1	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	0.	2.
21	0.	1.	1.	0.	0.	0.	0.	1.	1.	1.
31	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
51	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
61	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
71	1.	0.	2.	1.	0.	2.	0.	0.	0.	2.
81	1.	0.	0.	1.	1.	0.	0.	1.	1.	1.
91	0.	2.	2.	1.	3.	2.	1.	2.	1.	0.
101	1.	2.	0.	2.	1.	3.	1.	4.	2.	2.
111	1.	0.	0.	4.	0.	4.	1.	2.	0.	0.
121	1.	0.	3.	1.	2.	1.	1.	2.	0.	3.
131	3.	3.	2.	1.	3.	2.	5.	3.	5.	1.
141	1.	1.	0.	3.	3.	5.	4.	3.	1.	0.
151	1.	4.	4.	1.	0.	0.	2.	3.	3.	1.
161	5.	3.	3.	5.	3.	0.	2.	3.	4.	6.
171	6.	3.	2.	2.	2.	5.	4.	6.	3.	7.
181	5.	5.	5.	6.	6.	3.	5.	7.	2.	4.
191	4.	6.	5.	9.	8.	9.	7.	7.	5.	8.
201	9.	8.	13.	9.	7.	8.	11.	9.	7.	9.
211	12.	11.	12.	11.	15.	3.	15.	23.	11.	13.
221	17.	19.	13.	14.	18.	25.	15.	19.	17.	20.
231	23.	31.	30.	28.	28.	31.	29.	35.	31.	38.
241	45.	48.	58.	53.	50.	67.	60.	83.	69.	98.
251	96.	91.	102.	117.	111.	127.	156.	124.	146.	147.
261	159.	139.	116.	83.	62.	52.	42.	40.	33.	41.
271	31.	38.	38.	30.	43.	26.	38.	46.	39.	35.
281	44.	48.	40.	41.	83.	75.	62.	97.	79.	82.
291	86.	108.	116.	116.	130.	136.	151.	167.	183.	198.
01	192.	223.	232.	218.	232.	194.	172.	145.	108.	84.
311	90.	48.	34.	34.	31.	21.	7.	8.	9.	1.
321	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	1.	1.	1.	0.	2.	2.	1.
351	2.	3.	0.	2.	3.	3.	2.	3.	1.	3.
361	2.	3.	3.	0.	0.	0.	2.	0.	1.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	1.	1.	1.	1.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9403	Customer ID: 2291-3-2
Analysis: ARSENIC	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-355-131/B-0
Technologist: D. R. JACKSON	Date: 7-08-91
Starting Time: 7:45	Temperature: N/A
Ending Time: 11:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5595	11		
2	REAGENT BLANK	R9400-5695	12		
3	SAMPLE 2291-3-2	R9403-5795	13		
4	SAM DUP OF 2291-3-2	R9403-5895	14		
5	FINAL LMCS CHECK STD	R9405-5595	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 CHECK STD	119B38-E/0.5 mL			N/A

A-6000-881 (03/92)

9312130439

ARSENIC ANALYSIS - UNDIGESTED SAMPLE

Sample Point: 102AW
Date: 6-14-91
Time Issued: 11:1
Priority: 26
Determination: As
Method/Standard: LA-355-131
Result Units: % RECOVERY
Charge Code: W1HEU
Rerun: 0
Sample Size: 50 mg (.500 ml)
Customer ID: STD
EDP R741 AS/HYDRD
STDH 119838-E RESULT 99.9%
STD VAL %REC
1.016
49.928/500 = .9.99e-2/100e-1
Analyst: GC275
Date: 7-8-91

Sample Point: 102AW
Date: 6-14-91
Time Issued: 11:2
Determination: As
Method/Standard: LA-355-131
Result Units: UG/G
Charge Code: W1HEU
Rerun: 0
Sample Size: 1 ml
Customer ID: REG. BL
REAGENT BLANK
0.000
< 5ng / 1000 = < 5.00 e-3 ppm
Analyst: GC275
Date: 7-8-91

Sample Point: 102AW
Date: 6-14-91
Time Issued: 11:
Determination: As
Method/Standard: LA-355-131
Result Units: UG/G
Charge Code: W1HEU
Sample Size: .025 ml
0.743
36.274 ng / 25 ml = 1.45 ppm mg/L
Analyst: GC275
Date: 7-8-91

Sample Point: 102AW
Date: 6-14-91
Time Issued: 11:
Determination: As
Method/Standard: LA-355-131
Result Units: UG/G
Charge Code: W1HEU
Rerun: 0
Sample Size: .025 ml
0.898 Spiked
34.023 ng / 25 ml = 1.36 ppm
Analyst: GC275
Date: 7-8-91

Sample Point: 102AW
Date: 6-14-91
Time Issued: 11:14
Priority: 26
Determination: As
Method/Standard: LA-355-131
Result Units: % RECOVERY
Charge Code: W1HEU
Rerun: 0
Sample Size: 50 mg (.500 ml)
Customer ID: STD
EDP R741 AS/HYDRD
STDH 119838-E RESULT 111.8%
STD VAL %REC
1.195
58.88 ng / 500 ml = 1.118e-1 / 100e-1
Analyst: GC275
Date: 7-8-91

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	As		
Procedure:	LA-355-131	Revision:	B-0
Instrument:	PERKIN-ELMER	Property No.:	WA77479
Technologist:	D. R. JACKSON	Payroll No.: 6C275	Date: 7-08-91

Calibration Standard: 118B38-E
Analyte Concentration: .1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.0000	0.00	0.000
2	0.2000 mL	20.00 ng	0.438
3	0.4000 mL	40.00 ng	0.820
4	0.1000 mL	100.00 ng	2.012
5			
6			
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21			

Comments:

A-6000-882 (03/92)

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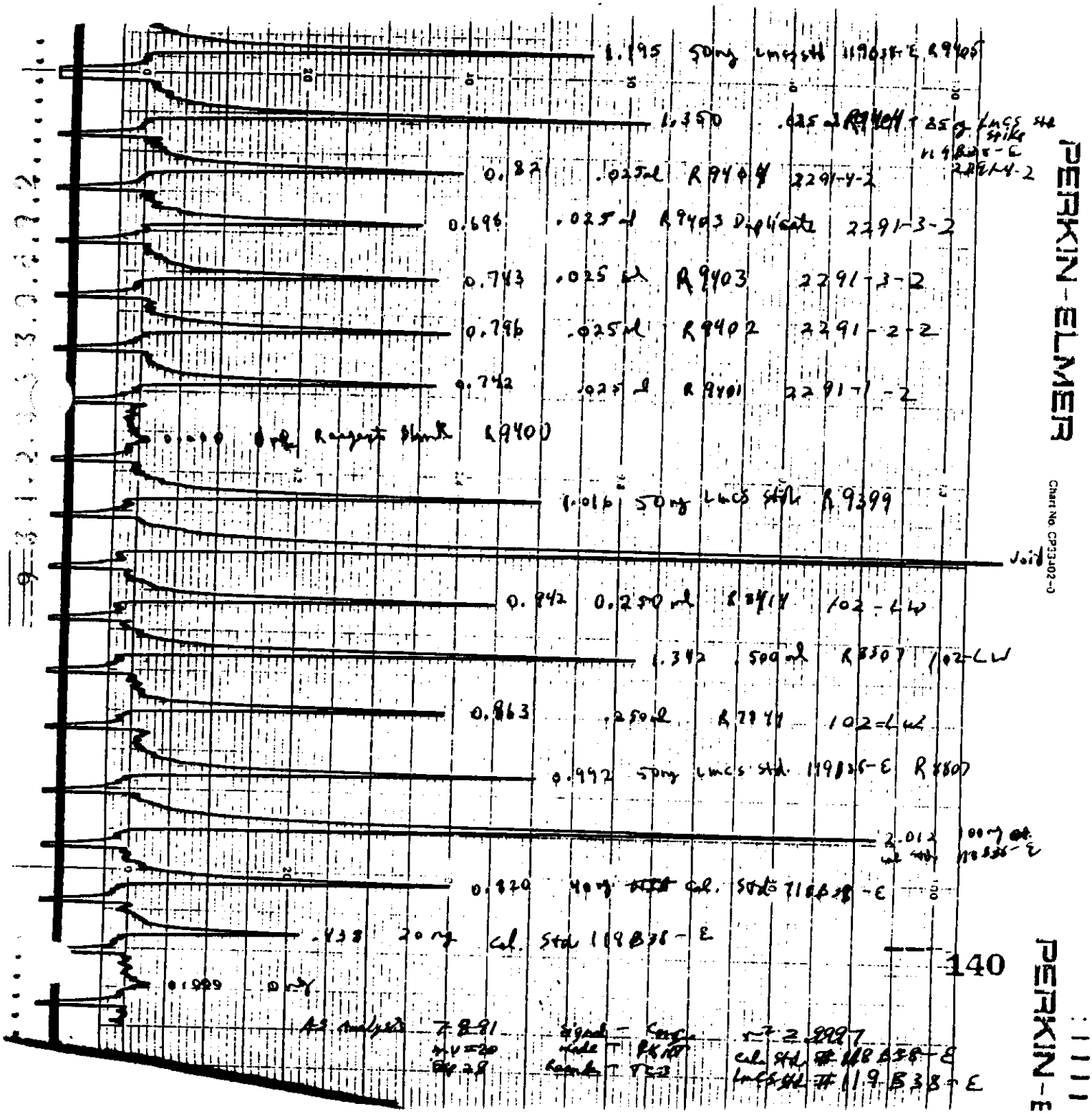

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9403	Customer ID: 2291-3-2
Analysis: MERCURY	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-325-102/A-2
Technologist: D. R. JACKSON	Date: 7-29-91
Starting Time: 7:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5597	11		
2	REAGENT BLANK	R9400-5697	12		
3	SAMPLE 2291-3-2	R9403-5797	13		
4	SAM DUP OF 2291-3-2	R9403-5897	14		
5	FINAL LMCS CHECK STD	R9405-5597	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 CHECK STD	123B38-B/2.0 mL			2.0 mL

A-6000-881 (03/92)

MERCURY ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9399.-559/	102AW	6-14-91	11: 1	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 2.0 ml
Customer ID: BID.

Remarks, Calculations, Results:
EDP R/16 HG/HYDRD
STDW 123838-B REBULT 1.09E-1
STD VAL 1.00E-1 %REC 109.070
0.538 217.49 / 2000 =

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9400.-569/	102AW	6-14-91	11: 2	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
0.010
$\frac{<5}{1000} = <5.00E^{-3}$ PPM

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9403.-579/	102AW	6-14-91	11: /	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: 2291-33

Remarks, Calculations, Results:
5-11-91
0.007
$\frac{<5}{1000} = <5.00E^{-3}$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9404.-589/	102AW	6-14-91	11: /	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: 2291-33

Remarks, Calculations, Results:
DUPLICATE SAMPLE
5-11-91
0.006
$\frac{<5}{1000} = <5.00E^{-3}$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed			

Serial No	Sample Point	Date	Time Issued	Priority
R 9405.-599/	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Remarks
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 2.0 ml
Customer ID: BID

Remarks, Calculations, Results:
EDP R/16 HG/HYDRD
STDW/23838-B REBULT 1.07E-1
STD VAL 1.00E-1 %REC 107.070
0.530 21408 / 2000

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C275				
Hrs	Hrs	Hrs	Hrs	Hrs
Date: 7-29-91	Time Completed			

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Hg				
Procedure:	LA-325-102	Revision:	A-2		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	7-29-91

Calibration Standard: 122B38-C
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.00	0.00	0.000
2	1.00 mL	100.00 ng	0.270
3	2.00 mL	200.00 ng	0.540
4	4.00 mL	400.00 ng	0.943
5			
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Comments:

A-6000-882 (03/92)

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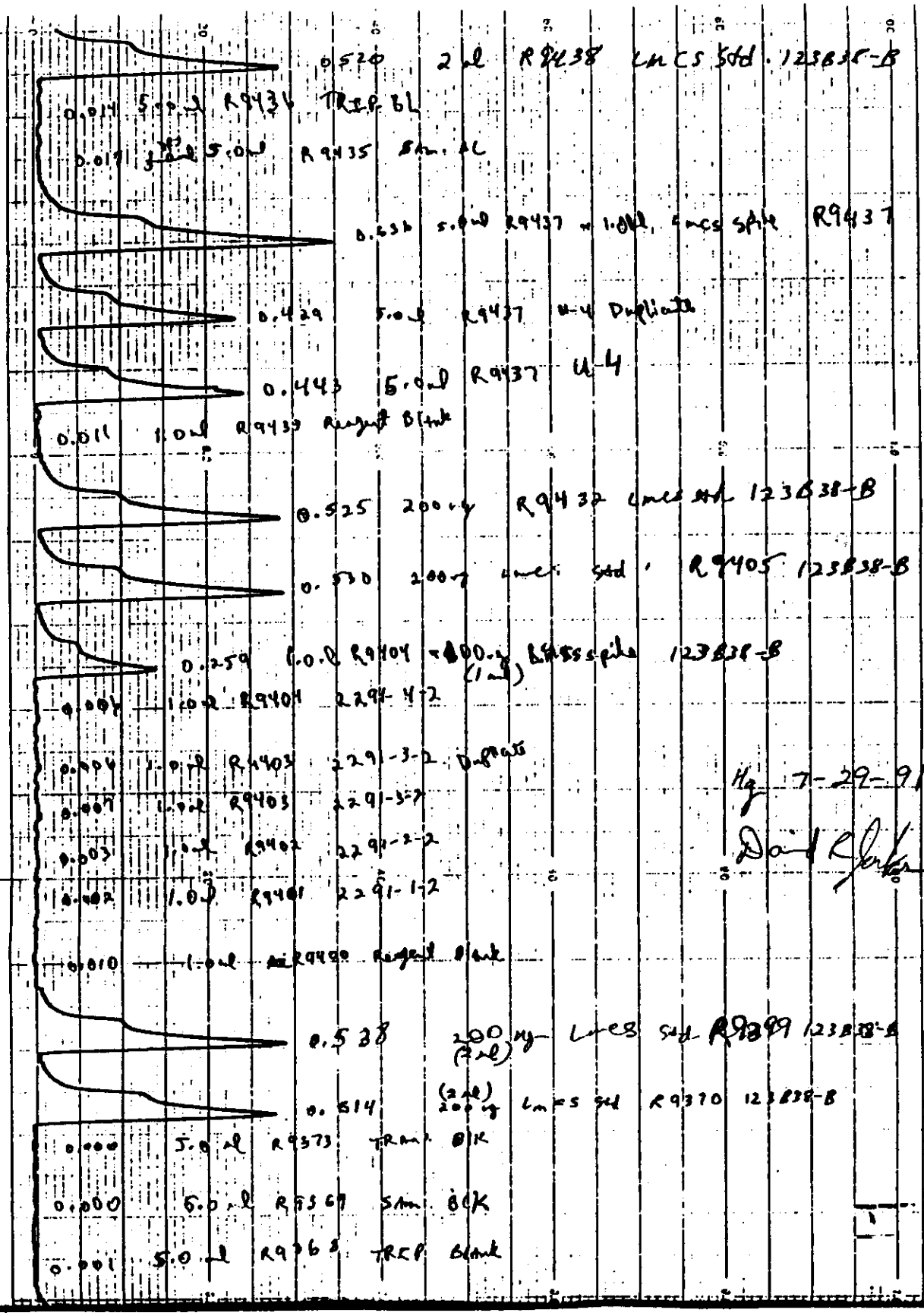

Hg 7-29-91
David Parker

PERKIN-ELMER

PERKIN-ELMER

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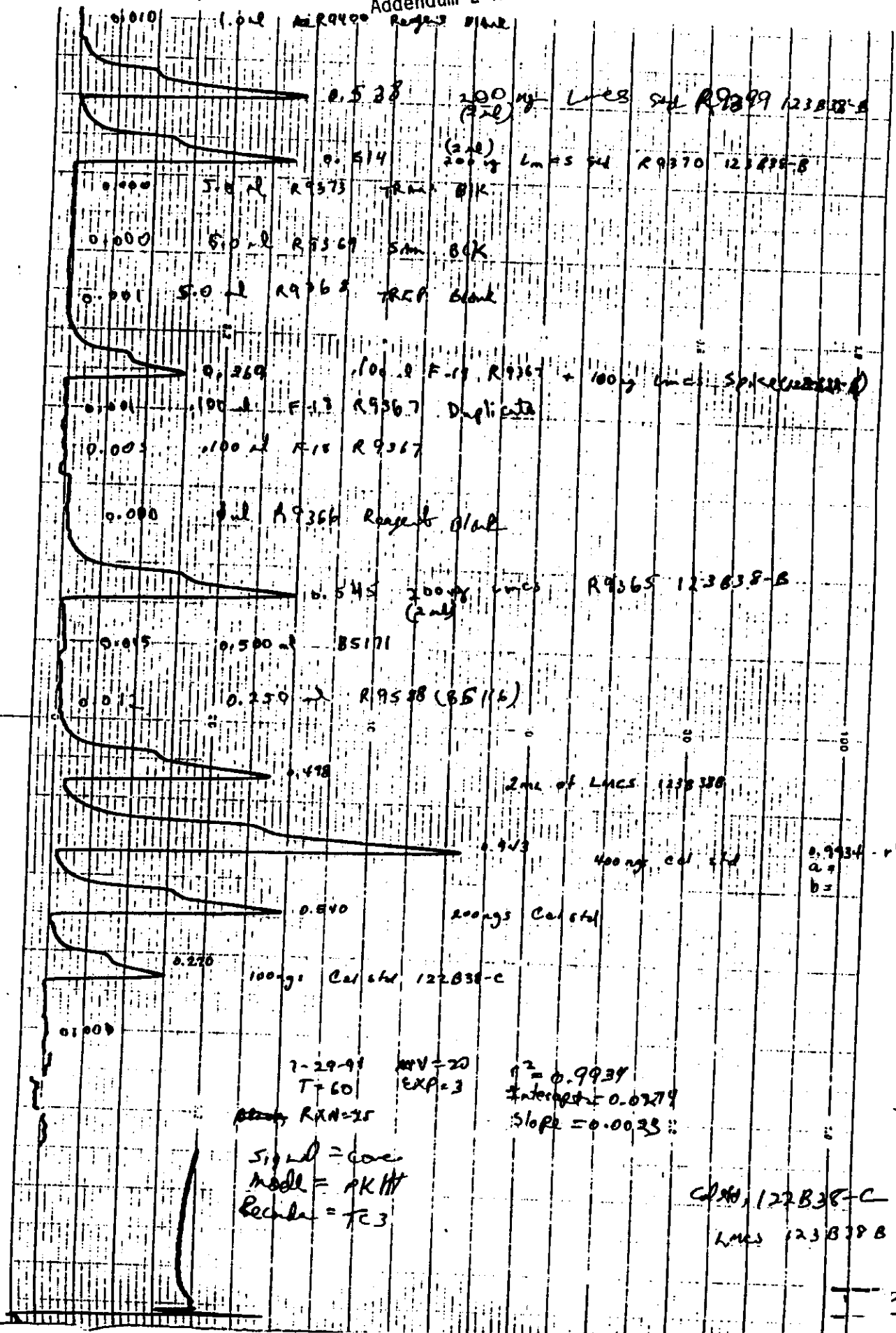

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9403	Customer ID: 2291-3-2
Analysis: SELENIUM	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-365-131/B-0
Technologist: D. R. JACKSON	Date: 9-17-91
Starting Time: 13:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5596	11		
2	REAGENT BLANK	R9400-5696	12		
3	SAMPLE 2291-3-2	R9403-5796	13		
4	SAM DUP OF 2291-3-2	R9403-5896	14		
5	FINAL LMCS CHECK STD	R9405-5596	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 CHECK STD	125B38-A/0.5 mL			N/A

A-6000-881 (03/92)

SELENIUM ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
R 9399.-559c	102AW	6-14-91	11: 1	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	W1DEO	0

Sample Size: 7 .50ml (50g)
Customer ID: STD

Remarks, Calculations, Results:
EDP R/43 SE/HYDRD
STDH/25AN-A REBUL: 9.82E-2
STD VAL %REC 98.240
0.9000 49.099/500

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
6C225				RKFuller
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-17-91	Time Completed	Lab Use Only		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9400.-569c	102AW	6-14-91	11: 2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	W1DEO	0

Sample Size: 7 1.0ml
Customer ID: REG. BL

Remarks, Calculations, Results:
REAGENT BLANK
-0.023 <5/1000 = <5.00E-3 ppm

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
6C225				RKFuller
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-17-91	Time Completed	Lab Use Only		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9403.-559c	102AW	6-14-91	11: 7	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	W1DEO	0

Sample Size: 9-17-91 1.0ml ~~100ml~~ DRS
Customer ID: 2291-33

Remarks, Calculations, Results:
-0.034 <5/1000 = <5.00E-3

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
6C225				RKFuller
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-17-91	Time Completed	Lab Use Only		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9403.-559c	102AW	6-14-91	11: 7	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	W1DEO	0

Sample Size: ~~100ml~~ 1.0ml
Customer ID: 2291-33

Remarks, Calculations, Results:
DUPLICATE SAMPLE
-0.065 <5/1000 = <5.00E-3

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
6C225				RKFuller
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-17-91	Time Completed	Lab Use Only		

Serial No.	Sample Point	Date	Time Issued	Priority
R 9405.-559c	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	W1DEO	0

Sample Size: 7 .50ml (50g)
Customer ID: SID

Remarks, Calculations, Results:
EDP R/43 SE/HYDRD
STDH/25AN-A REBUL: 8.91E-2
STD VAL %REC 89.170
0.820 44.54/500 =

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
6C225				
Hrs	Hrs	Hrs	Hrs	Hrs
Date 9-17-91	Time Completed	Lab Use Only		

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Se				
Procedure:	LA-365-131	Revision:	B-0		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	9-17-91

Calibration Standard: 124B38A
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.000	0.00	0.000
2	0.200 mL	20.00 ng	0.394
3	0.400 mL	40.00 ng	0.790
4	1.000 mL	100.00 ng	1.775
5			
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21			

Comments:

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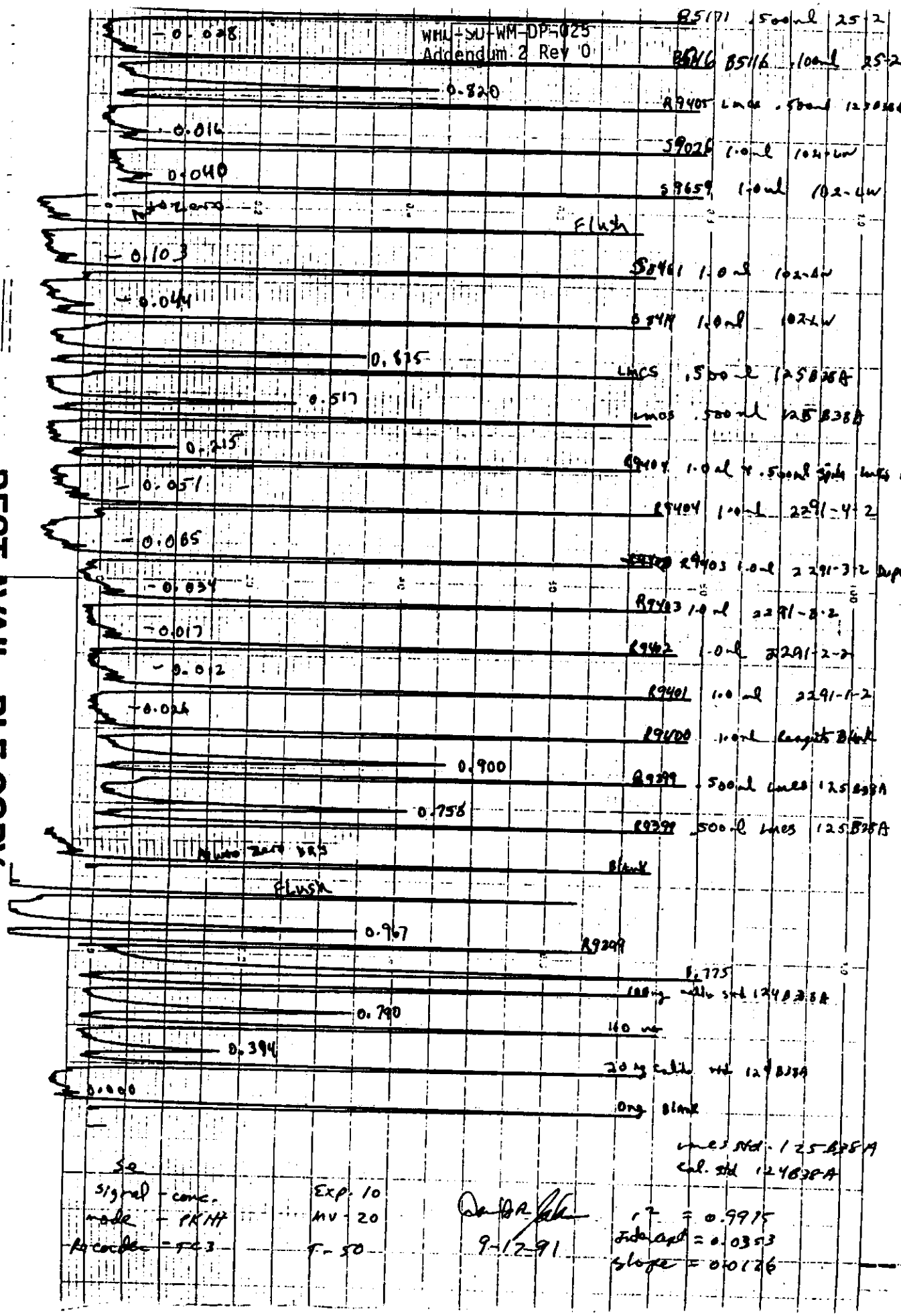

LMCS Std. 125B38A
Cal. Std 124B38A

Se
signal - conc.
mode - PKHT
Recorder - FC3

Exp. 10
MV - 20
T - 50

9-12-91

r^2 = 0.9975
Intercept = 0.0353
Slope = 0.0126

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V-ELMER
PERKIN-ELMER

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9404	Customer ID: 2291-4-2
Analysis: VISUAL CHECK AND OVER-THE-TOP READING	Sample Prep: UNDIGESTED

Instrument: N/A	Procedure/Rev: LA-519-151/D-1
Technologist: M. BIERMAN	Date: 6-14-91
Starting Time: 13:30	Temperature: 25degC
Ending Time: 15:00	Chemist: N/A

	Description	Lab ID		Description	Lab ID
1	SAMPLE 1-2	R9401-5000	11		
2	SAMPLE 2-2	R9402-5000	12		
3	SAMPLE 3-2	R9403-5000	13		
4	SAMPLE 4-2	R9404-5000	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
N/A				N/A

A-6000-881 (03/92)

VISUAL CHECK AND OVER-THE-TOP READING ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9401:-5000	102AW	6-14-91	11:4	26

Determination	Method Reference	Result Limits	Charge Code	Results
APPEAR	16-3M-01		WIDEO	0

Sample Size	Customer ID
2	2291-1-2

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-UM
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clear
some solids settled
on bottom of vial

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Date	Time Completed			
6/14/91				

Serial No	Sample Point	Date	Time Issued	Priority
R 9402:-5000	102AW	6-14-91	11:5	26

Determination	Method Reference	Result Limits	Charge Code	Results
APPEAR	16-3M-01 5-11-92		WIDEO	0

Sample Size	Customer ID
2	2291-1-3

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-UM
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity - clear
no solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Date	Time Completed			
6/14/91				

Serial No	Sample Point	Date	Time Issued	Priority
R 9403:-5000	102AW	6-14-91	11:11	26

Determination	Method Reference	Result Limits	Charge Code	Results
APPEAR	16-3M-01 5-11-92		WIDEO	0

Sample Size	Customer ID
2	2291

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-UM
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
aqueous solution
light tint yellow
clarity clear
some solids settled
on vial bottom

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Date	Time Completed			
6/14/91				

Serial No	Sample Point	Date	Time Issued	Priority
R 9404:-5000	102AW	6-14-91	11:14	26

Determination	Method Reference	Result Limits	Charge Code	Results
APPEAR	16-3M-01 5-11-92		WIDEO	0

Sample Size	Customer ID
2	2291

Remarks, Calculations, Results

A. JAR IDN
B. JAR TARE WT.
C. JAR TOTAL WT.
D. C-UM
E. EST. VOL./LENGTH
F. VISUAL REMARKS

no visible organic
light tint yellow
aqueous solution
clarity - clear
solids present

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC559				
Date	Time Completed			
6/14/91				

9 3 1 2 2 3 0 5 0 3

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9404	Customer ID: 2291-4-2
Analysis: AMERICIUM 241	Sample Prep: UNDIGESTED

Instrument: WB57237	Procedure/Rev: LA-503-156/C-3
Technologist: M. BIERMAN	Date: 11-25-91
Starting Time: N/A	Temperature: 25degC
Ending Time: N/A	Chemist: S. CATLOW

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9413-5582	11		
2	REAGENT BLANK	R9414-5682	12		
3	SAMPLE OF 2291-4-2	R9404-5782	13		
4	FINAL LMCS CHECK STD	R9419-5582	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
LMCS CHECK STD	43B43/0.1 mL			N/A
THESE SAMPLES WERE RERUN.				

A-6000-881 (03/92)

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

Sample Point: 102AW
Date: 6-14-91
AM241
% RECOVERY
RERUN
BTD
"AEA" - 480MIN ATTACH PRINTOUT
EDP K201 A0001
BTDW43B43 RESULT 3.74E'
BTD VAL 3.74E' XREC 119.170
Am243(18B43) .100ml
(over)
11/25/91

#3 11-27-91 AJ R9413-5582

$\frac{2302}{5} - 10$

$\frac{(4123)(2.274E^{-3})(.1)(1000)(101)}{.3759} =$

4.0 7766

Sample Point: 102AW
Date: 6-14-91
AM241
uCi/L
RERUN
"AEA" - 480MIN ATTACH PRINTOUT
COUNT AS uCi/L
Am243(18B43) .100ml
1ml 8 OHNO3
21.17E-2 uCi/g
(over)
11/25/91

#1 11-27-91 AO R9414-5682

$\frac{810}{5} - 8$

$\frac{(2.05)(2.274E^{-3})(.1)(1000)(1)}{.9719} =$

4.0 3514

Sample Point: 102AW R9418
AM241
uCi/L
RERUN
"AEA" - 480MIN ATTACH PRINTOUT
COUNT AS uCi/L
Am243(18B43) .100ml
.500ml Con HNO3
1.75E-1 uCi/g

$\frac{(.0918)(2.274E^{-3})(.1)(1000)(2)}{.2389} =$

11/25/91

#3 11-27-91 AJ R9404-5782

$\frac{181}{5} - 10$

3.4 4167

R 9419.-5582	102AW	6-14-91		
241Am	LA-503-156	R. McLUVENY	WIIIC	

RERUN

.100-10-1-1

EDP 1201 AN001

"AEA" - 480MIN ATTACH PRINTOUT

STDN 43845 NEBUL 3.53E1

BTD VAL 3.14E1 %REC 112.4190

A-243(18845), .100-1

Dilution 50 HNO3

66559				
MGR				
11/25/91				

#1 11-27-91 R9419-5582

$\frac{359}{5}$ -8

$$\frac{(5953)(2.274E^{-3})(.1)(1000)(101)}{.3872} =$$

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

WHC-SD-WM-DP-025
Addendum 2 Rev 0

DATA REDUCTION REPORT

SAMPLE
R9413-3582
File ID: SD6146.SPC

Counted on: 11/27/91 @13: 0
Detector/Geometry number: 6/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	7.1	6.8	360.363	360.363	24.000	17.253	12.000	0.000
2	4084.1	4131.6	300.280	300.280	24.000	18.225	12.000	3.397
3	2517.1	2581.1	255.520	255.520	20.000	12.802	10.000	2.196

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ml
1	Pu236	0.0118	5.756	5.764	-0.008	0.08	2.49	13.41	0.604E-05
2	Pu238	0.6123	5.499	5.481	0.018	0.09	129.67	919.37	0.428E-03
	Am241		5.480	5.481	-0.001				0.328E-03
3	Am243	0.3759	5.234	5.271	-0.037	0.06	79.60	3814.83	0.172E-02

DETECTOR CALIBRATION.
Energy(MEV) = 4.070 + (0.0047)*Channel
Energy range (MeV): 4.070 TO 6.476
Efficiency = 0.1897 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	107229.0	100.000
Smoothed	107229.0	100.000
Composite fit	105863.3	98.743
Residuals	1341.8	1.254

Analyzed by: _____
69549

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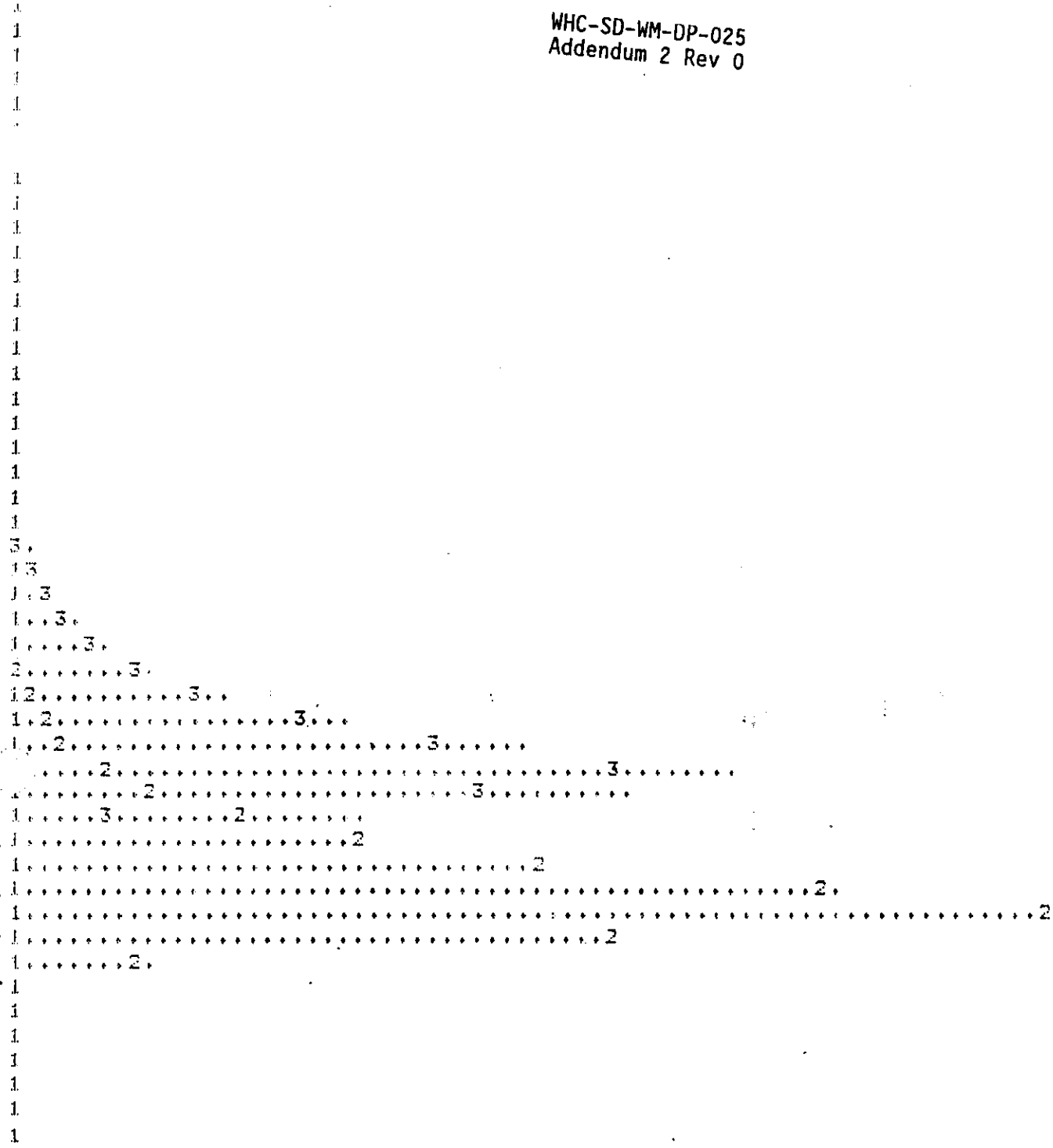

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1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	1.	2.
21	2.	5.	2.	1.	3.	3.	3.	2.	3.	6.
31	3.	2.	3.	6.	3.	4.	2.	2.	3.	3.
41	4.	2.	5.	1.	10.	2.	2.	3.	2.	3.
51	5.	7.	3.	5.	6.	6.	4.	6.	9.	4.
61	6.	5.	3.	8.	7.	12.	6.	2.	6.	5.
71	3.	6.	8.	7.	10.	3.	4.	12.	7.	4.
81	7.	11.	6.	8.	8.	9.	7.	3.	3.	12.
91	9.	10.	13.	14.	12.	10.	11.	8.	9.	11.
101	13.	14.	13.	4.	12.	9.	10.	9.	13.	9.
111	13.	17.	18.	10.	17.	22.	10.	21.	21.	12.
121	14.	11.	8.	23.	17.	30.	22.	13.	15.	17.
131	16.	17.	21.	13.	21.	23.	14.	24.	14.	27.
141	10.	26.	25.	25.	23.	44.	24.	38.	26.	42.
151	36.	31.	33.	35.	45.	34.	33.	32.	51.	50.
161	47.	39.	43.	38.	37.	54.	44.	52.	36.	51.
171	50.	44.	57.	60.	68.	64.	62.	62.	66.	62.
181	92.	66.	73.	78.	82.	97.	76.	87.	74.	91.
191	91.	93.	100.	106.	130.	105.	109.	131.	116.	121.
201	135.	188.	154.	170.	173.	169.	176.	171.	198.	197.
211	228.	216.	215.	235.	242.	253.	246.	271.	294.	327.
221	322.	369.	351.	371.	394.	405.	420.	447.	474.	496.
231	511.	574.	587.	646.	697.	720.	707.	786.	846.	892.
241	914.	959.	1027.	1074.	1128.	1166.	1215.	1234.	1331.	1431.
251	1466.	1418.	1659.	1581.	1656.	1586.	1360.	1383.	1267.	1113.
261	982.	878.	751.	688.	577.	594.	538.	533.	582.	562.
271	552.	583.	627.	647.	683.	687.	729.	743.	793.	884.
281	923.	996.	998.	1041.	1142.	1201.	1285.	1392.	1498.	1517.
291	1592.	1735.	1719.	1889.	1970.	2042.	2124.	2251.	2176.	2185.
301	2158.	2129.	1842.	1766.	1534.	1307.	1035.	899.	714.	580.
1	440.	320.	234.	201.	163.	96.	65.	64.	31.	21.
321	13.	3.	5.	3.	3.	1.	0.	2.	0.	4.
331	1.	0.	1.	1.	2.	0.	2.	4.	1.	1.
341	5.	0.	3.	5.	3.	3.	3.	5.	3.	4.
351	4.	4.	1.	7.	2.	3.	2.	3.	5.	3.
361	5.	4.	2.	3.	5.	1.	1.	2.	1.	2.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	2.	0.	0.	0.	0.	0.	0.	0.	2.
481	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

9 3 1 2 1 3 0 5 0 9

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

WHC-SD-WM-DP-025
Addendum 2 Rev 0

DATA REDUCTION REPORT

SAMPLE
R9414-3682
File ID: SD7766.SPC

Counted on: 11/27/91 @13: 0
Detector/Geometry number: 7/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.6	4.2	359.872	359.872	28.000	30.848	14.000	7.145
2	72.2	29.8	300.284	300.284	12.000	2.000	6.000	0.200
3	1473.3	1493.2	233.597	233.597	28.000	30.281	14.000	8.021

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/cc
1	Pu236	0.0029	5.756	5.767	-0.011	0.15	0.14	1.00	0.451E-06
	Cm243		5.786	5.767	0.019				0.603E-06
2	Pu238	0.0232	5.499	5.487	0.012	0.01	1.19	11.88	0.335E-
	Am241		5.480	5.487	-0.007				0.410E-
3	Am243	0.9719	5.234	5.268	-0.034	0.14	45.85	3003.19	0.133E-03

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.482
Efficiency 0.1338 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23417.0	100.000
Smoothed	23417.0	100.000
Composite fit	23588.2	100.731
Residuals	-171.2	-0.731

Analyzed by: _____
69549

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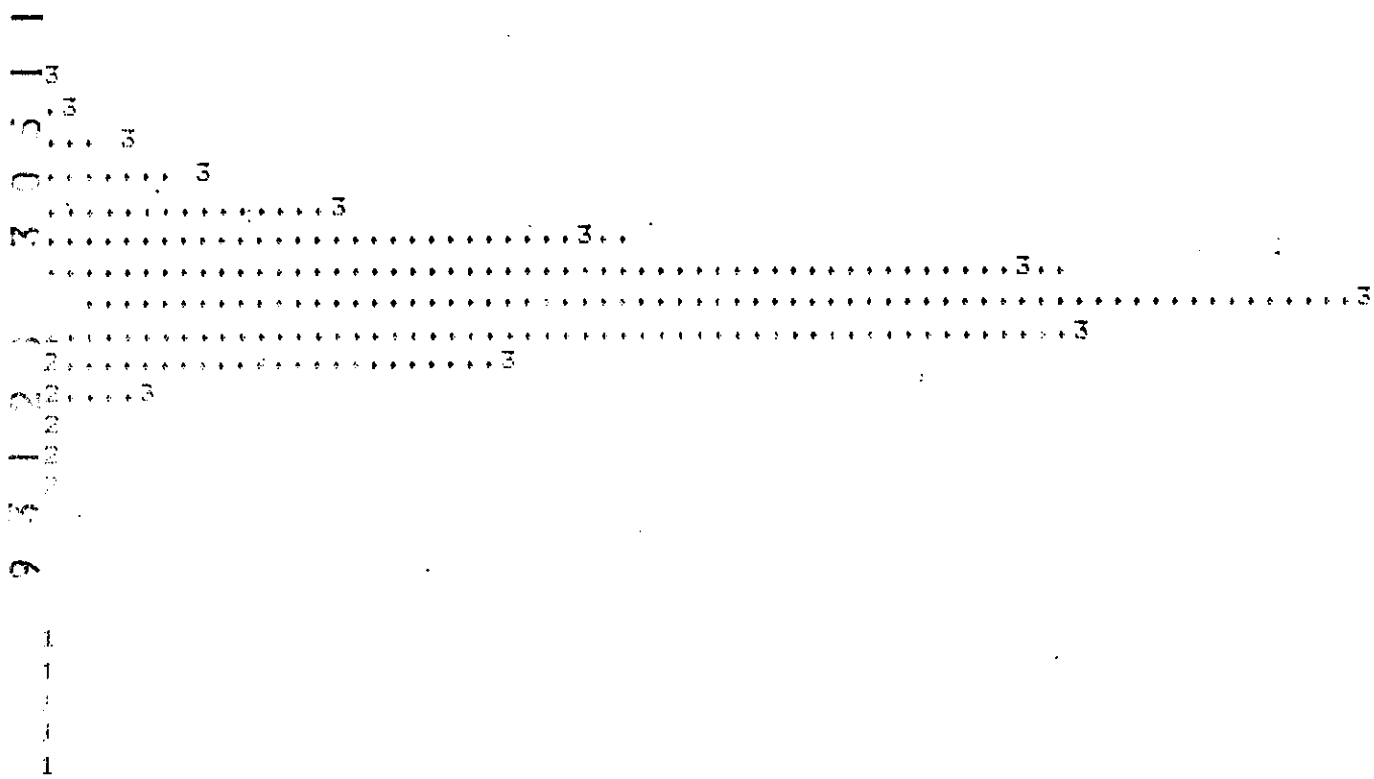

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1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	1.	1.	0.	3.	1.
21	1.	0.	0.	3.	0.	1.	1.	0.	0.	0.
31	1.	1.	2.	1.	1.	0.	0.	1.	1.	0.
41	0.	0.	2.	0.	3.	3.	0.	0.	1.	0.
51	1.	0.	0.	1.	1.	3.	1.	2.	0.	0.
1	1.	0.	1.	0.	0.	2.	0.	0.	1.	1.
71	1.	0.	1.	0.	2.	2.	1.	1.	0.	2.
81	1.	0.	1.	2.	0.	0.	0.	1.	3.	0.
91	1.	0.	0.	0.	2.	0.	0.	1.	0.	2.
101	1.	1.	2.	1.	0.	1.	0.	1.	1.	2.
111	2.	2.	2.	0.	1.	2.	2.	2.	0.	3.
121	2.	1.	1.	0.	1.	2.	2.	1.	2.	2.
131	1.	0.	2.	1.	2.	0.	1.	3.	0.	3.
141	2.	2.	0.	0.	1.	1.	2.	3.	3.	2.
151	1.	3.	1.	0.	2.	1.	2.	3.	2.	2.
161	3.	3.	1.	3.	5.	3.	3.	4.	2.	8.
171	3.	5.	6.	6.	9.	6.	1.	6.	2.	10.
181	8.	10.	7.	6.	8.	12.	6.	5.	5.	5.
191	12.	4.	15.	13.	10.	23.	12.	25.	19.	16.
201	17.	23.	28.	22.	25.	23.	29.	34.	35.	46.
211	30.	36.	46.	51.	65.	62.	66.	71.	85.	83.
221	103.	93.	96.	115.	134.	158.	150.	190.	192.	231.
231	249.	259.	255.	297.	356.	333.	387.	433.	463.	451.
241	536.	537.	579.	618.	645.	689.	689.	680.	753.	795.
251	809.	728.	827.	755.	747.	701.	653.	640.	600.	516.
261	493.	464.	389.	330.	311.	252.	209.	185.	146.	121.
271	108.	82.	56.	46.	32.	48.	27.	24.	17.	9.
281	6.	13.	9.	13.	4.	7.	6.	10.	7.	3.
291	4.	6.	4.	7.	5.	4.	10.	11.	6.	10.
301	4.	4.	8.	9.	6.	6.	2.	7.	4.	2.
1	4.	2.	2.	2.	0.	1.	0.	4.	1.	0.
321	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	1.	0.	1.	1.	1.	0.	1.	2.
341	1.	2.	1.	1.	0.	1.	1.	1.	2.	2.
351	1.	3.	1.	2.	1.	3.	3.	1.	2.	6.
361	1.	0.	3.	0.	3.	2.	2.	1.	1.	1.
371	1.	0.	0.	0.	2.	1.	0.	0.	0.	1.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9403-5882
File ID: SD2389.SPC

Counted on: 11/28/91 @ 4: 0
Detector/Geometry number: 2/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	134.8	130.0	301.421	301.421	24.000	17.432	12.000	7.255
2	80.5	78.0	256.078	256.078	24.000	15.958	12.000	6.199

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ea
1	Pu238	0.6279	5.499	5.502	-0.003	0.08	2.87	17.77	0.800E-05
	Am241		5.480	5.502	-0.022				0.613E-05
2		0.3721		5.288		0.08	1.70	7.58	0.341E-05

DETECTOR CALIBRATION

Energy(MEV) = 4.085 + (0.0047)*Channel
Energy range (MeV): 4.085 TO 6.491
Efficiency = 0.2247 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	2445.0	100.000
Smoothed	2444.9	99.996
Composite fit	2288.9	93.617
Residuals	156.0	6.379

Analyzed by: _____
62820

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SPECTRUM SD2389.SPC

1 LEGEND: RAW = ... MODELED PEAKS = 1,2,.., ETC 512.4

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1.............................2.
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2....1..
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1.
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Raw Data Dump for AEA Spectrum: SP:SD2389.SPC

1	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	2.	0.
91	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
101	1.	1.	1.	0.	0.	0.	1.	0.	0.	1.
111	0.	0.	0.	1.	0.	1.	1.	0.	0.	1.
121	3.	0.	1.	1.	0.	0.	0.	1.	1.	1.
131	1.	0.	0.	0.	0.	0.	1.	2.	0.	1.
141	0.	0.	0.	2.	0.	1.	0.	1.	1.	1.
151	0.	0.	2.	0.	2.	1.	0.	0.	0.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
171	0.	0.	0.	0.	0.	0.	3.	3.	0.	2.
181	0.	0.	0.	2.	1.	0.	0.	1.	1.	0.
191	2.	1.	2.	0.	3.	1.	0.	1.	0.	1.
201	1.	3.	0.	0.	1.	0.	1.	1.	1.	0.
211	1.	4.	0.	1.	4.	1.	4.	0.	3.	4.
221	1.	3.	1.	2.	2.	4.	3.	1.	5.	6.
231	2.	5.	4.	7.	7.	6.	4.	7.	13.	10.
241	16.	11.	22.	20.	18.	23.	29.	32.	30.	35.
251	33.	31.	52.	54.	47.	47.	43.	28.	36.	30.
261	21.	22.	20.	13.	21.	9.	6.	4.	9.	7.
271	7.	6.	8.	4.	7.	6.	6.	6.	11.	8.
281	11.	11.	14.	23.	22.	23.	20.	25.	32.	32.
291	29.	37.	42.	44.	58.	46.	74.	82.	76.	92.
301	75.	67.	63.	63.	38.	42.	48.	28.	32.	24.
311	18.	20.	8.	8.	9.	4.	4.	3.	2.	4.
321	4.	0.	1.	0.	0.	0.	0.	3.	0.	0.
331	0.	0.	2.	0.	0.	0.	0.	1.	0.	0.
341	0.	3.	0.	0.	2.	0.	3.	0.	2.	2.
351	0.	1.	0.	1.	2.	0.	1.	1.	0.	1.
361	1.	0.	1.	0.	0.	1.	0.	0.	1.	0.
371	0.	0.	1.	1.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	1.	0.	0.	1.	0.	1.
431	1.	1.	1.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	1.	0.	1.
461	0.	0.	0.	1.	0.	0.	0.	0.	1.	2.
71	0.	0.	1.	3.	1.	0.	0.	0.	0.	1.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

G E N E R A L A L P H A E N E R G Y A N A L Y S I S

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9404-0782
File ID: SD5114.SPC

Counted on: 11/27/91 01:[illegible]
Detector/Geometry number: [illegible]
Count time: 50000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	[illegible] Initial	[illegible] Final
1	21.9	20.[illegible]	301.620	301.620	38.000	16.711	14.000	[illegible]
2	25.1	22.8	252.873	252.873	40.000	48.343	21.000	[illegible]
3	30.4	24.2	198.932	198.932	64.000	67.[illegible]	[illegible]	[illegible]
4	15.0	14.4	163.903	163.903	34.000	20.820	12.000	[illegible]
5	13.4	11.9	126.780	126.780	28.000	17.434	14.000	[illegible]
6	8.0	4.0	84.717	84.717	28.000	[illegible]	[illegible]	[illegible]
7	9.0	5.7	38.330	38.330	42.000	103.788	16.000	34.[illegible]

PEAK RESULTS

Peak ID	Isotope	AREA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	[illegible]	Activity [illegible]
1	Pu239	0.0915	5.499	5.498	0.001	0.[illegible]	0.[illegible]	4.24	0.1[illegible]E-0[illegible]
[illegible]	Am241		5.480	5.498	-0.018				0.1[illegible]E-0[illegible]
[illegible]	Am243	0.2389	5.234	5.274	-0.040	0.22	1.81	72.21	0.[illegible]E-0[illegible]
[illegible]		0.5748		5.026		0.40	1.84	12.46	0.[illegible]E-0[illegible]
[illegible]		0.0968		4.863		0.12	0.73	3.22	0.1[illegible]E-0[illegible]
[illegible]		0.1432		4.703		0.03	1.10	4.87	0.[illegible]E-0[illegible]
[illegible]		0.0113		4.300		0.02	0.09	0.38	0.[illegible]E-0[illegible]
7	U 238	0.0410	4.200	4.287	-0.087	0.72	0.31	1.77	0.[illegible]E-0[illegible]

DETECTOR CALIBRATION

Energy(MEV) = 4.111 + (0.0046)(Channel)
Energy range (MeV): 4.111 TO [illegible] Mev
Efficiency 0.[illegible] CPM/DPM

TOTAL COUNT DATA

Item	Total	% Residuals
Raw spectrum	3782.0	100.000
Smoothed	3782.0	99.[illegible]
Composite fit	3782.3	101.[illegible]
Residuals	[illegible]	-1.[illegible]

Analyzed By: _____
MAE

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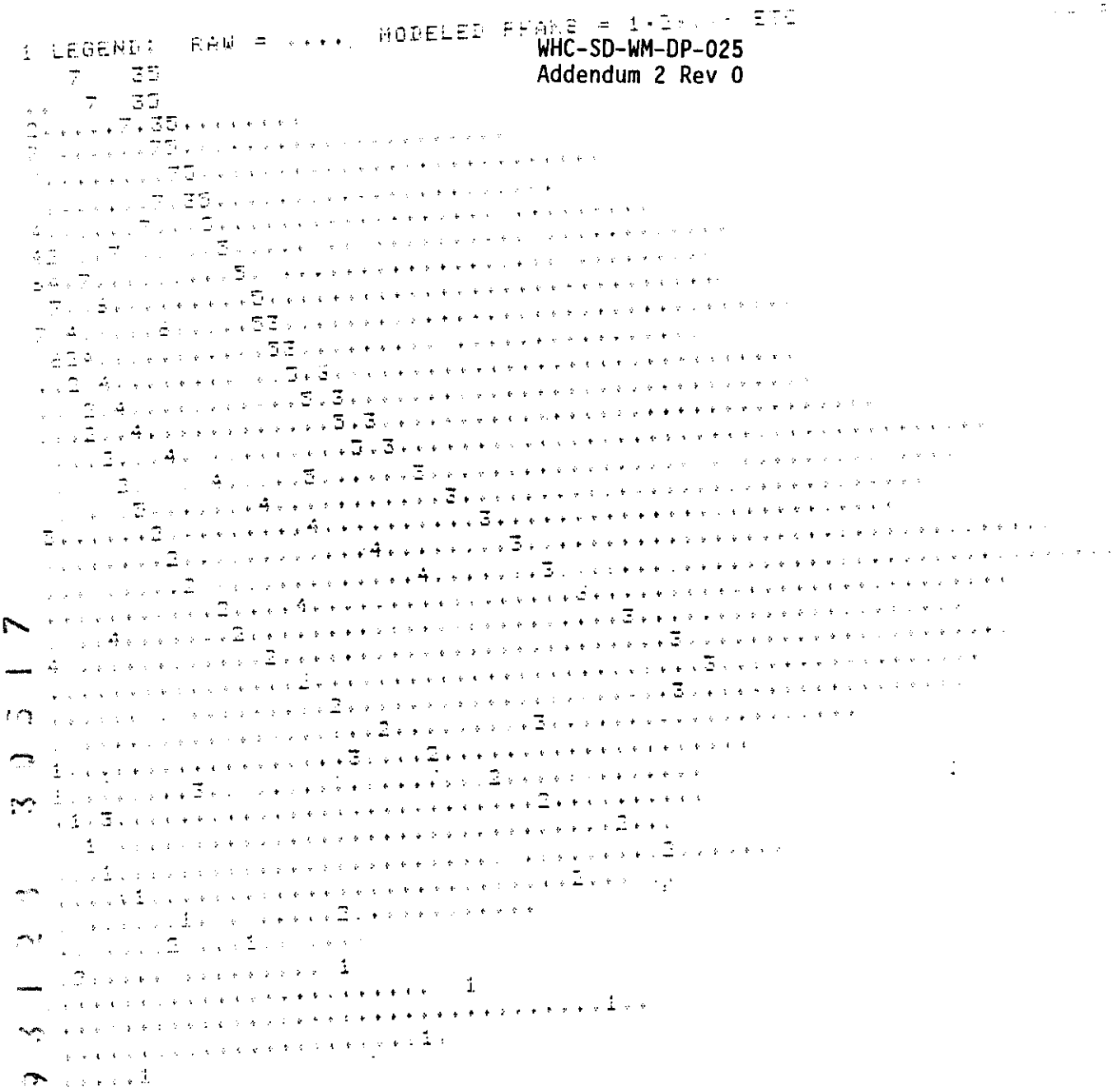

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Raw Data Dump for AEA Spectrum: SF13B3114.PE

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	4.	6.	7.	8.	9.
21	4.	7.	5.	13.	13.	7.	10.	10.	5.	11.
31	11.	12.	4.	6.	10.	9.	22.	12.	[illegible]	[illegible]
41	6.	9.	6.	12.	12.	7.	9.	8.	12.	13.
51	6.	12.	9.	15.	15.	20.	9.	11.	13.	11.
61	9.	13.	12.	15.	13.	17.	11.	10.	10.	11.
71	14.	9.	12.	16.	10.	9.	8.	9.	17.	12.
81	17.	9.	10.	20.	17.	13.	15.	10.	9.	12.
91	13.	14.	9.	13.	10.	10.	10.	17.	13.	13.
101	15.	14.	13.	17.	6.	13.	16.	12.	15.	17.
111	14.	9.	6.	9.	14.	24.	20.	22.	8.	15.
121	14.	17.	16.	16.	14.	15.	17.	22.	16.	13.
131	16.	15.	14.	18.	21.	17.	12.	16.	20.	9.
141	13.	12.	11.	14.	11.	18.	13.	13.	14.	15.
151	17.	17.	20.	20.	15.	15.	19.	19.	21.	22.
161	20.	17.	19.	21.	22.	17.	17.	17.	18.	20.
171	20.	13.	19.	13.	7.	14.	10.	15.	13.	17.
181	15.	20.	22.	20.	29.	23.	14.	8.	17.	[illegible]
191	22.	12.	20.	14.	16.	12.	20.	17.	21.	16.
201	13.	19.	12.	14.	19.	16.	14.	16.	20.	15.
211	14	11.	15.	12.	13.	14.	11.	13.	12.	11.
221	2.	13.	16.	19.	11.	17.	19.	5.	7.	8.
231	3.	16.	12.	10.	16.	11.	15.	7.	15.	12.
241	11.	7.	11.	7.	15.	12.	7.	15.	9.	[illegible]
251	14.	20.	16.	11.	9.	10.	13.	11.	10.	8.
261	8.	11.	11.	9.	10.	12.	10.	7.	2.	8.
271	6.	6.	6.	9.	2.	3.	6.	2.	7.	3.
281	6.	9.	2.	3.	3.	3.	5.	5.	7.	8.
291	8.	8.	4.	4.	6.	10.	12.	15.	16.	12.
1	11.	10.	9.	10.	12.	8.	7.	7.	3.	2.
311	4.	0.	0.	1.	0.	3.	0.	0.	1.	0.
321	0.	0.	0.	0	0.	10.	0.	0.	0.	1.
331	0.	0.	1.	0.	0.	0.	0.	1.	1.	0.
341	1.	0.	0.	0.	1.	0.	1.	2.	1.	1.
351	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
361	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
371	1.	0.	0.	0.	0.	0.	0.	0.	0.	0
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	1.	0.	0.	1.	0.	0.	0	0.	0.	1.
491	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
511	0	0.								

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G E N E R A L A L P H A E N E R G Y A N A L Y S I S

Rev. 1.10

DATA REDUCTION REPORT

SAMPLE
R9419-0382
File ID: SD4167.SPC

Counted on: 11/27/91 @19: 0
Detector/Geometry number: 4/ 1
Count time: 30000. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	4.5	4.5	359.257	359.257	20.000	13.017	10.000	4.519
2	396.0	391.5	304.327	304.327	24.000	13.627	12.000	3.638
3	247.1	242.4	260.133	260.133	20.000	11.626	10.000	5.673
4	5.6	4.7	147.046	147.046	180.000	2.000	90.000	0.200

PEAK RESULTS

Peak ID	Isotope	AEA Fract.	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	d/m	Activity uCi/ug
1	Pu236	0.0060	5.756	5.749	0.007	0.05	0.10	0.77	0.347E-0[illegible]
2	Pu238	0.5952	5.499	5.491	0.008	0.06	7.42	103.48	0.466E-0[illegible]
	Am241		5.480	5.491	-0.011				0.337E-0[illegible]
3		0.3872		5.283		0.03	6.13	48.47	0.218E-0[illegible]
4		0.0113		4.751		0.01	0.18	1.44	0.647E-0[illegible]

DETECTOR CALIBRATION

Energy(MEV) = 4.060 + (0.0047)*Channel
Energy range (MeV): 1.060 TO 6.467
Efficiency = 0.1944 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8216.0	100.000
Smoothed	8215.3	99.992
Composite fit	7910.7	96.284
Residuals	304.6	3.708

Analyzed by: _____
MAC

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1 LEGEND: RAW = ... MODELED PEAKS = 1,2,... EXP 1373.0

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Raw Data Dump for AEA Spectrum: SF:SD4167.SPC

1	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	0.	2.
21	0.	1.	1.	0.	0.	0.	0.	1.	1.	1.
31	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
51	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
61	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
71	1.	0.	2.	1.	0.	2.	0.	0.	0.	2.
81	1.	0.	0.	1.	1.	0.	0.	1.	1.	1.
91	0.	2.	2.	1.	3.	2.	1.	2.	1.	0.
101	1.	2.	0.	2.	1.	3.	1.	4.	2.	2.
111	1.	0.	0.	4.	0.	4.	1.	2.	0.	0.
121	1.	0.	3.	1.	2.	1.	1.	2.	0.	3.
131	3.	3.	2.	1.	3.	2.	3.	3.	3.	1.
141	1.	1.	0.	3.	3.	5.	4.	3.	1.	0.
151	1.	4.	4.	1.	0.	0.	2.	3.	3.	1.
161	5.	3.	3.	5.	3.	0.	2.	3.	4.	6.
171	6.	3.	2.	2.	2.	5.	4.	6.	3.	7.
181	5.	5.	5.	6.	6.	3.	5.	7.	2.	4.
191	4.	6.	5.	7.	8.	9.	7.	7.	5.	8.
201	9.	8.	13.	9.	7.	8.	11.	9.	7.	9.
211	12.	11.	12.	11.	13.	3.	13.	23.	11.	13.
221	17.	19.	13.	14.	18.	25.	15.	19.	17.	20.
231	23.	31.	30.	28.	28.	31.	29.	35.	31.	38.
241	45.	48.	58.	53.	50.	67.	60.	83.	69.	98.
251	96.	91.	102.	117.	111.	127.	136.	124.	146.	147.
261	159.	139.	116.	83.	62.	52.	42.	40.	33.	41.
271	31.	38.	38.	30.	43.	26.	38.	46.	39.	30.
281	44.	48.	40.	41.	83.	73.	62.	97.	79.	82.
291	86.	108.	116.	116.	130.	136.	151.	167.	183.	198.
	192.	223.	232.	218.	232.	194.	172.	143.	108.	84.
311	90.	48.	34.	34.	31.	21.	7.	8.	9.	1.
321	2.	2.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	1.	1.	1.	0.	2.	2.	1.
351	2.	3.	0.	2.	3.	3.	2.	3.	1.	3.
361	2.	3.	3.	0.	0.	0.	2.	0.	1.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	1.	1.	1.	1.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

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WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9404	Customer ID: 2291-4-2
Analysis: ARSENIC	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-355-131/B-0
Technologist: D. R. JACKSON	Date: 7-08-91
Starting Time: 7:45	Temperature: N/A
Ending Time: 11:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5595	11		
2	REAGENT BLANK	R9400-5695	12		
3	SAMPLE 2291-4-2	R9404-5795	13		
4	SPIKE OF SAMPLE 2291-4-2	R9404-5995	14		
5	FINAL LMCS CHECK STD	R9405-5595	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 CHECK STD	119B38-E/0.5 mL			N/A
SPIKE	119B38-E/0.25 mL			N/A

A-6000-881 (03/92)

ARSENIC ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

Serial No: R 9499.-5595 | Sample Point: 102AW | Date: 6-14-91 | Time Issued: 11:1 | Priority: 26
Determination: As | Method/Standard: LA-355-131 | Result Units: % RECOVERY | Charge Code: W1HFO | Remarks: 0
Sample Size: 50 mg (.500 ml) | Customer ID: STD 1
Remarks, Comments, Results:
EDP R741 AS/HYDRO
STDH 19838-C RESULT 99.9%
STD VAL %REC
1.016
49.928/.500 = 9.99e-2/100ml-1
Analyst-1: GC275 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5
Date: 7-8-91 | Time Completed | Lab Unit Mgr

Serial No: R 9400.-5695 | Sample Point: 102AW | Date: 6-14-91 | Time Issued: 11:2 | Priority: 26
Determination: As | Method/Standard: LA-355-131 | Result Units: UG/G | Charge Code: W1HFO | Remarks: 0
Sample Size: 1 ml .025 ml | Customer ID: REG. 1
Remarks, Comments, Results:
REAGENT BLANK
0.000
<5ng/1000 = <5.00 e-3 ppm
Analyst-1: GC275 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5
Date: 7-8-91 | Time Completed | Lab Unit Mgr

Serial No: R 9404.-5695 | Sample Point: 102AW | Date: 6-14-91 | Time Issued: 11:12 | Priority: 26
Determination: As | Method/Standard: LA-355-131 | Result Units: UG/G | Charge Code: W1HFO | Remarks: 0
Sample Size: .025 ml | Customer ID
Remarks, Comments, Results:
0.921
40.175 ng/25 ml = 1.607 ppm
Analyst-1: GC275 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5
Date: 7-8-91 | Time Completed | Lab Unit Mgr

Serial No: R 9404.-5695 | Sample Point: 102AW | Date: 6-14-91 | Time Issued: 11:12 | Priority: 26
Determination: AS | Method/Standard: LA-355-131 | Result Units: % RECOVERY | Charge Code: W1HFO | Remarks: 0
Sample Size: .025 ml | Customer ID
Remarks, Comments, Results:
SAMPLE SPIKED ID
SPIKE ID 19838-L
SPIKE VOLUME 35ng 0.250 ml
1.350
66.63ng - 40.175ng / 25ng x100 = 105.8%
Analyst-1: GC275 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5
Date: 7-8-91 | Time Completed | Lab Unit Mgr

Serial No: R 9405.-5595 | Sample Point: 102AW | Date: 6-14-91 | Time Issued: 11:14 | Priority: 26
Determination: As | Method/Standard: LA-355-131 | Result Units: % RECOVERY | Charge Code: W1HFO | Remarks: 0
Sample Size: 50 mg (.500 ml) | Customer ID: STD
Remarks, Comments, Results:
EDP R741 AS/HYDRO
STDH 19838-C RESULT 111.8%
STD VAL %REC
1.195
59.88 ng/500 ml = 1.118e-1/100ml-1
Analyst-1: GC275 | Analyst-2 | Analyst-3 | Analyst-4 | Analyst-5
Date: 7-8-91 | Time Completed | Lab Unit Mgr

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte: As

Procedure: LA-355-131 | Revision: B-0

Instrument: PERKIN-ELMER | Property No.: WA77479

Technologist: D. R. JACKSON | Payroll No.: 6C275 | Date: 7-08-91

Calibration Standard: 118B38-E

Analyte Concentration: .1000 ppm

Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.0000	0.00	0.000
2	0.2000 mL	20.00 ng	0.438
3	0.4000 mL	40.00 ng	0.820
4	0.1000 mL	100.00 ng	2.012
5			
6			
7			
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18			
19			
20			
21			

Comments:

A-6000-882 (03/92)

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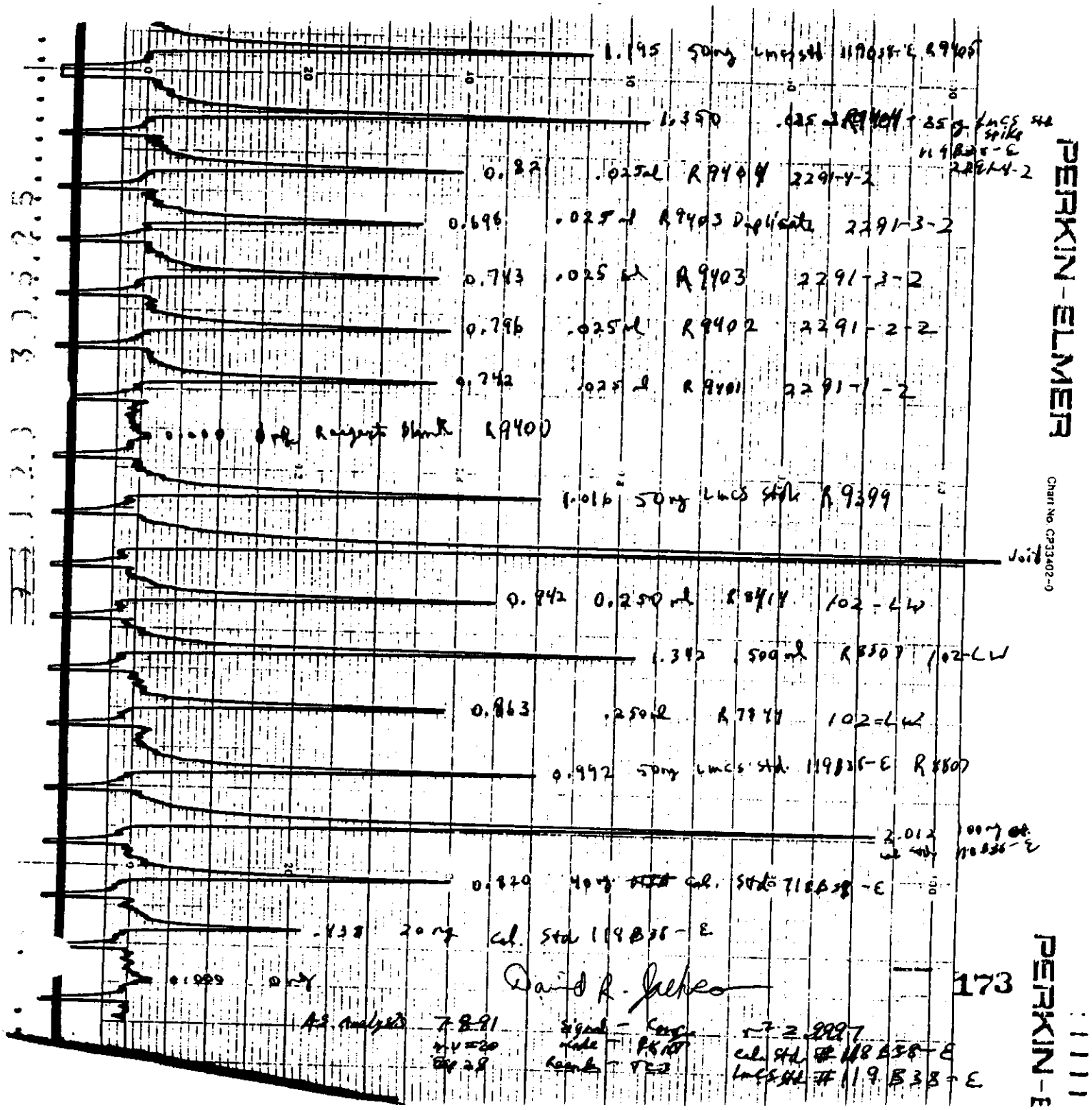

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9404	Customer ID: 2291-4-2
Analysis: MERCURY	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-325-102/A-2
Technologist: D. R. JACKSON	Date: 7-29-91
Starting Time: 7:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5597	11		
2	REAGENT BLANK	R9400-5697	12		
3	SAMPLE 2291-4-2	R9404-5797	13		
4	SPIKE OF SAMPLE 2291-4-2	R9404-5997	14		
5	FINAL LMCS CHECK STD	R9405-5597	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 CHECK STD	123B38-B/2.0 mL			2.0 mL
SPIKE	123B38-B/1.0 mL			N/A

A-6000-881 (03/92)

MERCURY ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-025
Addendum 2 Rev 0

Serial No	Sample Point	Date	Time Issued	Priority
R 9399.-559/	102AW	6-14-91	11:1 1	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 2.0 ml
Customer ID: STD.

Remarks, Calculations, Results
EDP R/16 UG/ITDRD
STDH 123638-B RESULT 1.09E-1
STD VAL 1.00E-1 %REC 109.070
0.538 217.49 / 2000 =

Analyst - 1: 6C225
Date: 7-29-91

Serial No	Sample Point	Date	Time Issued	Priority
R 9400.-569/	102AW	6-14-91	11:2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: REG. BL

Remarks, Calculations, Results
REAGENT BLANK
0.010
25 / 1000 = 25.00E-3 PPM

Analyst - 1: 6C225
Date: 7-29-91

Serial No	Sample Point	Date	Time Issued	Priority
R 9404.-579/	102AW	6-14-91	11:12	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Hg	LA-325-102	UG/G	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: 2291-112

Remarks, Calculations, Results
0.006
25 / 1000 = 25.00E-3 PPM

Analyst - 1: 6C225
Date: 7-29-91

Serial No	Sample Point	Date	Time Issued	Priority
R 9404.-599/	102AW	6-14-91	11:12	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 1.0 ml
Customer ID: 2291-112

Remarks, Calculations, Results
SAMPLE SPIKED ID/23 B38-B
SPIKE ID
SPIKE VOLUME 1.0 ml
0.259
(98.65) - (25) / 1000 = 9.87E-2 98.7%

Analyst - 1: 6C225
Date: 7-29-91

Serial No	Sample Point	Date	Time Issued	Priority
R 9405.-599/	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Hg	LA-325-102	% RECOVERY	W1BED	0

Sample Size: ? 2.0 ml
Customer ID: STD

Remarks, Calculations, Results
EDP R/16 UG/ITDRD
STDH/23 B38-B RESULT 1.07E-1
STD VAL 1.00E-1 %REC 107.070
0.538 214.08 / 2000

Analyst - 1: 6C225
Date: 7-29-91

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

Analyte:	Hg				
Procedure:	LA-325-102	Revision:	A-2		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	7-29-91

Calibration Standard: 122B38-C
Analyte Concentration: 0.1000 ppb
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.00	0.00	0.000
2	1.00 mL	100.00 ng	0.270
3	2.00 mL	200.00 ng	0.540
4	4.00 mL	400.00 ng	0.943
5			
6			
7			
8			
9			
10			
11			
12			
13			
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17			
18			
19			
20			
21			

Comments:

A-6000-882 (03/92)

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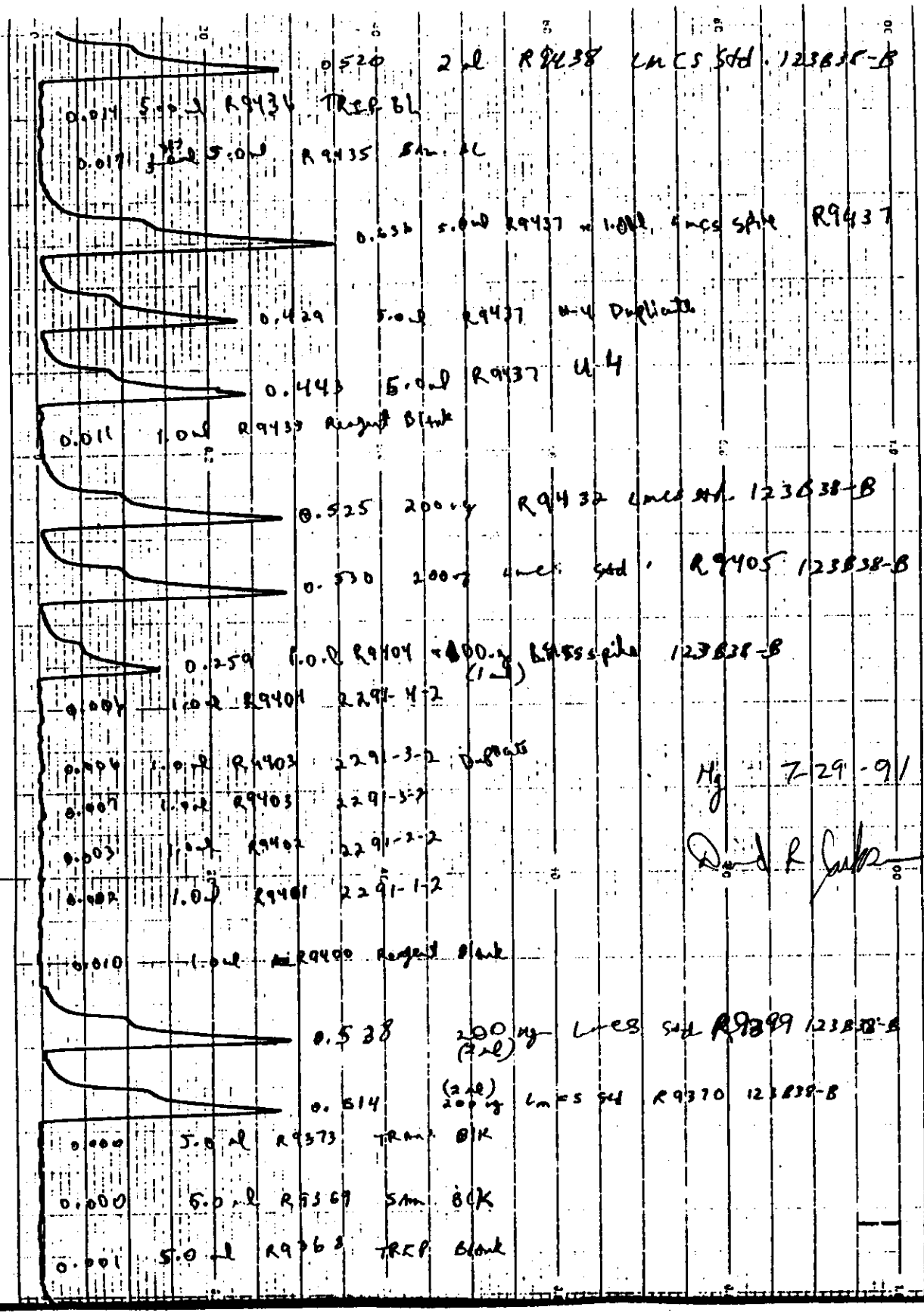
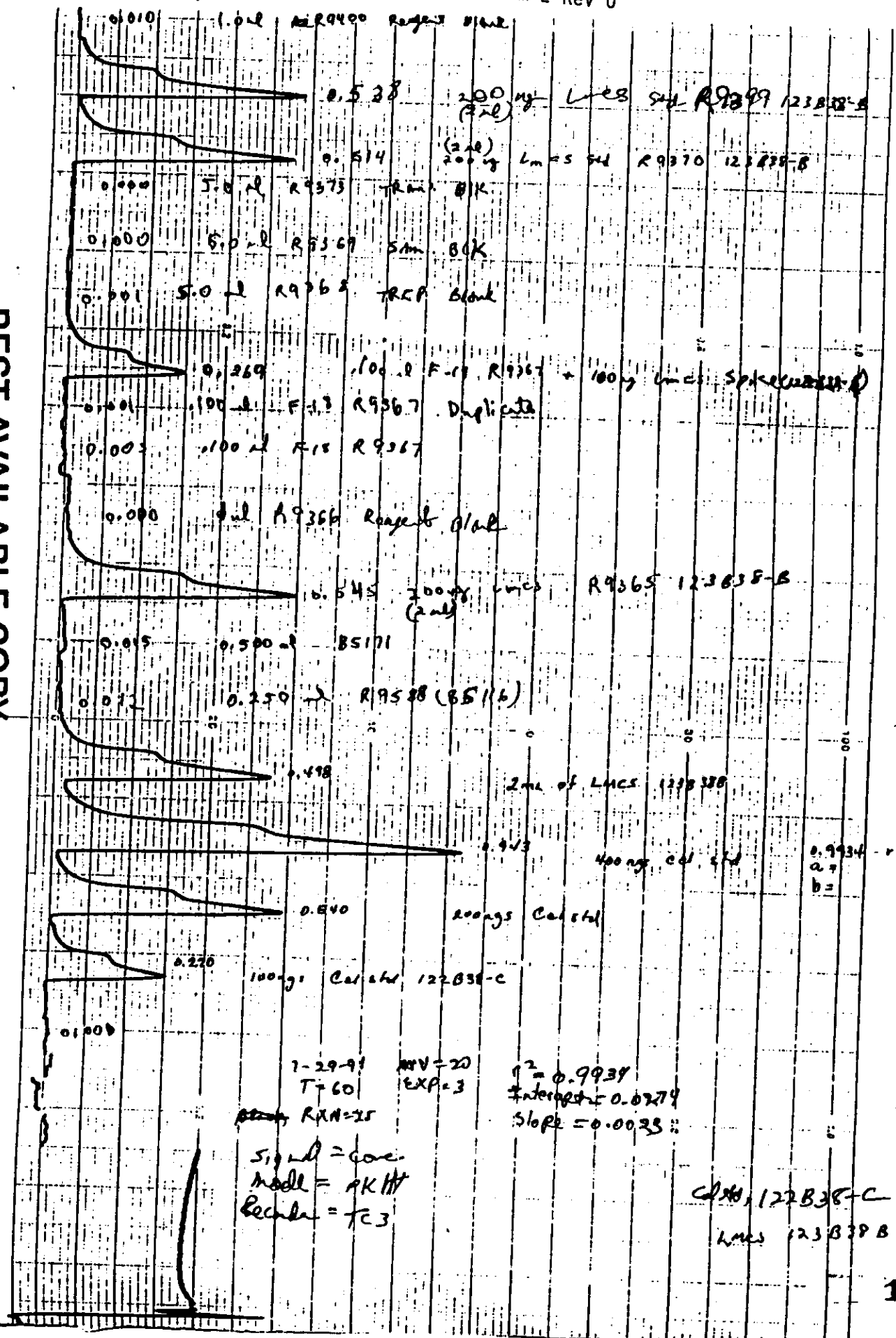


Hg 7-29-91

David R Gabe

PERKIN-ELMER

PERKIN-ELMER



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PERKIN-ELMER

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY

ANALYTICAL BATCH

Lab Segment Serial No.: R9404	Customer ID: 2291-4-2
Analysis: SELENIUM	Sample Prep: UNDIGESTED

Instrument: PERKIN ELMER WA77479	Procedure/Rev: LA-365-131/B-0
Technologist: D. R. JACKSON	Date: 9-17-91
Starting Time: 13:00	Temperature: N/A
Ending Time: 15:00	Chemist: R. K. FULLER

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	R9399-5596	11		
2	REAGENT BLANK	R9400-5696	12		
3	SAMPLE 2291-4-2	R9404-5796	13		
4	SPIKE OF SAMPLE 2291-4-2	R9404-5996	14		
5	FINAL LMCS CHECK STD	R9405-5596	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 CHECK STD	125B38-A/0.5 mL			N/A
SPIKE	125B38-A/0.5 mL			N/A

A-6000-881 (03/92)

SELENIUM ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
R 9399.-5596	102AW	6-14-91	11:1	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	WIDEO	0

Sample Size: ? .500 ml (50 µg) — Customer ID: STD

Remarks, Calculations, Results:
EDP R743 SE/HYDRD
SIDW/25818-A RESULT 9.82E-2
STD VAL %REC 98.240
0.9000 49.099/500

Analyst 1: 6C225 — Analyst 2: — Analyst 3: — Analyst 4: — Analyst 5: RKFuller
Date: 9-17-91 — Time Completed: — Lab Use Only:

Serial No	Sample Point	Date	Time Issued	Priority
R 9400.-5596	102AW	6-14-91	11:2	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	WIDEO	0

Sample Size: ? 1.0 ml — Customer ID: REG. DL

Remarks, Calculations, Results:
REAGENT BLANK
-0.023
<5/1000 = <5.00E-3 ppm

Analyst 1: 6C225 — Analyst 2: — Analyst 3: — Analyst 4: — Analyst 5: RKFuller
Date: 9-17-91 — Time Completed: — Lab Use Only:

Serial No	Sample Point	Date	Time Issued	Priority
R 9404.-5996	102AW	6-14-91	11:12	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	UG/G	WIDEO	0

Sample Size: ? ~~.500 ml~~ 1.0 ml — Customer ID: 9-17-91

Remarks, Calculations, Results: DRS 9-17-91
-0.051
<5/1000 = <5.00E-3 ppm

Analyst 1: 6C225 — Analyst 2: — Analyst 3: — Analyst 4: — Analyst 5: RKFuller
Date: 9-17-91 — Time Completed: — Lab Use Only:

Serial No	Sample Point	Date	Time Issued	Priority
R 9404.-5996	102AW	6-14-91	11:12	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	WIDEO	0

Sample Size: ? ~~.500 ml~~ 1.0 ml — Customer ID: 9-17-91

Remarks, Calculations, Results:
SAMPLE SPIKED ID 12SB18-A
SPIKE ID
SPIKE VOLUME .500 ml
0.215
10.203/500 = 2.04E-2 x 100 = 20.4%
9-18-91 FLAG: MATRIX INTERFERENCE DUE TO SAMPLE SIZE

Analyst 1: 6C225 — Analyst 2: — Analyst 3: — Analyst 4: — Analyst 5: RKFuller
Date: 9-17-91 — Time Completed: — Lab Use Only:

Serial No	Sample Point	Date	Time Issued	Priority
R 9405.-5596	102AW	6-14-91	11:14	26

Determination	Method/Standard	Result Units	Charge Code	Rerun
Se	LA-365-131	% RECOVERY	WIDEO	0

Sample Size: ? .500 ml (50 µg) — Customer ID: SID

Remarks, Calculations, Results:
EDP R743 SE/HYDRD
SIDW/25818-A RESULT 8.91E-2
STD VAL %REC 89.140
0.820 44.54/500 =

Analyst 1: 6C225 — Analyst 2: — Analyst 3: — Analyst 4: — Analyst 5:
Date: 9-17-91 — Time Completed: — Lab Use Only:

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
CALIBRATION RECORD

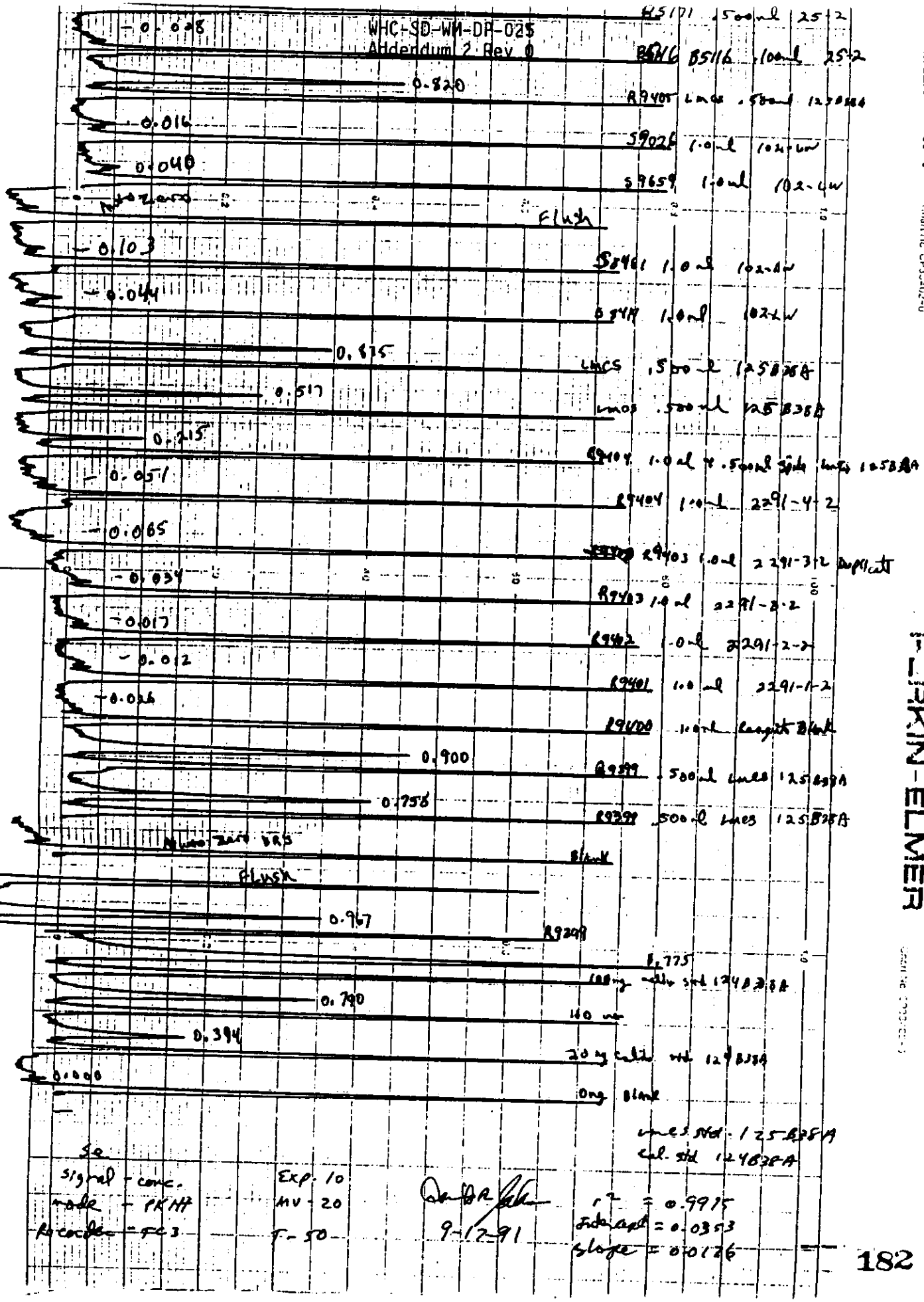
Analyte:	Se				
Procedure:	LA-365-131	Revision:	B-0		
Instrument:	PERKIN ELMER	Property No.:	WA77479		
Technologist:	D. R. JACKSON	Payroll No.:	6C275	Date:	9-17-91

Calibration Standard: 124B38A
Analyte Concentration: 0.1000 ppm
Type of Calibration: LINEAR

	Dilution	Concentration	Instrument Reading Unit
1	0.000	0.00	0.000
2	0.200 mL	20.00 ng	0.394
3	0.400 mL	40.00 ng	0.790
4	1.000 mL	100.00 ng	1.775
5			
6			
7			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Comments:

A-6000-882 (03/92)



Se
Signal - conc.
mode - PKHT
Recorder - FC3

Exp. 10
MV - 20
T - 50

9-12-91

r² = 0.9995
Intercept = 0.0353
slope = 0.0126

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