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45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR TANK 241-AN-106, GRAB SAMPLES 6AN-95-1 THROUGH 6AN-95-9.

Ruth A. Esch

Westinghouse Hanford Company, Richland, WA 99352
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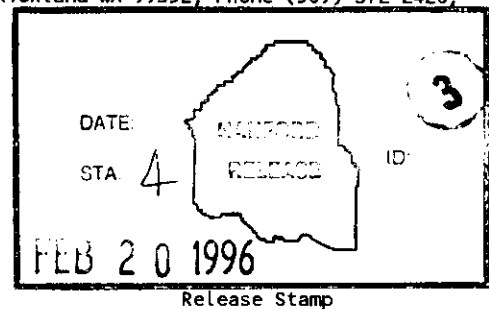
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WHC-SD-WM-DP-168, REV. 0

ANALYTICAL SERVICES

**45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR
TANK 241-AN-106, GRAB SAMPLES
6AN-95-1 THROUGH 6AN-95-9**

Project Coordinator: Ruth A. Esch

**Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management**

by

**Westinghouse Hanford Company
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Richland, Washington**

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NARRATIVE

**45 DAY SAFETY SCREENING AND FINAL RESULTS FOR TANK 241-AN-106
GRAB SAMPLES 6AN-95-1 THROUGH 6AN-95-9**

SUMMARY

Eight grab samples (6AN-95-1, 6AN-95-2, 6AN-95-3, 6AN-95-4, 6AN-95-5, 6AN-95-6, 6AN-95-7, and 6AN-95-8) and one field blank (6AN-95-9) were taken from tank 241-AN-106. The following analyses were performed in support of the Safety Screening program, as specified in the Tank 241-AN-106 Grab Sampling and Analysis Plan (TSAP) (reference 1): differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), total alpha activity (AT), and bulk density.

Based on the results of vapor monitoring prior to sampling, the vapor in tank AN-106 dome space is far below the lower flammability limits (LFL) stated in the TSAP.

The eight samples collected from this tank were all liquids, no solids were retrieved. On an average, the samples were approximately 77% moisture. None of the samples exhibited exotherms, and there was no detectable alpha activity in any of the samples. Therefore, the results for DSC and AT were not compared to the safety screening limits at a confidence level of 95%.

No exothermic or alpha activity was expected, as indicated by the data collected in previous sampling events (see Internal Memo 753-95-104 "Assessment of Need for Sampling and Safety Screening of Tank 241-AN-106" in the correspondence section of this document).

The accuracy and precision for all of the sample analyses was within $\pm 10\%$. No further analyses are required in support of the Safety Screening Program.

When compared to the criteria in the Safety Screening Data Quality Objective (reference 2), the data indicate that the tank is "safe".

SCOPE

This document serves as the 45 day safety screening and final report deliverable for the tank 241-AN-106 grab samples collected on November 21 and 22, and December 29, 1995. All of the samples were subsampled and analyzed in accordance with the TSAP (reference 1).

Attachment 1 is provided as a cross-reference for relating the tank farm customer ID numbers with the 222-S Laboratory sample numbers. The subsamples that were generated in the laboratory for analysis are also identified in these diagrams.

Included in this report are the tank dome space flammability screening and primary safety screening results. Copies of the subsampling information worksheets and all of the raw data are also included.

TANK DOME SPACE FLAMMABILITY SCREENING

The dome space was sampled and analyzed for the presence of flammable gases prior to sampling tank AN-106. The results of the combustible gas monitoring twenty feet below the top of riser 22A are presented in Table 1. Although the TSAP indicates that the results shall be reported as a percentage of the lower flammability limit (%LFL), the instrumentation used to collect the data reports as a percentage of the lower explosive limit (%LEL). For the purpose of screening the tank dome space, the %LEL is an acceptable substitute for %LFL, since the two values are used interchangeably in reference to the physical properties of chemical hazards (reference 3).

Table 1: Characteristics of Vapor Space as Determined by Combustible Gas Monitoring
Tank 241-AN-106, Dome Space in Riser 22A

Vapor Characteristic Measured	Results
Flammable vapor concentration as percent of lower explosion limit (LEL)	0%
Volume percent oxygen gas	n/a
Concentration of ammonia gas	0 ppm
Concentration of total organic carbon vapor	0 ppm

ppm = parts per million

n/a = data not available

APPEARANCE AND SAMPLE HANDLING

Appearance

Four grab samples (6AN-95-1, 6AN-95-2, 6AN-95-3, and 6AN-95-4) were removed from tank 241-AN-106 riser 22A on November 21, 1995, and four (6AN-95-5, 6AN-95-6, 6AN-95-7, and 6AN-95-8) from riser 21A and November 22, 1995. The field blank was collected from riser 22A on December 29, 1995.

Samples 6AN-95-4 and 6AN-95-8 were both collected at a depth of 667 inches in an attempt to obtain sludge material. Visual observation in the 222-S Laboratory indicated that there was less than 1 gram of solids in these samples. The tank coordinator was contacted, and it was decided that the lab would proceed with supernate analyses only on these samples. No further attempts were made to collect sludge material because 667 inches is the lowest achievable depth.

Table 2 summarizes the appearance information for the eight samples and the field blank. The reported sampling depths were recorded from the tank farm sample labels attached to the sample containers.

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Table 2: Appearance for Tank 241-AN-106 Liquid Grab Samples

CUSTOMER ID	LAB ID	SAMP DEPTH (IN.)	APPEARANCE			
			Color	Clarity	Org Layer	Solids
6AN-95-1	S96T000131	522	Yellow	Clear	None	None
6AN-95-2	S96T000132	592	Yellow	Clear	None	None
6AN-95-3	S96T000133	652	Yellow	Clear	None	None
6AN-95-4	S96T000135	667	Gray/yellow	Clear	None	Trace gray/brown
6AN-95-5	S96T000149	522	Yellow	Clear	None	Trace orange/brown
6AN-95-6	S96T000150	592	Yellow	Clear	None	Trace orange/brown
6AN-95-7	S96T000151	652	Yellow	Clear	None	None
6AN-95-8	S96T000152	667	Gray/yellow	Clear	None	Trace gray/brown
6AN-95-9 Field Blank	S96T000134	240	Colorless	Clear	None	None

Subsampling

For each sample and the field blank, one 20 mL unfiltered subsample was recovered for safety screening analyses, and one 60 mL unfiltered subsample was created for archive. Approximately 40 mL of each sample is being held for possible future analysis by the Process Chemistry and Statistics group at the 222-S Laboratory.

There was less than 1 gram of solids in samples 6AN-95-4 and 6AN-95-8, which is insufficient for analysis. Therefore, no attempt was made to separate and save these solids.

ANALYTICAL RESULTS

A summary of the analytical results is presented in Table 3.

Following the data summary tables is a section which contains the Data Verification and Deliverable (DVD) summary report for radionuclide analyses. This report summarizes the total alpha activity results and provides data qualifiers and total propagated uncertainty (TPU) values for results. The TPU values are based on the uncertainties inherent in each step of the analysis process. They are used to determine "reasonable" RPD values which may be used to accept valid data that do not meet the TSAP acceptance criteria. A report guide is provided at the front of this section to assist in understanding the "flagging" of the data presented.

Thermogravimetric Analysis (TGA)

The percent moisture content was determined by TGA using procedures LA-514-114 Rev. C-1 and LA-560-112 Rev. B-1. The procedures are for the Perkin-Elmer and Mettler TGA instruments, respectively. The analysis was performed in duplicate on direct samples.

Results for the eight tank samples submitted were in the range of 73.71 to 79.37 percent moisture. The field blank gave an average result of 100.0 percent moisture. All of the samples produced only one weight loss step between approximately 50° C to 200° C. The relative percent difference (RPD) between sample and duplicate results for all samples were less than 10%. Sample 6AN-95-7 (S96T000155) was rerun due to noise causing a 93.9% RPD. The rerun was reported as a replicate indicated by "1" after the sample number.

For sample 6AN-95-3 (S96T000138), the results for the original analysis were not used because of a problem retrieving the sample data from the computer. Therefore, the results are marked as "n/a" in the report. The rerun was reported as a replicate indicated by "1" after the sample number.

Differential Scanning Calorimetry (DSC)

The energetics determination was performed by DSC using procedures LA-514-114 Rev. C-1 and LA-514-113 Rev. C-1. The two procedures are for the Perkin-Elmer and Mettler DSC instruments, respectively. The analysis was performed in duplicate on direct samples.

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None of the nine samples submitted exhibited exotherms. Therefore, the exothermic energy based on a dry weight of sample was not calculated for any of the samples. Since all of the exothermic results were 0.0 joules/g, the 95% upper confidence limit was not calculated.

Density

The density for all of the samples was determined by performing a bulk density analysis during subsampling, using procedure LO-160-103 Rev. B-0. A single determination was made for each sample, with the exception of samples 6AN-95-4 and 6AN-95-8 which had duplicate measurements taken. The RPDs on the duplicates were less than 2%. The density results were in the range of 1.16 to 1.22 g/mL. The bulk density for the field blank was 1.00 g/mL.

Total Alpha (AT)

The AT determination was performed using procedure LA-508-101 Rev. D-2. The analysis was performed in duplicate on direct samples.

Alpha activity results are reported as either a positive number, or a less than value which is based on the critical level calculated from the background count rate and counting time. The critical level is the activity value which must be exceeded before a sample can be said to contain any material above the background. As a sample result approaches this critical level, it is statistically valid to have positive results less than the method detection limit, as well as less than values greater than the detection limit. The detection limits, uncertainties, and less than values were calculated in accordance with procedure LA-508-002 Rev. B-0.

For this report, the largest positive result that was above the background was $1.73\text{e-}3 \mu\text{Ci/mL}$. This value was equal to the method detection limit calculated for that sample, and four orders of magnitude less than the action limit of $61.5 \mu\text{Ci/mL}$.

The 95% upper confidence limits were not calculated, since all of the results were below the method detection limit of critical level.

The DVD report "flags" one of the laboratory control standards as "low" with a standard recovery of 79%. Although this standard is below the calculated 3σ range of 80 - 120% recovery, it is within the statistical control limits for the method. Therefore, the sample results were considered to be acceptable, and the batch was not rerun.

References

1. WHC-SD-WM-TSAP-070, REV. 0, "Tank 241-AN-106 Grab Sampling and Analysis Plan", dated December 11, 1995, Westinghouse Hanford Company, Richland, WA 99352.
2. WHC-SD-WM-SP-004, Rev. 2, "Tank Safety Screening Data Quality Objective", dated August 31, 1995, Westinghouse Hanford Company, Richland, WA 99352.
3. NIOSH Pocket Guide to Chemical Hazards, 1994 edition.

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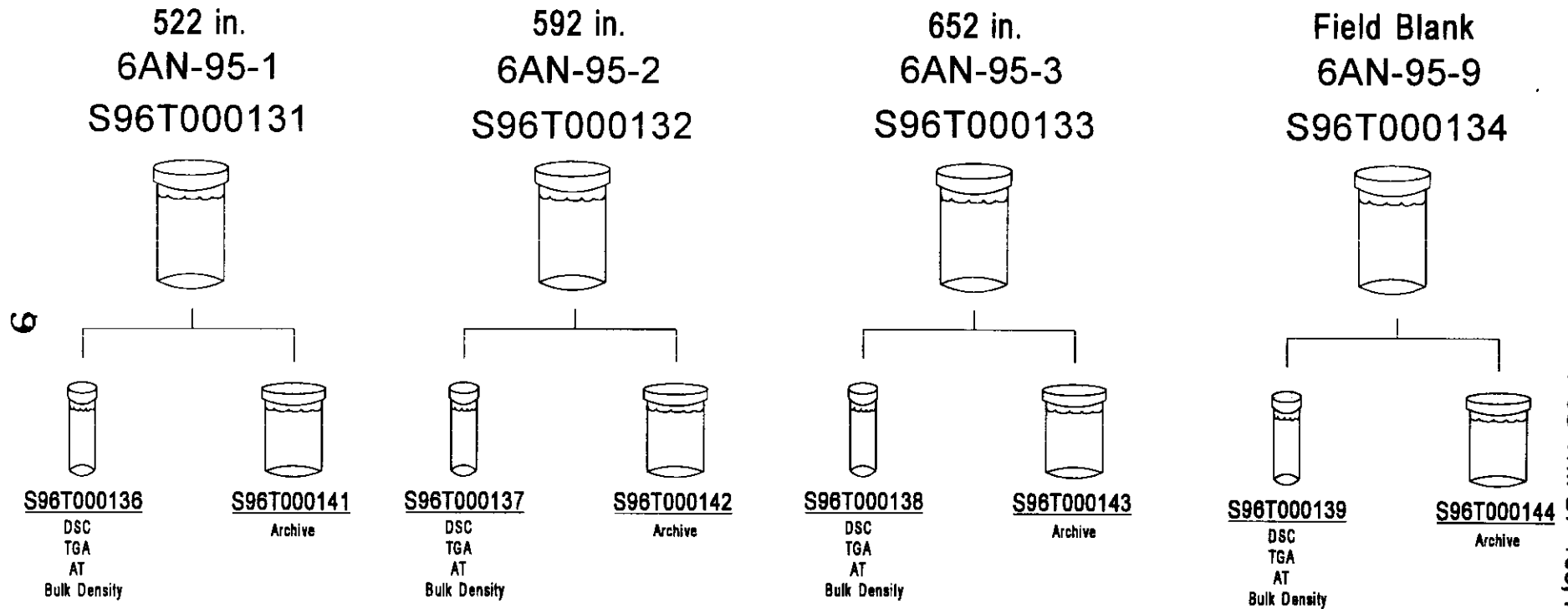
ATTACHMENT 1

AN-106 GRAB SAMPLE BREAKDOWN

Attachment 1 (1 of 3)

AN-106 GRAB SAMPLE BREAKDOWN

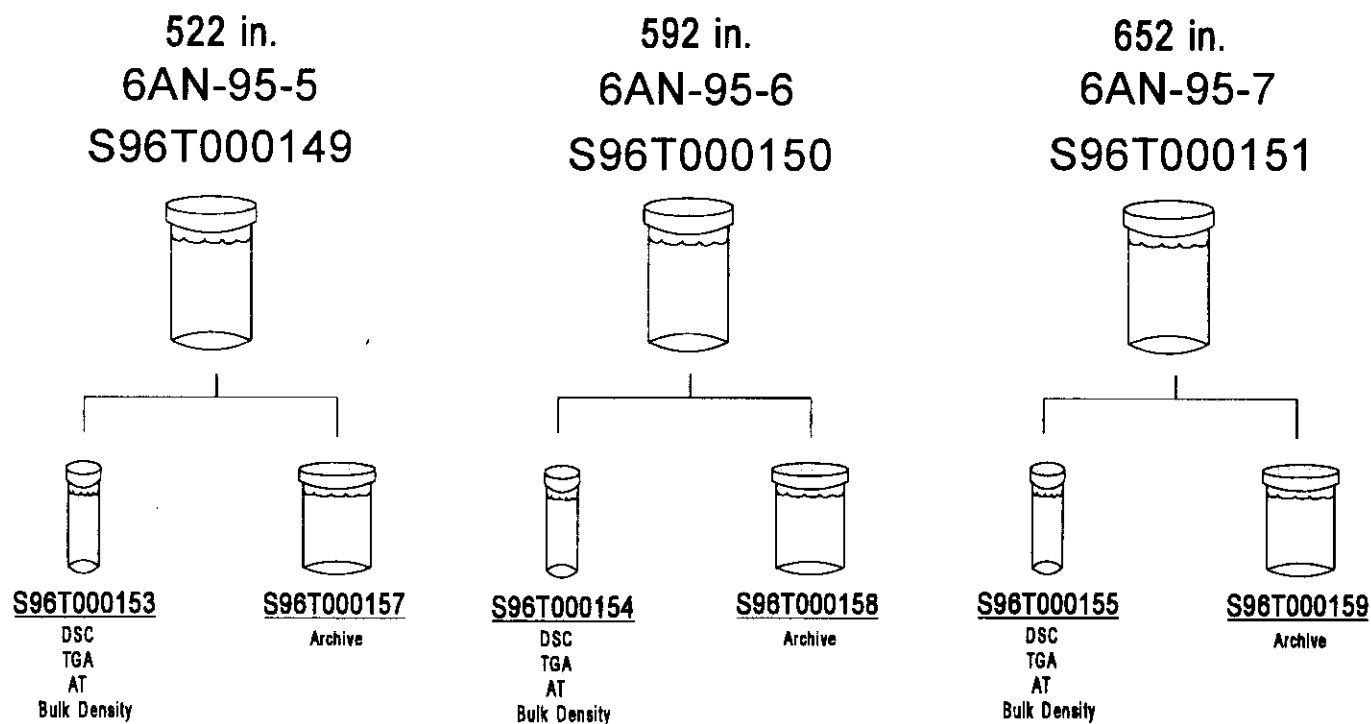
Riser 22A



Attachment 1 (2 of 3)

AN-106 GRAB SAMPLE BREAKDOWN

Riser 21A



Attachment 1 (3 of 3)

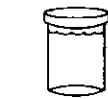
AN-106 GRAB SAMPLE BREAKDOWN

Riser 22A
667 in.
6AN-95-4
S96T000135



Solid Liquid

Less than 1 gram
of solid was present
in the sample. The
solids were not
collected.



S96T000145
Archive



S96T000140
AT
DSC
TGA
Bulk Density

Riser 21A
667 in.
6AN-95-8
S96T000152



Solid Liquid

Less than 1 gram
of solid was present
in the sample. The
solids were not
collected.



S96T000160
Archive



S96T000156
AT
DSC
TGA
Bulk Density

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SAMPLE DATA SUMMARY

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Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 22A
SEGMENT #: 6AN-95-1

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000136			% Water by TGA using Mettler	%	None	None	101.6	n/a	78.71	78.35	78.53	0.46	n/a	n/a	n/a
S96T000136			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.52	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000136			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.180	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000136			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	79.22	1.540	1.16e-03	<1.41E-3	n/a	n/a	90.31	1.73e-03	1.00E+02

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A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 22A
SEGMENT #: 6AN-95-2

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000137			% Water by TGA using Mettler	%	None	None	101.6	n/a	76.86	77.26	77.06	0.52	n/a	n/a	n/a
S96T000137			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.00	98.52	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000137			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.170	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000137			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	79.22	1.540	<7.86E-04	1.16e-03	n/a	n/a	n/a	1.73e-03	5.00E+02

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A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 22A
SEGMENT #: 6AN-95-3

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000138	1		% Water by TGA using Mettler	%	None	None	101.9	n/a	76.56	75.48	76.02	1.42	n/a	n/a	n/a
S96T000138			% Water by TGA using Mettler	%	None	None	100.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S96T000138			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	105.8	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000138			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.180	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000138			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	79.22	1.540	1.73e-03	<1.41E-3	n/a	n/a	n/a	1.73e-03	8.55E+01

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A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 22A
SEGMENT #: 6AN-95-4

SEGMENT PORTION: Decanted Supernate (Liquid Grab Sludge)

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000140			% Water by TGA using Mettler	%	None	None	101.5	n/a	75.32	73.71	74.51	2.16	n/a	n/a	n/a
S96T000140			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.49	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000140			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.210	1.220	1.215	0.82	n/a	5.00e-01	n/a
S96T000140			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	94.02	<7.41e-03	<5.03E-03	<5.82E-3	n/a	n/a	108.9	1.17e-02	5.00E+02

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A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 21A
SEGMENT #: 6AN-95-5

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000153			% Water by TGA using Mettler	%	None	None	101.5	n/a	77.76	77.92	77.84	0.21	n/a	n/a	n/a
S96T000153			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.70	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000153			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.160	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000153			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	89.31	<2.53e-03	<2.53E-03	<2.57E-3	n/a	n/a	104.1	5.94e-03	5.00E+02

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A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 21A
SEGMENT #: 6AN-95-6

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000154			% Water by TGA on Perkin Elmer	%	None	None	102.1	n/a	79.37	77.14	78.25	2.85	n/a	n/a	n/a
S96T000154			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.70	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000154			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.180	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000154			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	89.31	<2.53e-03	<3.25E-03	<2.53E-3	n/a	n/a	n/a	5.94e-03	5.00E+02

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A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 21A
SEGMENT #: 6AN-95-7

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000155	1		% Water by TGA on Perkin Elmer	%	None	None	101.9	n/a	75.92	76.21	76.06	0.38	n/a	n/a	n/a
S96T000155			% Water by TGA on Perkin Elmer	%	None	None	102.1	n/a	26.70	73.93	50.32	93.9	n/a	n/a	n/a
S96T000155			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.70	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000155			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.190	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000155			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	89.31	<2.53e-03	<6.33E-02	<5.13E-3	n/a	n/a	n/a	5.94e-03	5.00E+02

=> Limit violated

=> Selected Limit

15-feb-1996 15:16:14
A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 21A
SEGMENT #: 6AN-95-8

SEGMENT PORTION: Decanted Supernate (Liquid Grab Sludge)

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000156			% Water by TGA using Mettler	%	None	None	102.2	n/a	74.23	74.64	74.44	0.55	n/a	n/a	n/a
S96T000156			DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	98.70	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000156			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.180	1.200	1.190	1.68	n/a	5.00e-01	n/a
S96T000156			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	94.02	<7.41e-03	<4.95E-03	<6.62E-3	n/a	n/a	109.2	1.17e-02	5.00E+02

=> Limit violated

=> Selected Limit

WHC-SD-WM-DP-168, REV. 0

15-feb-1996 15:16:42
A-0002-1

Table 3: Final Results for Tank 241-AN-106
AN-106 GRAB

RISER: 22A
SEGMENT #: 6AN-95-9

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Action Limits		Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
					Lower	Upper									
S96T000139			% Water by TGA using Mettler	%	None	None	102.0	n/a	99.64	100.8	100.2	1.16	n/a	n/a	n/a
S96T000139			DSC Exotherm using Mettler	Joules/g	-1.0e+00	480.0	105.8	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S96T000139			Bulk Density of Sample	g/mL	None	None	n/a	n/a	1.000	n/a	n/a	n/a	n/a	5.00e-01	n/a
S96T000139			Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	79.22	1.540	6.06e-07	<4.16E-7	n/a	n/a	n/a	8.56e-07	1.42E+02

=> Limit violated

=> Selected Limit

WHC-SD-WM-DP-168, REV. 0

RADIOCHEMISTRY SAMPLE REPORT

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016Contact R. A. EschClient TWRSTank AN106**REPORT GUIDE****WHC-SD-WM-DP-168, REV. 0
ABOUT THE DATA SUMMARY SECTION**

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DUPLICATES**Final Report****REPORT GUIDES**

Page 1

SUMMARY DATA SECTION

Page 1

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Lab id 222-SProtocol GRABVersion 1.0Form DVD-RGVersion 3.08Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016

Contact R. A. EschClient TWRSTank AN106**GUIDE, cont.****WHC-SD-WM-DP-168, REV. 0****ABOUT THE DATA SUMMARY SECTION**

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

Page 2

Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016

Contact R. A. Esch

Client TWRS

Tank AN106

SAMPLE SUMMARY

WHC-SD-WM-DP-168, REV. 0

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	PRIORITY COLLECTED	RECEIVED
AN106 S1 Safety Screen	R: 22A S: 6AN-95-1 C: n/	LIQUID		S96T000136		11/22/95 10:48
AN106 S1 Safety Screen-D	R: 22A S: 6AN-95-1 C: n/	LIQUID		S96T000136D		
AN106 S1 Safety Screen-S	R: 22A S: 6AN-95-1 C: n/	LIQUID		S96T000136S		
AN106 S2 Safety Screen	R: 22A S: 6AN-95-2 C: n/	LIQUID		S96T000137		11/22/95 10:48
AN106 S2 Safety Screen-D	R: 22A S: 6AN-95-2 C: n/	LIQUID		S96T000137D		
AN106 S3 Safety Screen	R: 22A S: 6AN-95-3 C: n/	LIQUID		S96T000138		11/22/95 10:11
AN106 S3 Safety Screen-D	R: 22A S: 6AN-95-3 C: n/	LIQUID		S96T000138D		
AN106 S4 Sfty Scrn Dect	R: 22A S: 6AN-95-4 C: n/	LIQUID		S96T000140		11/22/95 15:00
AN106 S4 Sfty Scrn Dect-	R: 22A S: 6AN-95-4 C: n/	LIQUID		S96T000140D		
AN106 S4 Sfty Scrn Dect-	R: 22A S: 6AN-95-4 C: n/	LIQUID		S96T000140S		
AN106 S9 Safety Screen	R: 22A S: 6AN-95-9 C: n/	LIQUID		S96T000139		12/29/95 11:33
AN106 S9 Safety Screen-D	R: 22A S: 6AN-95-9 C: n/	LIQUID		S96T000139D		
DI Blank		LIQUID		B4992-2		
DI Blank		LIQUID		B5169-2		
Lab Control Sample		LIQUID		S4992-1		
Lab Control Sample		LIQUID		S5169-1		

Final Report

SAMPLE SUMMARY

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SUMMARY DATA SECTION

Page 3

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch

Client TWRS
Tank AN106

QC SUMMARY

WHC-SD-WM-DP-168, REV. 0

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	%	SAMPLE	BASIS	DAYS FROM/TO		LAB	DEPARTMENT
							COLL	RCVD		
				MOIST	AMOUNT	AMOUNT	RCVD	RPTD	SAMPLE ID	SAMPLE ID
96000016-L		AN106 S1 Safety Screen	LIQUID						77 S96T000136	
		AN106 S2 Safety Screen	LIQUID						77 S96T000137	
		AN106 S3 Safety Screen	LIQUID						77 S96T000138	
		AN106 S4 Sfty Scrn Dect	LIQUID						77 S96T000140	
		AN106 S9 Safety Screen	LIQUID						40 S96T000139	
		AN106 S1 Safety Screen-D	LIQUID						77 S96T000136D	
		AN106 S1 Safety Screen-S	LIQUID						77 S96T000136S	
		AN106 S2 Safety Screen-D	LIQUID						77 S96T000137D	
		AN106 S3 Safety Screen-D	LIQUID						77 S96T000138D	
		AN106 S4 Sfty Scrn Dect-	LIQUID						77 S96T000140D	
		AN106 S4 Sfty Scrn Dect-	LIQUID						77 S96T000140S	
		AN106 S9 Safety Screen-D	LIQUID						40 S96T000139D	
LIQUID		DI Blank	LIQUID						84992-2	
		DI Blank	LIQUID						85169-2	
		Lab Control Sample	LIQUID						84992-1	
		Lab Control Sample	LIQUID						85169-1	

Final Report

QC SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-QS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

PREP BATCH SUMMARY

WHC-SD-WM-DP-168, REV. 0

SDG 96000016

Contact R. A. Esch

Client TWRS

Tank AN106

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED						QUALIFIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG		MS/ORIG
Gas Proportional Counting												
AT	LIQUID	Alpha Analysis	96000472	15.0	4			1	1	4/4	1/1	
			96000675	15.0	1			1	1	1/1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Final Report

PREP BATCH SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-PBS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch

Client TWRS
Tank AN106

WORK SUMMARY

WHC-SD-WM-DP-168, REV. 0

CLIENT SAMPLE ID	LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED		SUF-					
CUSTODY	Priority	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
AN106 S1 Safety Screen R: 22A S: 6AN-95-1 C: n/ LIQUID		S96T000136 11/22/95	4992-4	AT		01/18/96		SLF	Alpha Analysis
AN106 S1 Safety Screen-D R: 22A S: 6AN-95-1 C: n/ LIQUID		S96T000136D 11/22/95	4992-5	AT		01/18/96		SLF	Alpha Analysis
AN106 S1 Safety Screen-S R: 22A S: 6AN-95-1 C: n/ LIQUID		S96T000136S 11/22/95	4992-6	AT		01/18/96		SLF	Alpha Analysis
AN106 S2 Safety Screen R: 22A S: 6AN-95-2 C: n/ LIQUID		S96T000137 11/22/95	4992-7	AT		01/18/96		SLF	Alpha Analysis
AN106 S2 Safety Screen-D R: 22A S: 6AN-95-2 C: n/ LIQUID		S96T000137D 11/22/95	4992-8	AT		01/18/96		SLF	Alpha Analysis
AN106 S3 Safety Screen R: 22A S: 6AN-95-3 C: n/ LIQUID		S96T000138 11/22/95	4992-9	AT		01/18/96		SLF	Alpha Analysis
AN106 S3 Safety Screen-D R: 22A S: 6AN-95-3 C: n/ LIQUID		S96T000138D 11/22/95	4992-10	AT		01/18/96		SLF	Alpha Analysis
AN106 S4 Sfty Scrn Dect R: 22A S: 6AN-95-4 C: n/ LIQUID		S96T000140 11/22/95	5169-4	AT		01/25/96		SLF	Alpha Analysis
AN106 S4 Sfty Scrn Dect- R: 22A S: 6AN-95-4 C: n/ LIQUID		S96T000140D 11/22/95	5169-5	AT		01/25/96		SLF	Alpha Analysis
AN106 S4 Sfty Scrn Dect- R: 22A S: 6AN-95-4 C: n/ LIQUID		S96T000140S 11/22/95	5169-6	AT		01/25/96		SLF	Alpha Analysis

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WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CWS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch

WORK SUMMARY, cont.

Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

CLIENT SAMPLE ID LOCATION CUSTODY	PRIORITY	MATRIX	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
AN106 S9 Safety Screen R: 22A S: 6AN-95-9 C: n/ LIQUID			S96T000139 12/29/95	4992-11	AT		01/18/96		SLF	Alpha Analysis
AN106 S9 Safety Screen-D R: 22A S: 6AN-95-9 C: n/ LIQUID			S96T000139D 12/29/95	4992-12	AT		01/18/96		SLF	Alpha Analysis
DI Blank LIQUID			B4992-2	4992-2	AT		01/18/96		SLF	Alpha Analysis
DI Blank LIQUID			B5169-2	5169-2	AT		01/25/96		SLF	Alpha Analysis
Lab Control Sample LIQUID			S4992-1	4992-1	AT		01/18/96		SLF	Alpha Analysis
Lab Control Sample LIQUID			S5169-1	5169-1	AT		01/25/96		SLF	Alpha Analysis

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	PRIORITY	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AT		Alpha Analysis	222-S Lab Analytical Procedure	5			2	2	5	2
TOTALS				5			2	2	5	2

Final Report

WORK SUMMARY

Page 2

SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CWS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016

Contact R. A. Esch

Client TWRS

Tank AN106

BLANKS

WHC-SD-WM-DP-168, REV. 0

Lab sample id B4992-2		Client sample id DI Blank					
Dept sample id		Material/Matrix LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Total Alpha	12587-46-1	7.63E-07	93	8.6E-07		UL	AT 96000472

Lab sample id B5169-2		Client sample id DI Blank					
Dept sample id		Material/Matrix LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Total Alpha	12587-46-1	<1.2E-02		1.2E-02		U	AT 96000675

Supernatant liquid

Final Report

BLANKS

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SUMMARY DATA SECTION

Page 8

Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-BLANK
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY
TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch

LAB CONTROL SAMPLES

Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

Lab sample id <u>S4992-1</u>					Client sample id <u>Lab Control Sample</u>					
Dept sample id _____					Material/Matrix _____ <u>LIQUID</u>					
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS PROTOCOL (TOTAL) LIMITS PREP BATCH
Total Alpha	1.22E-05	16	8.6E-08			AT	1.54E-5	5.0	79	80-120 70-123 96000472

Lab sample id <u>S5169-1</u>					Client sample id <u>Lab Control Sample</u>					
Dept sample id _____					Material/Matrix _____ <u>LIQUID</u>					
ANALYTE	RESULT uCi/mL	σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	σ ERR %	REC %	3σ LMTS PROTOCOL (TOTAL) LIMITS PREP BATCH
Total Alpha	9.59E-06	16	1.2E-07			AT	1.02E-5	5.0	94	76-124 70-123 96000675

Supernatant liquid

Final Report

LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-LCS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T0001360

AN106 S1 Safety Screen

DUPLICATE
WHC-SD-WM-DP-168, REV. 0

SDG 96000016

Contact R. A. Esch

DUPLICATE

Lab sample id S96T0001360

Dept sample id

Client TWRS

Tank AN106

ORIGINAL

Lab sample id S96T000136

Dept sample id

Received 11/22/95

Client sample id AN106 S1 Safety Screen

Location/Matrix R: 22A S: 6AN-95-1 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE UCi/mL	2σ TPU %	MDA UCi/mL	RDL UCi/mL	QUALI- FIERS	TEST	ORIGINAL UCi/mL	2σ TPU %	MDA UCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<1.7E-03		1.7E-03		UL	AT	1.16E-03	100	1.7E-03	UL	-	

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-1 Core: n/a

Loc: Riser: 22A Seg: 6AN-95-1 Core: n/a

Final Report

DUPLICATES

Page 1

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000137D

AN106 S2 Safety Screen

DUPLICATE
WHC-SD-WM-DP-168, REV. 0

SDG 96000016

Contact R. A. Esch

DUPLICATE

Lab sample id S96T000137D

Dept sample id

ORIGINAL

Lab sample id S96T000137

Dept sample id

Received 11/22/95

Client TWRS

Tank AN106

Client sample id AN106 S2 Safety Screen

Location/Matrix R: 22A S: 6AN-95-2 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	1.16E-03	110	1.7E-03		UL	AT	<1.7E-03		1.7E-03	UL	-	

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-2 Core: n/a

Loc: Riser: 22A Seg: 6AN-95-2 Core: n/a

Final Report

DUPLICATES

Page 2

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T0001380

AN106 S3 Safety Screen

DUPLICATE WHC-SD-WM-DP-168, REV. 0

SDG 96000016

Contact R. A. Esch

DUPLICATE

Client TWRS

Tank AN106

Lab sample id S96T0001380

Dept sample id

ORIGINAL

Lab sample id S96T000138

Dept sample id

Received 11/22/95

Client sample id AN106 S3 Safety Screen

Location/Matrix R: 22A S: 6AN-95-3 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE UCi/mL	2σ TPU %	MDA UCi/mL	RDL UCi/mL	QUALI- FIERS	TEST	ORIGINAL UCi/mL	2σ TPU %	MDA UCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<1.7E-03		1.7E-03		UL	AT	1.73E-03	87	1.7E-03	L	2	201 198

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-3 Core: n/a

Loc: Riser: 22A Seg: 6AN-95-3 Core: n/a

Final Report

DUPLICATES

Page 3

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000139D

AN106 S9 Safety Screen

WHC-SD-WM-DP-168, REV. C

SDG 96000016

Contact R. A. Esch

DUPLICATE

Lab sample id S96T000139D

Dept sample id

ORIGINAL

Lab sample id S96T000139

Dept sample id

Received 12/29/95

Client TWRS

Tank AN106

Client sample id AN106 S9 Safety Screen

Location/Matrix R: 22A S: 6AN-95-9 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<8.6E-07		8.6E-07		UL	AT	6.06E-07	140	8.6E-07	UL		

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-9 Core: n/a

Loc: Riser: 22A Seg: 6AN-95-9 Core: n/a

Final Report

DUPLICATES

Page 4

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T0001400

AN106 S4 Sfty Scrn Dect

DUPLICATE

WHC-SD-WM-DP-168, REV. 0

SDG 96000016

Contact R. A. Esch

DUPLICATE

Lab sample id S96T0001400

Dept sample id

ORIGINAL

Lab sample id S96T000140

Dept sample id

Received 11/22/95

Client TWRS

Tank AN106

Client sample id AN106 S4 Sfty Scrn Dect

Location/Matrix R: 22A S: 6AN-95-4 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<1.2E-02		1.2E-02		U	AT	<1.2E-02		1.2E-02	U	-	

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-4 Core: n/a

Samp: AN106 S4 Sfty Scrn Dect Liq

Loc: Riser: 22A Seg: 6AN-95-4 Core: n/a

Final Report

DUPLICATES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000136S

AN106 S1 Safety Screen

MATRIX SPIKE

WHC-SD-WM-DP-168, REV. 0

SDG 96000016

Contact R. A. Esch

MATRIX SPIKE

Lab sample id S96T000136S

Dept sample id

ORIGINAL

Lab sample id S96T000136

Dept sample id

Received 11/22/95

Client TWRS

Tank AN106

Client sample id AN106 S1 Safety Screen

Location/Matrix R: 22A S: 6AN-95-1 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	SPIKE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	ORIGINAL uCi/mL	2σ TPU %	REC 3σ % (TOTAL)	LNTS LIMITS	PROTOCOL
Total Alpha	3.66E-02				L AT	3.92E-2	5.0	1.16E-03	100	90	77-123	80-120

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-1 Core: n/a

Loc: Riser: 22A Seg: 6AN-95-1 Core: n/a

Final Report

MATRIX SPIKES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-MS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000140S

AN106 S4 Sfty Scrn Dect

MATRIX SPIKE

WHC-SD-WM-DP-168, REV. C

SDG 96000016

Contact R. A. Esch

MATRIX SPIKE

Lab sample id S96T000140S

Dept sample id

ORIGINAL

Lab sample id S96T000140

Dept sample id

Received 11/22/95

Client TWRS

Tank AN106

Client sample id AN106 S4 Sfty Scrn Dect

Location/Matrix R: 22A S: 6AN-95-4 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	SPIKE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	ORIGINAL uCi/mL	2σ TPU %	REC 3σ % (TOTAL)	LMTS LIMITS	PROTOCOL
Total Alpha	4.27E-02				AT	3.92E-2	5.0			109	74-126 80-120	

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-4 Core: n/a

Samp: AN106 S4 Sfty Scrn Dect Liq

Loc: Riser: 22A Seg: 6AN-95-4 Core: n/a

Final Report

MATRIX SPIKES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-MS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000136

AN106 S1 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. C

SDG <u>96000016</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000136</u>	Client sample id <u>AN106 S1 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 22A S: 6AN-95-1 C: n/ LIQUID</u>
Received <u>11/22/95</u>	Collected _____
Chain of custody id _____	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	1.16E-03	100	1.7E-03		UL	AT

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-1 Core: n/a

Final Report

DATA SHEETS

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000137

AN106 S2 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000016</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000137</u>	Client sample id <u>AN106 S2 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 22A S: 6AN-95-2 C: n/ LIQUID</u>
Received <u>11/22/95</u>	Collected _____
Chain of custody id _____	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<1.7E-03		1.7E-03		UL	AT

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-2 Core: n/a

Final Report

DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000138

AN106 S3 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000016</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000138</u>	Client sample id <u>AN106 S3 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 22A S: 6AN-95-3 C: n/ LIQUID</u>
Received <u>11/22/95</u>	Collected _____
	Chain of custody id _____

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	1.73E-03	87	1.7E-03		L	AT

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-3 Core: n/a

Final Report

DATA SHEETS

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Lab id <u>222-s</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000140

AN106 S4 Sfty Scrn Dect

DATA SHEET

WHC-SD-WM-DP-168, REV. C

SDG <u>96000016</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000140</u>	Client sample id <u>AN106 S4 Sfty Scrn Dect</u>
Dept sample id _____	Location/Matrix <u>R: 22A S: 6AN-95-4 C: n/ LIQUID</u>
Received <u>11/22/95</u>	Collected _____
Chain of custody id _____	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<1.2E-02		1.2E-02		U	AT

Supernatant liquid

Samp: AN106 S4 Sfty Scrn Dect Liq
Loc: Riser: 22A Seg: 6AN-95-4 Core: n/a

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

S96T000139

AN106 S9 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000016</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000139</u>	Client sample id <u>AN106 S9 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 22A S: 6AN-95-9 C: n/ LIQUID</u>
Received <u>12/29/95</u>	Collected _____
	Chain of custody id _____

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	6.06E-07	140	8.6E-07		UL	AT

Supernatant liquid

Loc: Riser: 22A Seg: 6AN-95-9 Core: n/a

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DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

Client TWRS

Tank AN106

METHOD SUMMARY

ALPHA ANALYSIS

GAS PROPORTIONAL COUNTING

WHC-SD-WM-DP-168, REV. 0

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	1: Total Alpha	2: Sum, Alpha Emitters	RESULT RATIO (%) 2+1 2σ
------------------	------------------	-------------	-------------	----------	-------------------	---------------------------	----------------------------

Preparation batch 96000472

AN106 S1 Safety Screen	S96T000136			4992-4	U		
AN106 S1 Safety Screen-D	S96T000136D			4992-5	-	U	
AN106 S1 Safety Screen-S	S96T000136S			4992-6	ok		
AN106 S2 Safety Screen	S96T000137			4992-7	U		
AN106 S2 Safety Screen-D	S96T000137D			4992-8	-	U	
AN106 S3 Safety Screen	S96T000138			4992-9	1.73E-03		
AN106 S3 Safety Screen-D	S96T000138D			4992-10	ok	U	
AN106 S9 Safety Screen	S96T000139			4992-11	U		
AN106 S9 Safety Screen-D	S96T000139D			4992-12	-	U	
DI Blank	B4992-2			4992-2	U		
Lab Control Sample	S4992-1			4992-1	LOW		

Preparation batch 96000675

AN106 S4 Sfty Scrn Dect	S96T000140			5169-4	U		
AN106 S4 Sfty Scrn Dect-	S96T000140D			5169-5	-	U	
AN106 S4 Sfty Scrn Dect-	S96T000140S			5169-6	ok		
DI Blank	B5169-2			5169-2	U		
Lab Control Sample	S5169-1			5169-1	ok		

Nominal values and limits from method

RDLs (uCi/mL)

Supernatant liquid

80

Average

Final Report

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CMS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

Test AT Matrix LIQUID
SDG 96000016
Contact R. A. Esch

Client TWRS
Tank AN106

METHOD SUMMARY

ALPHA ANALYSIS
GAS PROPORTIONAL COUNTING

WHC-SD-WM-DP-168, REV. 0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MDA uCi/mL	ALIQ mL	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000472 2σ prep error 15.0 % Reference															
AN106 S1 Safety Screen	S96T000136		1.7E-03	0.0500	1.00	101		24	30				01/18/96	WB26872	
AN106 S1 Safety Screen-D	S96T000136D		1.7E-03	0.0500	1.00	101		24	30				01/18/96	WB26872	
AN106 S1 Safety Screen-S	S96T000136S			0.0500	1.00	1.00		24	30				01/18/96	WB26872	
AN106 S2 Safety Screen	S96T000137		1.7E-03	0.0500	1.00	101		24	30				01/18/96	WB26872	
AN106 S2 Safety Screen-D	S96T000137D		1.7E-03	0.0500	1.00	101		24	30				01/18/96	WB26872	
AN106 S3 Safety Screen	S96T000138		1.7E-03	0.0500	1.00	101		24	30				01/18/96	WB26872	
AN106 S3 Safety Screen-D	S96T000138D		1.7E-03	0.0500	1.00	101		24	30				01/18/96	WB26872	
AN106 S9 Safety Screen	S96T000139		8.6E-07	1.00	1.00	1.00		24	30				01/18/96	WB26872	
AN106 S9 Safety Screen-D	S96T000139D		8.6E-07	1.00	1.00	1.00		24	30				01/18/96	WB26872	
DI Blank	B4992-2		8.6E-07	1.00		1.00		24	30				01/18/96	WB26872	
Lab Control Sample	S4992-1		8.6E-08	10.0	1.00	1.00		24	30				01/18/96	WB26872	
Preparation batch 96000675 2σ prep error 15.0 % Reference															
AN106 S4 Sfty Scrn Dect	S96T000140		1.2E-02	1.00	1.00	10200		23	30				01/25/96	WB27807	
AN106 S4 Sfty Scrn Dect-	S96T000140D		1.2E-02	1.00	1.00	10200		23	30				01/25/96	WB27807	
AN106 S4 Sfty Scrn Dect-	S96T000140S			1.00	1.00	1.00		23	30				01/25/96	WB27807	
DI Blank	B5169-2		1.2E-02	1.00		10200		23	30				01/25/96	WB27807	
Lab Control Sample	S5169-1		1.2E-07	10.0	1.00	1.00		23	30				01/25/96	WB27807	

Nominal values and limits from method

0.100

30

20-55

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LD-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-508-101A Alpha in liquid samples, rev 42
LA-508-11NA Operation of the [Tennelec LB-5500 (n=0, A-5), LB-1000 (n=1, A-3), Gamma Products (n=4, A-2)] Alpha/Beta Counting Systems

AVERAGES ± 2 SD MDA 3.3E-03 ± 9.6E-03
FOR 16 SAMPLES EFFICIENCY 24 ± 0.96

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METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CMS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. EschClient TWRS
Tank AN106**REPORT GUIDE**

WHC-SD-WM-DP-168, REV. 0

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Protocol	GRAB
Version	1.0
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Version	3.08
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WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. EschClient TWRS
Tank AN106**REPORT GUIDE**

WHC-SD-WM-DP-168, REV. 0

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016Contact R. A. EschClient TWRSTank AN106**REPORT GUIDE**

WHC-SD-WM-DP-168, REV. 0

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. EschClient TWRS
Tank AN106**REPORT GUIDE**

WHC-SD-WM-DP-168, REV. 0

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.
- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity). If the MDA is blank, the ERROR is used as the limit.

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Protocol GRAB
Version 1.0
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WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch

GUIDE, cont.

Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

DATA SHEET

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.
- Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.
- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA

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REPORT GUIDES

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
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WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. EschClient TWRS
Tank AN106**GUIDE, cont.**

WHC-SD-WM-DP-168, REV. C

DATA SHEET

may not be a good estimate of the 'real' minimum detectable activity.

- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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SUMMARY DATA SECTION

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Lab id	<u>222-S</u>
Protocol	<u>GRAB</u>
Version	<u>1.0</u>
Form	<u>DVD-RG</u>
Version	<u>3.08</u>
Report date	<u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch**REPORT GUIDE**Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. EschClient TWRS
Tank AN106**REPORT GUIDE**

WHC-SD-WM-DP-168, REV. 0

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.
- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.
- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.
- * The second limit for the RPD is the larger of:
 1. A fixed percentage specified in the protocol.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. EschClient TWRS
Tank AN106**GUIDE, cont.**

WHC-SD-WM-DP-168, REV. 0

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch**REPORT GUIDE**Client THRS
Tank AN106**WHC-SD-WM-DP-168, REV. C
MATRIX SPIKE**

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.
- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.
- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 2. The error of ADDED.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.

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SUMMARY DATA SECTION

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55Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch**GUIDE, cont.**Client TWRS
Tank AN106**WHC-SD-WM-DP-168, REV. 0
MATRIX SPIKE**

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016

Contact R. A. EschClient TWRSTank AN106**REPORT GUIDE**

WHC-SD-WM-DP-168, REV. 0

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data' means no amount ADDED was specified. 'LOW' and 'HIGH'

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SUMMARY DATA SECTION

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Lab id 222-SProtocol GRABVersion 1.0Form DVD-RGVersion 3.08Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016Contact R. A. EschClient TWRSTank AN106**GUIDE, cont.****WHC-SD-WM-DP-168, REV. 0
METHOD SUMMARY**

correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Preparation factors are underlined if greater than the nominal value specified for the QC batch.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.
- * Count times are underlined if less than the nominal value

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016
Contact R. A. Esch

GUIDE, cont.

Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

METHOD SUMMARY

specified for the method.

- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held (Analyzed - Collected) are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included.

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REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000016

SDG 96000016

Contact R. A. Esch

Client TWRS

Tank AN106

GUIDE, cont.

WHC-SD-WM-DP-168, REV. 0

METHOD SUMMARY

No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-RG

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017

Contact R. A. Esch

Client TWRS

Tank AN106

SAMPLE SUMMARY

WHC-SD-WM-DP-168, REV. 0

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	PRIORITY COLLECTED	RECEIVED
AN106 S5 Safety Screen	R: 21A S: 6AN-95-5 C: n/	LIQUID		S96T000153		11/22/95 15:32
AN106 S5 Safety Screen-D	R: 21A S: 6AN-95-5 C: n/	LIQUID		S96T000153D		
AN106 S5 Safety Screen-S	R: 21A S: 6AN-95-5 C: n/	LIQUID		S96T000153S		
AN106 S6 Safety Screen	R: 21A S: 6AN-95-6 C: n/	LIQUID		S96T000154		11/22/95 15:32
AN106 S6 Safety Screen-D	R: 21A S: 6AN-95-6 C: n/	LIQUID		S96T000154D		
AN106 S7 Safety Screen	R: 21A S: 6AN-95-7 C: n/	LIQUID		S96T000155		11/24/95 10:15
AN106 S7 Safety Screen-D	R: 21A S: 6AN-95-7 C: n/	LIQUID		S96T000155D		
AN106 S8 Sfty Scrn Dcnt	R: 21A S: 6AN-95-8 C: n/	LIQUID		S96T000156		11/24/95 10:15
AN106 S8 Sfty Scrn Dcnt-	R: 21A S: 6AN-95-8 C: n/	LIQUID		S96T000156D		
AN106 S8 Sfty Scrn Dcnt-	R: 21A S: 6AN-95-8 C: n/	LIQUID		S96T000156S		
DI Blank		LIQUID		B4991-2		
DI Blank		LIQUID		B5169-2		
Lab Control Sample		LIQUID		S4991-1		
Lab Control Sample		LIQUID		S5169-1		

Final Report

SAMPLE SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017

Contact R. A. Esch

Client TWRS

Tank AN106

QC SUMMARY

WHC-SD-WM-DP-168, REV. 0

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	X MOIST	SAMPLE AMOUNT	BASIS AMOUNT	DAYS FROM/TO		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
							COLL	RCVD		
96000017-L		AN106 S5 Safety Screen	LIQUID					77	S96T000153	
		AN106 S6 Safety Screen	LIQUID					77	S96T000154	
		AN106 S7 Safety Screen	LIQUID					75	S96T000155	
		AN106 S8 Sfty Scrn Dcnt	LIQUID					75	S96T000156	
		AN106 S5 Safety Screen-D	LIQUID					77	S96T000153D	
		AN106 S5 Safety Screen-S	LIQUID					77	S96T000153S	
		AN106 S6 Safety Screen-D	LIQUID					77	S96T000154D	
		AN106 S7 Safety Screen-D	LIQUID					75	S96T000155D	
		AN106 S8 Sfty Scrn Dcnt-	LIQUID					75	S96T000156D	
		AN106 S8 Sfty Scrn Dcnt-	LIQUID					75	S96T000156S	
LIQUID		DI Blank	LIQUID						B4991-2	
		DI Blank	LIQUID						B5169-2	
		Lab Control Sample	LIQUID						S4991-1	
		Lab Control Sample	LIQUID						S5169-1	

Final Report

QC SUMMARY

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SUMMARY DATA SECTION

Page 2

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-QS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017

Contact R. A. Esch

Client TWRS

Tank AN106

PREP BATCH SUMMARY

WHC-SD-WM-DP-168, REV. 0

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALIFIERS		
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS	DUP/ORIG
Gas Proportional Counting											
AT	LIQUID	Alpha Analysis	96000467	15.0	3			1	1	3/3	1/1
			96000675	15.0	1			1	1	1/1	1/1

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Final Report

PREP BATCH SUMMARY

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-PBS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017
Contact R. A. Esch

WORK SUMMARY

Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

CLIENT SAMPLE ID	LAB SAMPLE ID								
LOCATION	MATRIX	COLLECTED		SUF-					
CUSTODY	Priority	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
AN106 S5 Safety Screen R: 21A S: 6AN-95-5 C: n/ LIQUID		S96T000153 11/22/95	4991-4	AT		01/25/96		SLF	Alpha Analysis
AN106 S5 Safety Screen-D R: 21A S: 6AN-95-5 C: n/ LIQUID		S96T000153D 11/22/95	4991-5	AT		01/25/96		SLF	Alpha Analysis
AN106 S5 Safety Screen-S R: 21A S: 6AN-95-5 C: n/ LIQUID		S96T000153S 11/22/95	4991-6	AT		01/25/96		SLF	Alpha Analysis
AN106 S6 Safety Screen R: 21A S: 6AN-95-6 C: n/ LIQUID		S96T000154 11/22/95	4991-7	AT		01/25/96		SLF	Alpha Analysis
AN106 S6 Safety Screen-D R: 21A S: 6AN-95-6 C: n/ LIQUID		S96T000154D 11/22/95	4991-8	AT		01/25/96		SLF	Alpha Analysis
AN106 S7 Safety Screen R: 21A S: 6AN-95-7 C: n/ LIQUID		S96T000155 11/24/95	4991-9	AT		01/25/96		SLF	Alpha Analysis
AN106 S7 Safety Screen-D R: 21A S: 6AN-95-7 C: n/ LIQUID		S96T000155D 11/24/95	4991-10	AT		01/25/96		SLF	Alpha Analysis
AN106 S8 Sfty Scrn Dcnt R: 21A S: 6AN-95-8 C: n/ LIQUID		S96T000156 11/24/95	5169-7	AT		01/25/96		SLF	Alpha Analysis
AN106 S8 Sfty Scrn Dcnt- R: 21A S: 6AN-95-8 C: n/ LIQUID		S96T000156D 11/24/95	5169-8	AT		01/25/96		SLF	Alpha Analysis
AN106 S8 Sfty Scrn Dcnt- R: 21A S: 6AN-95-8 C: n/ LIQUID		S96T000156S 11/24/95	5169-9	AT		01/25/96		SLF	Alpha Analysis

Final Report

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CWS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017
Contact R. A. Esch

WORK SUMMARY, cont.

Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

CLIENT SAMPLE ID		LAB SAMPLE ID							
LOCATION	MATRIX	COLLECTED		SUF-					
CUSTODY	Priority	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
DI Blank		B4991-2	4991-2	AT		01/25/96		SLF	Alpha Analysis
	LIQUID								
DI Blank		B5169-2	5169-2	AT		01/25/96		SLF	Alpha Analysis
	LIQUID								
Lab Control Sample		S4991-1	4991-1	AT		01/25/96		SLF	Alpha Analysis
	LIQUID								
Lab Control Sample		S5169-1	5169-1	AT		01/25/96		SLF	Alpha Analysis
	LIQUID								

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	Priority	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AT		Alpha Analysis	222-S Lab Analytical Procedure	4			2	2	4	2
TOTALS				4			2	2	4	2

Final Report

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CWS
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017
Contact R. A. Esch**BLANKS**Client TWRS
Tank AN106

WHC-SD-WM-DP-168, REV. 0

Lab sample id <u>B4991-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Total Alpha	12587-46-1	<5.9E-03		5.9E-03		U	AT 96000467

Lab sample id <u>B5169-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Total Alpha	12587-46-1	<1.2E-02		1.2E-02		U	AT 96000675

Supernatant liquid

Final Report

BLANKS

Page 1

SUMMARY DATA SECTION

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Lab id	<u>222-S</u>
Protocol	<u>GRAB</u>
Version	<u>1.0</u>
Form	<u>DVD-BLANK</u>
Version	<u>3.08</u>
Report date	<u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

SDG 96000017

Contact R. A. Esch

LAB CONTROL SAMPLES

Client TWRS

Tank AN106

WHC-SD-WM-DP-168, REV. 0

Lab sample id <u>S4991-1</u>						Client sample id <u>Lab Control Sample</u>					
Dept sample id _____						Material/Matrix <u>LIQUID</u>					
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH
Total Alpha	9.11E-06	15	1.2E-07		AT	1.02E-5	5.0	89	77-123	70-123	96000467

Lab sample id <u>S5169-1</u>						Client sample id <u>Lab Control Sample</u>					
Dept sample id _____						Material/Matrix <u>LIQUID</u>					
ANALYTE	RESULT uCi/mL	σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH
Total Alpha	9.59E-06	16	1.2E-07		AT	1.02E-5	5.0	94	76-124	70-123	96000675

Supernatant liquid

Final Report

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

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Lab id 222-S
 Protocol GRAB
 Version 1.0
 Form DVD-LCS
 Version 3.08
 Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000153D

AN106 S5 Safety Screen

DUPLICATE

WHC-SD-WM-DP-168, REV. 0

SDG 96000017

Contact R. A. Esch

DUPLICATE

Client TWRS

Tank AN106

Lab sample id S96T000153D

Dept sample id

ORIGINAL

Lab sample id S96T000153

Dept sample id

Received 11/22/95

Client sample id AN106 S5 Safety Screen

Location/Matrix R: 21A S: 6AN-95-5 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<5.9E-03		5.9E-03		U	AT	<5.9E-03		5.9E-03	U		

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-5 Core: n/a

Loc: Riser: 21A Seg: 6AN-95-5 Core: n/a

Final Report

DUPLICATES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY
TANK AN106, GROUP 96000017

S96T000154D

AN106 S6 Safety Screen

DUPLICATE

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000017</u>		Client <u>TWRS</u>	
Contact <u>R. A. Esch</u>		Tank <u>AN106</u>	
DUPLICATE		ORIGINAL	
Lab sample id <u>S96T000154D</u>	Lab sample id <u>S96T000154</u>	Client sample id <u>AN106 S6 Safety Screen</u>	
Dept sample id _____	Dept sample id _____	Location/Matrix <u>R: 21A S: 6AN-95-6 C: n/ LIQUID</u>	
	Received <u>11/22/95</u>	Collected _____	
		Chain of custody id _____	

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<5.9E-03		5.9E-03		U	AT	<5.9E-03		5.9E-03	U		

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-6 Core: n/a

Loc: Riser: 21A Seg: 6AN-95-6 Core: n/a

Final Report

DUPLICATES

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-DUP
Version 3.08
Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000155D

AN106 S7 Safety Screen

DUPLICATE

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000017</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
DUPLICATE	ORIGINAL
Lab sample id <u>S96T000155D</u>	Lab sample id <u>S96T000155</u>
Dept sample id _____	Dept sample id _____
	Received <u>11/24/95</u>
	Client sample id <u>AN106 S7 Safety Screen</u>
	Location/Matrix <u>R: 21A S: 6AN-95-7 C: n/ LIQUID</u>
	Collected _____
	Chain of custody id _____

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<5.9E-03		5.9E-03		U	AT	<5.9E-03		5.9E-03	U	-	

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-7 Core: n/a

Loc: Riser: 21A Seg: 6AN-95-7 Core: n/a

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DUPLICATES

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SUMMARY DATA SECTION

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T0001560

AN106 S8 Sfty Scrn Dcnt

DUPLICATE

WHC-SD-WM-DP-168, REV. C

SDG 96000017

Contact R. A. Esch

DUPLICATE

Lab sample id S96T0001560

Dept sample id

ORIGINAL

Lab sample id S96T000156

Dept sample id

Received 11/24/95

Client TWRS

Tank AN106

Client sample id AN106 S8 Sfty Scrn Dcnt

Location/Matrix R: 21A S: 6AN-95-8 C: n/ LIQUID

Collected

Chain of custody id

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ PROT TOT LIMIT
Total Alpha	<1.2E-02		1.2E-02		U	AT	<1.2E-02		1.2E-02	U	-	

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-8 Core: n/a

Samp: AN106 S8 Sfty Scrn Dcnt Liq

Loc: Riser: 21A Seg: 6AN-95-8 Core: n/a

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DUPLICATES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000153S

AN106 S5 Safety Screen

MATRIX SPIKE

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000017</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
MATRIX SPIKE	ORIGINAL
Lab sample id <u>S96T000153S</u>	Lab sample id <u>S96T000153</u>
Dept sample id _____	Dept sample id _____
	Received <u>11/22/95</u>
	Client sample id <u>AN106 S5 Safety Screen</u>
	Location/Matrix <u>R: 21A S: 6AN-95-5 C: n/ LIQUID</u>
	Collected _____
	Chain of custody id _____

ANALYTE	SPIKE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	ORIGINAL uCi/mL	2σ TPU %	REC 3σ LMTS % (TOTAL)	PROTOCOL LIMITS
Total Alpha	4.08E-02				AT	3.92E-2	5.0			104 75-125	80-120

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-5 Core: n/a

Loc: Riser: 21A Seg: 6AN-95-5 Core: n/a

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MATRIX SPIKES

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-MS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000156S

AN106 S8 Sfty Scrn Dcnt

MATRIX SPIKE

WHC-SD-WM-DP-168, REV. C

SDG 96000017

Contact R. A. Esch

MATRIX SPIKE

Client TWRS

Tank AN106

ORIGINAL

Lab sample id S96T000156S

Lab sample id S96T000156

Client sample id AN106 S8 Sfty Scrn Dcnt

Dept sample id

Dept sample id

Location/Matrix R: 21A S: 6AN-95-8 C: n/ LIQUID

Received 11/24/95

Collected

Chain of custody id

ANALYTE	SPIKE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	ORIGINAL uCi/mL	2σ TPU %	REC 3σ LMTS % (TOTAL)	PROTOCOL LIMITS
Total Alpha	4.28E-02				AT	3.92E-2	5.0			109 74-126	80-120

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-8 Core: n/a

Samp: AN106 S8 Sfty Scrn Dcnt Liq

Loc: Riser: 21A Seg: 6AN-95-8 Core: n/a

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MATRIX SPIKES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-MS

Version 3.08

Report date 02/07/96

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000153

AN106 S5 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. C

SDG <u>96000017</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000153</u>	Client sample id <u>AN106 S5 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 21A S: 6AN-95-5 C: n/ LIQUID</u>
Received <u>11/22/95</u>	Collected _____
Chain of custody id _____	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<5.9E-03		5.9E-03		U	AT

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-5 Core: n/a

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000154

AN106 S6 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. C

SDG <u>96000017</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000154</u>	Client sample id <u>AN106 S6 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 21A S: 6AN-95-6 C: n/ LIQUID</u>
Received <u>11/22/95</u>	Collected _____
Chain of custody id _____	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<5.9E-03		5.9E-03		U	AT

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-6 Core: n/a

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Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000155

AN106 S7 Safety Screen

DATA SHEET

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000017</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000155</u>	Client sample id <u>AN106 S7 Safety Screen</u>
Dept sample id _____	Location/Matrix <u>R: 21A S: 6AN-95-7 C: n/ LIQUID</u>
Received <u>11/24/95</u>	Collected _____
	Chain of custody id _____

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<5.9E-03		5.9E-03		U	AT

Supernatant liquid

Loc: Riser: 21A Seg: 6AN-95-7 Core: n/a

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Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

S96T000156

AN106 S8 Sfty Scrn Dcnt

DATA SHEET

WHC-SD-WM-DP-168, REV. 0

SDG <u>96000017</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AN106</u>
Lab sample id <u>S96T000156</u>	Client sample id <u>AN106 S8 Sfty Scrn Dcnt</u>
Dept sample id _____	Location/Matrix <u>R: 21A S: 6AN-95-8 C: n/ LIQUID</u>
Received <u>11/24/95</u>	Collected _____
Chain of custody id _____	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<1.2E-02		1.2E-02		U	AT

Supernatant liquid

Samp: AN106 S8 Sfty Scrn Dcnt Liq Loc: Riser: 21A Seg: 6AN-95-8 Core: n/a
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Protocol <u>GRAB</u>
Version <u>1.0</u>
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Version <u>3.08</u>
Report date <u>02/07/96</u>

WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

Test AT Matrix LIQUID

SDG 96000017

Contact R. A. Esch

METHOD SUMMARY

ALPHA ANALYSIS

GAS PROPORTIONAL COUNTING

Client TWRS

Tank AN106

WHC-SD-WM-DP-168, REV. 0

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	1: Total Alpha	2: Sum, Alpha Emitters	RESULT RATIO (%) 2+1 2σ
Preparation batch 96000467					
AN106 S5 Safety Screen	S96T000153	4991-4	U		
AN106 S5 Safety Screen-D	S96T000153D	4991-5	- U		
AN106 S5 Safety Screen-S	S96T000153S	4991-6	ok		
AN106 S6 Safety Screen	S96T000154	4991-7	U		
AN106 S6 Safety Screen-D	S96T000154D	4991-8	- U		
AN106 S7 Safety Screen	S96T000155	4991-9	U		
AN106 S7 Safety Screen-D	S96T000155D	4991-10	- U		
DI Blank	B4991-2	4991-2	U		
Lab Control Sample	S4991-1	4991-1	ok		
Preparation batch 96000675					
AN106 S8 Sfty Scrn Dcnt	S96T000156	5169-7	U		
AN106 S8 Sfty Scrn Dcnt-	S96T000156D	5169-8	- U		
AN106 S8 Sfty Scrn Dcnt-	S96T000156S	5169-9	ok		
DI Blank	B5169-2	5169-2	U		
Lab Control Sample	S5169-1	5169-1	ok		
Nominal values and limits from method					80
RDLs (uCi/mL)					Average
Supernatant liquid					

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METHOD SUMMARIES

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SUMMARY DATA SECTION

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WHC 222-S LABORATORY

TANK AN106, GROUP 96000017

Test AT Matrix LIQUID
SDG 96000017
Contact R. A. Esch

Client TWRS
Tank AN106

METHOD SUMMARY

ALPHA ANALYSIS
GAS PROPORTIONAL COUNTING

WHC-SD-WM-DP-168, REV. C

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MDA UCi/mL	ALIQ mL	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000467 2σ prep error 15.0 % Reference															
AN106 S5 Safety Screen	S96T000153		5.9E-03	1.00	1.00	5150		24	30				01/25/96		WB26872
AN106 S5 Safety Screen-D	S96T000153D		5.9E-03	1.00	1.00	5150		24	30				01/25/96		WB26872
AN106 S5 Safety Screen-S	S96T000153S			1.00	1.00	1.00		24	30				01/25/96		WB26872
AN106 S6 Safety Screen	S96T000154		5.9E-03	1.00	1.00	5150		24	30				01/25/96		WB26872
AN106 S6 Safety Screen-D	S96T000154D		5.9E-03	1.00	1.00	5150		24	30				01/25/96		WB26872
AN106 S7 Safety Screen	S96T000155		5.9E-03	1.00	1.00	5150		24	30				01/25/96		WB26872
AN106 S7 Safety Screen-D	S96T000155D		5.9E-03	1.00	1.00	5150		24	30				01/25/96		WB26872
DI Blank	B4991-2		5.9E-03	1.00		5150		24	30				01/25/96		WB26872
Lab Control Sample	S4991-1		1.2E-07	10.0	1.00	1.00		24	30				01/25/96		WB26872
Preparation batch 96000675 2σ prep error 15.0 % Reference															
AN106 S8 Sfty Scrn Dcnt	S96T000156		1.2E-02	1.00	1.00	10200		23	30				01/25/96		WB27807
AN106 S8 Sfty Scrn Dcnt-	S96T000156D		1.2E-02	1.00	1.00	10200		23	30				01/25/96		WB27807
AN106 S8 Sfty Scrn Dcnt-	S96T000156S			1.00	1.00	1.00		23	30				01/25/96		WB27807
DI Blank	B5169-2		1.2E-02	1.00		10200		23	30				01/25/96		WB27807
Lab Control Sample	S5169-1		1.2E-07	10.0	1.00	1.00		23	30				01/25/96		WB27807
Nominal values and limits from method				0.100		30									
20-55															

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-508-101A Alpha in liquid samples, rev 42
LA-508-11NA Operation of the [Tennelec LB-5500 (n=0, A-5), LB-1000 (n=1, A-3), Gamma Products (n=4, A-2)] Alpha/Beta Counting Systems

AVERAGES ± 2 SD MDA 6.4E-03 ± 8.0E-03
FOR 14 SAMPLES EFFICIENCY 24 ± 0.99

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METHOD SUMMARIES

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WHC-SD-WM-DP-168, REV. 0

DOME SPACE FLAMMABILITY DATA

DATA SHEET 2 - IH&S VAPOR SURVEY

Tank No. AN-106Riser No. 22 ALocation ^{EXHAUSTER} (Breather, Vent, Riser, Dome Space, Breathing zone) _____VaporResultsTOC1.6 ppmNH₃25 ppmLEL0 %Tank No. AN-106Riser No. 22 ALocation (Breather, Vent, Riser, Dome Space, Breathing zone) _____VaporResultsTOC0 ppmNH₃0 ppmLEL0 %

Tank No. _____

Riser No. _____

Location (Breather, Vent, Riser, Dome Space, Breathing zone) _____

VaporResultsCOMMENTS:Signature/Date

Document No.

TO-080-065

Rev/Mod

C-3

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CORRESPONDENCE

From: Characterization Plans, Coordination, and Reports 75310-95-104
Phone: 373-2711 R2-12
Date: November 21, 1995
Subject: ASSESSMENT OF NEED FOR SAMPLING AND SAFETY SCREENING OF TANK
241-AN-106

To: G. A. Stanton S7-21

cc: T. M. Blaak S5-13 T. J. Kelley S7-21
R. G. Brown S7-12 J. G. Kristofzski R2-12
G. T. Dukelow S7-15 J. E. Meacham S7-15
 S. J. Eberlein R2-12 R. S. Popielarczyk R1-30
R. A. Esch T6-06 M. A. Wahl S7-04
G. D. Forehand S7-21 K. D. Wiemers K6-51
J. W. Hunt R2-12 JMC File/LB
J. M. Jones S5-13

- References: (1) WHC-SD-WM-SP-004, Rev. 2, "Tank Safety Screening Data Quality Objective," dated August 31, 1995.
- (2) WHC-SD-WM-PCP-008, Rev. 1, "Process Control Plan for 242-A Evaporator Campaign 94-1," dated March 7, 1994.
- (3) WHC-SD-WM-PE-053, Rev. 0, "242-A Campaign 94-1 Post Run Document," dated September 30, 1994.
- (4) Internal Memo, R. A. Dodd to W. E. Ross, "242-A Evaporator Campaign 94-2 Waste Compatibility Assessment of Tank 241-AW-106 Waste With Waste Contained in Tank 241-AN-106," dated September 9, 1994.
- (5) Internal Memo, M. A. Beck to J. M. Jones, "Results of Boildown and Mixing Studies on Tank AN-106 and Tank AY-101," dated July 28, 1995.
- (6) Personal communication with M. A. Beck, November 16, 1995.
- (7) Personal communication with T. M. Blaak, November 6, 1995.
- (8) Internal Memo, S. J. Eberlein to T. J. Kelley, "Double-Shell Tank Grab Sampling Prioritization," dated November 13, 1995.

Summary

The grab sampling event currently scheduled for tank 241-AN-106 should be postponed until additional programmatic justification is defined. Process knowledge indicates that there are no safety issues associated with the tank, and archive samples remain in the laboratory.

Tank 241-AN-106 has not been sampled and analyzed against the Tank Safety Screening Data Quality Objective (DQO) (see Reference 1). However, process knowledge (see References 2-5) indicates that the waste in tank 241-AN-106 is far below levels of concern for energetics and criticality. In addition, archive samples remain in the lab from a 1995 sampling event (see Reference 6). Finally, the tank contents are likely going to be transferred in the near future (see Reference 7). Therefore, sampling solely to address the Safety Screening DQO requirements would be of little value. Should other programs (such as privatization or compatibility) request samples from the tank, then the Safety Screening DQO should be applied to that sampling event.

Background

Tank 241-AN-106 was filled with waste from 241-AW-106 in September, 1994. The waste was from evaporator campaign 94-1. Process documents for this campaign indicate that no safety screening issues exist for this waste (see References 2 and 3). A waste compatibility study (see Reference 4) conducted prior to transfer of waste from 241-AW-106 to 241-AN-106 reports that both the 241-AW-106 waste to be transferred and the 241-AN-106 waste did not exhibit exotherms by differential scanning calorimetry (DSC) and had low Pu-239/240 concentrations. Grab samples were taken from tank 241-AN-106 in March of 1995 for an evaporator boildown study. DSC analyses indicated no exotherms (see Reference 5), and archive samples remain in the lab (see Reference 6). A table summarizing the analytical information is attached.

In addition, the waste in 241-106-AN is targeted for transfer to 241-AY-101 to combat caustic deficiency in that tank. This transfer is anticipated within the next eight months (see Reference 7).

Conclusion

Tank 241-AN-106 has been identified for sampling in a priority matrix for grab sampling (see Reference 8). However, the following points support the conclusion that grab sampling should not be conducted at this time:

- A) there is high confidence, based on process knowledge, that the waste in the tank will meet the "safe" criteria spelled out in the Safety Screening DQO;
- B) there is a strong possibility that the waste will be transferred from the tank in the near future;
- C) archive samples remain in the lab from a sampling event in March 1995.

As the Safety Screening DQO is the only DQO supported by the currently scheduled grab sampling event, the sampling event should be cancelled. Should the need arise to take samples to address other programmatic issues, then the safety screening analyses should be conducted at that time.

Should you have any questions regarding this assessment, please contact J. M. Conner at 373-2711.



J. M. Conner, Engineer
Characterization Plans, Coordination and Reports

pkc

Attachment

Summary of Analytical Information Used to Assess Safety Screening Issues for Tank 241-AN-106

Source of Data	Energetics (DSC)	Pu-239/240	Comments
Composite of samples from feed sources for campaign 94-1 (103-AP, 102-AW, and 106-AW) (Ref. 2)	"very minor exotherm ... above 230°C."	not reported	exotherm was near the detection limit and spread out over a range of 120°C
Evaporatory Slurry Samples (Ref. 3)	not reported	<6.52 E-04 $\mu\text{Ci/mL}$	Pu239/240 result is approx. 5 orders of magnitude* below the limit of 1 g/L. This sample is representative of the waste transferred to AN-106
AW-106/AN-106 compatibility assessment (Ref. 4)	no exotherm in AN-106 waste nor AW-106 waste	3.78E-05 $\mu\text{Ci/mL}$ in AN-106 heel < 6.05E-04 $\mu\text{Ci/mL}$ in AW-106	assessment conducted prior to transfer
Mixing/compatibility study of AY-101 and AN-106 waste (Ref. 5)	No exotherms to 500 °C for composite sample	not reported	composite included sample from AN-106 (no transfers since the sample was taken)

* Calculated using the conversion of 0.0615 Ci/g Pu 239/240.

WHC-SD-WM-DP-168, REV. 0

CHAIN OF CUSTODY FORMS

Westinghouse Hanford Company						CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST COPY										
							C.O.C. No.	N/A								
							Page	1 of 1								
Collector J. Sickels				Contact/Requestor N/A				Telephone No. 373-3578 MSIN FAX				S703				
SAF No. N/A				Sample Origin 241-AU-106 Risen #22A				Purchase Order/Charge Code N/A								
Project Title N/A				Logbook No. N/A				Ice Chest No. N/A Temp.								
Shipped To (Lab) 222c Labs				Method of Shipment WHC TRANSPORTATION				Bill of Lading/Air Bill No. N/A								
Protocol N/A				Data Turnaround N/A				Offsite Property No. N/A								
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis								Preservative			
GAN-95-B ³ ₁₋₂₂₋₉₅	L	11-21-95	1555	1 Glass 125mL	DOSE ON CONTACT 600mR/hr SEAL # 1066											
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)													MSDS Yes No X		SPECIAL INSTRUCTIONS WHC-SD-WM-DP-168, REV. 0 Hold Time	
Radioactive																
Relinquished By Print Sign		Date/Time		Received By Print Sign		Date/Time		Matrix *								
James Sickels James Sickels		11-22-95 0920		Charles E. Dugas Charles E. Dugas		11-22-95 0920		S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WI = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other								
Relinquished By		Date/Time		Received By		Date/Time										
Charles E. Dugas Charles E. Dugas		11-22-95 10:11		Charles E. Dugas Charles E. Dugas		11-22-95 10:11										
Relinquished By		Date/Time		Received By		Date/Time										
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time																

DISTRIBUTION: White - Remain with Samples Color - Customer

WHC-SD-WM-DP-168, REV. 0

SAMPLE HANDLING

Grab Sample Information Worksheet

Sample ID: 6AN-95-1
 LABCORE #: S96T000131
 Tank/Project: AN-106 GRAB

Date: 1/16/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: YELLOW
2. Is liquid clear or opaque: CLEAR
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or No
5. Approximate vol % settled solids: N/A %
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \underline{N/A} \%$

d. Other Information:

Dose rate 1100 mrad/hr
800 mrad/hr
 Sample depth 43'6" = 522 in.

DOE C. Determine bulk density of sample? Yes or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

Cone + sample 24.57g
 Tare Cone A 7.49g
17.08g

- a. Sum Net Weight for all cones 17.08 g
- b. Sum Total volumes for all cones 14.5 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}} = \underline{1.18} \text{ g/mL}$

Report as sample
 number S96T000136

Check wt. SDg = 49.994g

- d. Other Information: No organic layer
Use a 15ml centrifuge cone to determine bulk density of liquid

DOE D. Determine bulk density of solids? Yes or No N/A

1. Calculate bulk density of solids, if required: (BLKDEN01)

WHC-SD-WM-DP-168, REV. 0

- a. Sum Wgt. Solids for all cones $\frac{N/A}{N/A}$ g
 b. Sum Vol. Solids for all cones $\frac{N/A}{N/A}$ mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} \quad \frac{N/A}{N/A} \text{ g/mL}$$

 d. Other Information:

- $\frac{N/A}{N/A}$ E. Determine bulk density of liquids? Yes or No
1. Calculate bulk density of liquids, if required: (BLKDEN01)
- a. Wgt liquids for all cones $\frac{N/A}{N/A}$ g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones $\frac{N/A}{N/A}$ mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} \quad \frac{N/A}{N/A} \text{ g/mL}$$

 d. Other Information:

- $\frac{N/A}{N/A}$ F. Determine volume % solids by centrifugation? Yes or No
1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)
- a. Sum of Vol solids for all cones $\frac{N/A}{N/A}$ g
 b. Sum of Total vol for all cones $\frac{N/A}{N/A}$ mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 \quad \frac{N/A}{N/A} \%$$

 d. Other Information:

Grab Sample Information Worksheet

Sample ID: 6AN-95-2
LABCORE #: S96T000132
Tank/Project: AN-106 GRAB

WHC-SD-WM-DP-168, REV. 0

Date: 1/16/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: YELLOW
2. Is liquid clear or opaque: CLEAR
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or No
5. Approximate vol % settled solids: N/A %
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \underline{N/A} \%$

- d. Other Information:
Dose rate 1000 inrad/hr 1000 rad/hr No org. layer
sample depth 49' 4" = 592"

SEE C. Determine bulk density of sample? Yes or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

Cone + Soup. 24.85g
Tare Cone 7.49g
17.36g

- a. Sum Net Weight for all cones 17.36 g
- b. Sum Total volumes for all cones 14.8 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}} = \underline{1.17} \text{ g/mL}$

Report as sample
number S96T000137

- d. Other Information:
check wt 50g = 49.994g
use 15ml centrifuge cone for bulk density of liquid

N/A D. Determine bulk density of solids? Yes or No

1. Calculate bulk density of solids, if required: (BLKDEN01)

- a. Sum Wgt. Solids for all cones N/A g
 b. Sum Vol. Solids for all cones N/A mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} = \frac{N/A}{N/A} \text{ g/mL}$$

d. Other Information:

WHC-SD-WM-DP-168, REV. 0

N/A E. Determine bulk density of liquids? Yes or No

1. Calculate bulk density of liquids, if required: (BLKDEN01)

- a. Wgt liquids for all cones N/A g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones N/A mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} = \frac{N/A}{N/A} \text{ g/mL}$$

d. Other Information:

N/A F. Determine volume % solids by centrifugation? Yes or No

1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)

- a. Sum of Vol solids for all cones N/A g
 b. Sum of Total vol for all cones N/A mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 = \frac{N/A}{N/A} \%$$

d. Other Information:

Grab Sample Information Worksheet

WHC-SD-WM-DP-168, REV. 0

Sample ID: 6AN-95-3
LABCORE #: 596T000133
Tank/Project: AN-106 GRAB

Date: 1/16/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: YELLOW
2. Is liquid clear or opaque: CLEAR
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or No
5. Approximate vol % settled solids: N/A %
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \underline{N/A} \%$

d. Other Information:

Dose rate 1100 mrad/hr 800 mrad/hr non org. layer

Sample depth 54' 4" = 652"

LOC C. Determine bulk density of sample? Yes or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

- a. Sum Net Weight for all cones 16.85 g
- b. Sum Total volumes for all cones 14.3 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}} = \underline{1.18} \text{ g/mL}$

Report as sample number 596T000138

d. Other Information:

Check wt 50g = 49.994g
use 15mL centrifuge cone for bulk density of liquid

N/A D. Determine bulk density of solids? Yes or No

1. Calculate bulk density of solids, if required: (BLKDEN01)

WHC-SD-WM-DP-168, REV. 0

- a. Sum Wgt. Solids for all cones $\frac{N/A}{N/A}$ g
 b. Sum Vol. Solids for all cones $\frac{N/A}{N/A}$ mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} = \frac{N/A}{N/A} \text{ g/mL}$$

 d. Other Information:

N/A E. Determine bulk density of liquids? Yes or No

1. Calculate bulk density of liquids, if required: (BLKDEN01)
 a. Wgt liquids for all cones $\frac{N/A}{N/A}$ g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones $\frac{N/A}{N/A}$ mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} = \frac{N/A}{N/A} \text{ g/mL}$$

 d. Other Information:

N/A F. Determine volume % solids by centrifugation? Yes or No

1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)
 a. Sum of Vol solids for all cones $\frac{N/A}{N/A}$ g
 b. Sum of Total vol for all cones $\frac{N/A}{N/A}$ mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 = \frac{N/A}{N/A} \%$$

 d. Other Information:

①

AN-106 GRAB SAMPLES

★ 6AN-95-4 Sludge

Sampled 11/21/95 from riser 22A

Sampling Depth? 667 inDose Rate: w/o: 1700 mrad/hr
1400 uR

S96T000135

APPEARANCE: Grey Yellow liquid with a trace of grey/brown solids
Since there is insufficient solids to centrifuge or measure, will
obtain bulk density of liquid and subsample liquids only.

Measure the height of the settled solids and the total sample and calculate the volume percent settled solids according to the following equation.

$$\text{Vol \% Settled Solids} = \frac{\text{Height solids}}{\text{Height total sample}} = \frac{N/A \text{ mm}}{N/A \text{ mm}} \times 100 = \frac{N/A}{\%}$$

Agitate sample to suspend all of the solids and transfer the entire sample to centrifuge cones. Record the volume and weight of the sample before centrifugation. If the solids settle rapidly (within a few minutes), record the volume of solids before centrifugation. Centrifuge the sample for a minimum of 1 hour. Record volume of solids and liquids after centrifugation. Remove liquid and subsample for analysis and archive. Record weight of solids that remain. Subsample solids for analysis and archive.

Before centrifugation: 1/17/96Check weights: 50g = 49.9991/18/96check wt 50g = 50.001gobtain duplicate bulk density of liquid results using 15 ml conesFinal wt cone 1 + sample 19.60gTare wt cone 1 7.48gnet wt sample 12.12gvol sample 10.0 mLvol solids N/A mLFinal wt cone 2 + sample 19.37gTare wt cone 2 7.45gnet wt sample 11.92gvol sample 9.80 mLvol solids N/A mL

WHC-SD-WM-DP-168, REV. 0
AN-106 GRAB SAMPLES

(2)

★ 6AN-95-4 Sludge (Continued)

Final wt cone 3 + sludge g *N/A*
Tare wt cone 3 14.25 g *see 1/18/96*

net wt sample g
vol sample mL
vol solids mL

Record the total weight and volume of the sample as the sum of all of the cones.

Total wt. sample 12.12 g *Cone 1* Total vol sample 10.0 mL

Cone 2 Total wt sample 11.29 g *Cone 2* Total vol sample 9.80 mL

Bulk Density of sample before centrifugation: $\frac{\text{Total wt sample } 12.12 \text{ g}}{\text{Total vol sample } 10.0 \text{ mL}} = 1.21 \text{ g/mL}$ *Sample*

Bulk Density sample cone 2 = $\frac{11.29 \text{ g}}{9.80 \text{ mL}} = 1.15 \text{ g/mL}$ *see 1/18/96*
After Centrifugation: *1.22 Duplicate*

vol sample cone 1 N/A mL

vol solids cone 1 N/A mL

vol liquid cone 1 N/A mL

vol sample cone 2 N/A mL

vol solids cone 2 N/A mL

vol liquid cone 2 N/A mL

vol sample cone 3 N/A mL

vol solids cone 3 N/A mL

vol liquid cone 3 N/A mL

*Report as sample
596T000 140
with duplicate
see 1/2/96*

WHC-SD-WM-DP-168, REV. 0
AN-106 GRAB SAMPLES

③

★ 6AN-95-4 Sludge (Continued)

Remove liquid. Subsample ~~5 mL~~ ^{we. 1.8 g} for analysis and ~~40 mL~~ ^{not 1.8 g} for archive.

S96T000140 Analysis Dose Rate: w/o: ^{500 mR}~~600~~ mrad/hr ~ 19.8 mL

S96T000145 Archive Dose Rate: w/o: ^{500 mR}~~1000~~ mrad/hr V 8614

Final V8614 + liq. 197.47 g
Tare wt V8614 128.68 g
net wt liquids 68.79 g
~ 56.8 mL

Re-weigh cones and record weight of solids.

Final wt cone 1 + solids N/A g

Tare wt cone 1 14.26 g

net wt solids N/A g

Final wt cone 2 + solids N/A g

Tare wt cone 2 14.30 g

net wt solids N/A g

Final wt cone 3 + solids N/A g

Tare wt cone 3 14.25 g

net wt solids N/A g

Record the total weight and volume of the solids as the sum of all of the cones.

Total wt. solids N/A g

Total vol solids N/A mL

Total wt. liquid N/A g

Total vol liquid N/A mL

Bulk Density of centrifuged solids:

$$\frac{\text{Total wt solids } \underline{N/A} \text{ g}}{\text{vol solids } \underline{N/A} \text{ mL}} = \underline{N/A} \text{ g/mL}$$

Bulk Density of decanted supernate:

$$\frac{\text{Total wt liquid } \underline{N/A} \text{ g}}{\text{vol liquid } \underline{N/A} \text{ mL}} = \underline{N/A} \text{ g/mL}$$

(4)

AN-106 GRAB SAMPLES

★ 6AN-95-4 Sludge (Continued)

$$\text{Vol \% Solids} = \frac{\text{Total vol solids}}{\text{Total vol sample}} = \frac{\text{N/A mL}}{\text{N/A mL}} \times 100 = \text{N/A \%}$$

by centrifugation

S96T000146

SOLIDS For analysis (2 - 5 g)

Final wt vial + solids N/A gTare wt vial 20.55gnet wt solids N/A g

No solids -
insufficient solids for
subsampling

Dose Rate: w/o: N/A mrad/hr

S96T000147

SOLIDS For archive

Final wt vial + solids N/A gTare wt vial 128.76gnet wt solids N/A g

~~V-8613~~ see 1/18/96
not used for this
sample.

Dose Rate: w/o: N/A mrad/hr

Grab Sample Information Worksheet

Sample ID: 6AN-95-5
 LABCORE #: S96T000149
 Tank/Project: 6AN AN106 GRAB
 Date: 1/17/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: Yellow
2. Is liquid clear or opaque: Clear
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or No
5. Approximate vol % settled solids: TRACE % NR 1/17/96
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \frac{N/A}{N/A} \%$

d. Other Information:

Doserate 800 mrad/hr
400 mR/hr

Solids are rust
orange/brown
colored

Sample depth 43'6" = 522 in.

ROE C. Determine bulk density of sample? Yes or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

Cone + samp 24.63g
Tare Cone A 7.494g
17.14g

- a. Sum Net Weight for all cones 17.14 g
- b. Sum Total volumes for all cones 14.7 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}} = \frac{17.14}{14.7} \text{ g/mL}$

Report as sample
S96T000153 1/21/96

d. Other Information:

Check wt 50g = 50.000g
use 15ml centrifuge cone for bulk density of liquid

N/A D. Determine bulk density of solids? Yes or No

1. Calculate bulk density of solids, if required: (BLKDEN01)

WHC-SD-WM-DP-168, REV. 0

- a. Sum Wgt. Solids for all cones N/A g
 b. Sum Vol. Solids for all cones N/A mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} = \frac{\text{N/A}}{\text{N/A}} \text{ g/mL}$$

 d. Other Information:

N/A E. Determine bulk density of liquids? Yes or No

1. Calculate bulk density of liquids, if required: (BLKDEN01)

- a. Wgt liquids for all cones N/A g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones N/A mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} = \frac{\text{N/A}}{\text{N/A}} \text{ g/mL}$$

 d. Other Information:

N/A F. Determine volume % solids by centrifugation? Yes or No

1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)

- a. Sum of Vol solids for all cones N/A g
 b. Sum of Total vol for all cones N/A mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 = \frac{\text{N/A}}{\text{N/A}} \%$$

 d. Other Information:

Grab Sample Information Worksheet

WHC-SD-WM-DP-168, REV. 0

Sample ID: GAN-95-6
 LABCORE #: S96T000150
 Tank/Project: AN106 GRAB

Date: 1/17/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: YELLOW
2. Is liquid clear or opaque: CLEAR
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or No
5. Approximate vol % settled solids: Trace % *see 1/17/96*
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \frac{N/A}{N/A} \%$

d. Other Information:

*Doserate 1000 mrad/hr
 700 mrad/hr*

Sample depth 49'4" = 592"

*There was a "chunk"
 of orange/brown solid
 that looked like a piece
 of rusty metal.*

ROE C. Determine bulk density of sample? Yes or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

Cone + samp 25.21 g
Tare cone B 7.495 g
17.72

- a. Sum Net Weight for all cones 17.72 g
- b. Sum Total volumes for all cones 15.0 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}}$

1.18 g/mL
*Report as sample
 number S96T000154
 1/21/96*

d. Other Information:

*Check wt 50g = 50.000 g
 use 15 mL centrifuge cone for bulk density of liquid*

N/A D. Determine bulk density of solids? Yes or No

1. Calculate bulk density of solids, if required: (BLKDEN01)

WHC-SD-WM-DP-168, REV. 0

- a. Sum Wgt. Solids for all cones N/A g
 b. Sum Vol. Solids for all cones N/A mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} = \frac{\text{N/A}}{\text{N/A}} \text{ g/mL}$$

 d. Other Information:

N/A E. Determine bulk density of liquids? Yes or No

1. Calculate bulk density of liquids, if required: (BLKDEN01)
 a. Wgt liquids for all cones N/A g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones N/A mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} = \frac{\text{N/A}}{\text{N/A}} \text{ g/mL}$$

 d. Other Information:

N/A F. Determine volume % solids by centrifugation? Yes or No

1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)
 a. Sum of Vol solids for all cones N/A g
 b. Sum of Total vol for all cones N/A mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 = \frac{\text{N/A}}{\text{N/A}} \%$$

 d. Other Information:

Grab Sample Information Worksheet

WHC-SD-WM-DP-168, REV. 0

Sample ID: 6AN-95-7
LABCORE #: 896T000151
Tank/Project: AN106 GRAB

Date: 1/17/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: Yellow
2. Is liquid clear or opaque: Clear
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or No
5. Approximate vol % settled solids: N/A %
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \underline{N/A} \%$

- d. Other Information:
Dose rate 1600 mrad/hr
1200 mrad/hr

Sample depth 54'4" = 652 in.

ROE C. Determine bulk density of sample? Yes or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

Cone + samp 25.44
Tare Cone c 7.488g
17.95g

- a. Sum Net Weight for all cones 17.95 g
- b. Sum Total volumes for all cones 15.1 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}} = \underline{1.19} \text{ g/mL}$

Report as sample
number 596T000151 155
ROE 2/2/96

- d. Other Information:
check wt 50g = 50.000g
use 15ml centrifuge cone for bulk density of liquid

N/A D. Determine bulk density of solids? Yes or No

1. Calculate bulk density of solids, if required: (BLKDEN01)

WHC-SD-WM-DP-168, REV. 0

- a. Sum Wgt. Solids for all cones $\frac{N/A}{N/A}$ g
 b. Sum Vol. Solids for all cones $\frac{N/A}{N/A}$ mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} = \frac{N/A}{N/A} \text{ g/mL}$$

 d. Other Information:

N/A E. Determine bulk density of liquids? Yes or No

1. Calculate bulk density of liquids, if required: (BLKDEN01)
 a. Wgt liquids for all cones $\frac{N/A}{N/A}$ g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones $\frac{N/A}{N/A}$ mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} = \frac{N/A}{N/A} \text{ g/mL}$$

 d. Other Information:

N/A F. Determine volume % solids by centrifugation? Yes or No

1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)
 a. Sum of Vol solids for all cones $\frac{N/A}{N/A}$ g
 b. Sum of Total vol for all cones $\frac{N/A}{N/A}$ mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 = \frac{N/A}{N/A} \%$$

 d. Other Information:

AN-106 GRAB SAMPLES

★ 6AN-95-8 Sludge Sampled 11/22/95 from riser 21A
 Sampling Depth? 667 in.
 Dose Rate: w/o: 2200 mrad/hr
1500 mrad

S96T000152

APPEARANCE: Gray/yellow liquid trace of gray/brown solids
settled. There is insufficient solids to collect for any

Measure the height of the settled solids and the total sample and calculate the volume percent settled solids according to the following equation.

$$\text{Vol \% Settled Solids} = \frac{\text{Height solids}}{\text{Height total sample}} = \frac{N/A \text{ mm}}{N/A \text{ mm}} \times 100 = \frac{N/A}{N/A} \%$$

Agitate sample to suspend all of the solids and transfer the entire sample to centrifuge cones. Record the volume and weight of the sample before centrifugation. If the solids settle rapidly (within a few minutes), record the volume of solids before centrifugation. Centrifuge the sample for a minimum of 1 hour. Record volume of solids and liquids after centrifugation. Remove liquid and subsample for analysis and archive. Record weight of solids that remain. Subsample solids for analysis and archive.

Before centrifugation:

Check weights: 50g = 50.001g
will perform bulk density in duplicate using about 10ml liquid in each
of 2 15ml centrifuge cones.

Final wt cone ³ + sample 19.34g

Tare wt cone ³ 11.36g 7.50g

net wt sample 11.84g

vol sample 10.0 mL

vol solids N/A mL

Final wt cone ⁴ + sample 19.50g

Tare wt cone ⁴ 11.29g 7.50g

net wt sample 12.0 g

vol sample 10.0 mL

vol solids N/A mL

WHC-SD-WM-DP-168, REV. 0
AN-106 GRAB SAMPLES

6

★ 6AN-95-8 Sludge (Continued)

Final wt cone 6 + sludge _____ g

Tare wt cone 6 14.36 g

net wt sample _____ g

vol sample _____ mL

vol solids _____ mL

*N/A
see 1/18/96
Insufficient solids
to perform test*

Record the total weight and volume of the sample as the sum of all of the cones.

^{Cone 3}
Total wt. sample 11.84 g

^{Cone 3}
Total vol sample 10.0 mL

^{Cone 4}
Total wt sample 12.0 g

^{Cone 4}
Total vol sample 10.0 mL

Bulk Density of sample before centrifugation:

Total wt sample 11.84 g

Sample

1.18 g/mL

Bulk Density of sample Cone 4 = $\frac{12.0g}{10 mL} = 1.20g/mL$

Total vol sample 10 mL

After Centrifugation:

Duplicate

vol sample cone 4 _____ mL

vol sample cone 5 _____ mL

vol solids cone 4 _____ mL

vol solids cone 5 _____ mL

vol liquid cone 4 _____ mL

vol liquid cone 5 _____ mL

vol sample cone 6 _____ mL

vol solids cone 6 _____ mL

vol liquid cone 6 _____ mL

*N/A
see 1/18/96*

*Report in duplicate
as sample number
596T000156
see
2/2/96*

AN-106 GRAB SAMPLES

⑦

★ 6AN-95-8 Sludge (Continued)

Remove liquid. Subsample 5 mL for analysis and 60 mL for archive.

S96T000156 Analysis Dose Rate: w/o: ^{400 mR}800 mrad/hr ~ 20 mL

S96T000160 Archive Dose Rate: w/o: ^{1000 mR}1000 mrad/hr V 8616

Re-weigh cones and record weight of solids.

Final wt V8616 + liq. 203.62 g
Tare wt V 8616 129.33 g
Net wt liq 74.29 g
~ 62.4 mL

Final wt cone 4 + solids _____ g

Tare wt cone 4 14.56 g

net wt solids _____ g

Final wt cone 5 + solids _____ g

Tare wt cone 5 14.39 g

net wt solids _____ g

n/A
nrc 1/18/96

Final wt cone 6 + solids _____ g

Tare wt cone 6 14.36 g

net wt solids _____ g

Record the total weight and volume of the solids as the sum of all of the cones.

Total wt. solids _____ g

Total vol solids _____ mL

Total wt. liquid _____ g

Total vol liquid _____ mL

Bulk Density of centrifuged solids:

$$\frac{\text{Total wt solids} \text{ _____ g}}{\text{vol solids} \text{ _____ mL}} = \text{_____ g/mL}$$

Bulk Density of decanted supernate:

$$\frac{\text{Total wt liquid} \text{ _____ g}}{\text{vol liquid} \text{ _____ mL}} = \text{_____ g/mL}$$

n/A
nrc 1/18/96

WHC-SD-WM-DP-168, REV. 0
AN-106 GRAB SAMPLES

⑧

★ 6AN-95-8 Sludge (Continued)

Vol % Solids = $\frac{\text{Total vol solids}}{\text{Total vol sample}} = \frac{\text{ml}}{\text{mL}} \times 100 = \text{\%}$
by centrifugation *n/A see 1/18/86*

S96T000162

SOLIDS For analysis (2 - 5 g)

Final wt vial + solids _____g

Tare wt vial 20.34g

net wt solids _____g

Dose Rate: w/o: _____mrad/hr

*n/A
Insufficient solids to
create this subsample*

S96T000161

SOLIDS For archive

Final wt vial + solids _____g

Tare wt vial 129.14g

net wt solids _____g

Dose Rate: w/o: _____mrad/hr

~~V 8615~~

*Not used for
this sample*

*n/A
Insufficient
solids to create
this sample*

Grab Sample Information Worksheet

Sample ID: 6AN-95-9
 LABCORE #: 596T000134
 Tank/Project: AN106 GRAB

Date: 1/16/96 (Date of Breakdown)

A. Obtain the total weight of the grab sample:

Total weight of jar + sample = N/A grams

B. Description of Sample:

1. Color of liquid: COLORLESS
2. Is liquid clear or opaque: CLEAR
3. Approximate volume (Total): 125 mL
4. Are solids present: Yes or (No)
5. Approximate vol % settled solids: N/A %
6. If there is more than 2% settled solids, determine actual volume % settled solids:

- a. Height of solids: N/A mm
- b. Height of total sample: N/A mm
- c. Volume % settled solids:

$\frac{\text{Height of solids}}{\text{Height of Total Sample}} \times 100 = \underline{N/A} \%$

d. Other Information:

Dose rate <0.5 mixed/hr
<0.5 mixed/hr
 Sample depth 240 in

RAE C. Determine bulk density of sample? (Yes) or No

1. Calculate bulk density of sample, if required: (BLKDEN01)

Cone + samp 22.57 g
 Tare cone D 7.48 g
15.09 g

- a. Sum Net Weight for all cones 15.09 g
- b. Sum Total volumes for all cones 15.1 mL
- c. Determine bulk density of sample:

$\frac{\text{Sum of Net Weight}}{\text{Sum of Total Volume}} = \underline{1.00} \text{ g/mL}$

Report as sample
 number 596T000139
2/2/96

d. Other Information:

Check wt 50 g = 49.994 g

Use 15 mL centrifuge cone for bulk density of liquids
 Subsample 40 mL for analysis C40mL to test

N/A D. Determine bulk density of solids? Yes or No

1. Calculate bulk density of solids, if required: (BLKDEN01)

WHC-SD-WM-DP-168, REV. 0

- a. Sum Wgt. Solids for all cones N/A g
 b. Sum Vol. Solids for all cones N/A mL
 c. Determine bulk density of solids:

$$\frac{\text{Sum of Wgt. Solids}}{\text{Sum of Vol. Solids}} = \frac{\text{N/A}}{\text{N/A}} \text{ g/mL}$$

 d. Other Information:

N/A E. Determine bulk density of liquids? Yes or No

1. Calculate bulk density of liquids, if required: (BLKDEN01)
 a. Wgt liquids for all cones N/A g
 Wgt liquids = Sum of Net Wgt - Sum of Wgt solids
 b. Vol. liquids for all cones N/A mL
 Vol liquids = Sum of Total vol - Sum of Vol solids
 c. Determine bulk density of liquids:

$$\frac{\text{Wgt. Liquids}}{\text{Vol. Liquids}} = \frac{\text{N/A}}{\text{N/A}} \text{ g/mL}$$

 d. Other Information:

N/A F. Determine volume % solids by centrifugation? Yes or No

1. Calculate volume % solids by centrifugation, if required: (V%SLD-01)
 a. Sum of Vol solids for all cones N/A g
 b. Sum of Total vol for all cones N/A mL
 c. Determine volume % solids by centrifugation:

$$\frac{\text{Sum of Vol solids}}{\text{Sum of Total Volume}} \times 100 = \frac{\text{N/A}}{\text{N/A}} \%$$

 d. Other Information:

LABCORE Data Entry Template for Worklist#

4901

Analyst: RAE Instrument: NONE Book # N/A

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: AN-106 @BRKDWN samples 1,2,3,9

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
96000016	AN-106 GRAB	1 SAMPLE	S96T000132	0	@BRKDWN1 DOSERATE	LIQUID	N/A	1000		mrads/hour
96000016	AN-106 GRAB	1 SAMPLE	S96T000132	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000016	AN-106 GRAB	1 SAMPLE	S96T000132	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL
96000016	AN-106 GRAB	2 SAMPLE	S96T000133	0	@BRKDWN1 DOSERATE	LIQUID	N/A	1100		mrads/hour
96000016	AN-106 GRAB	2 SAMPLE	S96T000133	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000016	AN-106 GRAB	2 SAMPLE	S96T000133	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL
96000016	AN-106 GRAB	3 SAMPLE	S96T000134	0	@BRKDWN1 DOSERATE	LIQUID	N/A	10.5		mrads/hour
96000016	AN-106 GRAB	3 SAMPLE	S96T000134	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000016	AN-106 GRAB	3 SAMPLE	S96T000134	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL
96000016	AN-106 GRAB	4 SAMPLE	S96T000131	0	@BRKDWN1 DOSERATE	LIQUID	N/A	1100		mrads/hour
96000016	AN-106 GRAB	4 SAMPLE	S96T000131	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000016	AN-106 GRAB	4 SAMPLE	S96T000131	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL

Final page for worklist # 4901

RAE 1/16/96
Analyst Signature Date

Shute 1/29/96
Analyst Signature Date

SAMPLE ID	COLOR	CLEARITY	SOLIDS	ORG. LAYER
S96T000131	YELLOW	CLEAR	NONE	NONE
S96T000132	YELLOW	CLEAR	NONE	NONE
S96T000133	YELLOW	CLEAR	NONE	NONE
S96T000134	COLORLESS	CLEAR	NONE	NONE

Data Entry Comments:

Reviewed and Approved 2/2/96 RAE

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

4902

Analyst: ROE Instrument: NONE Book # N/A

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: AN-106 @BRKDWN samples 5,6,7

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
96000017	AN-106 GRAB	1 SAMPLE	S96T000149	0	@BRKDWN1 DOSERATE	LIQUID	N/A	800		mrad/hour
96000017	AN-106 GRAB	1 SAMPLE	S96T000149	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000017	AN-106 GRAB	1 SAMPLE	S96T000149	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		ml
96000017	AN-106 GRAB	2 SAMPLE	S96T000150	0	@BRKDWN1 DOSERATE	LIQUID	N/A	1000		mrad/hour
96000017	AN-106 GRAB	2 SAMPLE	S96T000150	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000017	AN-106 GRAB	2 SAMPLE	S96T000150	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		ml
96000017	AN-106 GRAB	3 SAMPLE	S96T000151	0	@BRKDWN1 DOSERATE	LIQUID	N/A	1600		mrad/hour
96000017	AN-106 GRAB	3 SAMPLE	S96T000151	0	@BRKDWN1 APPEAR02	LIQUID	N/A	complete		
96000017	AN-106 GRAB	3 SAMPLE	S96T000151	0	@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		ml

Final page for worklist # 4902

<u>ROE</u> Analyst Signature	<u>1/17/96</u> Date	<u>St M. Garland</u> Analyst Signature	<u>1-18-96</u> Date	
<u>Sample ID</u>	<u>Color</u>	<u>Clarity</u>	<u>Solids</u>	<u>Org Layer</u>
S96T000149	Yellow	clear	Trace orange/brown	None
S96T000150	Yellow	clear	Chunks of orange/brown solid	None
S96T000151	Yellow	Clear	None	None

Data Entry Comments:

Reviewed and approved by ROE 1/26/96

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

4904

Analyst: RAE Instrument: NONE Book # N/A

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: AN-106 @BRKDWN samples 4,8

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
96000017	AN-106 GRAB	1 SAMPLE	S96T000152	0	@BRKDWN1 DOSERATE	SOLID	N/A	<u>2200</u>		mrads/hour
96000017	AN-106 GRAB	1 SAMPLE	S96T000152	0	@BRKDWN1 APPEAR02	SOLID	N/A	<u>complete</u>		
96000017	AN-106 GRAB	1 SAMPLE	S96T000152	0	@BRKDWN1 SAMPAMT2	SOLID	N/A	<u>125</u>		ml
96000016	AN-106 GRAB	2 SAMPLE	S96T000135	0	@BRKDWN1 DOSERATE	SOLID	N/A	<u>1700</u>		mrads/hour
96000016	AN-106 GRAB	2 SAMPLE	S96T000135	0	@BRKDWN1 APPEAR02	SOLID	N/A	<u>complete</u>		
96000016	AN-106 GRAB	2 SAMPLE	S96T000135	0	@BRKDWN1 SAMPAMT2	SOLID	N/A	<u>125</u>		ml

Final page for worklist # 4904

RAE 1/18/96
Analyst Signature Date

R. Jones 1-18-96
Analyst Signature Date

<u>Sample ID</u>	<u>Color</u>	<u>Clarity</u>	<u>Solids</u>	<u>Org. Layer</u>
S96T000152	Gray/yellow liquid	clear	trace of gray/brown	NONE
S96T000135	Gray/yellow liquid	clear	trace of gray/brown	NONE

Data Entry Comments:

Reviewed and approved by RAE 1/26/96

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WHC-SD-WM-DP-168, REV. 0

INORGANIC ANALYSES

LABCORE Data Entry Template for Worklist#

5129

Analyst: ADO/EAL Instrument: DSC0 1 Book # 44112N14B

Method: LA-514-113 Rev/Mod C-1

Worklist Comment: Please run AN-106 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	LIQUID	28.45	30.1	N/A	Joules/g
96000016	AN-106 GRAB	2 SAMPLE	S96T000138	0	DSC-01	LIQUID	N/A	Ø		Joules/g
96000016	AN-106 GRAB	3 DUP	S96T000138	0	DSC-01	LIQUID	Ø	Ø	N/A	Joules/g
96000016	AN-106 GRAB	4 SAMPLE	S96T000139	0	DSC-01	LIQUID	N/A	Ø		Joules/g
96000016	AN-106 GRAB	5 DUP	S96T000139	0	DSC-01	LIQUID	Ø	Ø	N/A	Joules/g

Final page for worklist # 5129

Anthony Purno 1-30-96
Analyst Signature Date

A. Lambel 1-31-96
Analyst Signature Date

Verified by Blandina
Valenzuela
2/5/96

Newright 2/2/96

Data Entry Comments: S95T000138 produced an endotherm at 113.8°C with a delta H of 1415.4 J/g.

S96T000139 produced an endotherm at 105.8°C with a delta H of 1263.1 J/g.

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

BEST AVAILABLE COPY

IND 12N14 -B N2

File: 00105.001

DSC METTLER

30-Jan-96

8.127 mg

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 122 TO 128.

222-S Laboratory

exo>

Integration

Delta H 244 mJ

30.1 J/g

Peak 163.3°C

-11.4 mW

5. mW

120.

140.

160.

180. °C

Ally Purno 1-30-96

WHC-SD-WM-DP-168, REV. 0

S96T000138 SAM N2

23.771 mg

Rate: 10.0 °C/min

File: 00107.001

DSC METTLER

30-Jan-96

Ident: 0.0

222-S Laboratory

exo

50. mW

Integration

Delta H 33645 mJ

1415.4 J/g

Peak 113.8 °C

-103.0 mW

100.

200.

300.

400.

°C

123

S96T000140 DUP N2

23.128 mg

Rate: 10.0 °C/min

File: 00109.001

DSC METTLER

30-Jan-96

Ident: 0.0

222-S Laboratory

exo>

50. mW

Integration

Delta H25220 mJ

1090.5 J/g

Peak 131.9°C

-100.2 mW

100.

200.

300.

400.

°C

124

A. Lumbel

S96T000139 SAM N2

10.932 mg

Rate: 10.0 °C/min

File: 00111.001

DSC METTLER

31-Jan-96

Ident: 0.0

222-S Laboratory

exo >

Integration

Delta H13808 mJ

1263.1 J/g

Peak 105.8 °C

-99.1 mW

50. mW

125

100.

200.

300.

400.

°C

WHC-SD-WM-DP-168, REV. 0

S96T000139 DUP N2

9.921 mg

Rate: 10.0 °C/min

File: 00112.001

DSC METTLER

31-Jan-96

Ident: 0.0

222-S Laboratory

exo

50. mW

Integration

Delta H19984 mJ

2014.3 J/g

Peak 105.8°C

-103.3 mW

100.

200.

300.

400.

°C

LABCORE Data Entry Template for Worklist#

5130

Analyst: ADP Instrument: DSC0 3 Book # 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run AN-106 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	LIQUID	<u>28.45</u>	<u>28.02</u>	<u>N/A</u>	Joules/g
96000016	AN-106 GRAB	2 SAMPLE	S96T000140	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000016	AN-106 GRAB	3 DUP	S96T000140	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g
		4 STD			DSC-03	LIQUID	<u>28.45</u>	<u>28.08</u>	<u>N/A</u>	Joules/g
96000017	AN-106 GRAB	5 SAMPLE	S96T000153	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000017	AN-106 GRAB	6 DUP	S96T000153	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist #

5130

Analyst Signature

Date

2/6/96

Analyst Signature

Date

Data Entry Comments:

S96T000140 produced an endotherm at 117.1°C with a delta H of

1586.9 J/g.

S96T000153 produced an endotherm at 114.2°C with a delta H of 1864.9 J/g

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

5130

Analyst: ADP Instrument: DSC0 Book # 12N14B

Method: LA-514-113⁴ Rev/Mod C-1

Worklist Comment: Please run AN-106 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	LIQUID			N/A	Joules/g
96000016	AN-106 GRAB	2 SAMPLE	S96T000140	0	DSC-01	LIQUID	N/A			Joules/g
96000016	AN-106 GRAB	3 DUP	S96T000140	0	DSC-01	LIQUID			N/A	Joules/g
96000017	AN-106 GRAB	4 SAMPLE	S96T000153	0	DSC-01	LIQUID	N/A			Joules/g
96000017	AN-106 GRAB	5 DUP	S96T000153	0	DSC-01	LIQUID			N/A	Joules/g

Final page for worklist #

5130

Blandina Valenzuela for AD Purinton 2/6/96 reweight 2/7/96
Analyst Signature Date Analyst Signature Date

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number,
R = Replicate Number, A = Aliquot Code.

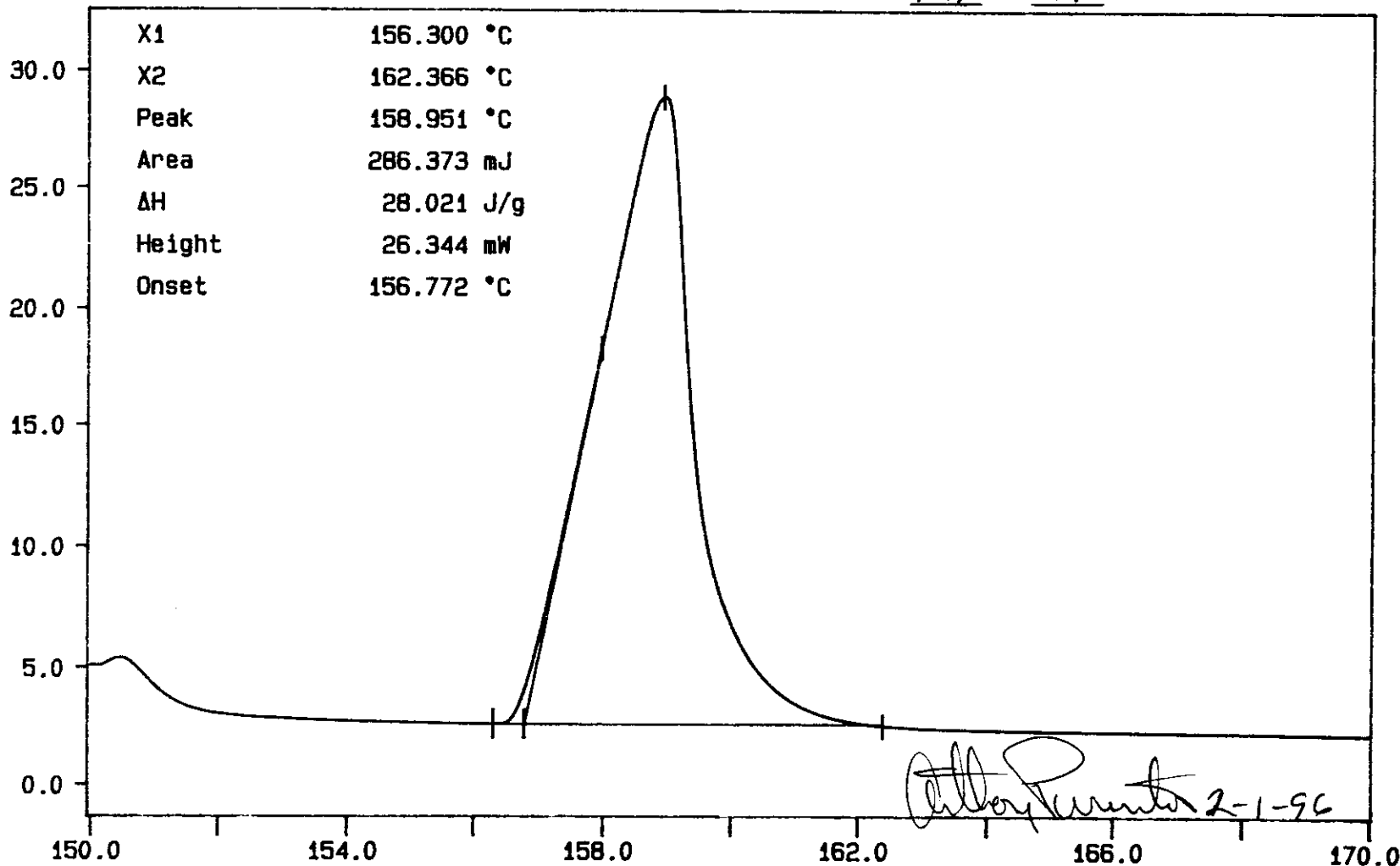
Curve 1: DSC

File info: IND020102 Thu Feb 1 06:05:17 1996

Sample Weight: 10.220 mg

12N14B Indium at 10C/min

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 129 TO 134.



N2, EXOTHERM DOWN

TEMP: 150.0 °C TIME: 0.0 min RATE: 10.0 °C/min
TEMP: 170.0 °C

Temperature (°C)

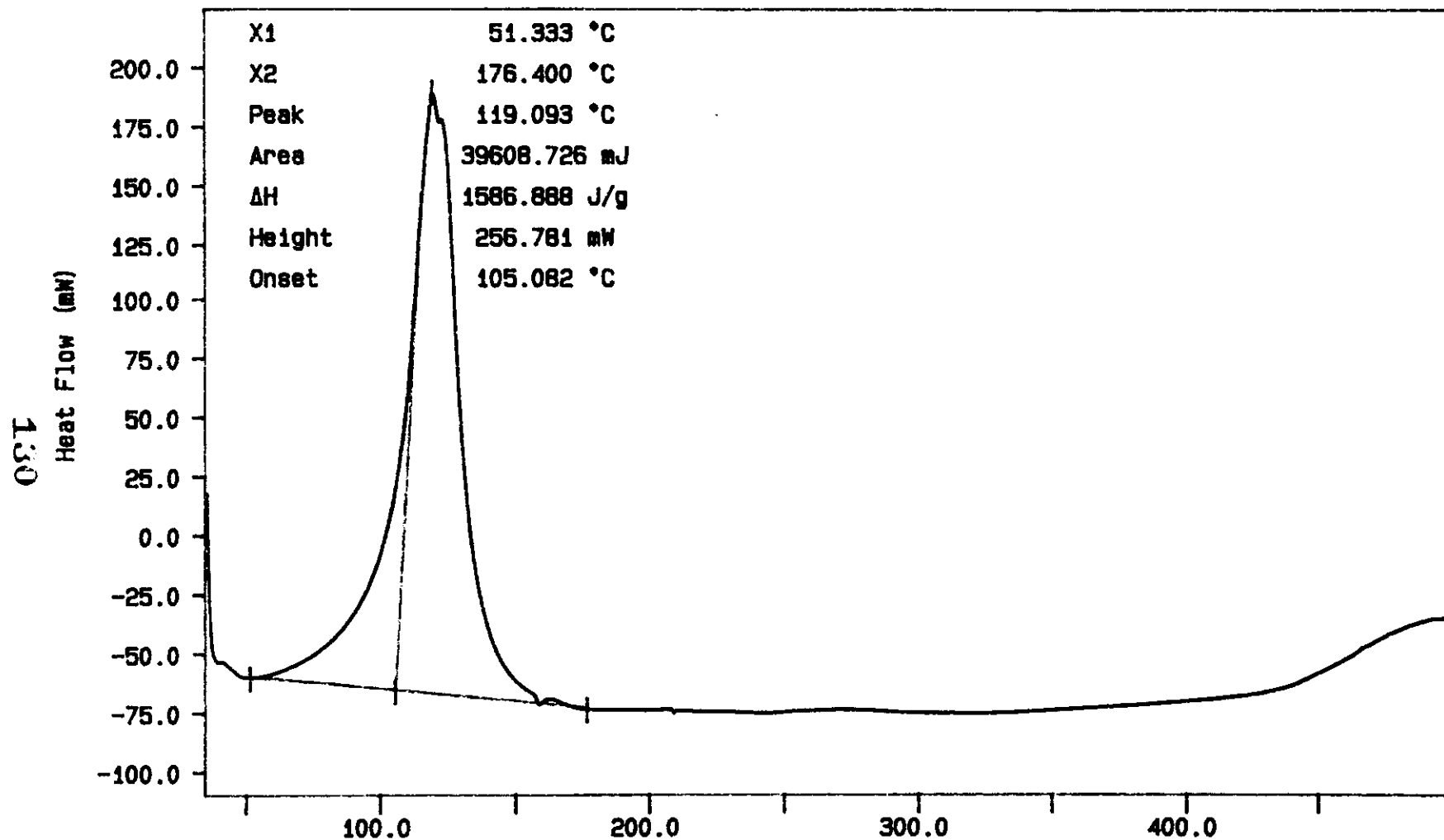
AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Thu Feb 1 06:20:33 1996

Curve 1: DSC

File info: SAM020108 Thu Feb 1 16: 43: 07 1996

Sample Weight: 24.960 mg

S96T000140 SAM



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP1: 35.0 °C
TEMP2: 500.0 °C
TIME1: 0.0 min
RATE1: 10.0 °/min

Temperature (°C)

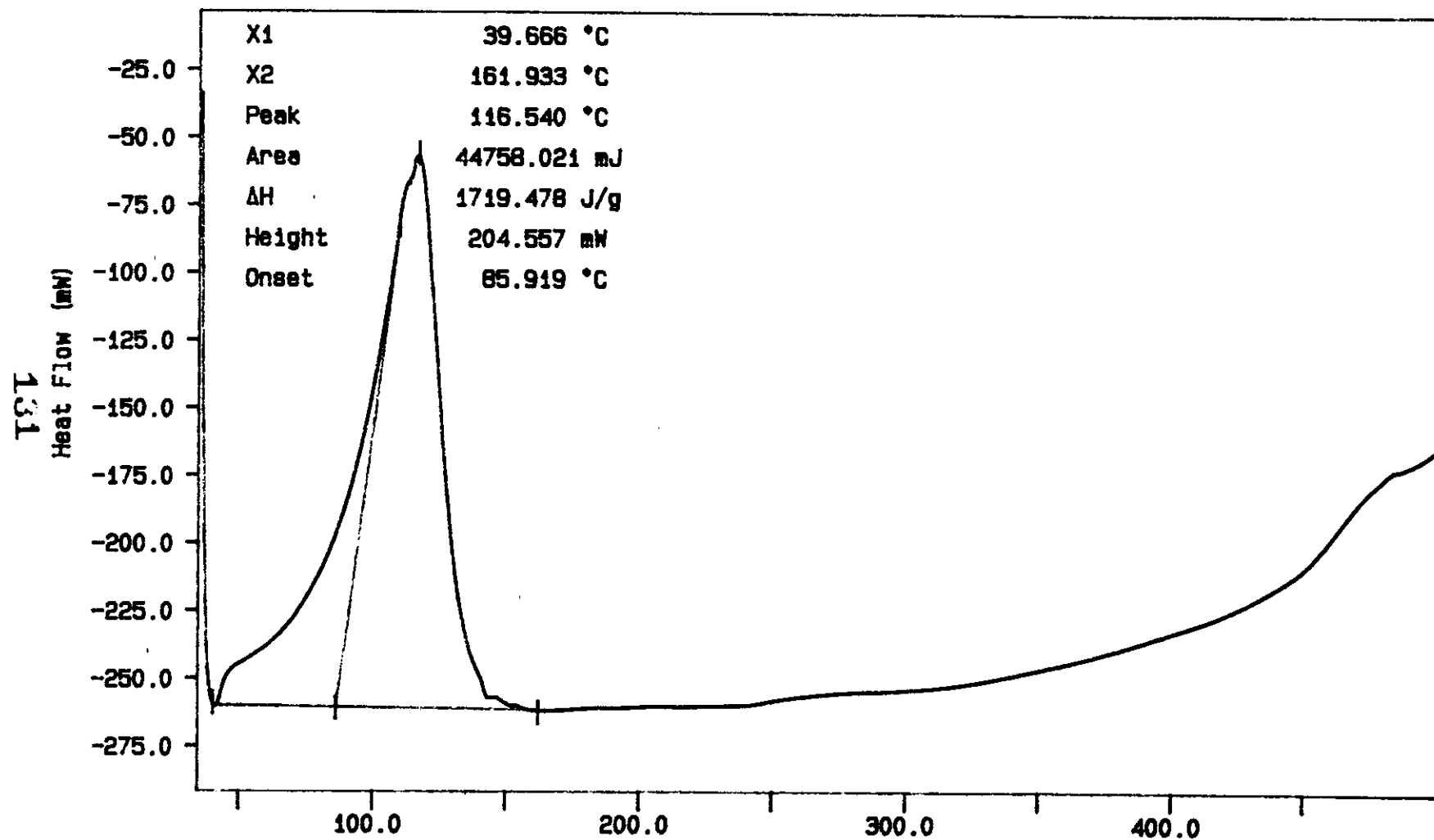
AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Thu Feb 1 16: 44: 38 1996

Curve 1: DSC

File info: SAM020109 Thu Feb 1 17:36:11 1996

Sample Weight: 26.030 mg

S96T000140 DUP



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP: 35.0 °C TIME: 0.0 min RATE: 10.0 °C/min

Temperature (°C)

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 07:35:50 1996

Curve 1: DSC

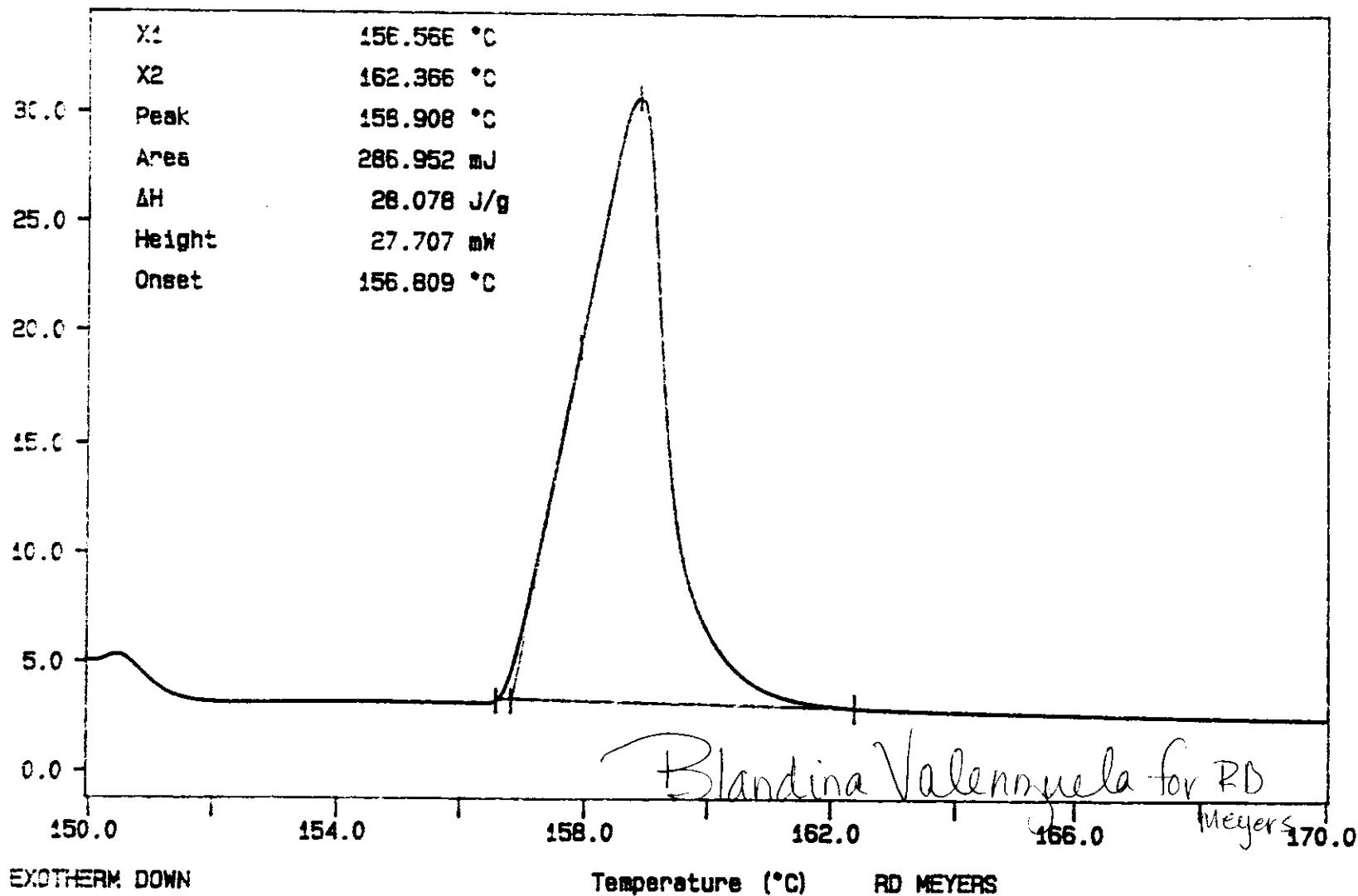
File info: qsav2 Fri Feb 2 07:52:48 1996

Sample Weight: 10.220 mg

12N14E Indium at 10C/min

132

Heat Flow (mW)



WHC-SD-WM-DP-168, REV.0

N2, EXOTHERM DOWN

TIME: 15:00 TIME: 0.0 min RATE: 10.0 C/min

Temperature (°C)

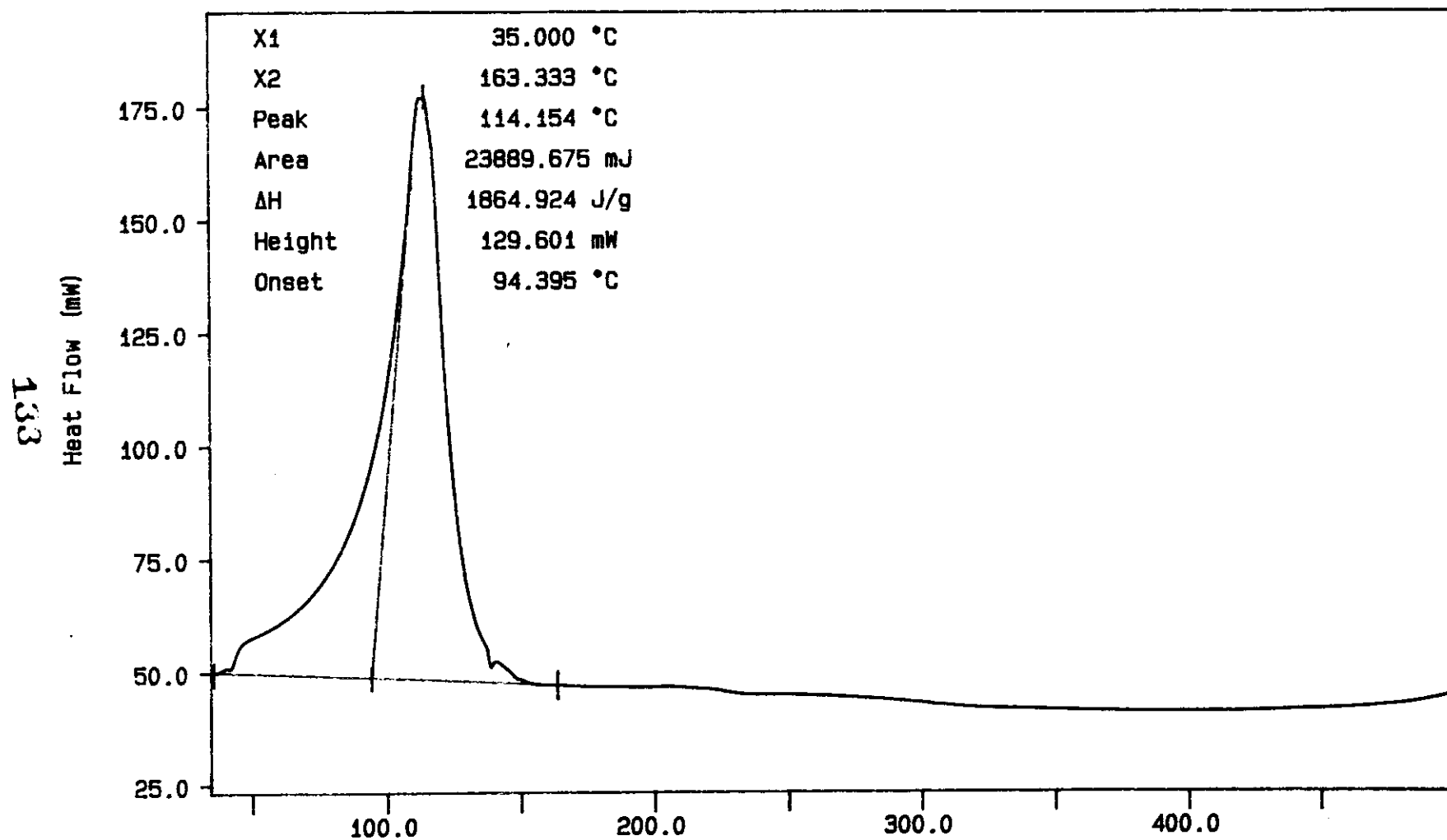
RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 07:56:09 1996

Curve 1: DSC

File info: sam020201 Fri Feb 2 10:26:41 1996

Sample Weight: 12.810 mg

S96T000153

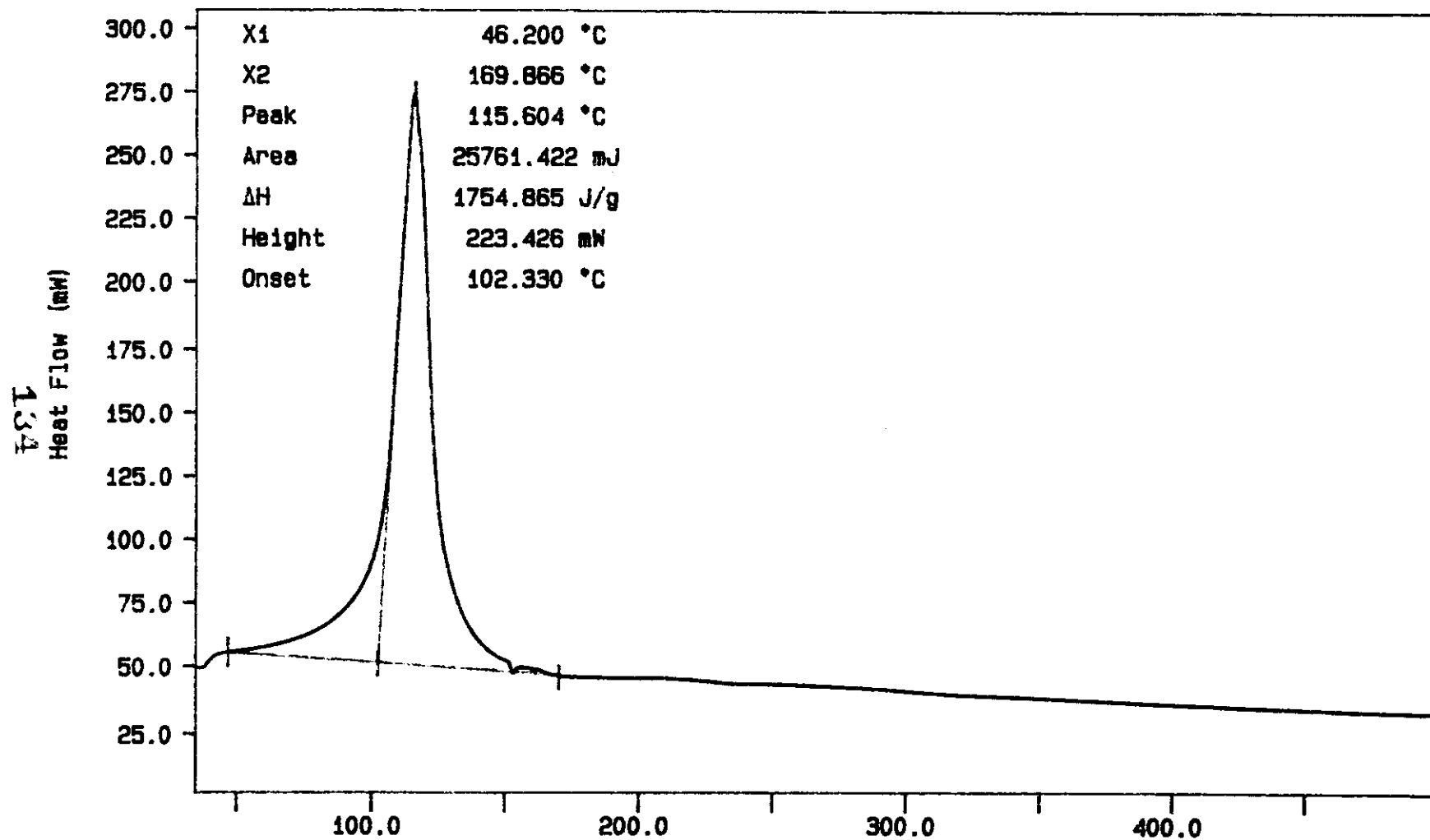


WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas
TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Feb 6 12:29:57 1996

Curve 1: DSC
File info: SAM020202 Fri Feb 2 11: 41: 55 1996
Sample Weight: 14.680 mg
S96T000153DUP



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas
TEMP1: 35.0 °C
TEMP2: 500.0 °C
TIME1: 0.0 min
RATE1: 10.0 °C/min

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 12: 48: 01 1996

LABCORE Data Entry Template for Worklist#

5131

Analyst: RDM Instrument: DSC0 3 Book # 12N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run AN-106 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	LIQUID	<u>28.45</u>	<u>28.08</u>	<u>N/A</u>	Joules/g
96000017	AN-106 GRAB	2 SAMPLE	S96T000154	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000017	AN-106 GRAB	3 DUP	S96T000154	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g
96000017	AN-106 GRAB	4 SAMPLE	S96T000155	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000017	AN-106 GRAB	5 DUP	S96T000155	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g
96000017	AN-106 GRAB	6 SAMPLE	S96T000156	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000017	AN-106 GRAB	7 DUP	S96T000156	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist #

5131

See attached for signatures

Analyst Signature [Signature] Date 2/6/96 BDV

Analyst Signature _____ Date _____

Verified by [Signature] 2/7/96

S96T000154 produced an endotherm at 116.4°C with a delta H of 1734.25 J/g
S96T000155 produced an endotherm at 115.2°C with a delta H of 1930.7 J/g

Data Entry Comments: S96T000156 produced an endotherm at 104.8°C with a
delta H of 1636.84 J/g

LABCORE Data Entry Template for Worklist#

5131

Analyst: [Signature] Instrument: DSC0 Book # 12M413

Method: LA-514-111⁴ Rev/Mod L-1
2/2/96

Worklist Comment: Please run AN-106 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	LIQUID			N/A	Joules/g
96000017	AN-106 GRAB	2 SAMPLE	S96T000154	0	DSC-01	LIQUID	N/A			Joules/g
96000017	AN-106 GRAB	3 DUP	S96T000154	0	DSC-01	LIQUID			N/A	Joules/g
96000017	AN-106 GRAB	4 SAMPLE	S96T000155	0	DSC-01	LIQUID	N/A			Joules/g
96000017	AN-106 GRAB	5 DUP	S96T000155	0	DSC-01	LIQUID			N/A	Joules/g
96000017	AN-106 GRAB	6 SAMPLE	S96T000156	0	DSC-01	LIQUID	N/A			Joules/g
96000017	AN-106 GRAB	7 DUP	S96T000156	0	DSC-01	LIQUID			N/A	Joules/g

Final page for worklist # 5131

[Signature] 2/2/96
Analyst Signature Date
[Signature] 2/2/96

[Signature] 2/7/96
Analyst Signature Date

Other instrument
was used
2/6/96
BDV

Data Entry Comments:

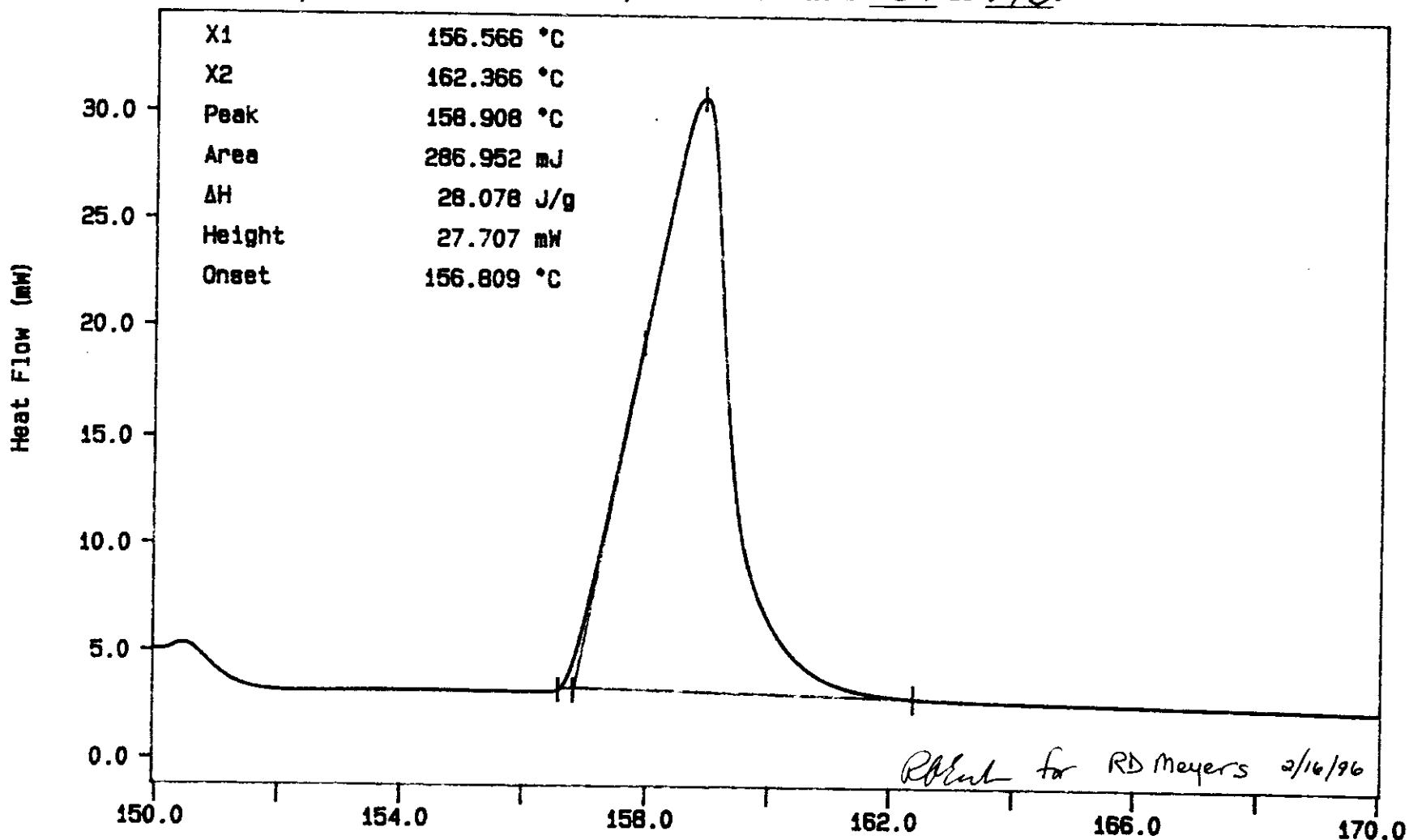
Curve 1: DSC

File info: qsav2 Fri Feb 2 07:52:48 1996

Sample Weight: 10.220 mg

12N14B Indium at 10C/min

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 137 TO 143.



WHC-SD-WM-DP-168, REV. 0

N2, EXOTHERM DOWN

TEMP: 150.0 °C TIME: 0.0 min RATE: 10.0 °C/min

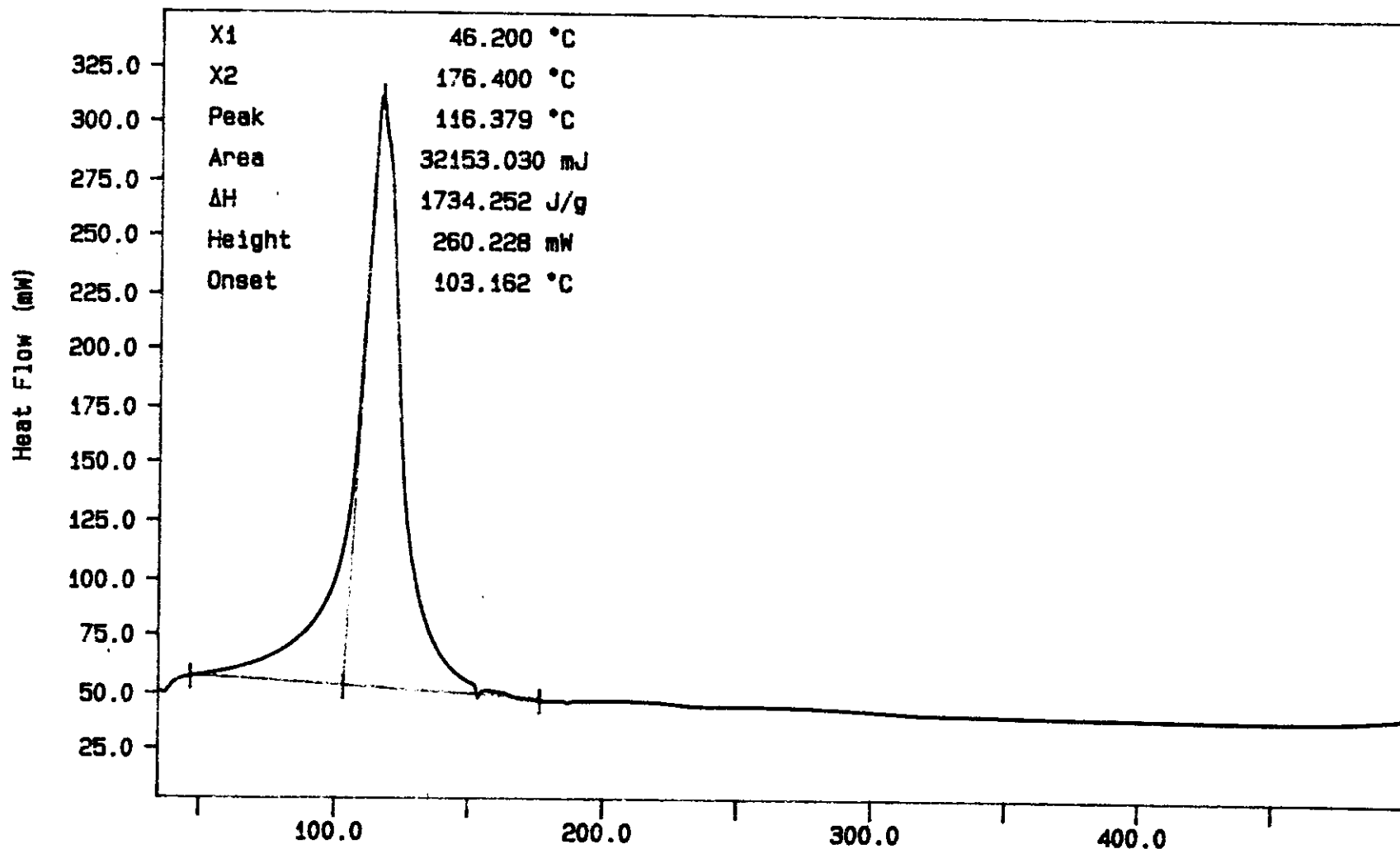
RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 07:56:09 1996

Curve 1: DSC

File info: qsav2 Fri Feb 2 13:43:01 1996

Sample Weight: 18.540 mg

S96T000154



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP: 35.0 °C TIME: 0.0 min RATE: 10.0 °C/min
TEMP: 500.0 °C

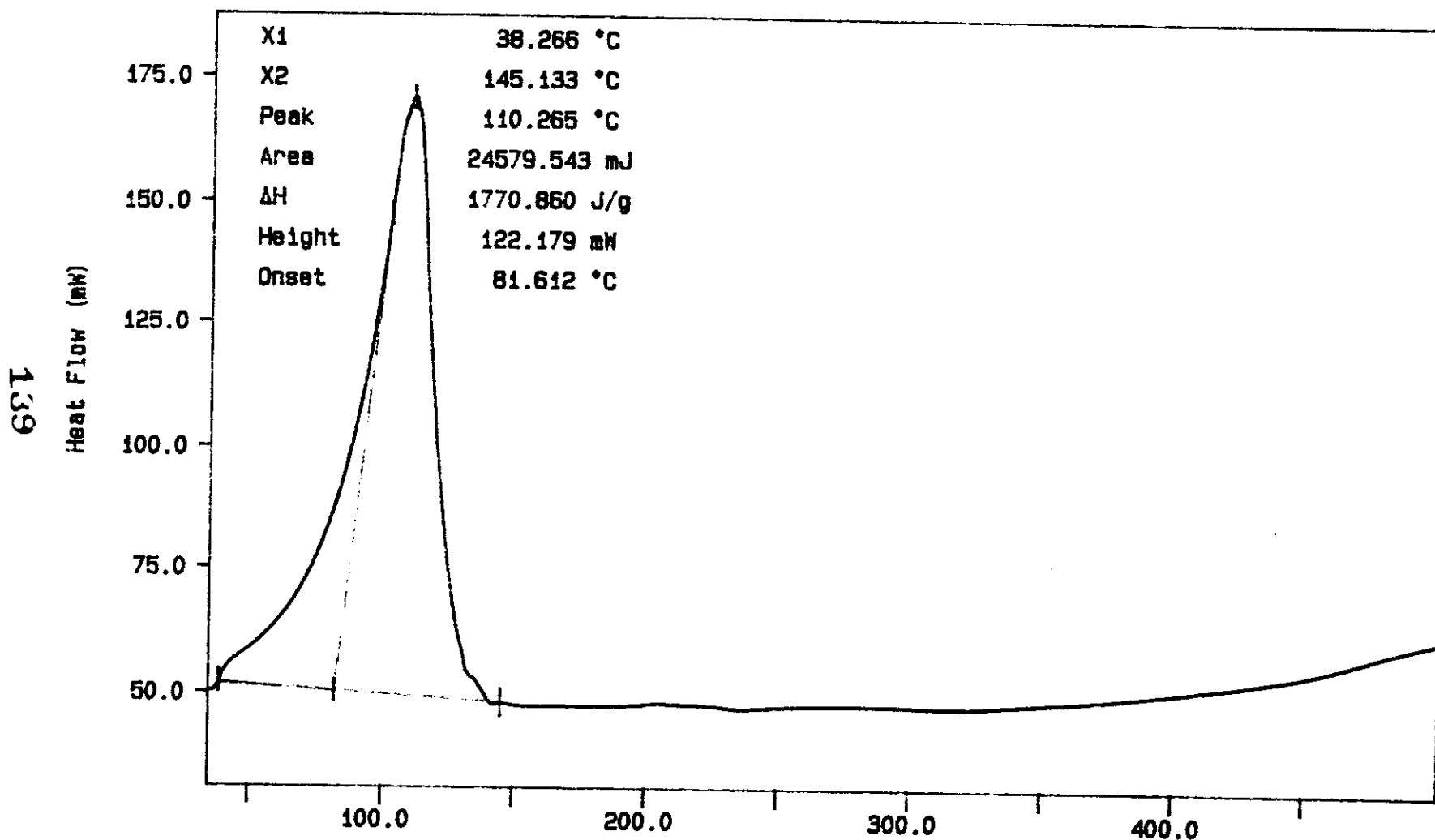
RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 13:44:49 1996

Curve 1: DSC

File info: qsav2 Fri Feb 2 14: 40: 01 1996

Sample Weight: 13.880 mg

S96T000154DUP



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 15: 48: 29 1996

Curve 1: DSC

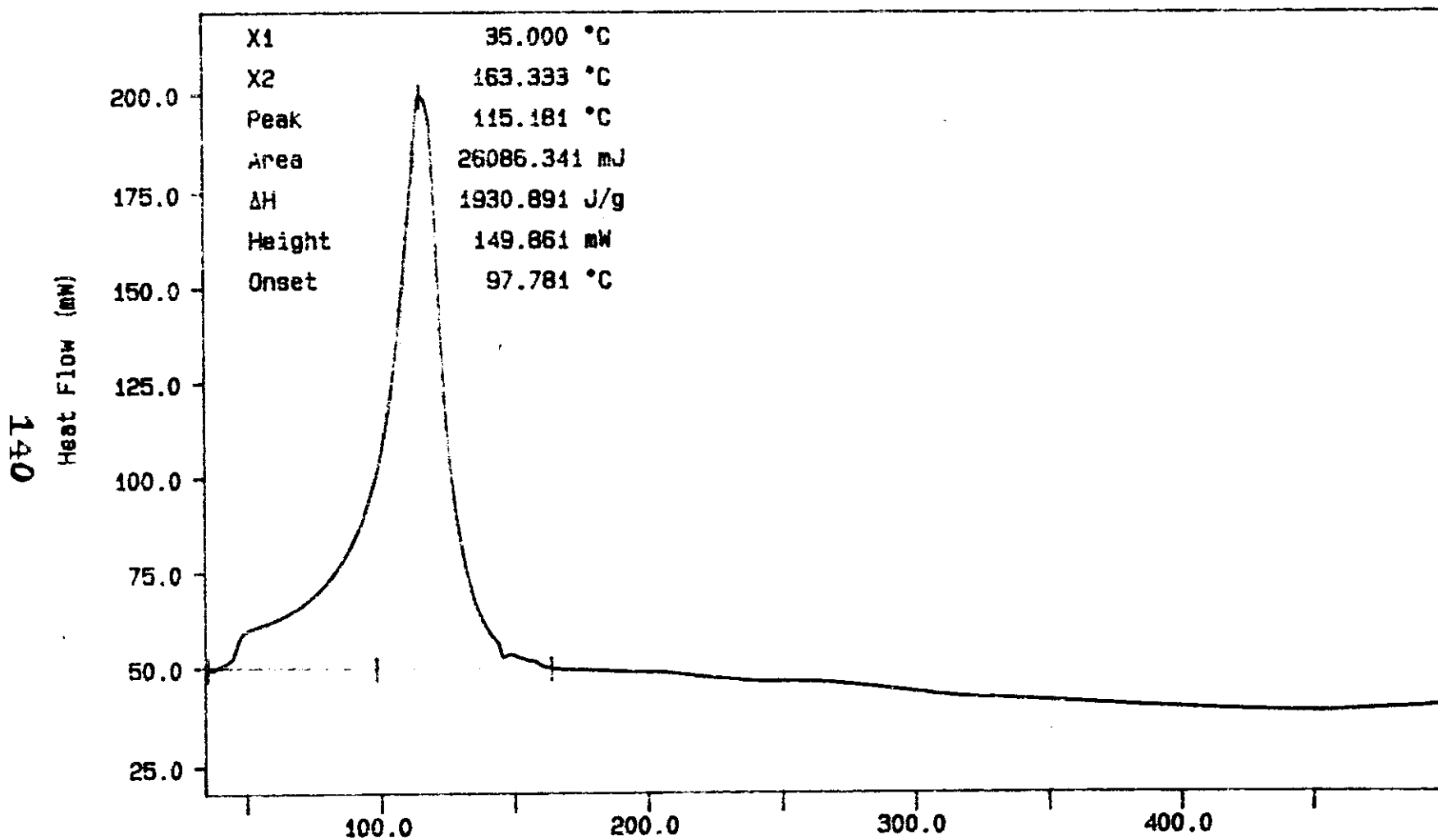
File info: SAM020203 Fri Feb 2 22:16:11 1996

Sample Weight: 13.510 mg

S96T000453

155 SMF2-2-96

BEST AVAILABLE COPY



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP: 35.0 °C TIME: 0.0 min RATE: 10.0 °C/min
TEMP: 500.0 °C

Temperature (°C)

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 2 22:21:55 1996

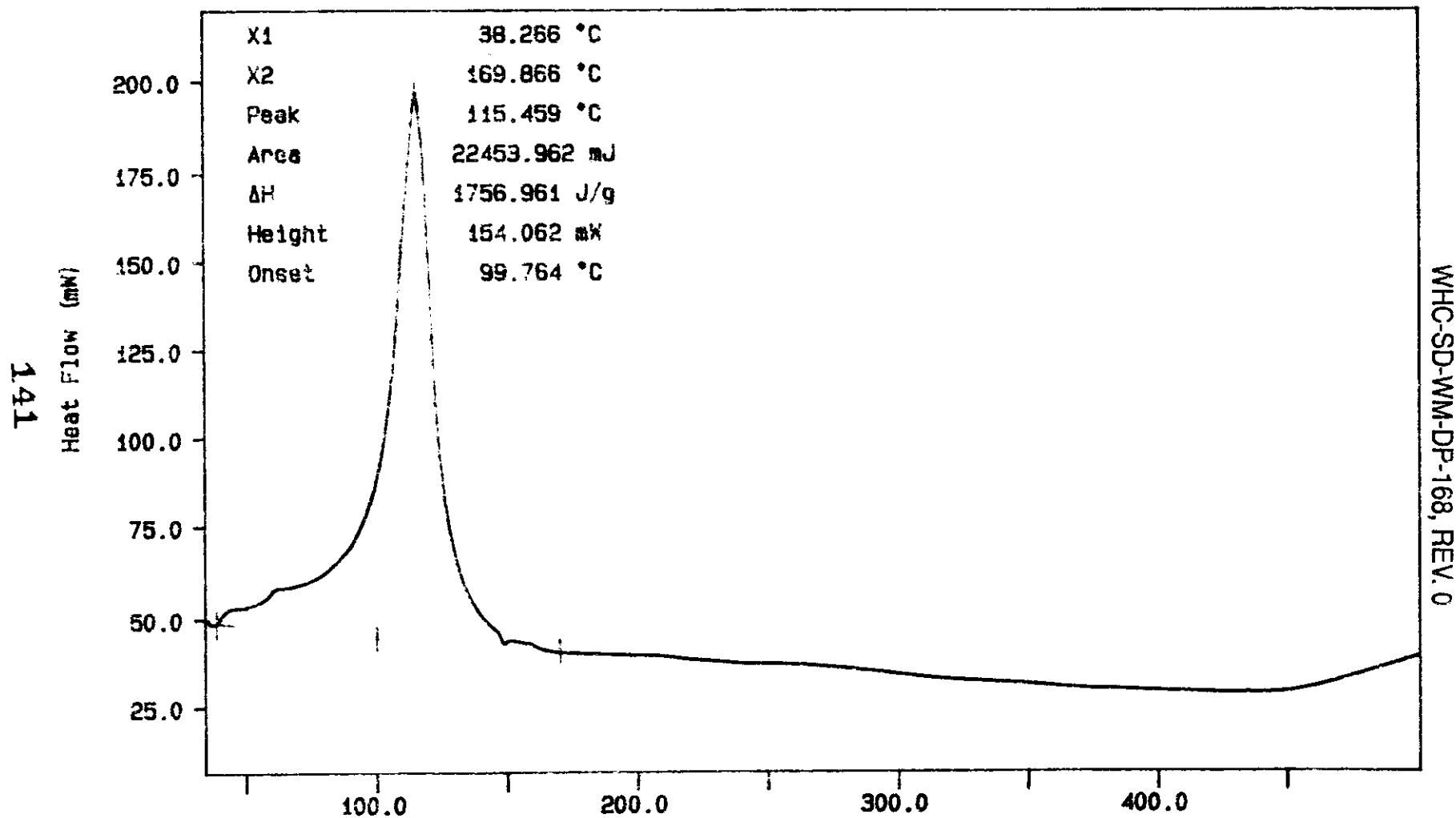
Curve 1: DSC

File info: SAM020204 Fri Feb 2 23:11:07 1996

Sample Weight: 12.780 mg

S9GT000155 DUP

BEST AVAILABLE COPY



exotherm down, N2 purge gas

TEMP: 35.0 °C TIME: 0.0 min RATE: 10.0 °C/min

Temperature (°C)

SM FULTON

PERKIN-ELMER

7 Series Thermal Analysis System

Fri Feb 2 23:12:10 1996

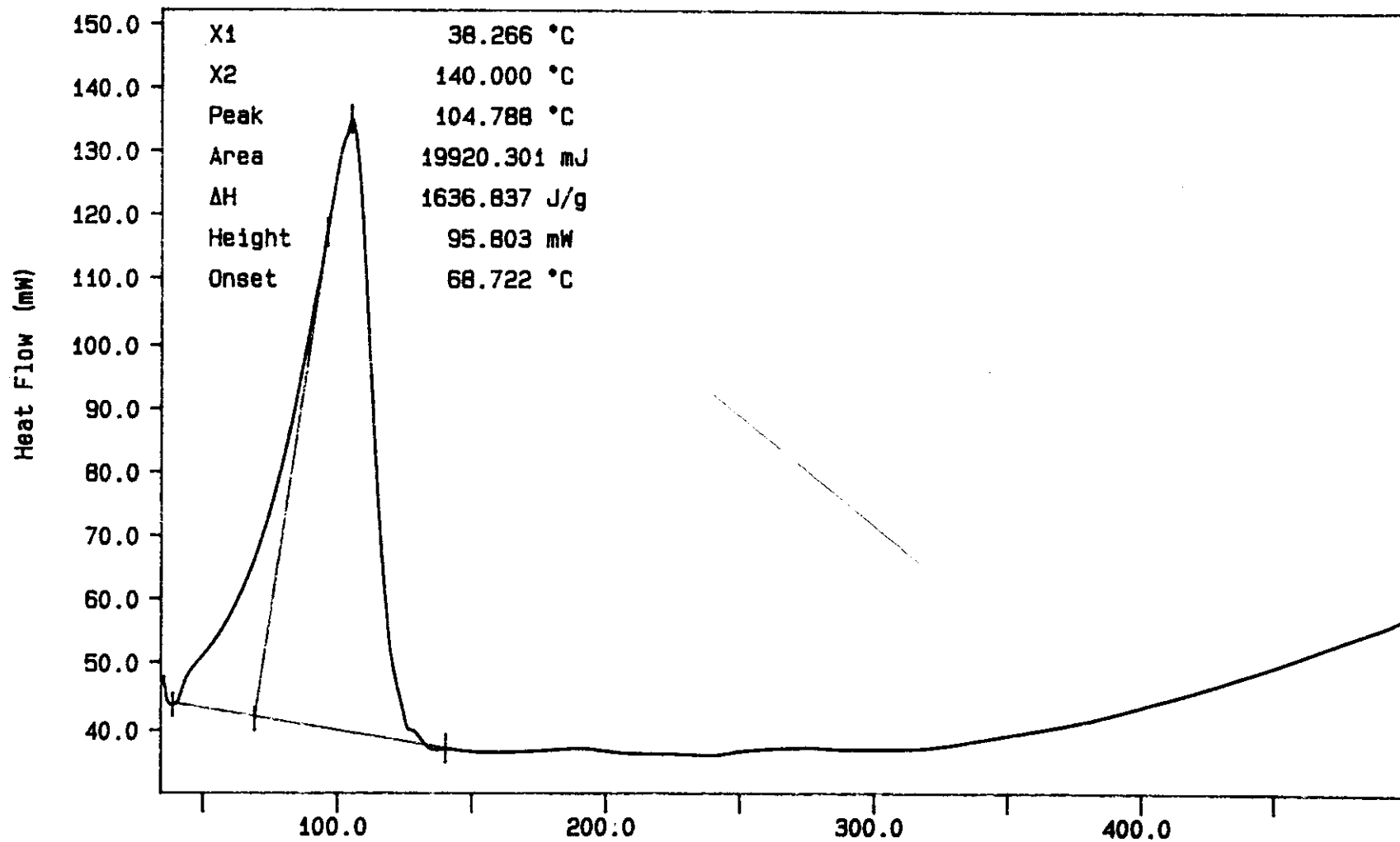
Curve 1: DSC

File info: SAM020205 Sat Feb 3 00:05:00 1996

Sample Weight: 12.170 mg

S963T000156

142



WHC-SD-WM-DP-168, REV.0

exotherm down, N2 purge gas

TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Feb 6 10:24:23 1996

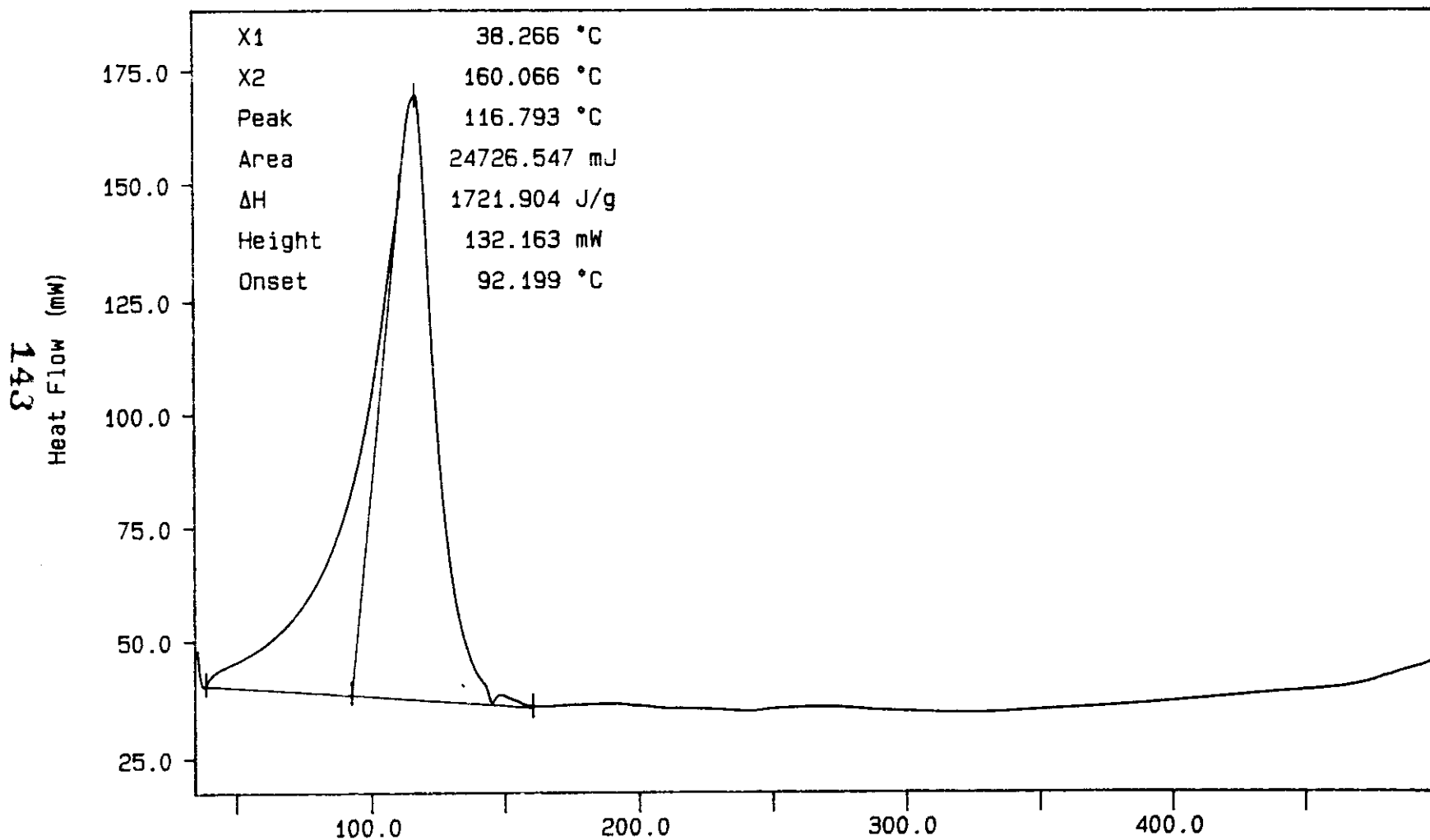
Curve 1: DSC

File info: SAM020206 Sat Feb 3 01:43:49 1996

Sample Weight: 14.360 mg

S96T000156 DUP

BEST AVAILABLE COPY



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Feb 3 01:47:05 1996

LABCORP Data Entry Template for Worklist#

5365

Analyst: SPE Instrument: DSC0 3 Book # 12 N14B

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: AN106 DSC RUN UNDER N2. RCJ

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	LIQUID	28.45	28.03*	N/A	Joules/g
96000016	AN-106 GRAB	2 SAMPLE	S96T000136	0	DSC-03	LIQUID	N/A	Ø		Joules/g
96000016	AN-106 GRAB	3 DUP	S96T000136	0	DSC-03	LIQUID	Ø	Ø	N/A	Joules/g
96000016	AN-106 GRAB	4 SAMPLE	S96T000137	0	DSC-03	LIQUID	N/A	Ø		Joules/g
96000016	AN-106 GRAB	5 DUP	S96T000137	0	DSC-03	LIQUID	Ø	Ø	N/A	Joules/g

Final page for worklist #

5365

Susie M. Dutton 2-3-96
Analyst Signature Date

Ne Wright 2/7/96
Analyst Signature Date

Verified by Blanca Valencia 2/7/96
IS: 2/7/96
ber

Data Entry Comments: S96T000136 produced an endotherm at 113.5°C with a
delta H of 1858.7 J/g

S96T000137 produced an endotherm at 113.2°C with a delta H of 1930.8 J/g.

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

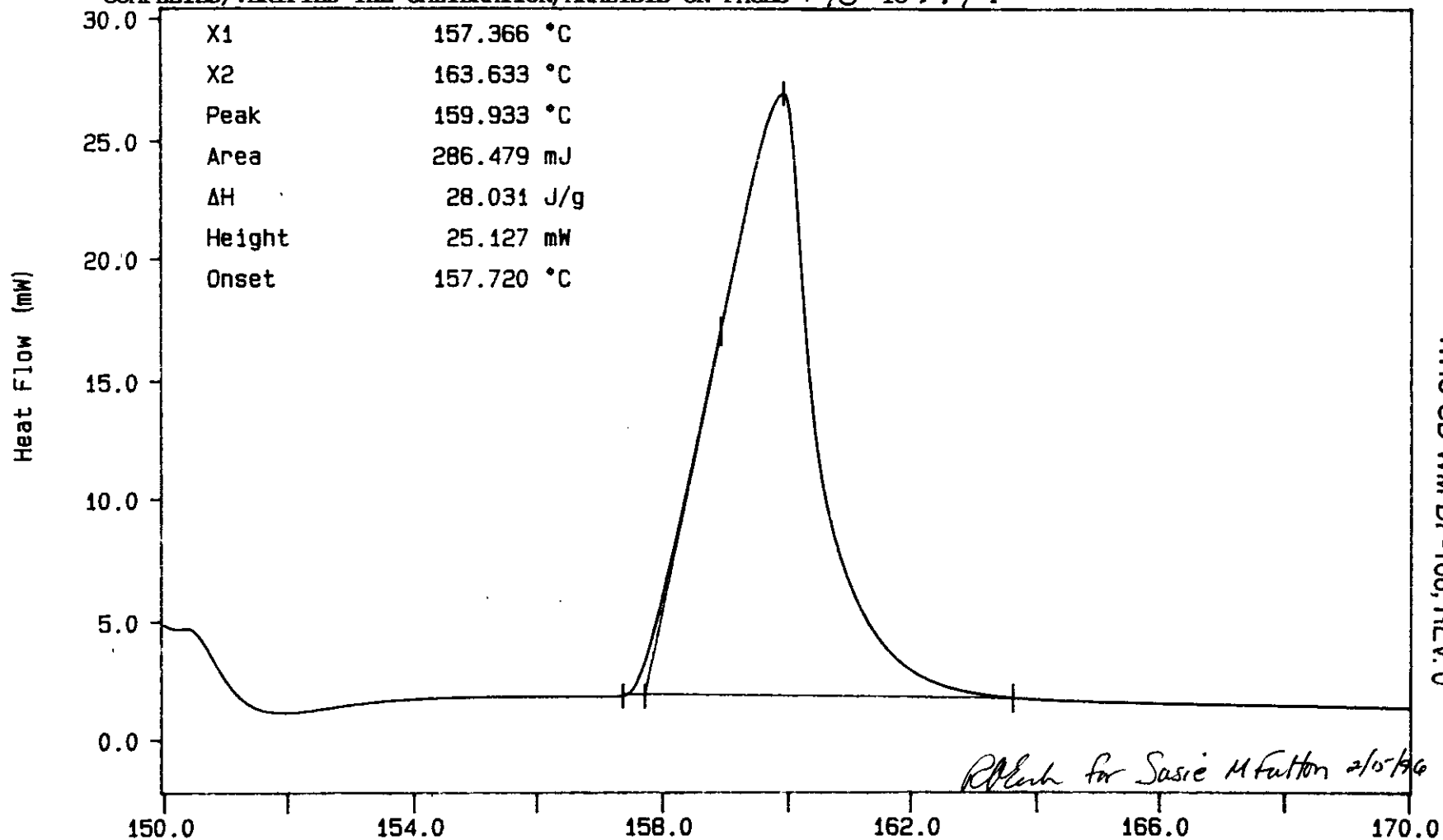
Curve 1: DSC

File info: ind020301 Sat Feb 3 06:41:10 1996

Sample Weight: 10.220 mg

12N14B Indium at 10C/min

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 145 TO 149.



N2, EXOTHERM DOWN

TEMP1: 150.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 170.0 °C

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Feb 3 18:32:36 1996

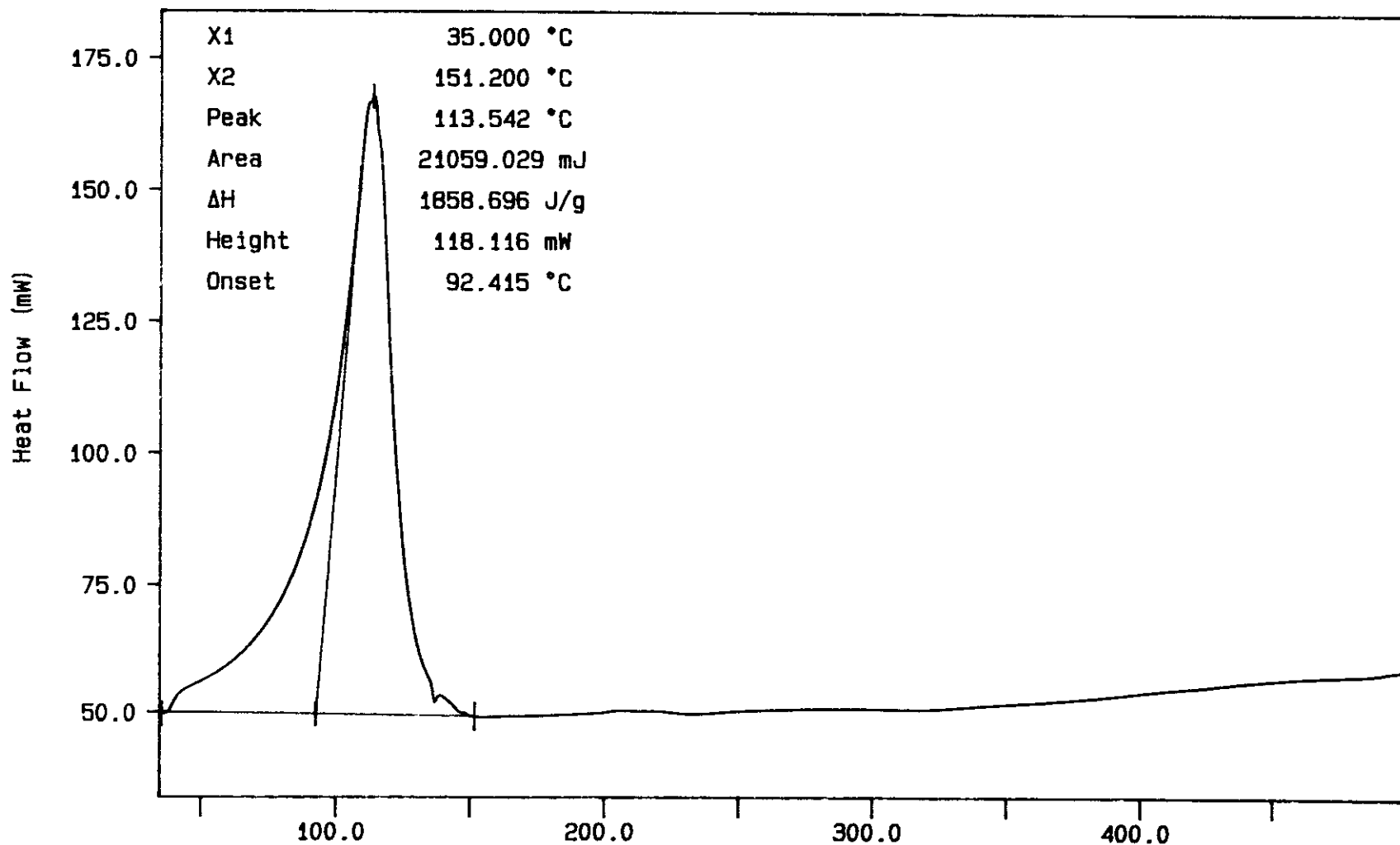
Curve 1: DSC

File info: SAM020305 Sat Feb 3 21:50:58 1996

Sample Weight: 11.330 mg

S96T000136

146



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas
TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

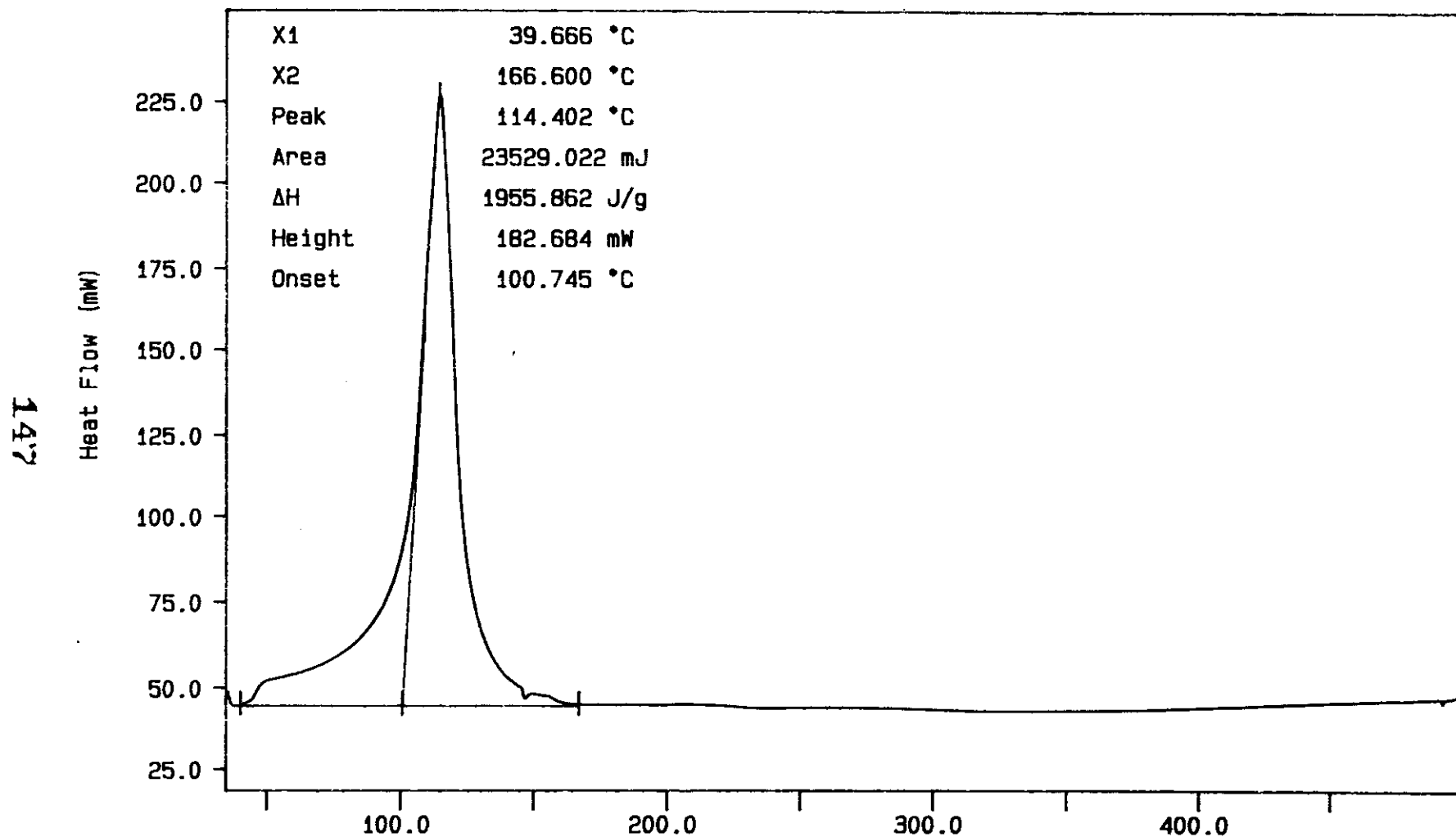
SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Feb 3 21:53:48 1996

Curve 1: DSC

File info: SAM020306 Sat Feb 3 22: 43: 25 1996

Sample Weight: 12.030 mg

S96T000136 DUP



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas
TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

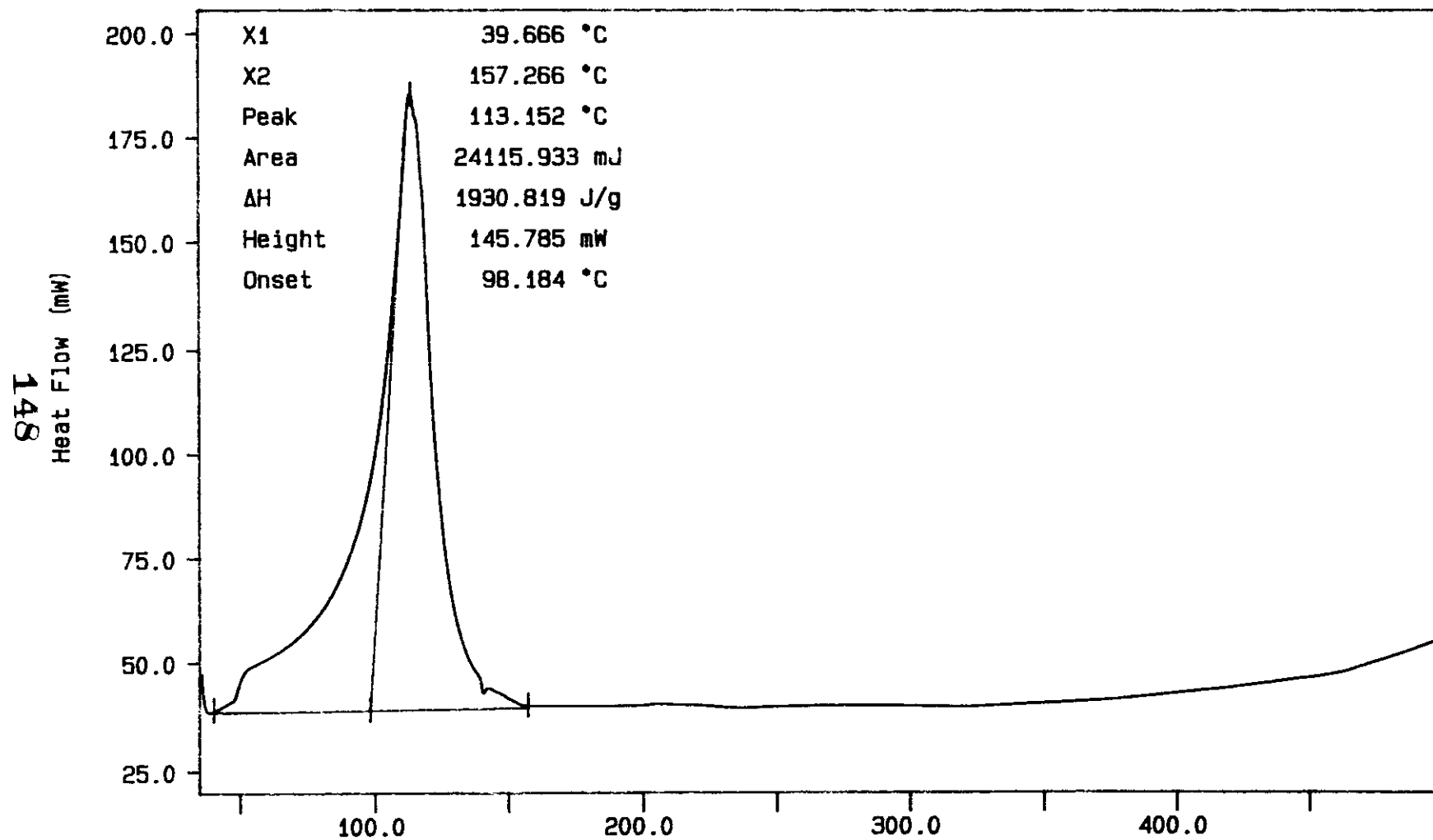
SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sat Feb 3 22: 45: 21 1996

Curve 1: DSC

File info: SAM020307 Sat Feb 3 23:34:47 1996

Sample Weight: 12.490 mg

S96T000137



WHC-SD-WM-DP-168, REV. 0

exotherm down, N2 purge gas

TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

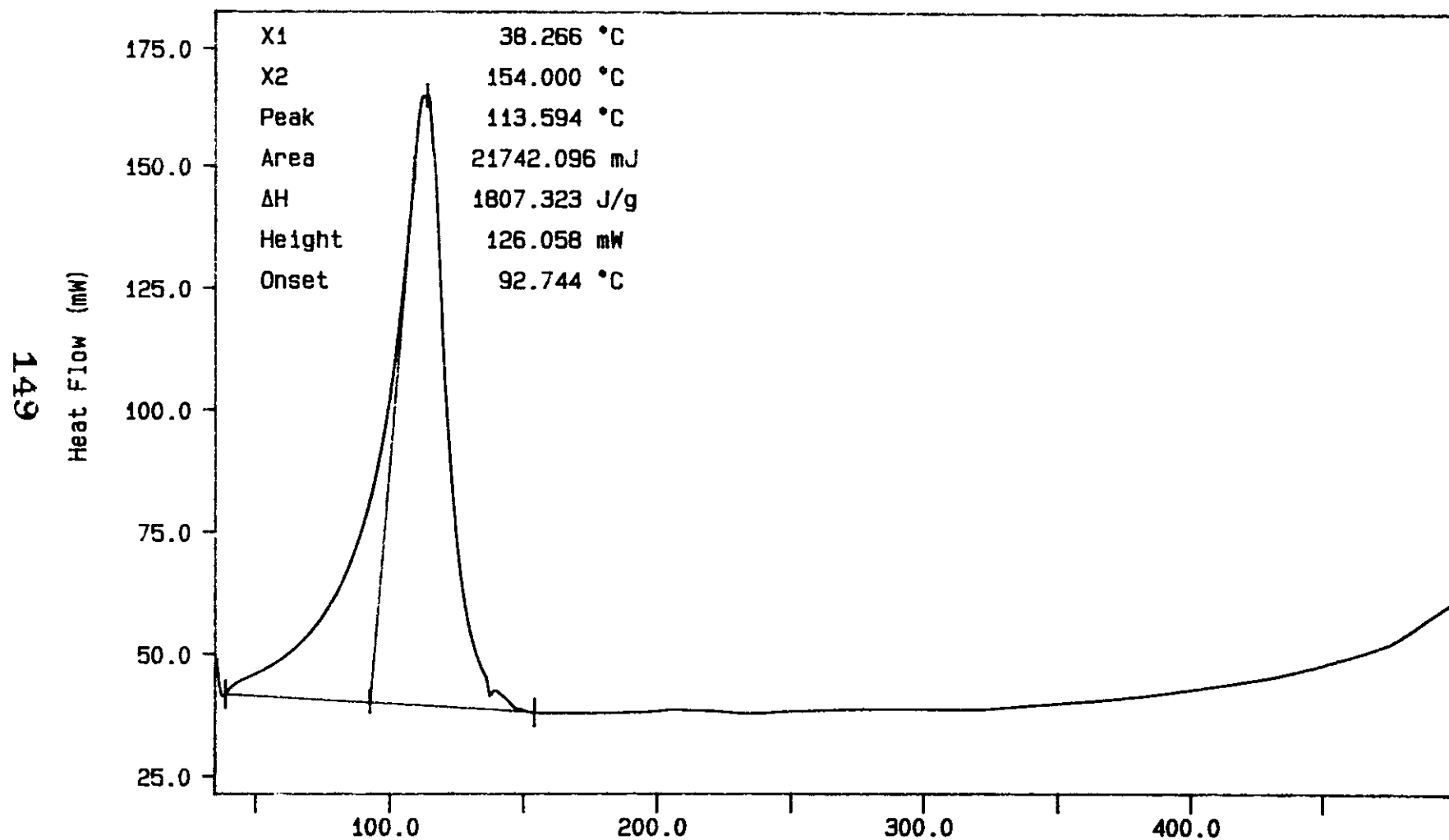
SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Feb 4 01:00:44 1996

Curve 1: DSC

File info: SAM020308 Sun Feb 4 01:50:43 1996

Sample Weight: 12.030 mg

S96T000137 DUP



WHC-SD-WM-DP-168, REV. C

exotherm down, N2 purge gas
TEMP1: 35.0 °C TIME1: 0.0 min RATE1: 10.0 °C/min
TEMP2: 500.0 °C

Temperature (°C)

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Feb 4 01:56:40 1996

LABCORE Data Entry Template for Worklist#

5144

Analyst: EAL Instrument: TGA0 1 Book # 75N8-A

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run AP-106 TGAs under N2. bdv

LAD 2/12/96

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				TGA-01	LIQUID	<u>59.2</u>	<u>60.17</u>	<u>N/A</u>	%
96000016	AN-106 GRAB	2	SAMPLE	S96T000136	0		TGA-01	LIQUID	<u>N/A</u>	<u>78.71</u>		%
96000016	AN-106 GRAB	3	DUP	S96T000136	0		TGA-01	LIQUID	<u>78.71</u>	<u>78.35</u>	<u>N/A</u>	%
96000016	AN-106 GRAB	4	SAMPLE	S96T000137	0		TGA-01	LIQUID	<u>N/A</u>	<u>76.86</u>		%
96000016	AN-106 GRAB	5	DUP	S96T000137	0		TGA-01	LIQUID	<u>76.86</u>	<u>77.26</u>	<u>N/A</u>	%

Final page for worklist #

5144

See attached for signatures
Analyst Signature _____ Date 2/8/96 BOV

[Signature] 2-9-96
Analyst Signature _____ Date _____

Verified by Blandina Valenzuela
2/12/96

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

5144

Analyst: EAK Instrument: TGA0 Book # 75N8-A

Method: LA-514-114 Rev/Mod E-T ^{2/8/96} _{BDV}

Worklist Comment: Please run AP-106 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	LIQUID			N/A	%
96000016	AN-106 GRAB	2 SAMPLE	S96T000136	0	TGA-03	LIQUID	N/A			%
96000016	AN-106 GRAB	3 DUP	S96T000136	0	TGA-03	LIQUID			N/A	%
96000016	AN-106 GRAB	4 SAMPLE	S96T000137	0	TGA-03	LIQUID	N/A			%
96000016	AN-106 GRAB	5 DUP	S96T000137	0	TGA-03	LIQUID			N/A	%

Final page for worklist # 5144

A. Lumbel 02/07/96
Analyst Signature Date

Analyst Signature Date

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 152 TO 156.

BEST AVAILABLE COPY

A. Lumbel 02/07/96

TGA STD 75N8-A

19.858 mg

Rate: 10.0 °C/min

File: 00006.001

TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

Height-11.95 mg

-60.17 %

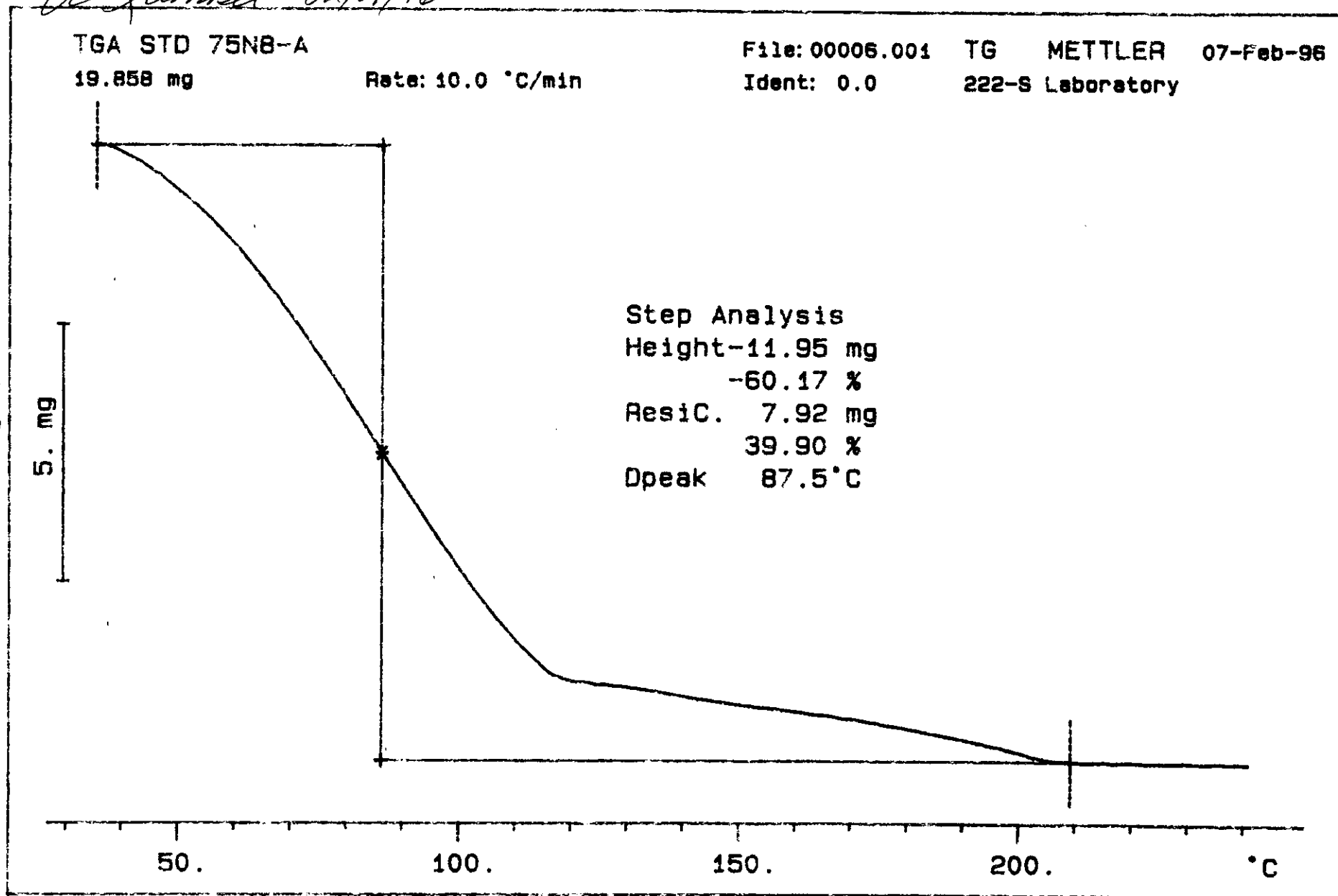
ResidC. 7.92 mg

39.90 %

Dpeak 87.5°C

152

5. mg



BEST AVAILABLE COPY

WHC-SD-WM-DP-168, REV. 0

A. Lambel

S95T000136 SAM N2

12.507 mg

Rate: 10.0 °C/min

File: 00007.001

TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

Height -9.84 mg

-78.71 %

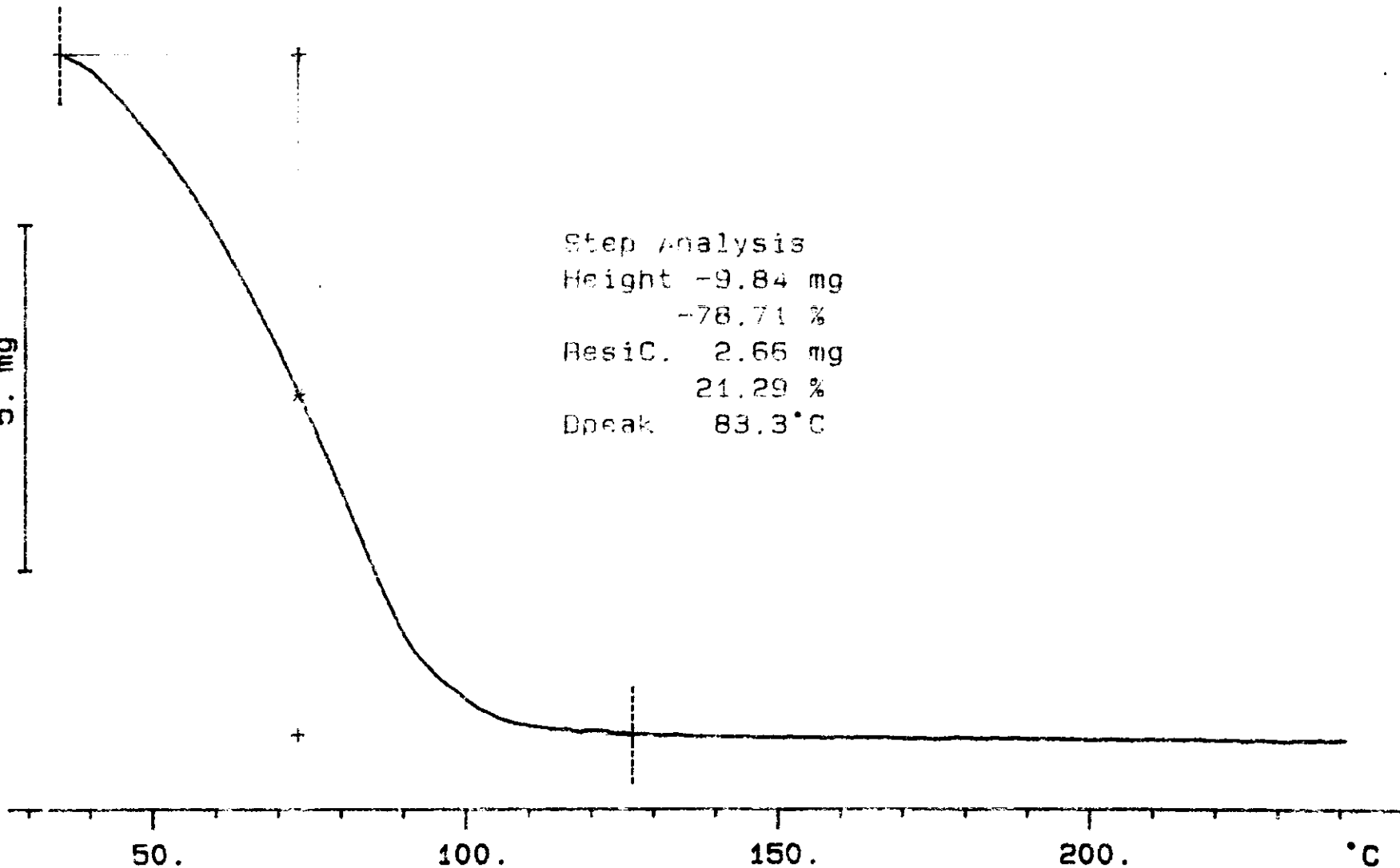
Resid. 2.66 mg

21.29 %

Dpeak 83.3 °C

153

5. mg



BEST AVAILABLE COPY

S95T000136 DUP N2

File: 00008.001 TG METTLER 07-Feb-96

14.690 mg

Rate: 10.0 °C/min

Ident: 0.0

222-S Laboratory

Step Analysis

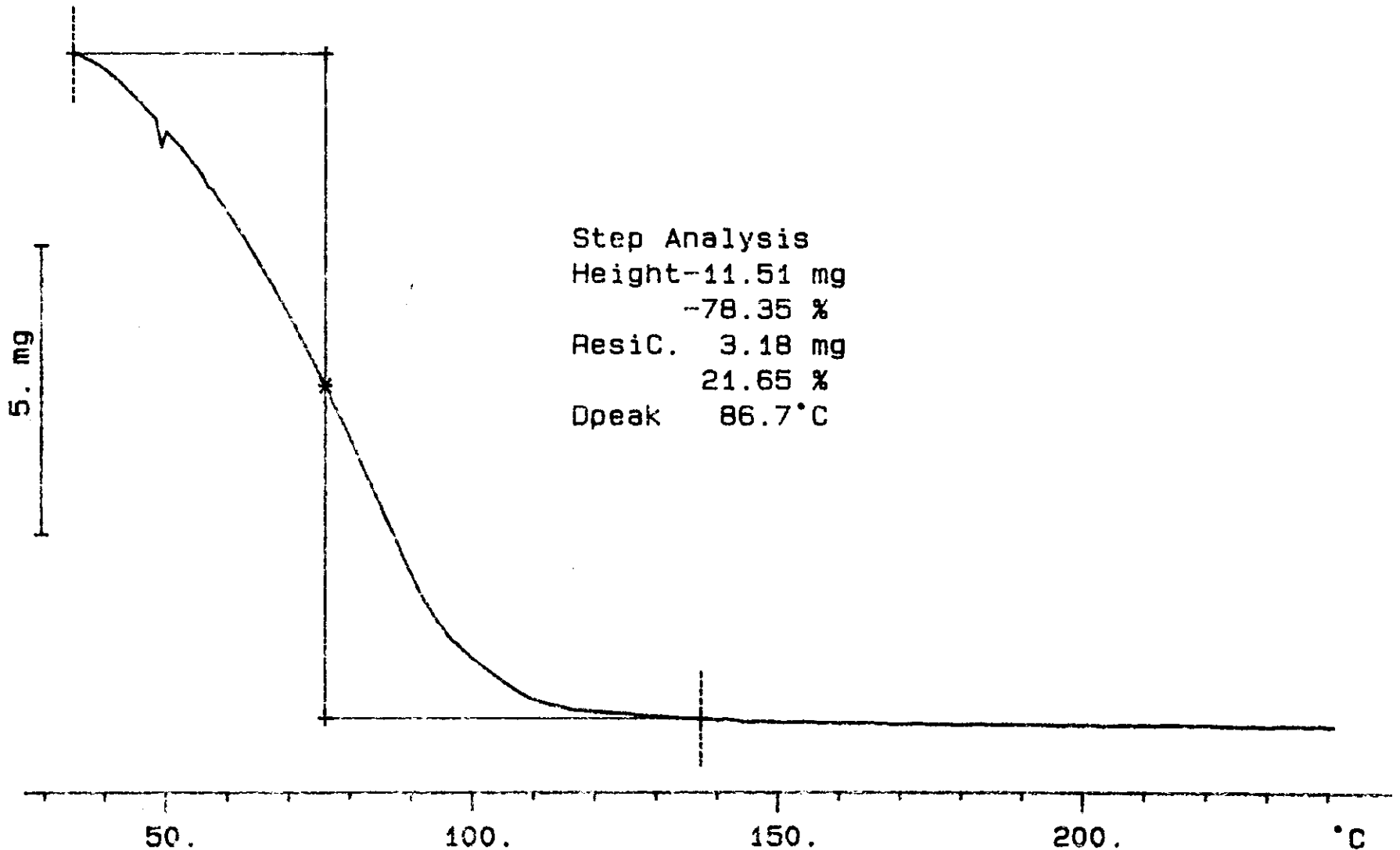
Height-11.51 mg

-78.35 %

ResiC. 3.18 mg

21.65 %

Dpeak 86.7°C



154

BEST AVAILABLE COPY

A. Lumbel

S95T000137 SAM N2

14.765 mg

Rate: 10.0 °C/min

File: 00009.001

TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

Height-11.85 mg

-76.86 %

ResidC. 3.42 mg

23.14 %

Dpeak 55.0 °C

5. mg

155

50. 100. 150. 200. °C

BEST AVAILABLE COPY

S95T000137 DUP

14.434 mg

Rate: 10.0 °C/min

File: 00010.001

TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

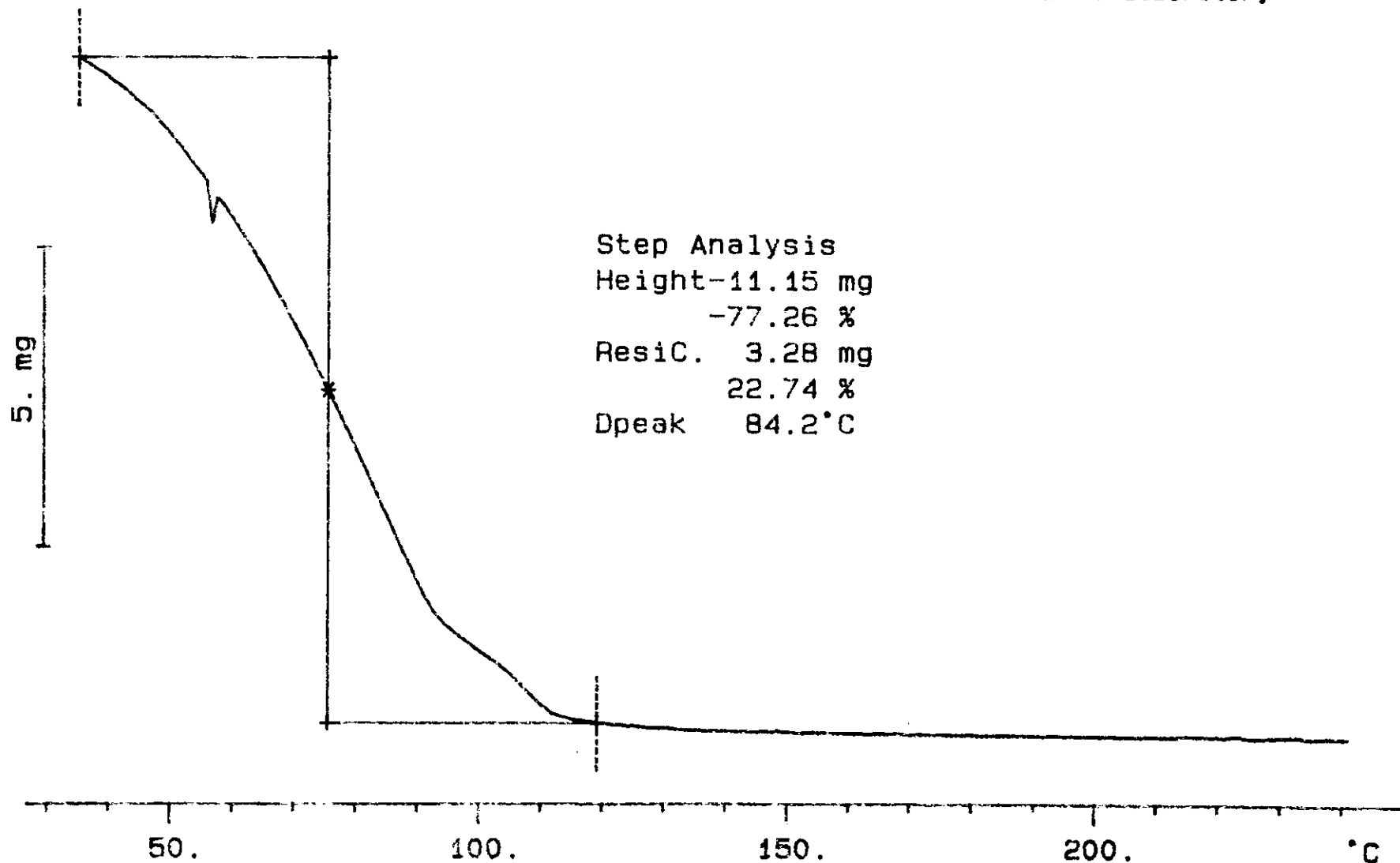
Height-11.15 mg

-77.26 %

ResidC. 3.28 mg

22.74 %

Dpeak 84.2°C



156

LABCORE Data Entry Template for Worklist#

5145

Analyst: RAG Instrument: TGA0 1 Book # 75N8-A

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run ^NAP-106 TGAs under N2. bdv

LAD 2/12/96

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				TGA-01	LIQUID	<u>59.0</u>	<u>59.59</u>	<u>N/A</u>	%
96000016	AN-106 GRAB	2	SAMPLE	S96T000138	0		TGA-01	LIQUID	<u>N/A</u>	<u>76.63</u>		%
96000016	AN-106 GRAB	3	DUP	S96T000138	0		TGA-01	LIQUID	<u>76.63</u>	<u>76.63</u>	<u>N/A</u>	%
		4	STD				TGA-01	LIQUID	<u>59.2</u>	<u>60.38</u>	<u>N/A</u>	%
96000016	AN-106 GRAB	5	SAMPLE	S96T000139	0		TGA-01	LIQUID	<u>N/A</u>	<u>99.64</u>		%
96000016	AN-106 GRAB	6	DUP	S96T000139	0		TGA-01	LIQUID	<u>99.64</u>	<u>100.81</u>	<u>N/A</u>	%

Final page for worklist #

5145

See attached for signatures
Analyst Signature 2/9/96
Date BBT

[Signature] 2-9-96
Analyst Signature Date

Verified by Blandina
Valenzuela
2/12/96

Data Entry Comments:

Due to a problem retrieving the data
files for sample S96T000138, these results were
not used in data package. Sample was rerun on worklist # 5145

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number,
R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

5145

Analyst: Ry/AL Instrument: TGA0 Book # 75N8-A

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run AP-106 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	LIQUID			N/A	%
96000016	AN-106 GRAB	2 SAMPLE	S96T000138	0	TGA-01	LIQUID	N/A			%
96000016	AN-106 GRAB	3 DUP	S96T000138	0	TGA-01	LIQUID			N/A	%
96000016	AN-106 GRAB	4 SAMPLE	S96T000139	0	TGA-01	LIQUID	N/A			%
96000016	AN-106 GRAB	5 DUP	S96T000139	0	TGA-01	LIQUID			N/A	%

Final page for worklist # 5145

Rae Ann Green 02-01-96
Analyst Signature Date

A. Lampel 02-07-96
Analyst Signature Date

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

TER 75N8-A

20.545 mg

Rate: 10.0 °C/min

File: 00130.001

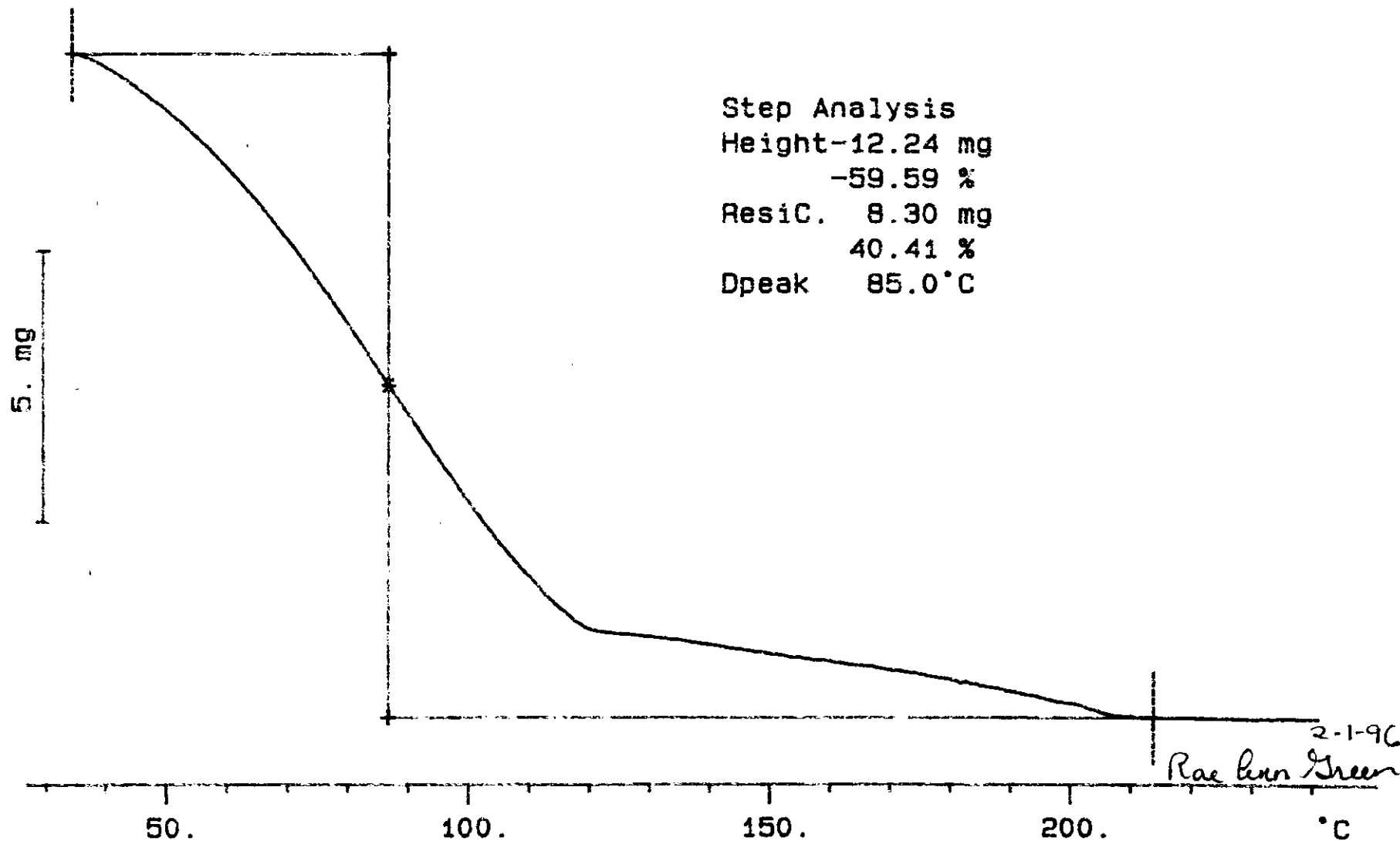
TG

METTLER

01-Feb-96

Ident: 0.0

222-S Laboratory



A. Lambert 02/07/96

TGA STD 75N8A

14.399 mg

Rate: 10.0 °C/min

File: 00002.001

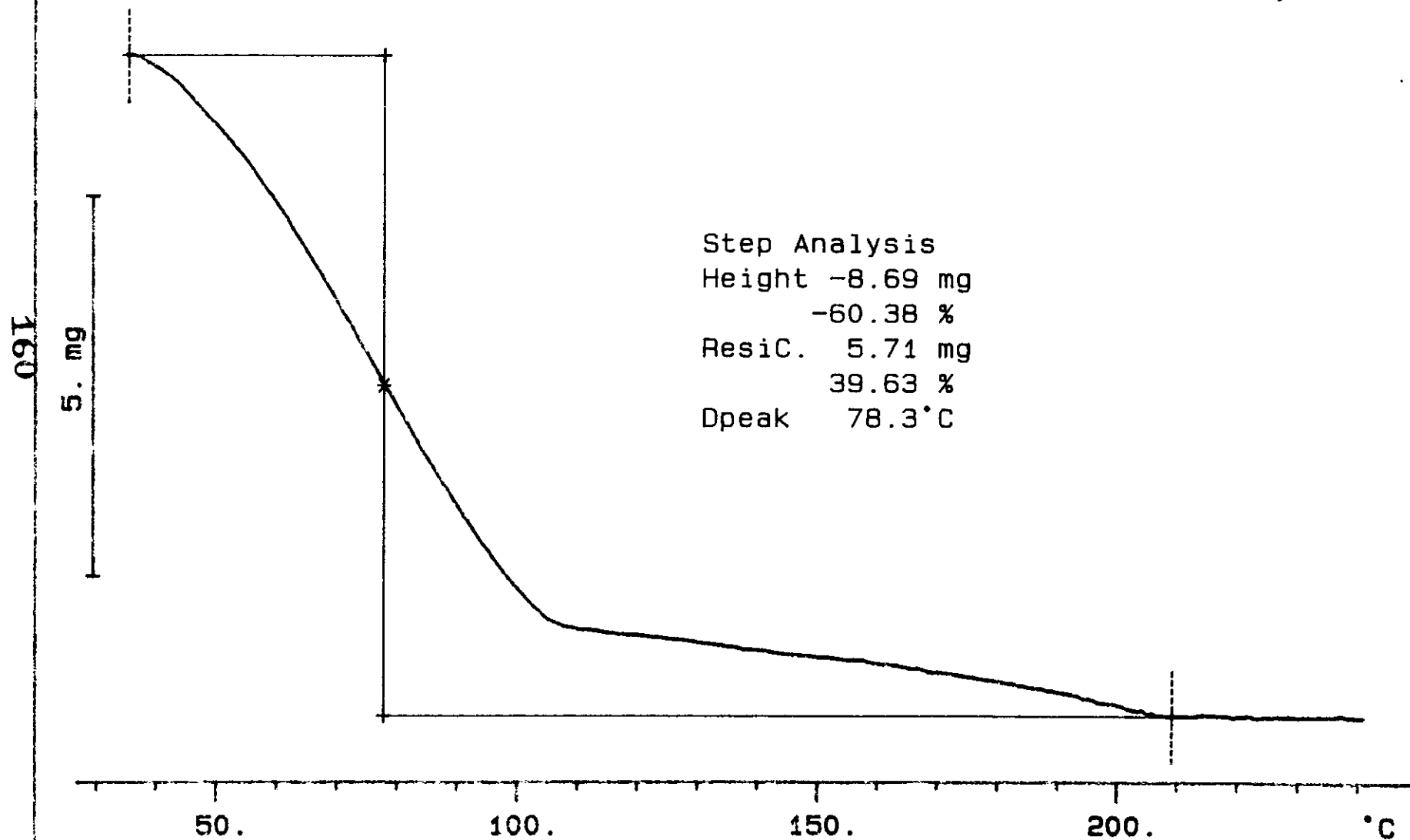
TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory



A. Lambel 02/07/96

S96T000139 SAM N2

10.409 mg

Rate: 10.0 °C/min

File: 00004.001

TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis
Height-10.37 mg
-99.64 %
ResidC. 0.04 mg
0.36 %

161

5. mg

50.

100.

150.

200.

°C

A. Lambert 02/07/96

S96T000139 DUP N2

9.710 mg

Rate: 10.0 °C/min

File: 00005.001

TG

METTLER

07-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

Height -9.79 mg

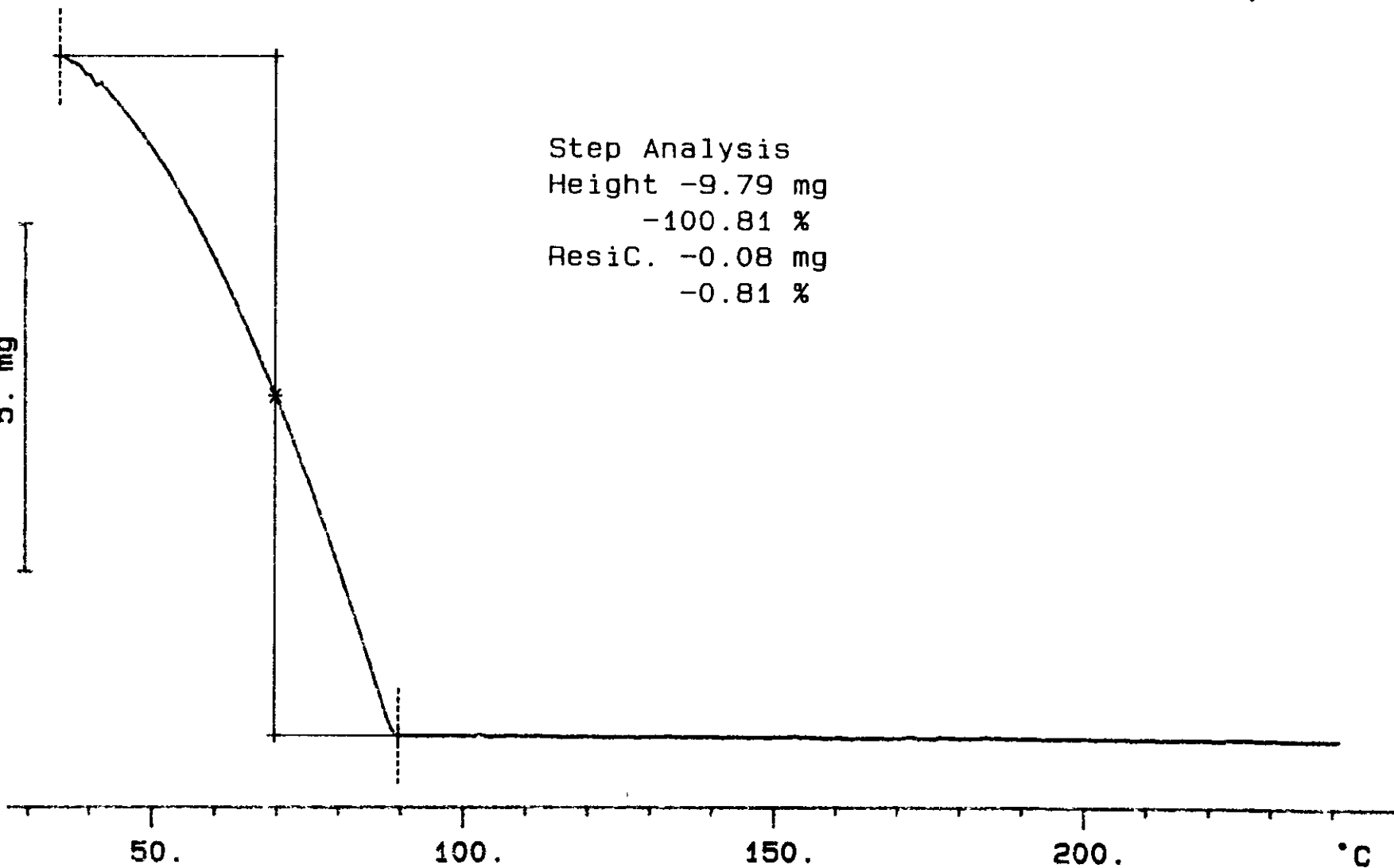
-100.81 %

ResiC. -0.08 mg

-0.81 %

162

5. mg



LABCORE Data Entry Template for Worklist#

5146

Analyst: ADP Instrument: TGA0 1 Book # 75N8A

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run AP-106 TGAs under N2. bdv

2/7/96

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	LIQUID	<u>59.2</u>	<u>60.11</u>	<u>N/A</u>	%
96000016	AN-106 GRAB	2 SAMPLE	S96T000140	0	TGA-01	LIQUID	<u>N/A</u>	<u>75.32</u>		%
96000016	AN-106 GRAB	3 DUP	S96T000140	0	TGA-01	LIQUID	<u>75.32</u>	<u>73.71</u>	<u>N/A</u>	%
96000017	AN-106 GRAB	4 SAMPLE	S96T000153	0	TGA-01	LIQUID	<u>N/A</u>	<u>77.76</u>		%
96000017	AN-106 GRAB	5 DUP	S96T000153	0	TGA-01	LIQUID	<u>77.76</u>	<u>77.92</u>	<u>N/A</u>	%

Final page for worklist #

5146

[Signature] 1-30-96
Analyst Signature Date

[Signature] 2-2-96
Analyst Signature Date

Rae Ann Green 1-31-96

Verified by Blandina Valenzuela
2/5/96

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 164 TO 168.

TER 75N8-A N2

28.582 mg

Rate: 10.0 °C/min

File: 00106.001

TG

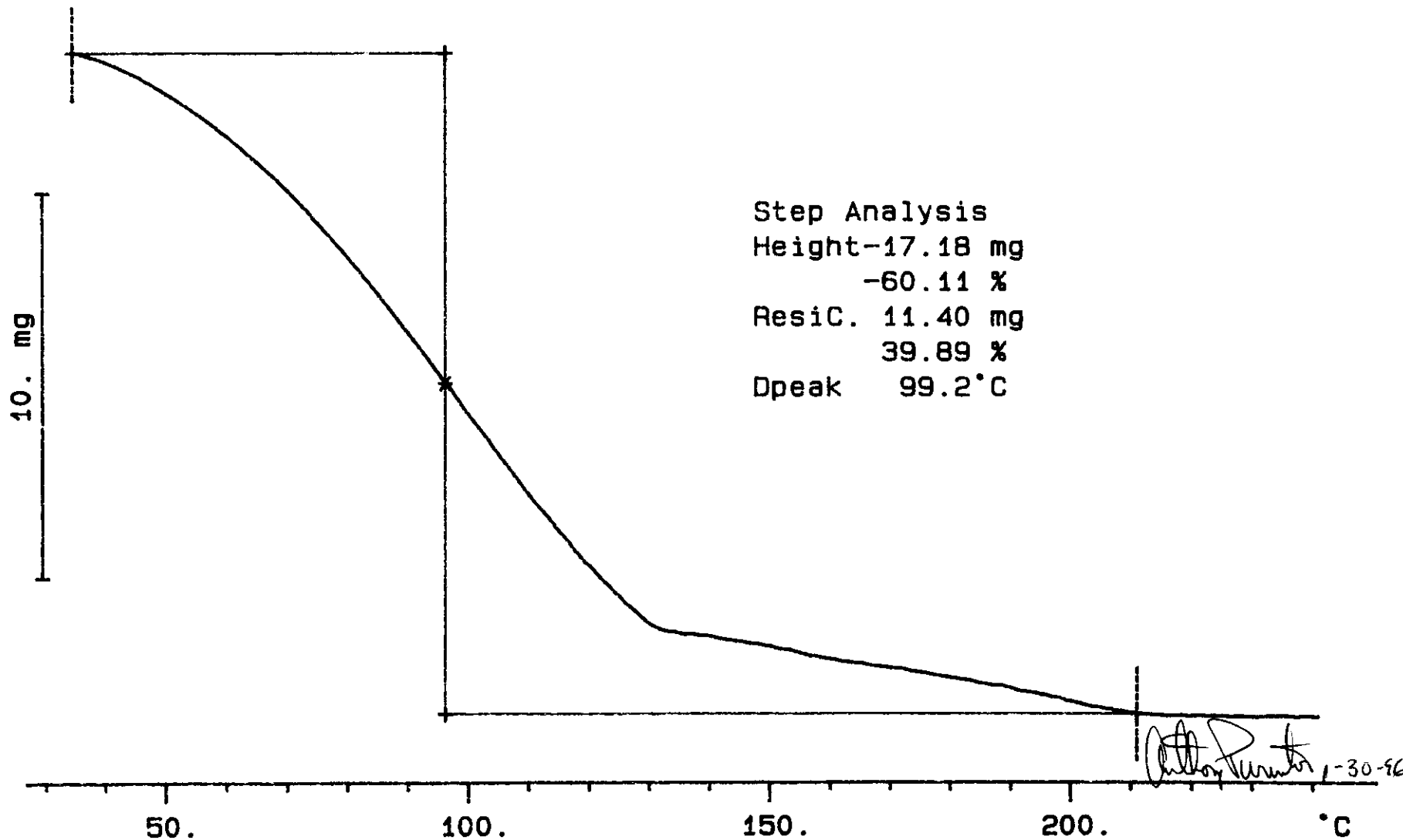
METTLER

30-Jan-96

Ident: 0.0

222-S Laboratory

Step Analysis
Height-17.18 mg
-60.11 %
ResidC. 11.40 mg
39.89 %
Dpeak 99.2 °C



S96T000140 SAM N2

25.239 mg

Rate: 10.0 °C/min

File: 00108.001

TG

METTLER

30-Jan-96

Ident: 0.0

222-S Laboratory

Step Analysis

Height-19.01 mg

-75.32 %

ResidC. 6.23 mg

24.68 %

Dpeak 103.0 °C

165

10. mg

100.

200.

300.

400.

°C

S96T000140 DUP N2

23.704 mg

Rate: 10.0 °C/min

File: 00110.001

Ident: 0.0

TG

METTLER

30-Jan-96

222-S Laboratory

Step Analysis

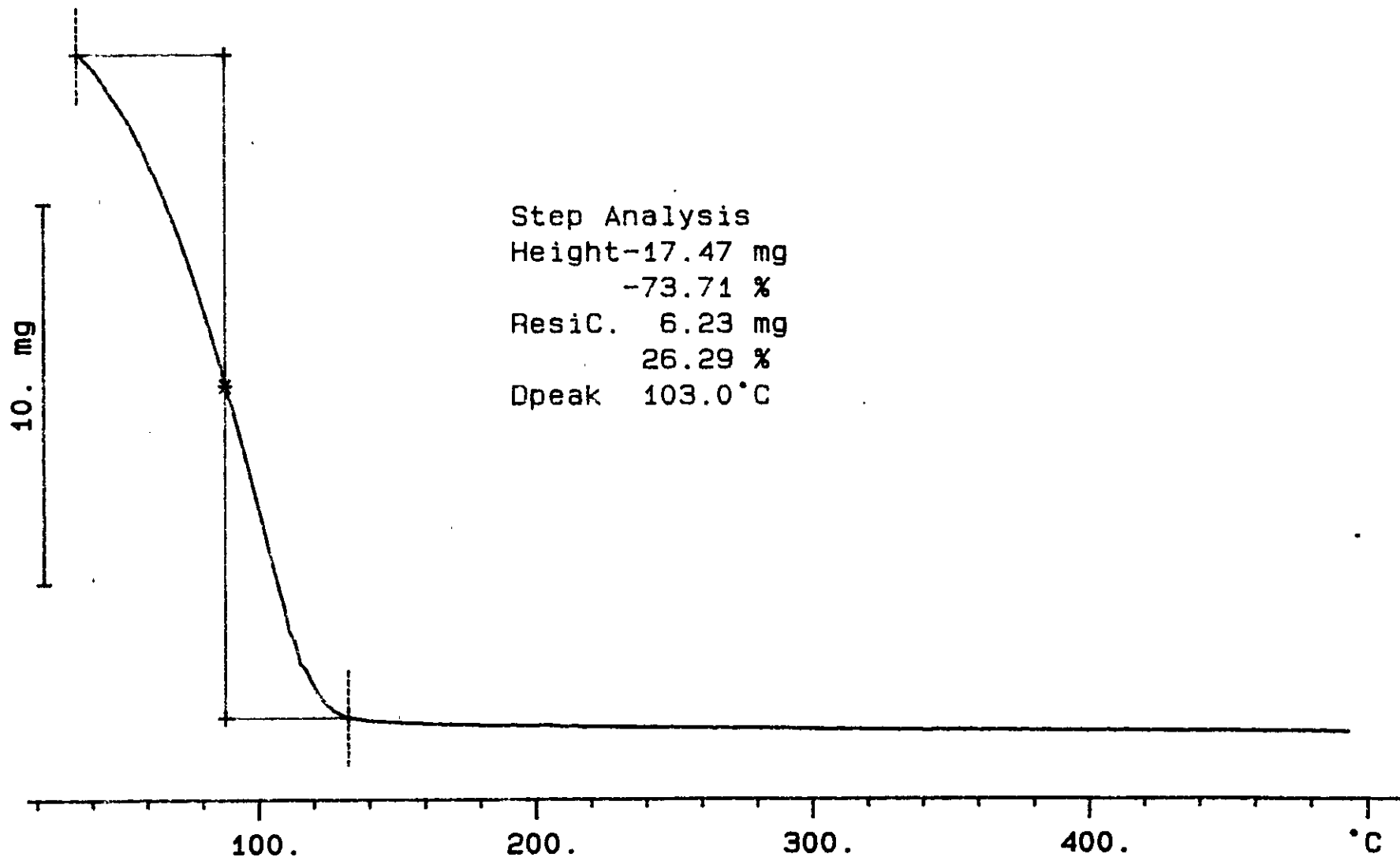
Height-17.47 mg

-73.71 %

ResiC. 6.23 mg

26.29 %

Dpeak 103.0 °C



166

W4C-SD-WM-DP-168, REV.0

S96T000153 SAM N2

11.416 mg

Rate: 10.0 °C/min

File: 00127.001

TG

METTLER

31-Jan-96

Ident: 0.0

222-S Laboratory

Step Analysis

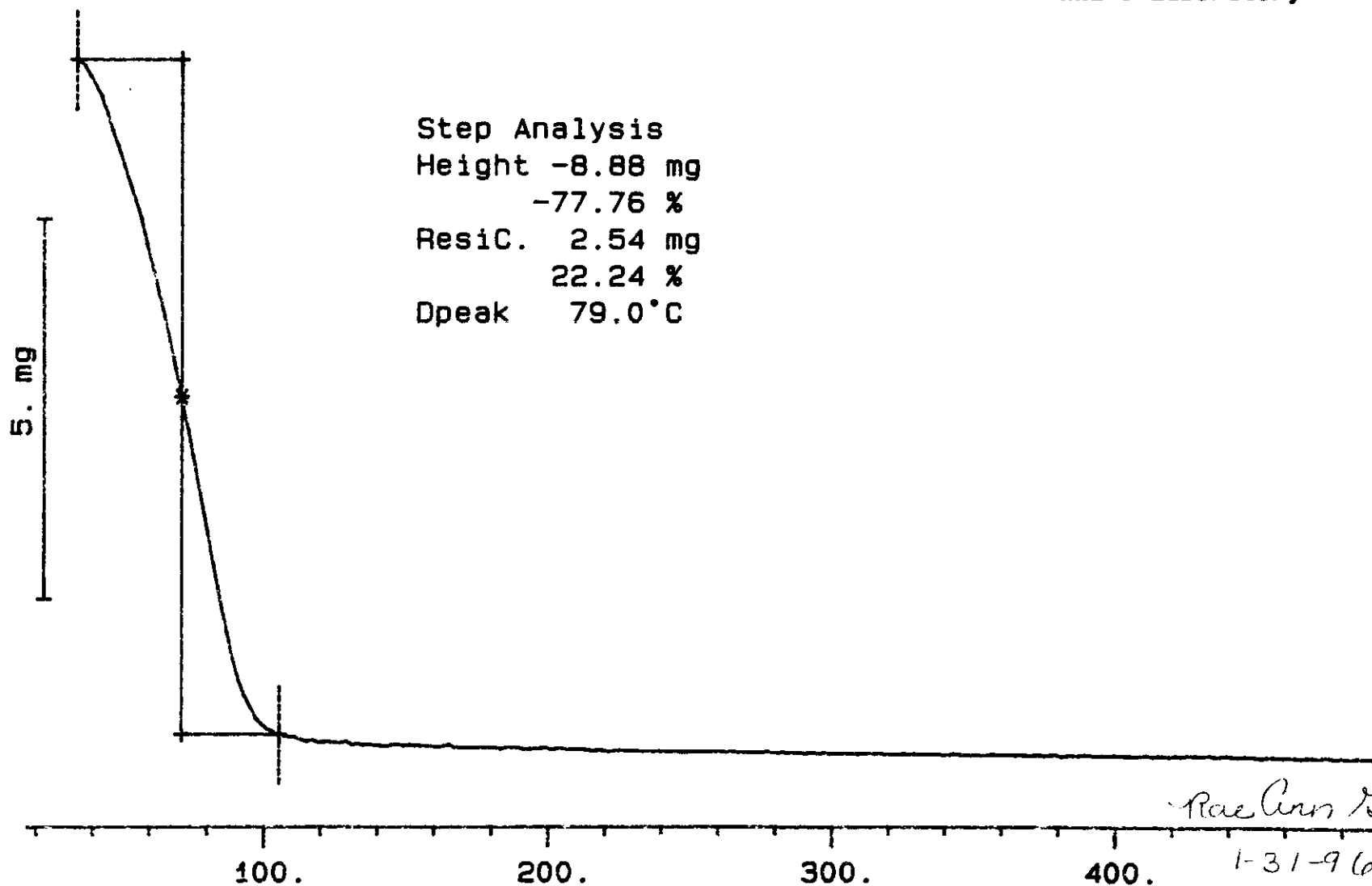
Height -8.88 mg

-77.76 %

Resid. 2.54 mg

22.24 %

Dpeak 79.0°C



Rae Ann Green

S96T000153 DUP N2

14.193 mg

Rate: 10.0 °C/min

File: 00129.001

TG

METTLER

31-Jan-96

Ident: 0.0

222-S Laboratory

Step Analysis

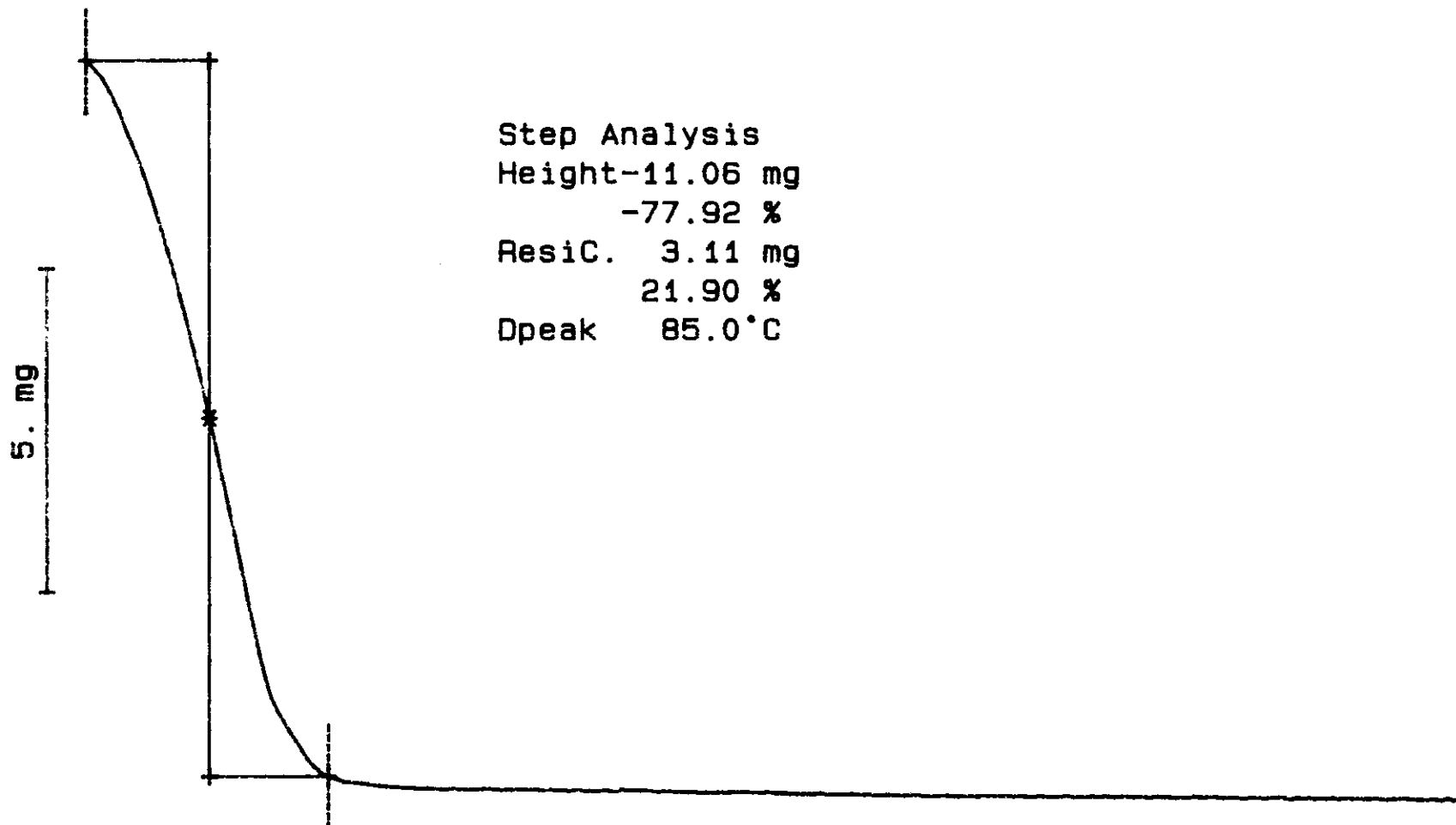
Height-11.06 mg

-77.92 %

ResiC. 3.11 mg

21.90 %

Dpeak 85.0 °C



Rae Ann Green

1-31-96 °C

168

WHC-SD-WM-DP-168, REV. 0

LABCORE Data Entry Template for Worklist#

5147

Analyst: RDM **Instrument:** TGA0 3 **Book #** 75A8A

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Please run AP-106 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	LIQUID	<u>59.2</u>	<u>60.46</u>	<u>N/A</u>	%
96000017	AN-106 GRAB	2 SAMPLE	S96T000154	0	TGA-03	LIQUID	<u>N/A</u>	<u>79.37</u>		%
96000017	AN-106 GRAB	3 DUP	S96T000154	0	TGA-03	LIQUID	<u>79.37</u>	<u>77.14</u>	<u>N/A</u>	%
96000017	AN-106 GRAB	4 SAMPLE	S96T000155	0	TGA-03	LIQUID	<u>N/A</u>	<u>26.70</u>		%
96000017	AN-106 GRAB	5 DUP	S96T000155	0	TGA-03	LIQUID	<u>26.70</u>	<u>73.93</u>	<u>N/A</u>	%
		6 STD			TGA-01	LIQUID	<u>59.2</u>	<u>60.52</u>	<u>N/A</u>	%
96000017	AN-106 GRAB	7 SAMPLE	S96T000156	0	TGA-01	LIQUID	<u>N/A</u>	<u>74.23</u>		%
96000017	AN-106 GRAB	8 DUP	S96T000156	0	TGA-01	LIQUID	<u>74.23</u>	<u>74.64</u>	<u>N/A</u>	%

Final page for worklist # 5147

See attached for signatures
Analyst Signature RDM **Date** 2/12/96

R. Jones 2-12-96
Analyst Signature **Date**

Verified by Blandina Valenzuela
2/14/96

Rerun for sample S96T000155 is reported on worklist # 5645

Data Entry Comments: S96T000155: the sample run had static electricity it interfered with the correct results. The sample shall be rerun because of static and due to high RPD's. The duplicate result would be closer to the true result.

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist#

5147

Analyst: Rom

Instrument: TGA0

Book # 75NB-A

Method: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run AP-106 TGAs under N2. bdv

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				TGA-01	LIQUID			N/A	%
96000017	AN-106 GRAB	2	SAMPLE	S96T000154	0		TGA-01	LIQUID	N/A			%
96000017	AN-106 GRAB	3	DUP	S96T000154	0		TGA-01	LIQUID			N/A	%
96000017	AN-106 GRAB	4	SAMPLE	S96T000155	0		TGA-01	LIQUID	N/A			%
96000017	AN-106 GRAB	5	DUP	S96T000155	0		TGA-01	LIQUID			N/A	%
96000017	AN-106 GRAB	6	SAMPLE	S96T000156	0		TGA-01	LIQUID	N/A			%
96000017	AN-106 GRAB	7	DUP	S96T000156	0		TGA-01	LIQUID			N/A	%

Final page for worklist #

5147

Rom 2/1/96
Analyst Signature Date
Smulston 2/11/96

Analyst Signature Date

Data Entry Comments:

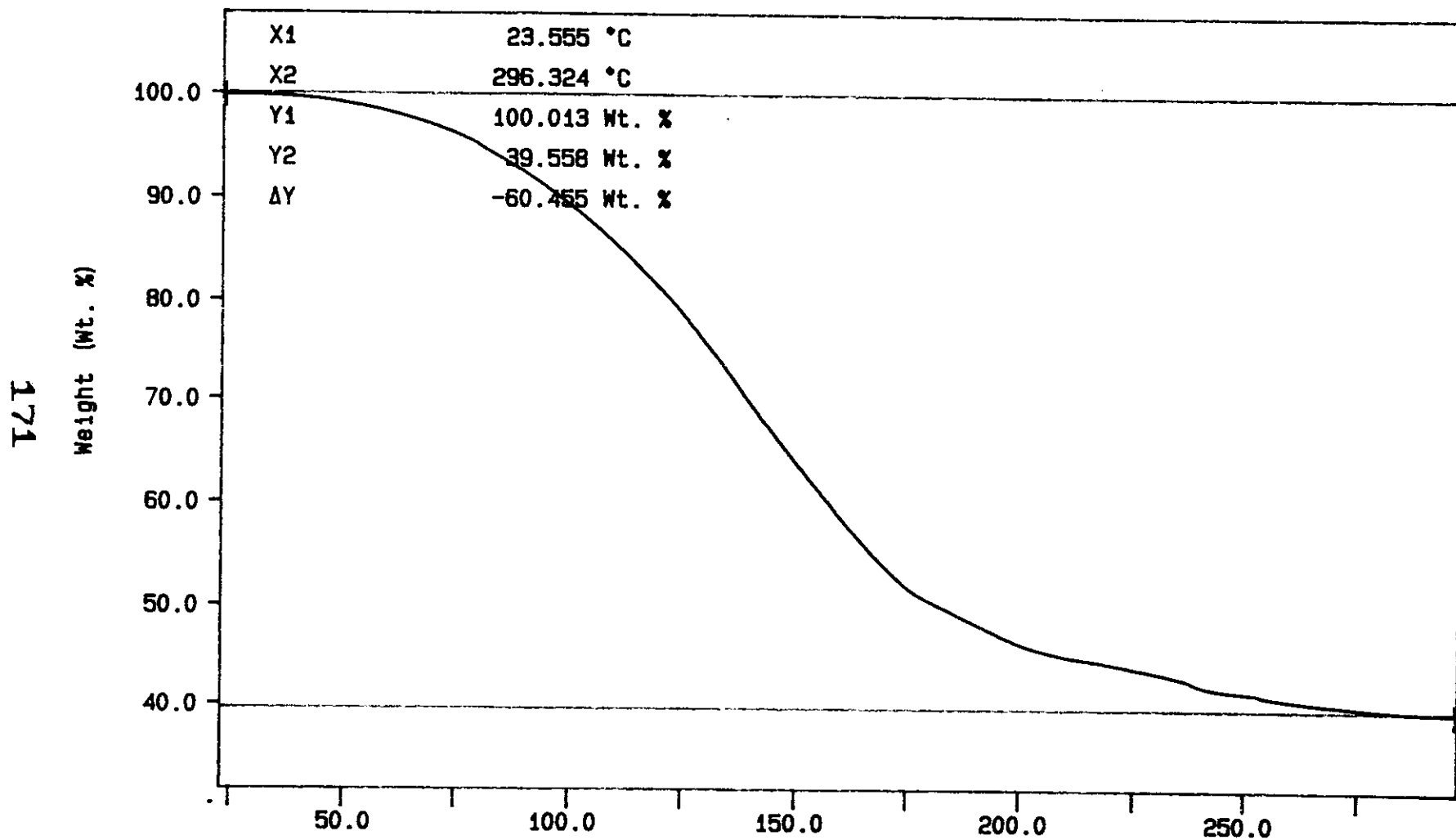
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Curve 1: TGA

File info: qsav1 Thu Feb 8 19:27:38 1996

Sample Weight: 27.189 mg

TERLIQ 75N8A



WHC-SD-WM-DP-168, REV. 0

N2 10C/MIN
TEMP1: 35.0 C
TEMP2: 300.0 C
TIME1: 0.0 min
RATE1: 10.0 C/min

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Thu Feb 8 19:52:40 1996

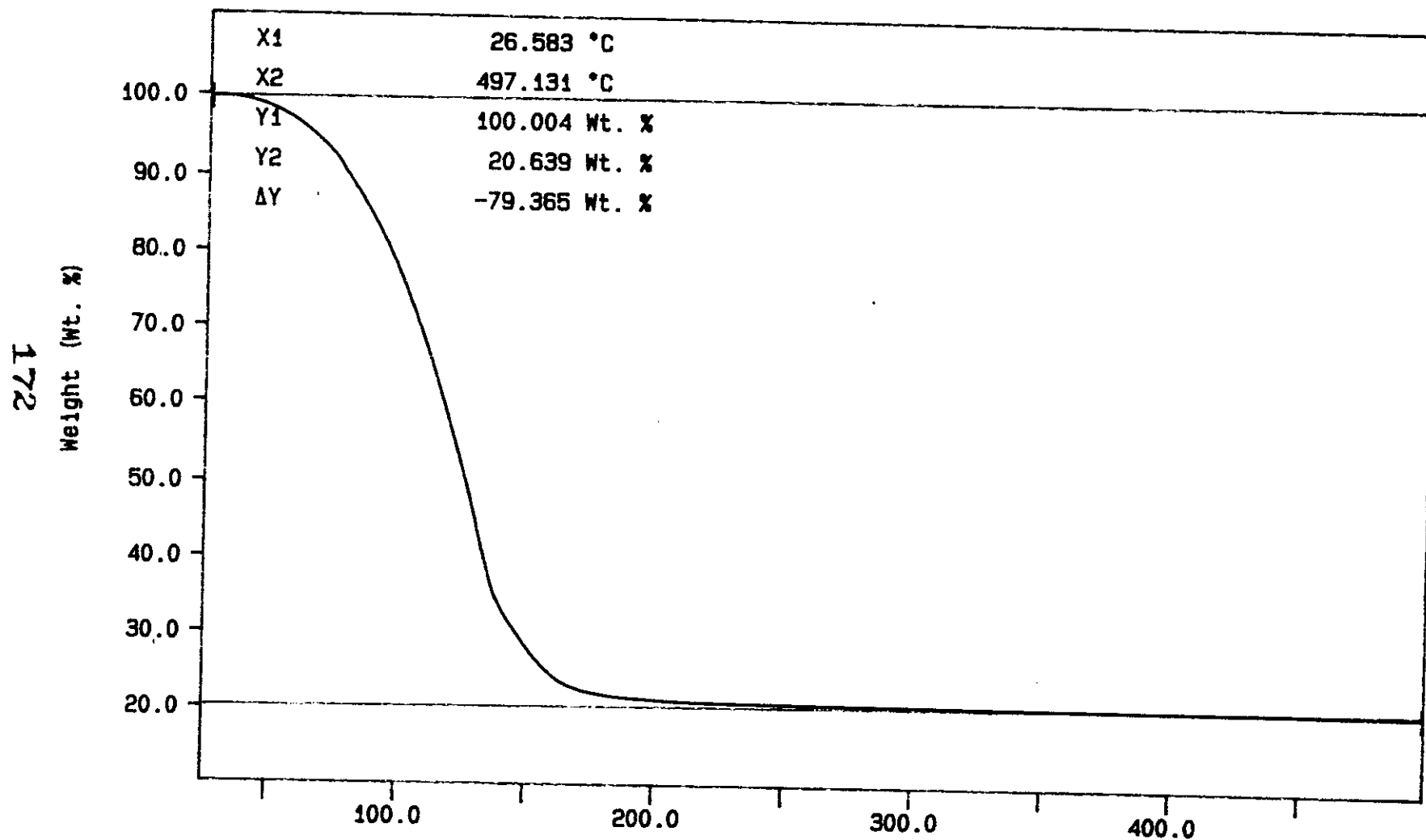
[Handwritten signature]

Curve 1: TGA

File info: qeav1 Thu Feb 8 20: 47: 36 1996

Sample Weight: 12.586 mg

S96T000154



WHC-SD-WM-DP-168, REV. 0

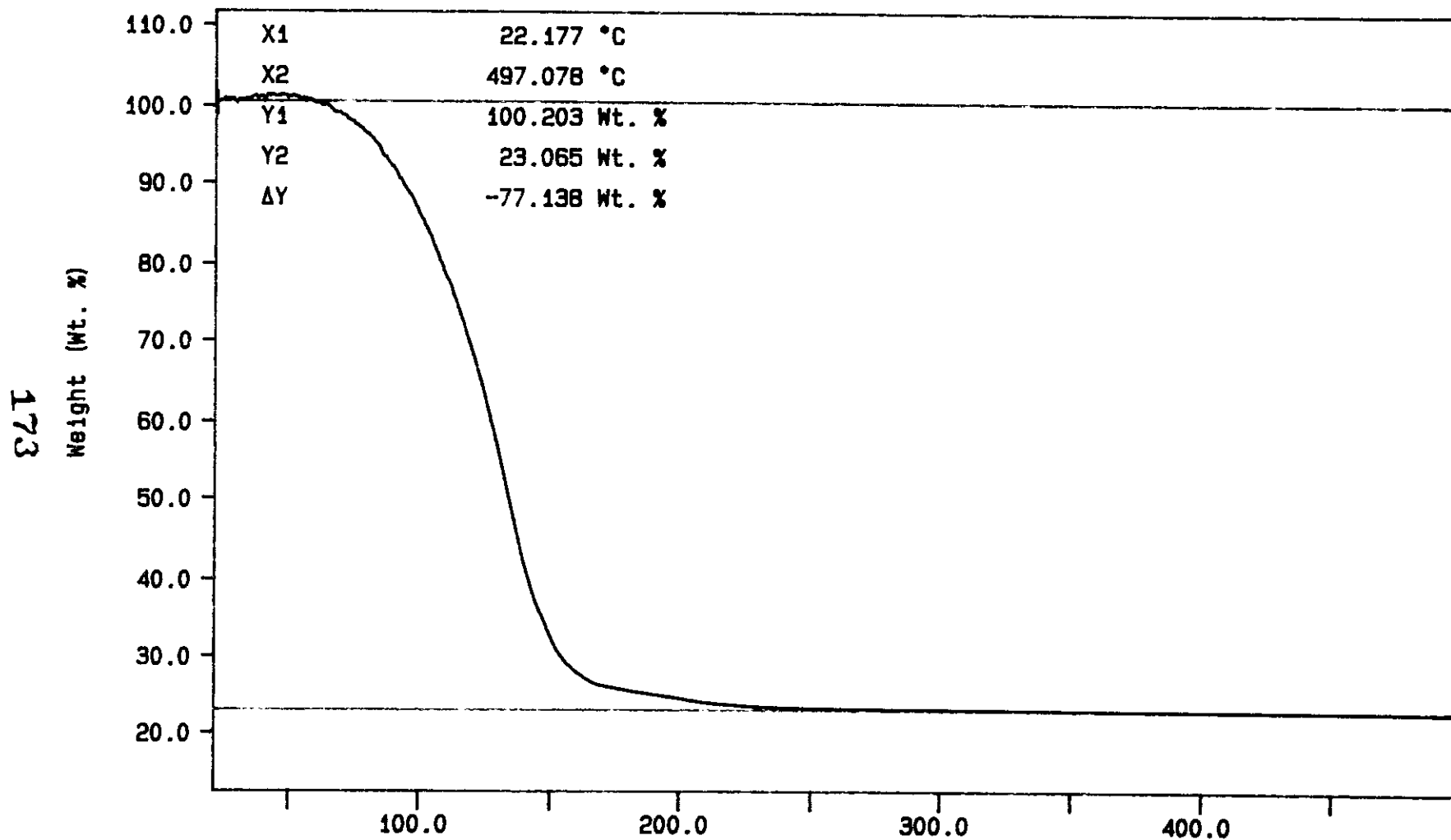
10C/MIN N2
TEMP: 35.0 °C
TEMP: 500.0 °C
TIME: 0.0 min RATE: 10.0 C/min

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Thu Feb 8 21: 46: 34 1996

R. Meyers 2/9/96

Curve 1: TGA
 File info: qsavi Thu Feb 8 22: 52: 20 1996
 Sample Weight: 12.439 mg
 S96T000154DUP



WHC-SD-WM-DP-168, REV. 0

10C/MIN N2
 TEMP: 35.0 °C
 TEMP: 500.0 °C
 TIME: 0.0 min RATE: 10.0 C/min

Temperature (°C)

RD MEYERS
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Fri Feb 9 00: 47: 10 1996

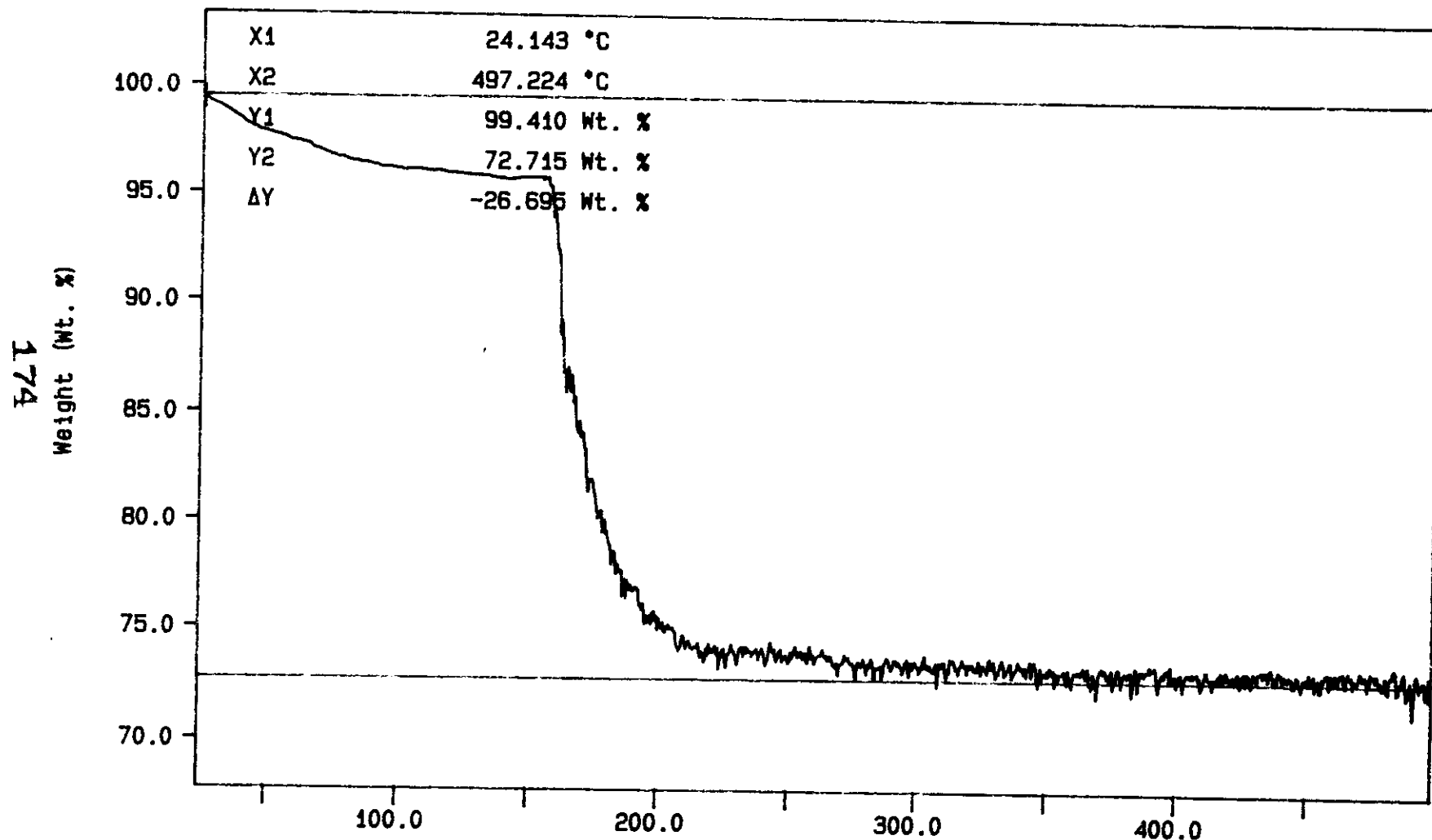
RD Meyers 2/9/96

Curve 1: TGA

File info: qsav1 Fri Feb 9 01: 41: 56 1996

Sample Weight: 4.432 mg

S96T000155



WHC-SD-WM-DP-168, REV. 0

10C/MIN N2
TEMP1: 35.0 C
TEMP2: 500.0 C
TIME1: 0.0 min
RATE1: 10.0 C/min

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 9 01: 43: 02 1996

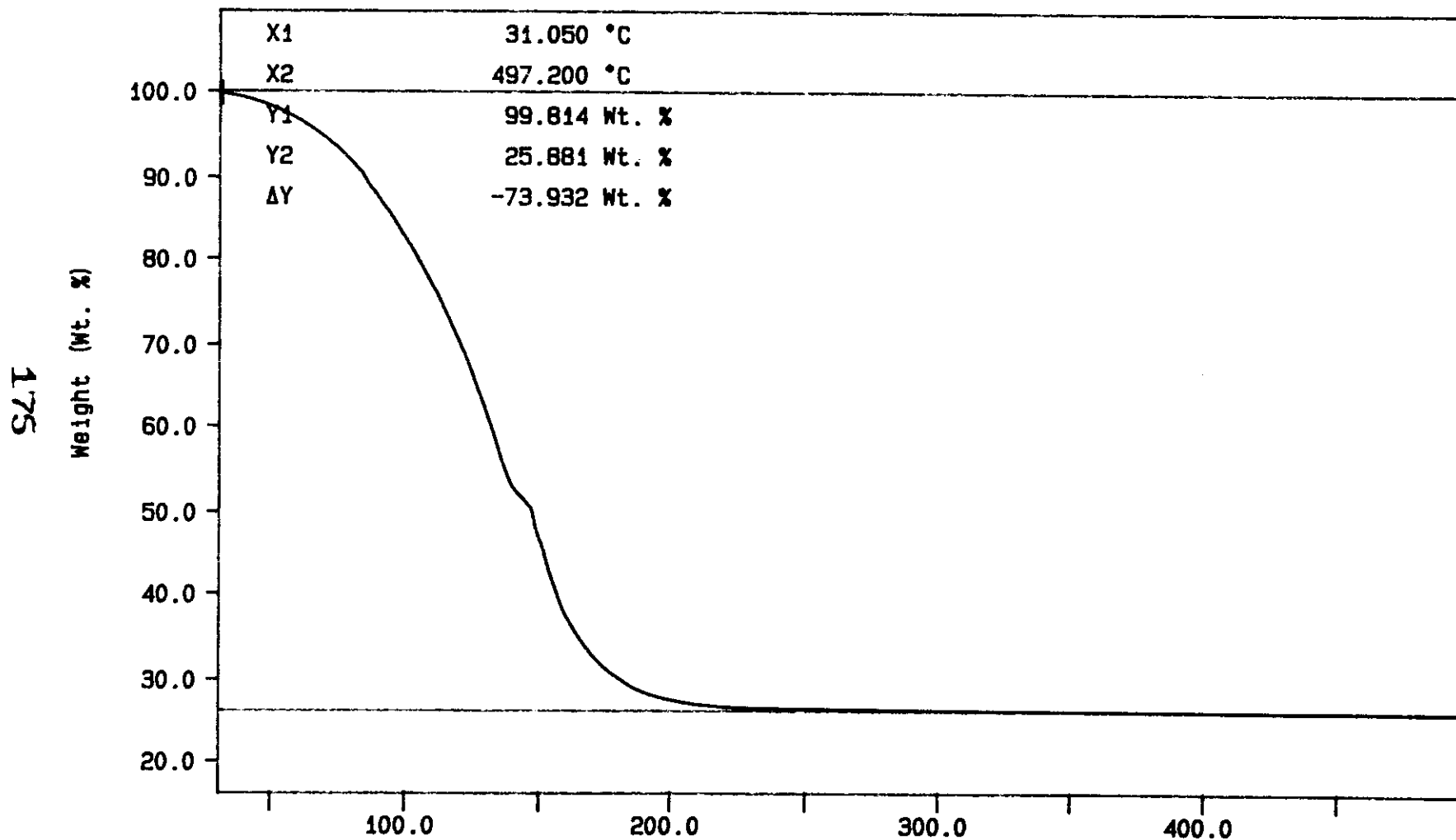
R. Meyers 2/9/96

Curve 1: TGA

File info: qsav1 Fri Feb 9 02:48:19 1996

Sample Weight: 21.297 mg

S96T000155DUP



WHC-SD-WM-DP-168, REV. C

10C/MIN N2
TEMP1: 35.0 C
TEMP2: 500.0 C
TIME1: 0.0 min
RATE1: 10.0 C/min

Temperature (°C)

RD MEYERS
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Feb 9 03:29:02 1996

R. Meyers 2/9/96

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 176 TO 178. BEST AVAILABLE COPY

TGA STD 75N8A

15.385 mg

Rate: 10.0 °C/min

File: 00028.001

TG

METTLER

11-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

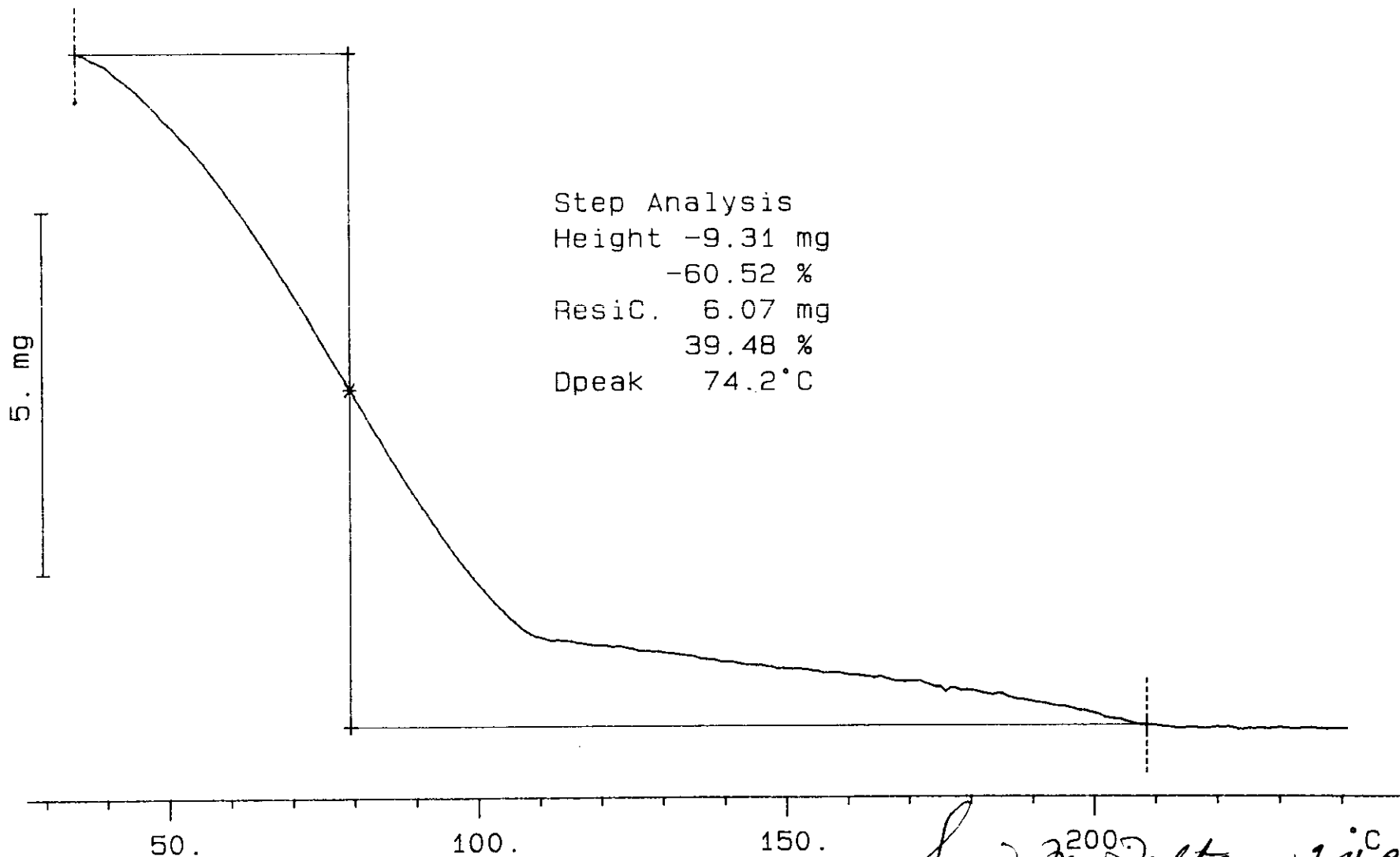
Height -9.31 mg

-60.52 %

ResidC. 6.07 mg

39.48 %

Dpeak 74.2°C



WHO-SD-WV-2-1001-2000

11-Feb-96

222-S Laboratory



BEST AVAILABLE COPY

S96T000156 DUP N2

File: 00030.001

TG

METTLER

11-Feb-96

12.286 mg

Rate: 10.0 °C/min

Ident: 0.0

222-S Laboratory

Step Analysis

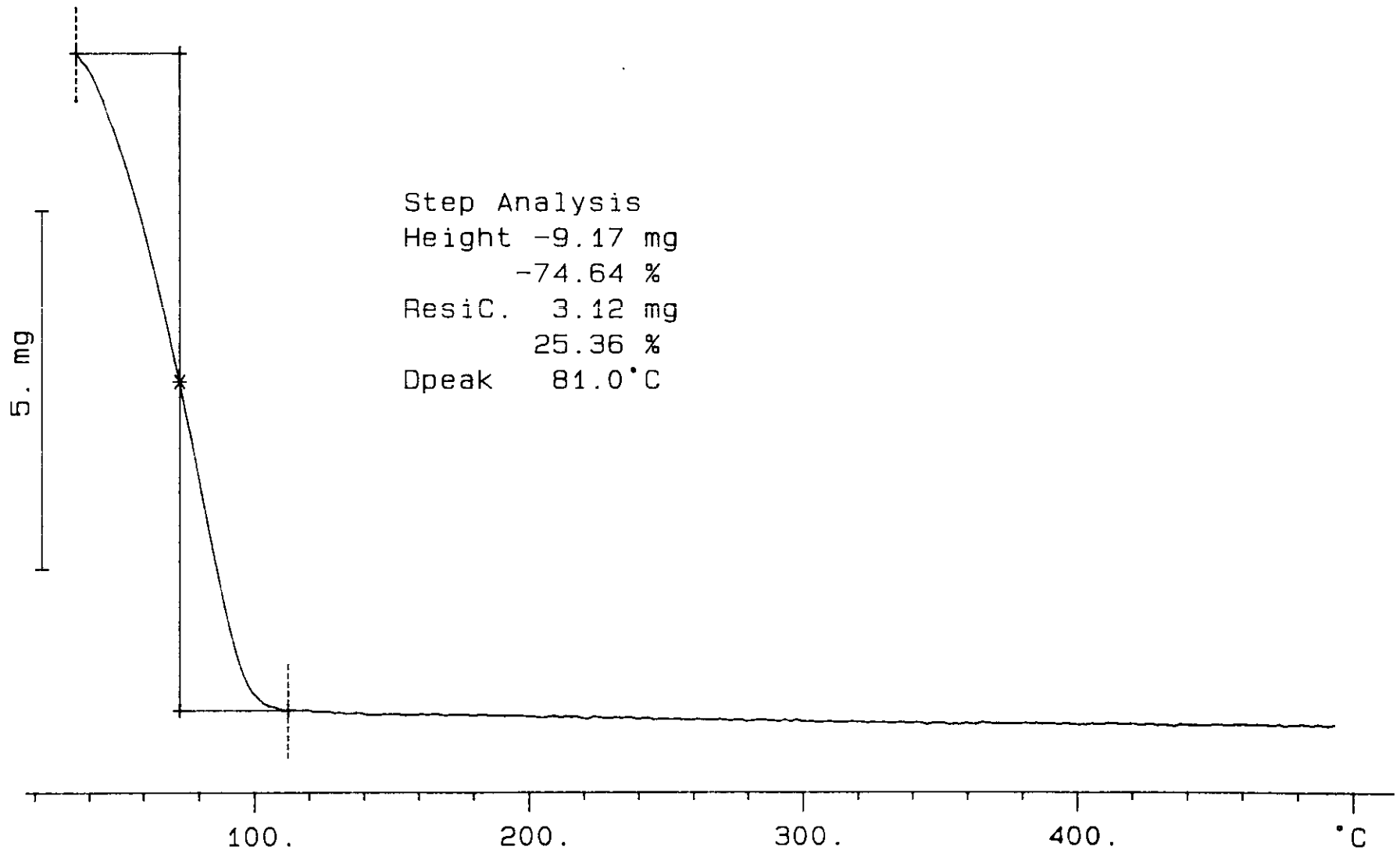
Height -9.17 mg

-74.64 %

ResiC. 3.12 mg

25.36 %

Dpeak 81.0 °C



178

WHC-SD-WM-DP-168, REV. 0

LABCORE Data Entry Template for Worklist#

5645

Analyst: ADP Instrument: TGA0 3 Book # 75N8A

Method: LA-514-114 Rev/Mod C-1

Worklist Comment: Reruns. Please run AN-106 TGA under N2.

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	LIQUID	<u>59.2</u>	<u>60.32</u>	<u>*</u>	<u>N/A</u> %
96000016	AN-106 GRAB	2 SAMPLE	S96T000138	0	TGA-03	LIQUID	<u>N/A</u>	<u>64.19</u>		%
96000016	AN-106 GRAB	3 DUP	S96T000138	0	TGA-03	LIQUID	<u>64.19</u>	<u>77.06</u>	<u>N/A</u>	%
96000017	AN-106 GRAB	4 SAMPLE	S96T000155	1	TGA-03	LIQUID	<u>N/A</u>	<u>75.92</u>		%
96000017	AN-106 GRAB	5 DUP	S96T000155	1	TGA-03	LIQUID	<u>75.92</u>	<u>76.21</u>	<u>N/A</u>	%

Final page for worklist # 5645

See attached for signatures
Analyst Signature 2/13/96

See attached for signatures
Analyst Signature 2/14/96 BOV

Verified by Blandina
Valenzuela
2/14/96

S96T000138 result is the sum of two weight loss steps. The sample experienced some static electricity at the beginning of the run, the duplicate did not. This is a rerun of the sample. ^{2/13/96} The sample has been run 4 times with the TGA. The chemist believes the sample contains approximately 75% water.

Data Entry Comments:

This sample (S96T000138) was rerun one more
time on worklist # 5682.

LABCORE Data Entry Template for Worklist#

5645

Analyst: ADP Instrument: TGA0 Book # 75N8A

Method: LA-560-112 Rev/Mod C-1

Worklist Comment: Reruns. Please run AN-106 TGA under N2.

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	LIQUID			N/A	%
96000016	AN-106 GRAB	2 SAMPLE	S96T000138	1	TGA-01	LIQUID	N/A			%
96000016	AN-106 GRAB	3 DUP	S96T000138	1	TGA-01	LIQUID			N/A	%
96000017	AN-106 GRAB	4 SAMPLE	S96T000155	0	TGA-01	LIQUID	N/A			%
96000017	AN-106 GRAB	5 DUP	S96T000155	0	TGA-01	LIQUID			N/A	%

Final page for worklist # 5645

Anthony Purnita 02/12/96
Analyst Signature Date

NE Wright 2/13/96
Analyst Signature Date

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

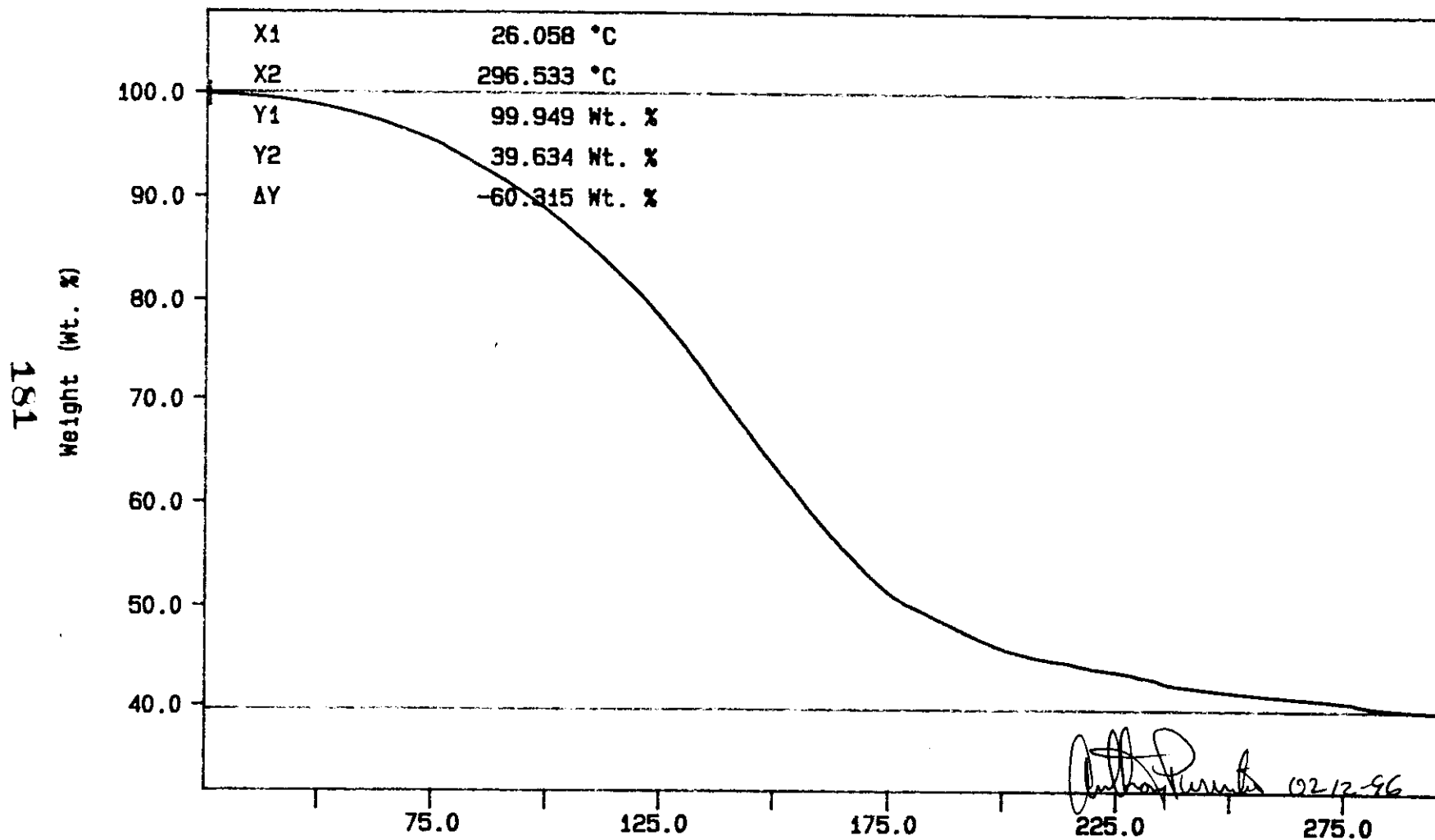
Curve 1: TGA

File info: TER021203 Mon Feb 12 22:04:33 1996

Sample Weight: 27.870 mg

TERLIQ 75N8A

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 181 TO 183.



WHC-SD-WM-DP-168, REV. 0

N2 10C/MIN

TEMP: 30.0 C TIME: 0.0 min RATE: 10.0 C/min
TEMP: 300.0 C

Temperature (°C)

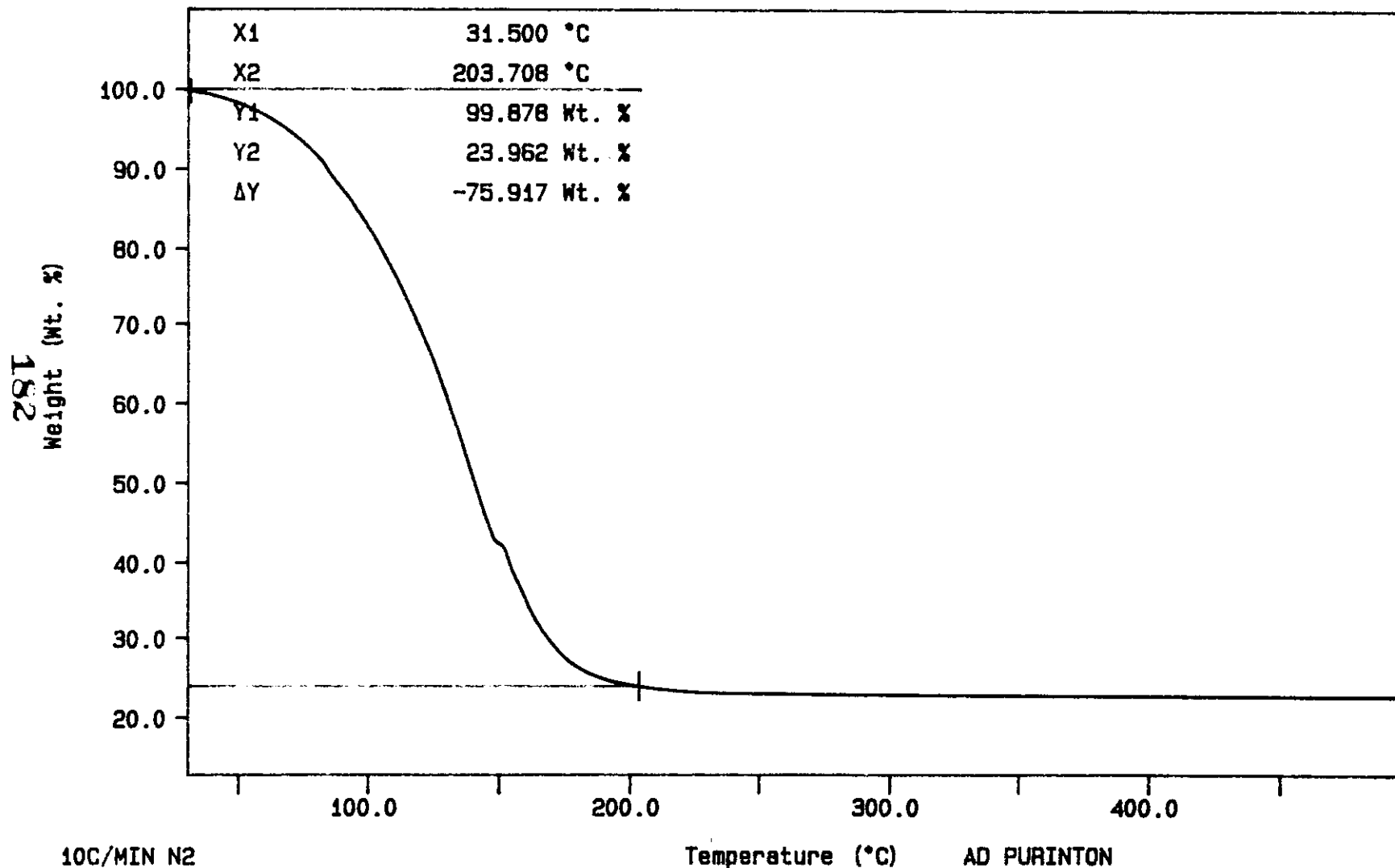
AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Mon Feb 12 22:13:36 1996

Curve 1: TGA

File info: SAM021208 Tue Feb 13 02:40:42 1996

Sample Weight: 20.735 mg

S96T000155 SAM



TEMP1: 95.0 °C
TEMP2: 500.0 °C
TIME1: 0.0 min
RATE1: 10.0 °C/min

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Feb 13 03:26:44 1996

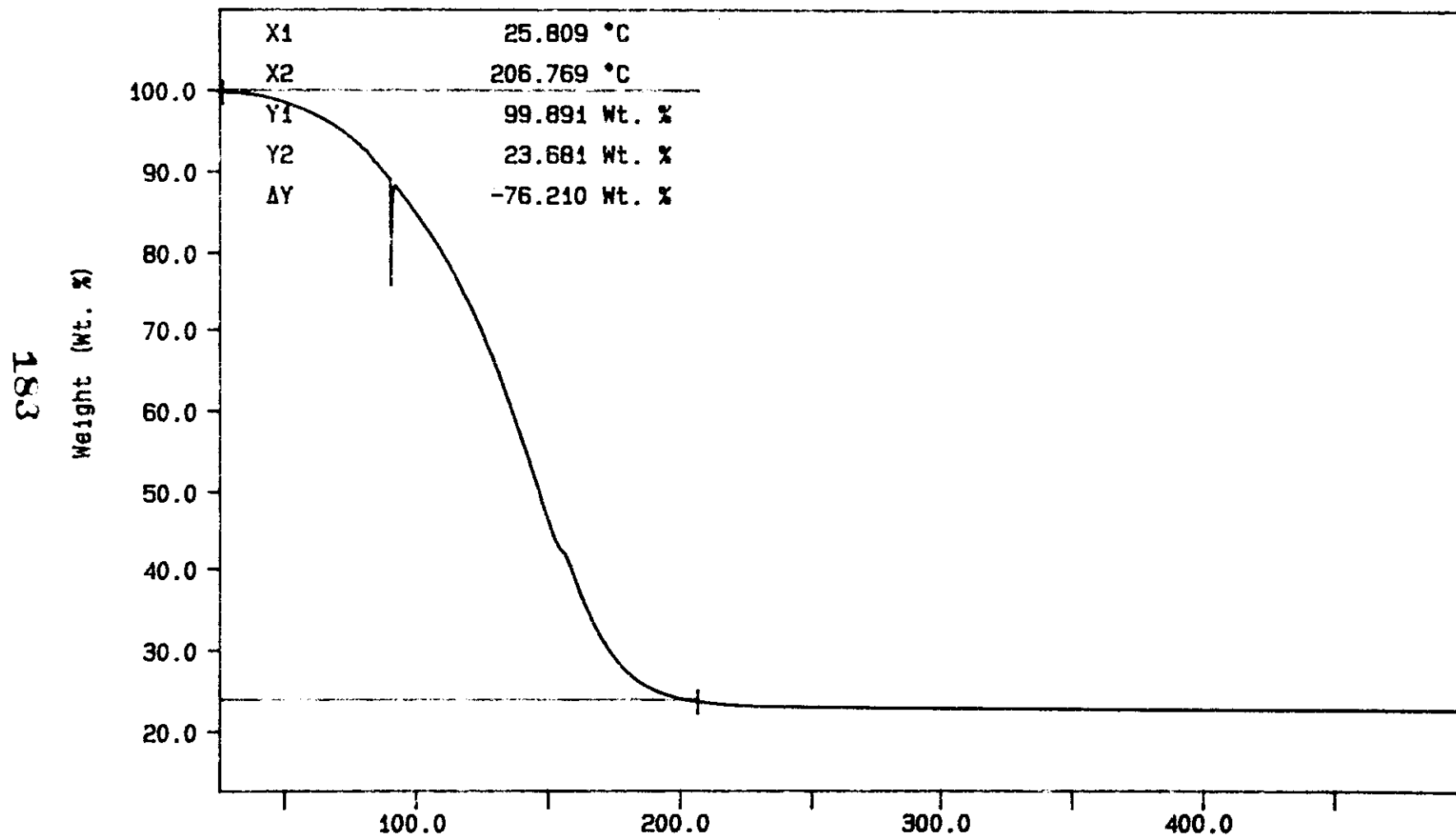
WHC-SD-WM-DP-168, REV. 0

Curve 1: TGA

File info: SAM021209 Tue Feb 13 04:26:05 1996

Sample Weight: 23.471 mg

S96T000155 DUP



10C/MIN N2
TEMP1: 36.0 C
TEMP2: 500.0 C
TIME1: 0.0 min
RATE1: 10.0 C/min

Temperature (°C)

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Feb 13 04:32:01 1996

WHC-SD-WM-DP-168, REV. 0

LABCORE Data Entry Template for Worklist#

5682

Analyst:

JLS

Instrument: TGA0

1

Book #

75N&A

Method: LA-560-112 Rev/Mod

B-1

Worklist Comment: Please run AN-106 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	LIQUID	<u>59.2</u>	<u>60.31</u>	<u>N/A</u>	%
96000016	AN-106 GRAB	2 SAMPLE	S96T000138	1	TGA-01	LIQUID	<u>N/A</u>	<u>76.56</u>		%
96000016	AN-106 GRAB	3 DUP	S96T000138	1	TGA-01	LIQUID	<u>76.56</u>	<u>75.48</u>	<u>N/A</u>	%

Final page for worklist #

5682

Analyst Signature

Date

Analyst Signature

Date

Verified by Blandina Valenzuela
2/15/96

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 185 TO 187.

TGA STD 75N8A N2

40.847 mg

Rate: 10.0 °C/min

File: 00062.001

TG

METTLER

14-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

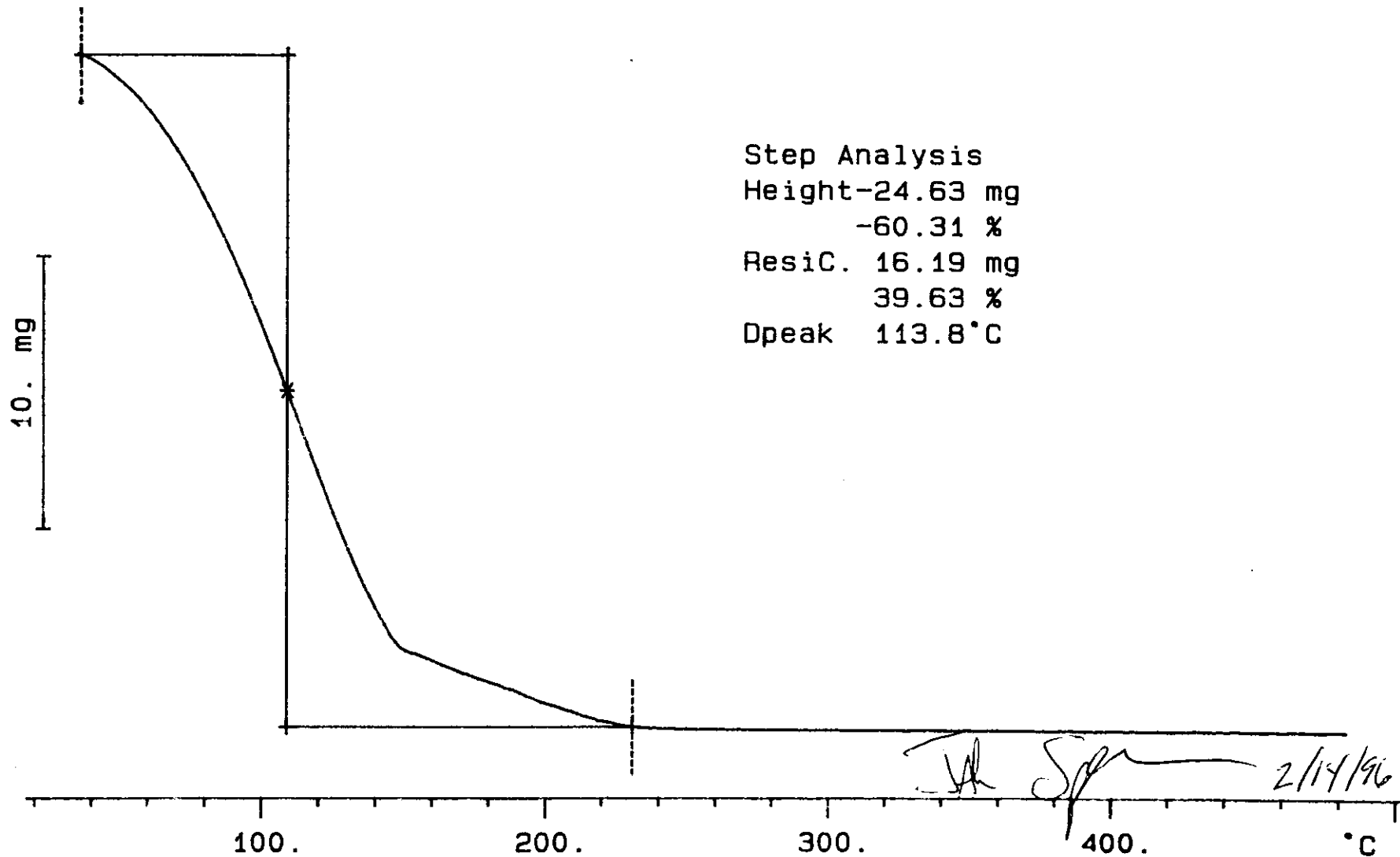
Height-24.63 mg

-60.31 %

ResiC. 16.19 mg

39.63 %

Dpeak 113.8 °C



S96T000138 N2

22.701 mg

Rate: 10.0 °C/min

File: 00065.001

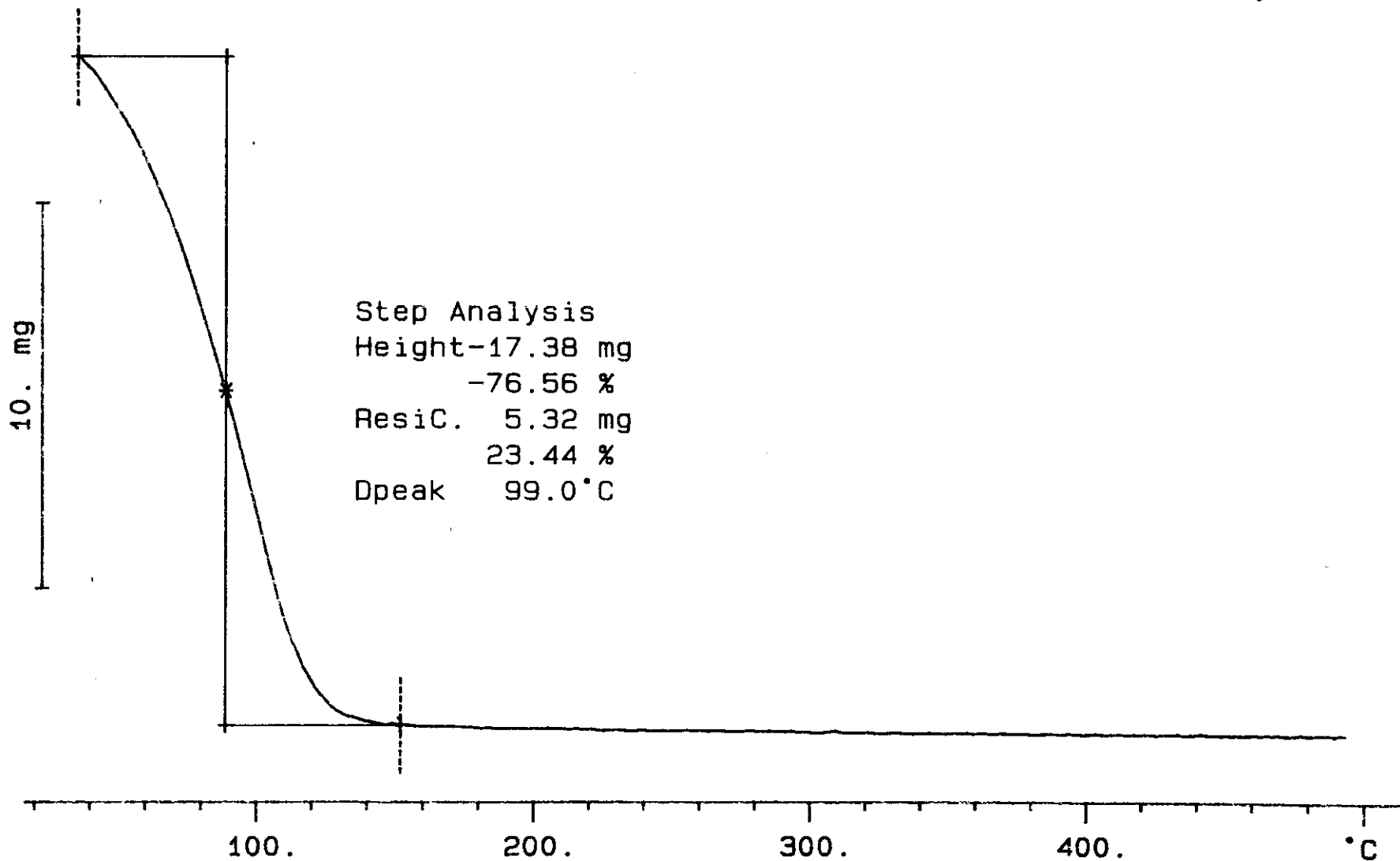
TG

METTLER

14-Feb-96

Ident: 0.0

222-S Laboratory



Dup
2/16/96

S96T000138 N2

23.424 mg

Rate: 10.0 °C/min

File: 00067.001

TG

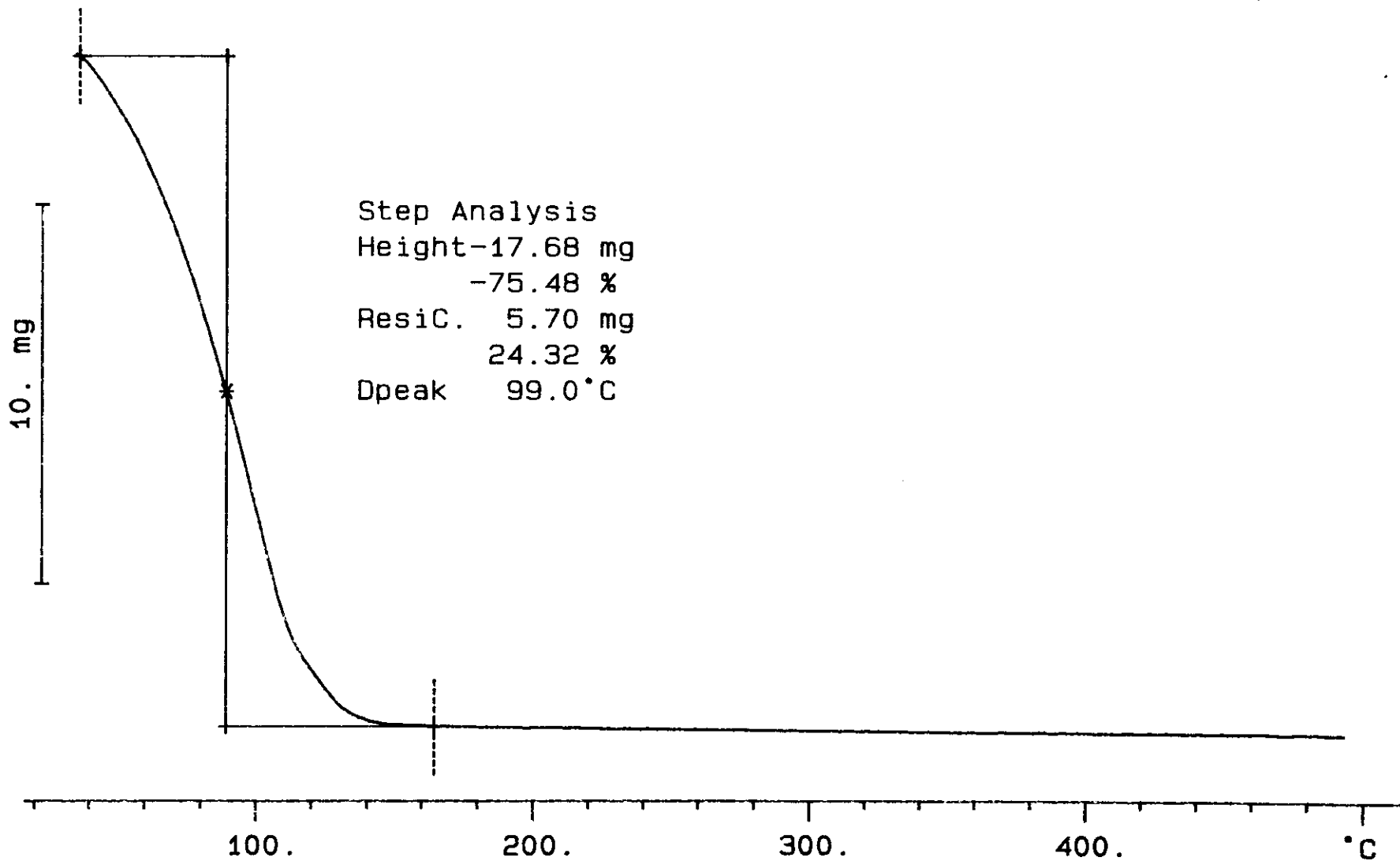
METTLER

14-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis
Height-17.68 mg
-75.48 %
ResiC. 5.70 mg
24.32 %
Dpeak 99.0 °C



187

WHC-SD-WM-DP-168, REV. 0

**THE FOLLOWING ANALYSES ARE INCLUDED IN THE
DATA PACKAGE BUT THE RESULTS HAVE NOT BEEN
REPORTED IN THE FINAL SUMMARY REPORTS.**

BEST AVAILABLE COPY

S96T000138 ^{2/12/96 RPY} ~~DUP~~ N2

12.544 mg

Rate: 10.0 °C/min

File: 00134.001

TG

METTLER

01-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

Height -9.61 mg

-76.63 %

Resid. 2.93 mg

23.37 %

Dpeak 81.0 °C

DATA
NOT USED
IN PACKAGE

Rae Ann Green 2-1-96

183

5. mg

100.

200.

300.

400.

°C

BEST AVAILABLE COPY

S96T000138 DUP N2

12.544 mg

Rate: 10.0 °C/min

File: 00134.001

TG

METTLER

01-Feb-96

Ident: 0.0

222-S Laboratory

Step Analysis

Weight: -2.61 mg

-20.83 %

Residue: 2.35 mg

18.77 %

Onset: 81.0 °C

190

5. mg

DATA
NOT USED
IN PACKAGE

Rae Ann Green 2-1-96

100.

200.

300.

400.

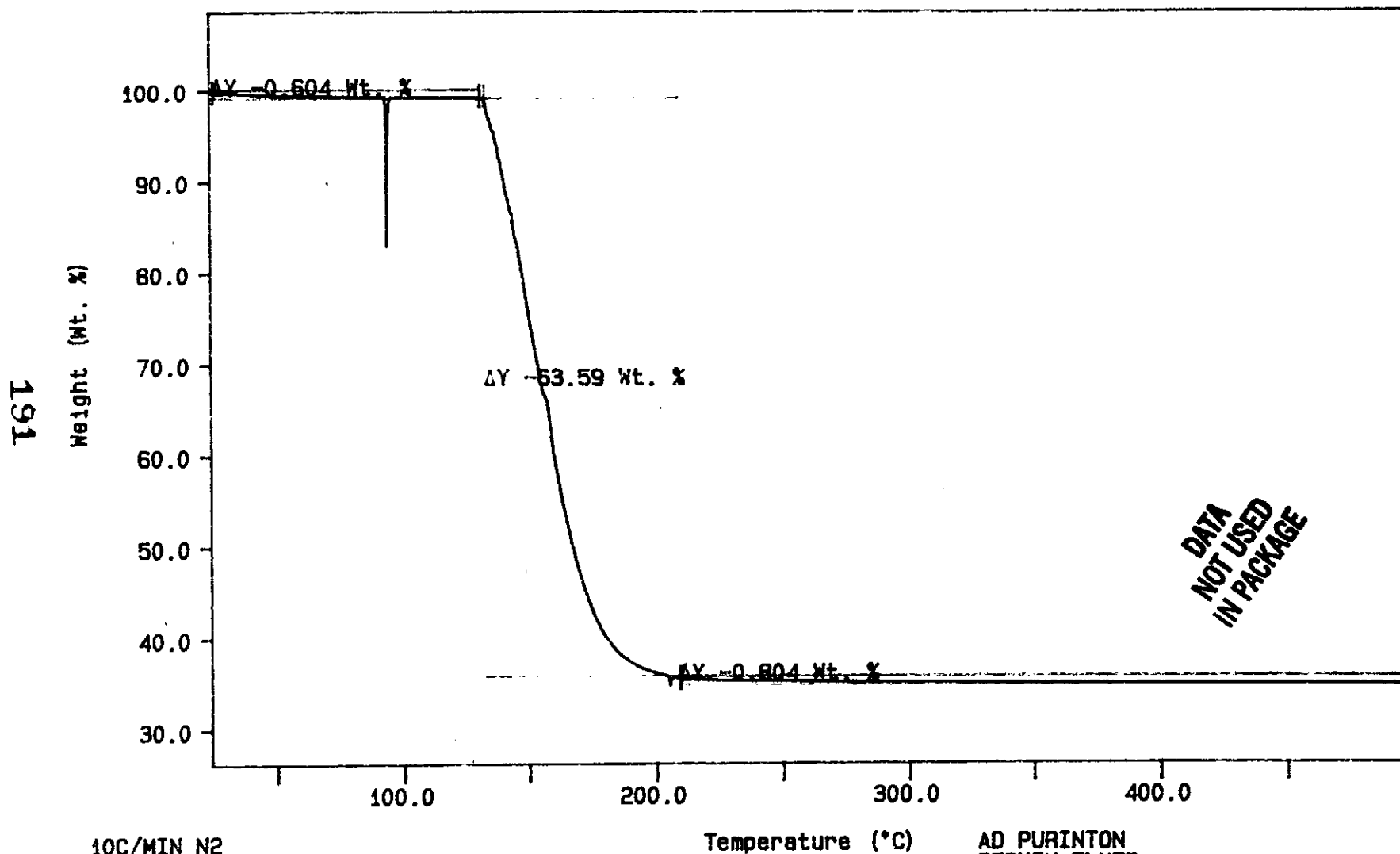
°C

Curve 1: TGA

File info: SAM021206 Mon Feb 12 23:20:23 1996

Sample Weight: 13.751 mg

S96T000138 SAM



10C/MIN N2
TEMP1: 35.0 C
TEMP2: 500.0 C
TIME1: 0.0 min
RATE1: 10.0 C/min

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Feb 13 00:38:07 1996

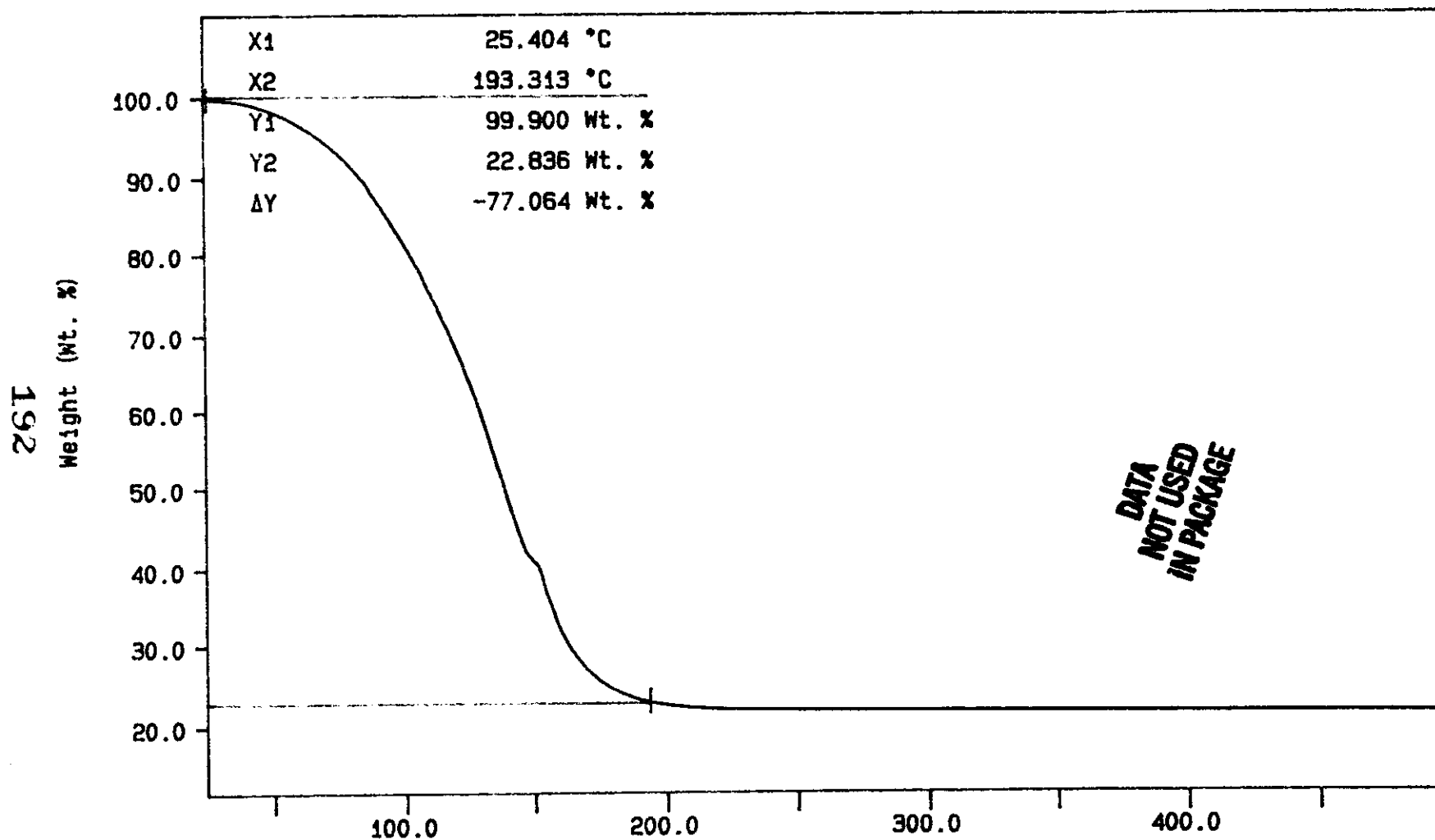
WHC-SD-WM-DP-168, REV.0

Curve 1: TGA

File info: SAM021207 Tue Feb 13 01:34:06 1996

Sample Weight: 21.029 mg

S96T000138 DUP



WHC-SD-WM-DP-168, REV. 0

10C/MIN N2
TEMP1: 35.0 C
TEMP2: 500.0 C
TIME1: 0.0 min
RATE1: 10.0 C/min

Temperature (°C)

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Tue Feb 13 01:38:59 1996

WHC-SD-WM-DP-168, REV. 0

RADIOCHEMICAL ANALYSES

LABCORE Data Entry Template for Worklist# 4991

Analyst: AKL Instrument: AB00 15 Book# 23856

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine Sample Size Using Ludlum.(if spk,use.1ml spk)lc

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@ALPHA01	LIQUID		
2 BLNK			@ALPHA01	LIQUID		
3 BLNK/BKG			@ALPHA01	LIQUID		
4 SAMPLE	S96T000153 0		@ALPHA01	LIQUID	96000017	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
5 DUP	S96T000153 0		@ALPHA01	LIQUID		
6 SPK	S96T000153 0		@ALPHA01	LIQUID		
7 SAMPLE	S96T000154 0		@ALPHA01	LIQUID	96000017	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
8 DUP	S96T000154 0		@ALPHA01	LIQUID		
9 SAMPLE	S96T000155 0		@ALPHA01	LIQUID	96000017	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
10 DUP	S96T000155 0		@ALPHA01	LIQUID		

Final page for worklist # 4991

A. Lewis 1/25/96
Analyst Signature Date

SE Hogan 1/26/96
Analyst Signature Date

C.J. O'neil 1/30/96

Data Entry Comments:

LABCORE Completed Worklist Report for Worklist# 4991

Analyst: ak1

Instrument: AB15

Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine Sample Size Using Ludlum.(if spk,use.1ml spk)lc

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		0ALPHA01 ALPHA01 LIQUID		1.02E-05	9.11E-6	89.310 % Recovery	
1 STD	0		0ALPHA01 ALPHA01E LIQUID		1.00	5.32E+00	5.320 % Ct. Error	
2 BLNK	0		0ALPHA01 ALPHA01 LIQUID		1	<2.53E-3	uCi/mL	
2 BLNK	0		0ALPHA01 ALPHA01E LIQUID		1.00	5.00E+02	500.000 %Ct. Error	
3 BLNK/BKG	0		0ALPHA01 ALPHA01 LIQUID		1.00E+00	9.46E-01	0.950 uCi/mL	
4 SAMPLE	S96T000153	0	0ALPHA01 ALPHA01 LIQUID		N/A <	2.53E-03	5.940e-003 uCi/mL	
4 SAMPLE	S96T000153	0	0ALPHA01 ALPHA01E LIQUID		N/A	5.00E+02	0.000 % Ct. Error	
5 DUP	S96T000153	0	0ALPHA01 ALPHA01 LIQUID		<2.53E-3	<2.57E-3	RPD	
5 DUP	S96T000153	0	0ALPHA01 ALPHA01E LIQUID		1.00	5.00E+02	500.000 % Ct. Error	
6 SPK	S96T000153	0	0ALPHA01 ALPHA01 LIQUID		3.92E-02	4.08E-02	104.080 % Recovery	
7 SAMPLE	S96T000154	0	0ALPHA01 ALPHA01 LIQUID		N/A <	3.25E-03	5.940e-003 uCi/mL	
7 SAMPLE	S96T000154	0	0ALPHA01 ALPHA01E LIQUID		N/A	5.00E+02	0.000 % Ct. Error	
8 DUP	S96T000154	0	0ALPHA01 ALPHA01 LIQUID		<3.25E-3	<2.53E-3	RPD	
8 DUP	S96T000154	0	0ALPHA01 ALPHA01E LIQUID		1.00	5.00E+02	500.000 % Ct. Error	
9 SAMPLE	S96T000155	0	0ALPHA01 ALPHA01 LIQUID		N/A <	6.33E-02	5.940e-003 uCi/mL	
9 SAMPLE	S96T000155	0	0ALPHA01 ALPHA01E LIQUID		N/A	5.00E+02	0.000 % Ct. Error	
10 DUP	S96T000155	0	0ALPHA01 ALPHA01 LIQUID		<6.33E-2	<5.13E-3	RPD	
10 DUP	S96T000155	0	0ALPHA01 ALPHA01E LIQUID		1.00	1.53E+02	153.000 % Ct. Error	

Final page for worklist# 4991

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____


Reviewer Signature

2/6/96
Date

Units shown for QC (BLK/BKG) may not reflect the actual units.

AT : LA-508-101 (D-2)

STANDARD

	STANDARD	REPLICATE
DETECTOR NUMBER	15	15
STD		
DISH SIZE (1, 2, or 5) (MS)	2	2
GROSS COUNTS (GC)	1522	1388
4991		
COUNT TIME in MINUTES (CT)	30	30
BACKGROUND in cpm (BKG)	0.37	0.37
AT		
SAMPLE SIZE in mL (SS)	10.000	10.000
DILUTION FACTOR (DF)	1	1
ALPHA01		
STANDARD BOOK NUMBER (Std BN)	23B56	23B56
EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID		
Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	50.363	45.897
Batch Number		
Standard Value in $\mu\text{Ci/mL}$	1.02E-05	
96000467		
Concentration in $\mu\text{Ci/L}$	= 9.53E-03	
Rerun		
Replicate Concentration in $\mu\text{Ci/L}$	= 8.69E-03	
0		
AVERAGE CONCENTRATION in $\mu\text{Ci/L}$	= 9.1093E-03	
Sample Prep		
N/A		
Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample		
ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/ μCi)		
WL#4991		
ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code		
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB26872		
Detection Levels and Less Than Values are determined from Procedure LA-508-002		
Prepared By		
SEH		
Chemist		
SLF		
ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	9.11E-06	
Analyst		
AKL		
Date Complete		
01/26/96		
RELATIVE COUNTING ERROR	= 5.3%	
Analysis Date		
01/25/96		
Analysis Time		
03:00 PM		
Sample Point		
AN-106		

DETECTION
LEVEL1.15E-07
 $\mu\text{Ci/mL}$

Analyst:

SEH

Date: 26-Jan-96

Signature of Chemist:

SLF

Date: 2/6/96

STANDARD.WB1 Rev. 1.0

508101ML

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (D-2)

LIQUIDS

BLNK	REPLICATE
15	15
2	2
11	10
30	30
0.37	0.37
1.000	1.000
5151	5151
1	1
0.2380	0.2380
0.259	0.259

DETECTOR NUMBER	15	15
BLNK	DISH SIZE (1 , 2 , or 5) (MS)	2
4991	GROSS COUNTS (GC)	11
4991	COUNT TIME in MINUTES (CT)	30
4991	BACKGROUND in cpm (BKG)	0.37
AT	SAMPLE SIZE in mL (SS)	1.000
ALPHA01	DILUTION FACTOR (DF)	5151
ALPHA01	DIGEST DILUTION FACTOR (DDF)	1
LIQUID	EFFICIENCY FACTOR (EFF)	0.2380
	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.259
Batch Number		
96000467	Blank Concentration in $\mu\text{Ci/L}$	< 2.53E+00
0	Replicate Concentration in $\mu\text{Ci/L}$	< 2.53E+00
0	Maximum Concentration in $\mu\text{Ci/L}$	< 2.5264E+00
Sample Prep		
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG	
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)	
WL#4991	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L	
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100	
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.	
Prepared By		
SEH		
Chemist		
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 2.53E-03
Analyst		
AKL	LESS Than Value was Determined from Lc.	
Date Complete		
01/26/96	RELATIVE COUNTING ERROR	500.0%
Analysis Date		
01/25/96		
Analysis Time		
03:00 PM		
Sample Point		
AN-106		

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
BLANK.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SAM4

AT : LA-508-101 (D-2) LIQUIDS

		SAMPLE	REPLICATE
DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
GROSS COUNTS (GC)		10	8
4991	COUNT TIME In MINUTES (CT)	30	30
BACKGROUND In cpm (BKG)		0.37	0.37
AT	SAMPLE SIZE In mL (SS)	1.000	1.000
DILUTION FACTOR (DF)		5151	5151
ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
EFFICIENCY FACTOR (EFF)		0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.259	0.259
Batch Number			
96000467	Blank Concentration in $\mu\text{Ci/L}$	< 2.53E+00	
Replicate	Replicate Concentration in $\mu\text{Ci/L}$	< 2.53E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 2.5264E+00	
Sample Prep			
N/A	Rs (Sample Count Rate) = $(TC / CT) - BKG$		
Sample	ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000153	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum)	=	< 2.53E-03
Analyst	LESS Than Value was Determined from Lc.		
AKL			
Date Complete	RELATIVE COUNTING ERROR		
01/26/96			
Analysis Date	500.0%		
01/25/96			
Analysis Time	5.94E-03 $\mu\text{Ci/mL}$		
03:00 PM			
Sample Point			
AN-106			

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96

SAMPLE.WB1 Rev. 1.0

508/01ML

WORKBOOK PAGE: DUPS

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
DETECTOR NUMBER		15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
4991	GROSS COUNTS (GC)	19	7
	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.37	0.37
	SAMPLE SIZE in mL (SS)	1.000	1.000
	DILUTION FACTOR (DF)	5151	5151
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.263	0.259
Batch Number			
96000467	Blank Concentration in $\mu\text{Ci/L}$	2.57E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 2.53E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 2.5672E+00	
Sample Prep			
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
S96T000153	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum)	=	< 2.57E-03
Analyst	LESS THAN Value was Determined from Rs.		
AKL			
Date Complete	RELATIVE COUNTING ERROR		
01/26/96	500.0%		
Analysis Date			
01/25/96			
Analysis Time			
03:00 PM			
Sample Point			
AN-106			

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
SAMPLE.WB1 Rev. 1.0	508/101ML	

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
SPK	DETECTOR NUMBER	15	15
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
WB26872	TOTAL COUNTS (TC)	65335	63915
4991	COUNT TIME in MINUTES (CT)	30	30
WB26872	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	1.000	1.000
WB26872	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	5151	5151
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000467	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9209E-02	3.9209E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.238	0.238
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	2.12E+01	2.08E+01
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	< 2.5264E-03	
N/A			
Sample #			
S96T000153	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Instrument Code	SAMPLE + SPIKE $\mu\text{Ci/mL}$ = $R_s * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
WB26872	QC ACTUAL = SVal		
Prepared By	QC FOUND = $((S+S \mu\text{Ci/mL} - \text{SAMPLE } \mu\text{Ci/mL}) * ((SDF/SVol)/(DF*DDF/SS)))$		
SEH	PERCENT SPIKE RECOVERY = $(QC \text{ FOUND} / QC \text{ ACTUAL}) * 100$		
Chemist			
SLF			
Analyst			
AKL			
Date Complete	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.		
01/26/96			
Analysis Date			
01/25/96	QC ACTUAL =	3.92E-02	
Analysis Time	QC FOUND =	4.08E-02	
03:00 PM	AVG. PERCENT SPIKE RECOVERY =	104.0%	
Sample Point			
AN-106			

Analyst:	SEH	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
SPIKE.WB1 Rev. 1.0 508101ML		

WORKBOOK PAGE: SAM7

AT : LA-508-101 (D-2) LIQUIDS

		SAMPLE	REPLICATE
DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
WORKLIST	GROSS COUNTS (GC)	13	12
4991	COUNT TIME in MINUTES (CT)	30	30
CAVONET	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
1000000	DILUTION FACTOR (DF)	5151	5151
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
1000000	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.333	0.294

Batch Number	
96000467	Blank Concentration in $\mu\text{Ci/L}$ < 3.25E+00
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ < 2.87E+00
0	Maximum Concentration in $\mu\text{Ci/L}$ < 3.2497E+00

Sample Prep	
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$
Sample 1	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
S96T000154	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	
SEH	
Chemist	
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) = < 3.25E-03
Analyst	
AKL	LESS THAN Value was Determined from Rmax.
Date Complete	
01/26/96	RELATIVE COUNTING ERROR 500.0%
Analysis Date	
01/25/96	
Analysis Time	
03:00 PM	
Sample Point	
AN-106	

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: DUP8

AT : LA-508-101 (D-2) LIQUIDS

		DUP	REPLICATE
TYPE	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Net Lc	GROSS COUNTS (GC)	10	11
4991	COUNT TIME in MINUTES (CT)	30	30
01/01/96	BACKGROUND in cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
01/25/96	DILUTION FACTOR (DF)	5151	5151
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
01/26/96	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.259	0.259
Batch Number			
96000467	Blank Concentration in $\mu\text{Ci/L}$	< 2.53E+00	
Repn	Replicate Concentration in $\mu\text{Ci/L}$	< 2.53E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 2.5264E+00	
Sample Prep			
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
S96T000154	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 2.53E-03	DETECTION LEVEL
Analyst	LESS Than Value was Determined from Lc.		
AKL			
Date Complete	RELATIVE COUNTING ERROR	500.0%	5.94E-03 $\mu\text{Ci/mL}$
01/26/96			
Analysis Date			
01/25/96			
Analysis Time			
03:00 PM			
Sample Point			
AN-106			

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96

SAMPLE.WB1 Rev. 1.0 508101ML

AT : LA-508-101 (D-2)

LIQUIDS

		SAMPLE	REPLICATE
DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
GROSS COUNTS	(GC)	206	9
4991	COUNT TIME in MINUTES (CT)	30	30
BACKGROUND in cpm	(BKG)	0.37	0.37
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
DILUTION FACTOR	(DF)	5151	5151
DIGEST DILUTION FACTOR	(DDF)	1	1
EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	6.497	0.259
Batch Number			
96000467	Blank Concentration in $\mu\text{Ci/L}$	6.33E+01	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 2.53E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 6.3336E+01	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000155	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 6.33E-02	DETECTION LEVEL
Analyst	LESS THAN Value was Determined from R_s .		
AKL			
Date Complete	RELATIVE COUNTING ERROR	500.0%	5.94E-03 $\mu\text{Ci/mL}$
01/26/96			
Analysis Date			
01/25/96			
Analysis Time			
03:00 PM			
Sample Point			
AN-106			

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96

SAMPLE.WB1 Rev. 1.0

508101ML

WORKBOOK PAGE: DUP1

AT : LA-508-101 (D-2) LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	18	19
4991	COUNT TIME In MINUTES (CT)	30	30
1 of 15	BACKGROUND In cpm (BKG)	0.37	0.37
AT	SAMPLE SIZE In mL (SS)	1.000	1.000
CS CODE	DILUTION FACTOR (DF)	5151	5151
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.527	0.263
Batch Number			
96000467	Blank Concentration in $\mu\text{Ci/L}$	< 5.13E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	2.57E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 5.1348E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000155	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 5.13E-03	DETECTION LEVEL
Analyst			
AKL	LESS THAN Value was Determined from Rmax.		
Date Complete			5.94E-03 $\mu\text{Ci/mL}$
01/26/96	RELATIVE COUNTING ERROR	153.2%	
Analysis Date			
01/25/96			
Analysis Time			
03:00 PM			
Sample Point			
AN-108			

Analyst:	AKL	Date: 26-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96

SAMPLE.WB1 Rev. 1.0

508101ML

LABCORE Data Entry Template for Worklist# 4992

Analyst: KT Instrument: AB00 15 Book# 14B56

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine Sample Size Using Ludlum.(if spk,use .1ml spk)lc

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@ALPHA01	LIQUID		
2 BLNK			@ALPHA01	LIQUID		
3 BLNK/BKG			@ALPHA01	LIQUID		
4 SAMPLE	S96T000136 0		@ALPHA01	LIQUID	96000016	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
5 DUP	S96T000136 0		@ALPHA01	LIQUID		
6 SPK	S96T000136 0		@ALPHA01	LIQUID		
7 SAMPLE	S96T000137 0		@ALPHA01	LIQUID	96000016	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
8 DUP	S96T000137 0		@ALPHA01	LIQUID		
9 SAMPLE	S96T000138 0		@ALPHA01	LIQUID	96000016	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
10 DUP	S96T000138 0		@ALPHA01	LIQUID		
11 SAMPLE	S96T000139 0		@ALPHA01	LIQUID	96000016	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
12 DUP	S96T000139 0		@ALPHA01	LIQUID		

Final page for worklist # 4992

Kim Thomas 1-18-96
Analyst Signature Date

[Signature] 1/19/96
Analyst Signature Date
Sue Hogan 1/14/96

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 4992

Analyst: knt Instrument: AB15 Book# _____

Method: _____ Rev/Mod _____

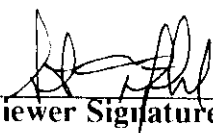
Worklist Comment: Determine Sample Size Using Ludlum.(if spk,use .1ml spk)lc

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD		0	@ALPHA01 ALPHA01	LIQUID	1.54E-05	1.22E-5	79.220 % Recovery	
1 STD		0	@ALPHA01 ALPHA01E	LIQUID	1.00	4.51E+00	4.510 % Ct. Error	
2 BLNK		0	@ALPHA01 ALPHA01	LIQUID	1	1.54E-3	0.000 uCi/mL	
2 BLNK		0	@ALPHA01 ALPHA01E	LIQUID	1.00	9.22E+01	92.200 % Ct. Error	
3 BLNK/BKG		0	@ALPHA01 ALPHA01	LIQUID	1.00E+00	3.24E+00	3.240 uCi/mL	
4 SAMPLE	S96T000136	0	@ALPHA01 ALPHA01	LIQUID	N/A	1.16E-03	1.730e-003 uCi/mL	
4 SAMPLE	S96T000136	0	@ALPHA01 ALPHA01E	LIQUID	N/A	1.00E+02	0.000 % Ct. Error	
5 DUP	S96T000136	0	@ALPHA01 ALPHA01	LIQUID	1.16E-3	<1.41E-3	RPD	
5 DUP	S96T000136	0	@ALPHA01 ALPHA01E	LIQUID	1.00	1.67E+02	167.000 % Ct. Error	
6 SPK	S96T000136	0	@ALPHA01 ALPHA01	LIQUID	3.92E-02	3.54E-02	90.310 % Recovery	
7 SAMPLE	S96T000137	0	@ALPHA01 ALPHA01	LIQUID	N/A <	7.86E-04	1.730e-003 uCi/mL	
7 SAMPLE	S96T000137	0	@ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02	0.000 % Ct. Error	
8 DUP	S96T000137	0	@ALPHA01 ALPHA01	LIQUID	<7.86E-4	1.16E-3	RPD	
8 DUP	S96T000137	0	@ALPHA01 ALPHA01E	LIQUID	1.00	1.11E+02	111.000 % Ct. Error	
9 SAMPLE	S96T000138	0	@ALPHA01 ALPHA01	LIQUID	N/A	1.73E-03	1.730e-003 uCi/mL	
9 SAMPLE	S96T000138	0	@ALPHA01 ALPHA01E	LIQUID	N/A	8.55E+01	0.000 % Ct. Error	
10 DUP	S96T000138	0	@ALPHA01 ALPHA01	LIQUID	1.73E-3	<1.41E-3	RPD	
10 DUP	S96T000138	0	@ALPHA01 ALPHA01E	LIQUID	1.00	2.76E+02	276.000 % Ct. Error	
11 SAMPLE	S96T000139	0	@ALPHA01 ALPHA01	LIQUID	N/A	6.06E-07	8.560e-007 uCi/mL	
11 SAMPLE	S96T000139	0	@ALPHA01 ALPHA01E	LIQUID	N/A	1.42E+02	0.000 % Ct. Error	
12 DUP	S96T000139	0	@ALPHA01 ALPHA01	LIQUID	6.06E-7	<4.16E-7	RPD	
12 DUP	S96T000139	0	@ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000 % Ct. Error	

Final page for worklist# 4992

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Reviewer Signature  Date 1/24/96

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

AT : LA-508-101 (D-2)

STANDARD

		STANDARD	REPLICATE
Type	DETECTOR NUMBER	15	15
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	1969	1902
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	10.000	10.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	14B56	14B56
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	65.453	63.220
Batch Number	Standard Value in $\mu\text{Ci/mL}$	1.54E-05	
96000472	Concentration in $\mu\text{Ci/L}$ =	1.24E-02	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ =	1.20E-02	
0	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	1.2177E-02	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
WL4992	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	1.22E-05	DETECTION LEVEL
Analyst			
KNT			
Date Complete			8.56E-08 $\mu\text{Ci/mL}$
01/19/96	RELATIVE COUNTING ERROR =	4.5%	
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	MCB	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

STANDARD.WB1 Rev. 1.0

508101ML

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (D-2) LIQUIDS

		BLNK	REPLICATE
Detector Number	15	15	
DISH SIZE (1, 2, or 5) (MS)	2	2	
GROSS COUNTS (GC)	20	15	
COUNT TIME in MINUTES (CT)	30	30	
BACKGROUND in cpm (BKG)	0.18	0.18	
SAMPLE SIZE in mL (SS)	0.050	0.050	
DILUTION FACTOR (DF)	101	101	
DIGEST DILUTION FACTOR (DDF)	1	1	
EFFICIENCY FACTOR (EFF)	0.2380	0.2380	
Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.487	0.320	
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	1.86E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	1.22E+00	
0	Average Concentration in $\mu\text{Ci/L}$	1.5420E+00	
Sample Prep			
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Average)	=	1.54E-03
Analyst			
KNT			
Date Complete			
01/19/96	RELATIVE COUNTING ERROR	92.2%	DETECTION LEVEL
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

BLANK.WB1 Rev. 1.0 508101ML

AT : LA-508-101 (D-2)

LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	14	15
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	0.050	0.050
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.287	0.320
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	1.10E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	1.22E+00	
0	Average Concentration in $\mu\text{Ci/L}$	1.1597E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000136	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Average) in $\mu\text{Ci/m}$	1.16E-03	DETECTION LEVEL
Analyst			
KNT			
Date Complete			1.73E-03 $\mu\text{Ci/mL}$
01/19/96	RELATIVE COUNTING ERROR	100.4%	
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:

KNT

Date: 19-Jan-96

Signature of Chemist:

SLF

Date: 1/23/96

SAMPLE.WB1 Rev. 1.0

508101ML

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
DUP	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
4992	GROSS COUNTS (GC)	10	16
4992	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	0.050	0.050
@ALPHA01	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
LIQUID	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.369	0.353
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	< 1.41E+00	
0	Replicate Concentration in $\mu\text{Ci/L}$	1.35E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 1.4114E+00	
Sample Prep			
N/A			
Sample	Rs (Sample Count Rate) = (TC / CT) - BKG		
S96T000136	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
Instrument Code	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
WB26872	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
Prepared By	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) in $\mu\text{Ci/m}$	< 1.41E-03	DETECTION LEVEL
Analyst	LESS THAN Value was Determined from Rmax.		
KNT			
Date Complete	RELATIVE COUNTING ERROR	167.2%	1.73E-03 $\mu\text{Ci/mL}$
01/19/96			
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96
SAMPLE.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	15	15
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	53005	59106
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.050	0.050
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000472	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9210E-02	3.9210E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.238	0.238
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	6.75E+00	7.53E+00
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	1.1597E-03	
N/A			
Sample #			
S96T000136	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Instrument Code	SAMPLE + SPIKE $\mu\text{Ci/mL}$ = $R_s * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
WB26872	QC ACTUAL = SVal		
Prepared By	QC FOUND = $((S+S \mu\text{Ci/mL} - \text{SAMPLE } \mu\text{Ci/mL}) * ((SDF/SVol)/(DF*DDF/SS)))$		
MCB	PERCENT SPIKE RECOVERY = $(QC \text{ FOUND} / QC \text{ ACTUAL}) * 100$		
Chemist			
SLF			
Analyst			
KNT			
Date Complete			
01/19/96			
Analysis Date			
01/18/96	QC ACTUAL =	3.92E-02	
Analysis Time	QC FOUND =	3.54E-02	
01:00 PM	AVG. PERCENT SPIKE RECOVERY =	90.2%	
Sample Point			
AN-106 GRAB			

Analyst:	MCB	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

SPIKE.WB1 Rev. 1.0

508101ML

WORKBOOK PAGE: SAM7

AT : LA-508-101 (D-2) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	6	11
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	0.050	0.050
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.206	0.187
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	< 7.86E-01	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	7.14E-01	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 7.8643E-01	
Sample Prep			
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
S96T000137	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) in $\mu\text{Ci/m}$	< 7.86E-04	DETECTION LEVEL
Analyst			
KNT	LESS THAN Value was Determined from Rmax.		
Date Complete			1.73E-03
01/19/96	RELATIVE COUNTING ERROR	500.0%	$\mu\text{Ci/mL}$
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

SAMPLE.WB1 Rev. 1.0

508101M

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	13	16
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	0.050	0.050
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.253	0.353
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	9.69E-01	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	1.35E+00	
0	Average Concentration in $\mu\text{Ci/L}$	1.1597E+00	
Sample Prep			
N/A			
Sample #	Rs (Sample Count Rate) = $(TC / CT) - BKG$		
S96T000137	ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
Instrument Code	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
WB26872	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
Prepared By	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Average)	in $\mu\text{Ci/m}$	1.16E-03
Analyst			DETECTION LEVEL
KNT			
Date Complete			1.73E-03
01/19/96	RELATIVE COUNTING ERROR	110.6%	$\mu\text{Ci/mL}$
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96
SAMPLE.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	22	16
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	0.050	0.050
Test Code	DILUTION FACTOR (DF)	101	101
ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.553	0.353
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	2.12E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	1.35E+00	
0	Average Concentration in $\mu\text{Ci/L}$	1.7332E+00	
Sample Prep			
N/A			
Sample #	Rs (Sample Count Rate) = $(TC / CT) - BKG$		
S96T000138	ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
Instrument Code	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
WB26872	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
Prepared By	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Average) in $\mu\text{Ci/m}$	1.73E-03	DETECTION LEVEL
Analyst			
KNT			
Date Complete			1.73E-03 $\mu\text{Ci/mL}$
01/19/96	RELATIVE COUNTING ERROR	85.5%	
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

SAMPLE.WB1 Rev. 1.0 508101M

AT : LA-508-101 (D-2) LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	10	8
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	0.050	0.050
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.369	0.288
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	< 1.41E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 1.10E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 1.4114E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000138	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) in $\mu\text{Ci/mL}$	< 1.41E-03	DETECTION LEVEL
Analyst			
KNT	LESS THAN Value was Determined from Rmax.		
Date Complete			1.73E-03
01/19/96	RELATIVE COUNTING ERROR	276.0%	$\mu\text{Ci/mL}$
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

SAMPLE.WB1 Rev. 1.0

508101ML

WORKBOOK PAGE: SAM1

AT : LA-508-101 (D-2) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	11	19
4992	COUNT TIME In MINUTES (CT)	30	30
AT or TB ?	BACKGROUND In cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE In mL (SS)	1.000	1.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.187	0.453
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	3.53E-04	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	8.58E-04	
0	Average Concentration in $\mu\text{Ci/L}$	6.0565E-04	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000139	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Average) in $\mu\text{Ci/m}$	6.06E-07	DETECTION LEVEL
Analyst			
KNT			
Date Complete			8.56E-07 $\mu\text{Ci/mL}$
01/19/96	RELATIVE COUNTING ERROR	141.7%	
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96

SAMPLE.WB1 Rev. 1.0

508101ML

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	12	6
4992	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.18	0.18
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.220	0.206
Batch Number			
96000472	Blank Concentration in $\mu\text{Ci/L}$	4.16E-04	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 3.89E-04	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 4.1638E-04	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000139	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) in $\mu\text{Ci/mL}$	< 4.16E-07	DETECTION LEVEL
Analyst	LESS THAN Value was Determined from R_s .		
KNT			
Date Complete	RELATIVE COUNTING ERROR	500.0%	8.56E-07 $\mu\text{Ci/mL}$
01/19/96			
Analysis Date			
01/18/96			
Analysis Time			
01:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	KNT	Date: 19-Jan-96
Signature of Chemist:	SLF	Date: 1/23/96
SAMPLE.WB1 Rev. 1.0	508101ML	

LABCORE Data Entry Template for Worklist# 5169

Analyst: AKL Instrument: AB00 [#]14 Book# 23856

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine sample size using Ludlum, spike .1mL. skm

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@ALPHA01	LIQUID		
2 BLNK			@ALPHA01	LIQUID		
3 BLNK/BKG			@ALPHA01	LIQUID		
4 SAMPLE	S96T000140 0		@ALPHA01	LIQUID	96000016	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
5 DUP	S96T000140 0		@ALPHA01	LIQUID		
6 SPK	S96T000140 0		@ALPHA01	LIQUID		
7 SAMPLE	S96T000156 0		@ALPHA01	LIQUID	96000017	AN-106 GRAB
Analytes Requested: ALPHA01 , ALPHA01E						
8 DUP	S96T000156 0		@ALPHA01	LIQUID		
9 SPK	S96T000156 0		@ALPHA01	LIQUID		

Final page for worklist # 5169

C. Lewis 1/25/96
Analyst Signature Date

SE Kloger 1/29/96
Analyst Signature Date

C. Opinen 1/30/96

Data Entry Comments:

AT : LA-508-101 (D-2)

STANDARD

		STANDARD	REPLICATE
Type	DETECTOR NUMBER	14	14
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	1442	1484
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE SIZE in mL (SS)	10.000	10.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	23B56	23B56
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	47.737	49.137
Batch Number	Standard Value in $\mu\text{Ci/mL}$	1.02E-05	
9600675	Concentration in $\mu\text{Ci/L}$ =	9.46E-03	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ =	9.73E-03	
0	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	9.5947E-03	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
WL#5169	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	9.59E-06	DETECTION LEVEL
Analyst			
AKL			
Date Complete			1.15E-07 $\mu\text{Ci/mL}$
01/29/96	RELATIVE COUNTING ERROR =	5.2%	
Analysis Date			
01/25/96			
Analysis Time			
02:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	SEH	Date: 29-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
STANDARD.WB1 Rev. 1 0 508101ML		

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (D-2) LIQUIDS

	BLNK	REPLICATE
Type	DETECTOR NUMBER	14
BLNK	DISH SIZE (1, 2, or 5) (MS)	2
Work List	GROSS COUNTS (GC)	13
5169	COUNT TIME in MINUTES (CT)	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33
AT	SAMPLE SIZE in mL (SS)	1.000
Test Code	DILUTION FACTOR (DF)	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.367
Batch Number		
96000675	Blank Concentration in $\mu\text{Ci/L}$	< 7.41E+00
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 4.95E+00
0	Maximum Concentration in $\mu\text{Ci/L}$	< 7.4064E+00
Sample Prep		
N/A		
Sample #	Rs (Sample Count Rate) = $(TC / CT) - BKG$	
WL#5169	ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$	
Instrument Code	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$	
WB27807	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$	
Prepared By	Detection Levels and Less Than Values are determined from Procedure LA-508-002.	
SEH		
Chemist		
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 7.41E-03
Analyst	LESS THAN Value was Determined from Rmax.	
AKL		
Date Complete	RELATIVE COUNTING ERROR	500.0%
01/29/96		
Analysis Date		
01/25/96		
Analysis Time		
02:00 PM		
Sample Point		
AN-106 GRAB		

Analyst:	AKL	Date: 29-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96

BLANK.WB1 Rev. 1.0

508101/mL

AT : LA-508-101 (D-2)

LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	3	10
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
Test Code	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.245	0.249
Batch Number			
96000675	Blank Concentration in $\mu\text{Ci/L}$	< 4.95E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 5.03E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 5.0252E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000140	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 5.03E-03	DETECTION LEVEL
Analyst	LESS Than Value was Determined from Lc.		
AKL			
Date Complete			1.17E-02 $\mu\text{Ci/mL}$
01/29/96	RELATIVE COUNTING ERROR	500.0%	
Analysis Date			
01/25/96			
Analysis Time			
02:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	AKL	Date: 29-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
SAMPLE.WB1 Rev. 1.0 508101ML		

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	11	7
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
Test Code	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.288	0.245
Batch Number			
96000675	Blank Concentration in $\mu\text{Ci/L}$	< 5.82E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 4.95E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 5.8218E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000140	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 5.82E-03	DETECTION LEVEL
Analyst	LESS THAN Value was Determined from Rmax.		
AKL			
Date Complete	RELATIVE COUNTING ERROR	500.0%	1.17E-02 $\mu\text{Ci/mL}$
01/29/96			
Analysis Date			
01/25/96			
Analysis Time			
02:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	AKL	Date: 29-Jan-96
Signature of Chemist.	SLF	Date: 2/6/96
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SPIKE6

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	14	14
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	65188	64217
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	1.000	1.000
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000675	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9209E-02	3.9209E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2274	0.2274
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	4.39E+01	4.32E+01
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	< 5.0252E-03	
N/A			
Sample #	Rs (Sample Count Rate) = (TC / CT) - BKG		
S96T000140	SAMPLE + SPIKE $\mu\text{Ci/mL}$ = Rs * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
Instrument Code	QC ACTUAL = SVal		
WB27807	QC FOUND = (((S+S $\mu\text{Ci/mL}$ - SAMPLE $\mu\text{Ci/mL}$) * ((SDF/SVol)/(DF*DDF/SS))))		
Prepared By	PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100		
SEH			
Chemist			
SLF			
Analyst			
AKL			
Date Complete	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.		
01/29/96			
Analysis Date			
01/25/96	QC ACTUAL	=	3.92E-02
Analysis Time	QC FOUND	=	4.27E-02
02:00 PM	AVG. PERCENT SPIKE RECOVERY	=	108.9%
Sample Point			
AN-106 GRAB			

Analyst:	SEH	Date: 29-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
SPIKE.WB1 Rev. 1.0 508101ML		

WORKBOOK PAGE: SAM7

AT : LA-508-101 (D-2)

LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	9	9
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
Test Code	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.245	0.245
Batch Number			
96000675	Blank Concentration in $\mu\text{Ci/L}$	< 4.95E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 4.95E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 4.9453E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000156	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 4.95E-03	DETECTION LEVEL
Analyst	LESS Than Value was Determined from Lc.		
AKL			
Date Complete	RELATIVE COUNTING ERROR	500.0%	1.17E-02 $\mu\text{Ci/mL}$
01/29/96			
Analysis Date			
01/25/96			
Analysis Time			
02:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:

AKL

Date: 29-Jan-96

Signature of Chemist:

SLF

Date: 2/6/96

SAMPLE.WB1 Rev. 1.0

508101ML

AT : LA-508-101 (D-2) LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	12	9
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
Test Code	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE	0.327	0.245
Batch Number			
96000675	Blank Concentration in $\mu\text{Ci/L}$	< 6.62E+00	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 4.95E+00	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 6.6154E+00	
Sample Prep			
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000156	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The\ Square\ Root\ of\ TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 6.62E-03	DETECTION LEVEL
Analyst	LESS THAN Value was Determined from Rmax.		
AKL			
Date Complete	RELATIVE COUNTING ERROR	500.0%	1.17E-02 $\mu\text{Ci/mL}$
01/29/96			
Analysis Date			
01/25/96			
Analysis Time			
02:00 PM			
Sample Point			
AN-106 GRAB			

Analyst:	AKL	Date: 29-Jan-96
Signature of Chemist:	SLF	Date: 2/6/96
SAMPLE.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	14	14
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	65018	64655
5169	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.33	0.33
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	1.000	1.000
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000675	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9209E-02	3.9209E-02
Renin	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2274	0.2274
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	4.38E+01	4.35E+01
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	< 4.9453E-03	
N/A			
Sample #			
S96T000156			
Instrument Code			
WB27807			
Prepared By			
SEH			
Chemist			
SLF			
Analyst			
AKL			
Date Complete			
01/29/96			
Analysis Date			
01/25/96			
Analysis Time			
02:00 PM			
Sample Point			
AN-106 GRAB			

Rs (Sample Count Rate) = (TC / CT) - BKG

SAMPLE + SPIKE $\mu\text{Ci/mL}$ = Rs * DF * DDF / (EFF * SS * 2220000dpm/ μCi)

QC ACTUAL = SVal

QC FOUND = (((S+S $\mu\text{Ci/mL}$ - SAMPLE $\mu\text{Ci/mL}$) * ((SDF/SVol)/(DF*DDF/SS))))

PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100

NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.

QC ACTUAL	=	3.92E-02
QC FOUND	=	4.28E-02
AVG. PERCENT SPIKE RECOVERY	=	109.2%

Analyst:	SEH	Date: 29-Jan-96
Signature of Chemist	SLF	Date: 2/6/96

SPIKE.WB1 Rev. 1.0 508101ML

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DISTRIBUTION SHEET

To Distribution	From Production Planning and Control	Page 1 of 1		
		Date: 02/09/96		
Project Title/Work Order WHC-SD-WM-DP-168, Rev.0, "45-Day Safety Screening Results and Final Report for Tank 241-AN-106, Grab Samples 6AN-95-1 through 6AN-95-9."		EDT NO.: 614777		
		ECN NO.: N/A		
Name	MSIN	Text With all Attach	EDT/ECN ONLY	
<u>Pacific Northwest Laboratory</u>				
J. R. Gormsen	K7-28		X	
S. J. Harris	K7-22	X		
K. L. Silvers	P7-27		X	
<u>U.S. Department of Energy, RL</u>				
C. A. Babel	S7-54	X		
<u>Westinghouse Hanford Company</u>				
J. N. Appel	G3-21		X	
H. Babad	S7-30	X		
R. A. Esch	T6-06	X		
G. D. Forehand	S7-31		X	
V. W. Hall	T6-03	X		
D. C. Hetzer	S6-31		X	
J. E. Hyatt	S3-31	X		
L. Jensen	R2-12	X		
N. W. Kirch	R2-11	X		
M. J. Kupfer	H5-49	X		
J. E. Meacham	S7-15	X		
L. W. Shelton	H5-49	X		
B. C. Simpson	R2-12		X	
L. A. Tusler	R2-11	X		
J. A. Voogd	H5-03		X	
Central Files	A3-88	2		
EDMC	H6-08	X		
LTIC	T6-03		X	
TCRC	R2-12	X		
TFIC (Tank Farm Information Center)	R1-20		X	
<u>Washington State Department of Ecology</u>				
Single-Shell Tank Unit Manager				
A. B. Stone	B5-18	X		
<u>U. S. Department of Energy</u>				
Jim Poppiti			X	
12800 Middlebrook Rd.				
Trevion II, EM-36				
Germantown, MD 20874				
<u>Los Alamos Technical Associates</u>				
T. T. Tran	B1-44	X		