0057663 CH0002

CANBERRA

From: Michael G. Cantaloub, NDA Scientist, Canberra Hanford
To: Joan Kessner, Bechtel 233-S STR
Via: Bruce Gillespie, Canberra Hanford Project Manager
Date: 02APRIL02

SUBJ: SPREADSHEET UPDATE FOR DATA SUBMITTAL CH002

This letter addresses the change in the 233-S Item Analysis Spreadsheets Version 3.0b.

Batch data submittals CH002 (1000-122001-0001) and CH003 (1000-0100802-0001) contained data for 55-gallon drums assayed using the ISOCS system. The data was reduced and final results reported using the validated 233-S NDA data analysis spreadsheet, Version 3.0. Shortly after CH003 submittal, the NDA data analysis spreadsheet was updated and Version 3.0b released. The Version 3.0b spreadsheet contains a Pu (g) + 3 sigma TMU and Pu(g) + 3 sigma calculation. The "3 sigma TMU' calculation includes all uncertainty estimates whereas the "3 sigma" calculation only considers the measurement uncertainty or counting statistics. Individual item data originally showing under the Pu (g) + 3 sigma heading of the Version 3.0 spreadsheet now shows up under the Pu (g) + 3 sigma TMU heading in the Version 3.0b spreadsheet.

To keep the final NDA batch reports in uniform appearance and assure the same information is available in each batch report, the individual drum assay data in CH002 and CH003 have been 'brought forward' into the Version 3.0b spreadsheet.

Attached to this letter are NDA analysis results using the 3.0b spreadsheet for Batch Data submittal CH002. In addition to the individual printouts, a results summary table has been provided. The individual item calibrations and raw data printouts are contained in the original submittals. The final characterization results have not changed nor has the final waste classification been altered as a result of bringing the data forward into the latest NDA data analysis spreadsheet.

The attached pages were replaced by me per lab direction. NACuttlee 4/9/02
Excluding Page 2 which replaces section 4 Summary results.

RECEIVED JUN 13 2002 EDMC

RECEIVED APR 2002

Canberra Industries, Inc.
1050 Gillmore, Suite A
Richland, Washington 99352
Tel. 509-943-3442 Fax 509-943-0363

COGEMA GROUP

CANBERRA

Summary of package assay results for Data Batch Report CH002 - Revised

Package or Item ID	Assay Weight (kg)	TRU Act (nCi/g)	TRU TMU Uncert (nCi/g)	Pu Mass (g)	Pu Mass(g) + 3 sigma
233S-01-0002	96.5	3.70E+04	± 3.13E+04	2.51E+01	3.10E+01
233S-01-0003	124.5	3.35E+02	± 2.96E+02	2.87E-01	3.64E-01
233S-01-0005	110.8	9.66E+02	± 1.01E+03	6.83E-01	8.57E-01
233S-01-0006	53.8	2.34E+02	± 5.94E+01	9.67E-02	1.26E-01
233S-01-0008	126.2	3.51E+03	± 3.41E+03	2.93E+00	3.63E+00
233S-01-0010	65.5	9.13E+02	± 5.41E+02	4.73E-01	5.93E-01
233S-01-0011	68	2.53E+03	± 1.21E+03	9.71E-01	1.21E+00
233S-01-0014	90	1.72E+03	± 8.26E+02	1.29E+00	1.60E+00
233S-01-0021	106.9	2.73E+03	± 2.31E+03	2.05E+00	2.54E+00
233S-01-0023	99.4	2.32E+03	± 2.88E+03	1.33E+00	1.65E+00
233S-01-0023	REPLICATE	2.41E+03	± 3.11E+03	1.34E+00	1.67E+00
233S-01-0024	161.4	2.32E+03	± 1.22E+03	3.04E+00	3.76E+00
233S-01-0025	138.9	4.28E+02	± 9.36E+02	4.52E-01	5.68E-01
233S-01-0026	123.5	9.12E+02	± 9.31E+02	7.26E-01	9.06E-01
233S-01-0027	98.3	5.59E+02	± 5.42E+02	3.74E-01	5.65E-01

Canberra Industries, Inc.
1050 Gillmore, Suite A
Richland, Washington 99352
Tel. 509-943-3442 Fax 509-943-0363

COGEMA GROUP

233-S Item Analysis Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0002	**Assay Date:**	12-Nov-01
File Name:	950	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.40E+04	1.10E+03		
Am-241	1.01E+04	3.98E+02		
Np-237	4.96E+00	2.38E-01		
U-238				
U-235				
Cs-137	1.63E-02	1.22E-03		
Co-60				

Item Parameters:

Contamination:	Internal	Item Type:	Barrel	Calcs:	Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	212.2	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.01E+04	+/-	3.04E+04	Use Meas
Calculated	1.94E+04	+/-	2.09E+04	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	5.67E+03	+/-	2.38E+03
Pu-239	1.40E+04	+/-	5.87E+03
Pu-240	7.28E+03	+/-	3.06E+03
Pu-241	2.72E+04	+/-	1.14E+04
Pu-242	7.36E+00	+/-	3.09E+00
Am-241	1.01E+04	+/-	3.04E+04
Np-237	4.96E+00	+/-	2.06E+00
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.63E-02	+/-	6.83E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	3.70E+04	+/-	3.13E+04	Calc from Pu-239 Act
Pu (g):	2.51E+01	**Pu (g) + 3 sigma:**	5.68E+01	

Comments:

Weight is net. Gross wt. - Tare wt.

Errors:

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0003	**Assay Date:**	7-Nov-01
File Name:	940	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.24E+02	1.11E+01		
Am-241	9.57E+01	8.73E+00		
Np-237	1.93E-02	1.00E-03		
U-238				
U-235				
Cs-137	5.86E-04	5.86E-05		
Co-60				

Item Parameters:

Contamination: Internal | Item Type: Barrel | Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	273.9	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	9.57E+01	+/-	2.90E+02	Use Meas
Calculated	1.72E+02	+/-	1.87E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	5.03E+01	+/-	2.12E+01
Pu-239	1.24E+02	+/-	5.24E+01
Pu-240	6.46E+01	+/-	2.73E+01
Pu-241	2.41E+02	+/-	1.02E+02
Pu-242	6.53E-02	+/-	2.76E-02
Am-241	9.57E+01	+/-	2.90E+02
Np-237	1.93E-02	+/-	8.02E-03
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.86E-04	+/-	2.49E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	3.35E+02	+/-	2.96E+02	Calc from Pu-239 Act
Pu (g):	2.87E-01	**Pu (g) + 3 sigma:**	6.52E-01	

Comments:

Weight is Net Wt. 331.8 lbs. - 57.9 lbs.= 273.9

Errors:

Analyst: Martin Winterrose

Date: 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0005	**Assay Date:**	5-Nov-01
File Name:	926	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	3.31E+02	2.82E+01		
Am-241	3.28E+02	2.87E+01		
Np-237	1.94E-01	9.36E-03		
U-238				
U-235				
Cs-137	6.10E-03	7.51E-04		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	243.8	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	3.28E+02	+/-	9.93E+02	Use Meas
Calculated	4.58E+02	+/-	4.97E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	1.34E+02	+/-	5.65E+01
Pu-239	3.31E+02	+/-	1.39E+02
Pu-240	1.72E+02	+/-	7.27E+01
Pu-241	6.44E+02	+/-	2.72E+02
Pu-242	1.74E-01	+/-	7.34E-02
Am-241	3.28E+02	+/-	9.93E+02
Np-237	1.94E-01	+/-	8.05E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	6.10E-03	+/-	2.62E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	9.66E+02	+/-	1.01E+03	Calc from Pu-239 Act
Pu (g):	6.83E-01	**Pu (g) + 3 sigma:**	1.55E+00	

Comments: Net Wt.used. High Np-237 ratio does not affect final results. Errors:High Np-237 ratio,

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0006	**Assay Date:**	1030/01
File Name:	904	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	9.66E+01	9.67E+00		
Am-241	4.83E+01	4.23E+00		
Np-237	4.11E-03	3.22E-04		
U-238				
U-235				
Cs-137	7.08E-04	8.42E-05		
Co-60				

Item Parameters:

Contamination:	Internal	Item Type:	Barrel	Calcs:	Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	118.3	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	4.83E+01	+/-	5.22E+01	Use Meas
Calculated	1.34E+02	+/-	9.06E+01	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	3.91E+01	+/-	9.62E+00
Pu-239	9.66E+01	+/-	2.37E+01
Pu-240	5.03E+01	+/-	1.24E+01
Pu-241	1.88E+02	+/-	4.62E+01
Pu-242	5.08E-02	+/-	1.25E-02
Am-241	4.83E+01	+/-	5.22E+01
Np-237	4.11E-03	+/-	9.74E-04
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	7.08E-04	+/-	1.79E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.34E+02	+/-	5.94E+01	Calc from Pu-239 Act
Pu (g):	9.67E-02	**Pu (g) + 3 sigma:**	1.68E-01	

Comments:

Weight is Net Wt.176.2 lbs. - 57.9 lbs = 118.3

Errors:

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0008	**Assay Date:**	7-Nov-01
File Name:	939	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.25E+03	9.91E+01		
Am-241	1.11E+03	7.05E+01		
Np-237	1.23E-01	6.03E-03		
U-238				
U-235				
Cs-137	5.52E-04	3.09E-04		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	277.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.11E+03	+/-	3.35E+03	Use Meas
Calculated	1.73E+03	+/-	1.87E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	5.06E+02	+/-	2.13E+02
Pu-239	1.25E+03	+/-	5.25E+02
Pu-240	6.50E+02	+/-	2.73E+02
Pu-241	2.43E+03	+/-	1.02E+03
Pu-242	6.57E-01	+/-	2.76E-01
Am-241	1.11E+03	+/-	3.35E+03
Np-237	1.23E-01	+/-	5.11E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.52E-04	+/-	3.84E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	3.51E+03	+/-	3.41E+03	Calc from Pu-239 Act
Pu (g):	2.93E+00	**Pu (g) + 3 sigma:**	6.63E+00	

Comments:

Weight is Net Wt. 335.5 lbs. - 57.9 lbs.

Errors:

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0010	**Assay Date:**	1-Nov-01
File Name:	922	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	3.88E+02	3.29E+01		
Am-241	1.66E+02	3.78E+01		
Np-237	2.03E-01	9.82E-03		
U-238				
U-235				
Cs-137	3.18E-01	1.05E-02		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	144.1	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.66E+02	+/-	5.04E+02	Use Meas
Calculated	5.37E+02	+/-	5.82E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	1.57E+02	+/-	6.62E+01
Pu-239	3.88E+02	+/-	1.63E+02
Pu-240	2.02E+02	+/-	8.52E+01
Pu-241	7.55E+02	+/-	3.18E+02
Pu-242	2.04E-01	+/-	8.60E-02
Am-241	1.66E+02	+/-	5.04E+02
Np-237	2.03E-01	+/-	8.43E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.18E-01	+/-	1.31E-01
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	9.13E+02	+/-	5.41E+02	Calc from Pu-239 Act
Pu (g):	4.73E-01	**Pu (g) + 3 sigma:**	1.07E+00	

Comments: Net Wt. Used. Error condition does not affect the results. Pu values are for the 375Kev peak. Errors:High Np-237 ratio,

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0011	**Assay Date:**	25-Oct-01
File Name:	890	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.64E+02	6.31E+01		
Am-241	1.17E+03	8.39E+01		
Np-237	2.63E-01	1.28E-02		
U-238				
U-235				
Cs-137	5.84E-01	2.02E-02		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	150.1	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.17E+03	+/-	3.54E+03	Calc from Pu-239
Calculated	1.06E+03	+/-	1.15E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	3.10E+02	+/-	1.30E+02
Pu-239	7.64E+02	+/-	3.22E+02
Pu-240	3.98E+02	+/-	1.68E+02
Pu-241	1.49E+03	+/-	6.26E+02
Pu-242	4.02E-01	+/-	1.69E-01
Am-241	1.06E+03	+/-	1.15E+03
Np-237	2.63E-01	+/-	1.09E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.84E-01	+/-	2.42E-01
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.53E+03	+/-	1.21E+03	Calc from Pu-239 Act	
Pu (g):	9.71E-01	**Pu (g) + 3 sigma:**	2.20E+00		

Comments:

Net Wt. Used.

Errors:

Analyst: Martin Winterrose

Date: 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0014	Assay Date:	25-Oct-01
File Name:	889	File Name:	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.67E+02	6.13E+01		
Am-241	2.41E+02	5.92E+01		
Np-237	9.91E-02	4.87E-03		
U-238				
U-235				
Cs-137	1.93E-03	1.57E-04		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	198.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	2.41E+02	+/-	7.31E+02	Use Meas
Calculated	1.06E+03	+/-	1.15E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	3.11E+02	+/-	1.31E+02
Pu-239	7.67E+02	+/-	3.22E+02
Pu-240	4.00E+02	+/-	1.68E+02
Pu-241	1.49E+03	+/-	6.28E+02
Pu-242	4.04E-01	+/-	1.70E-01
Am-241	2.41E+02	+/-	7.31E+02
Np-237	9.91E-02	+/-	4.11E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.93E-03	+/-	8.11E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	1.72E+03	+/-	8.26E+02	Calc from Pu-239 Act	
Pu (g):	1.29E+00	Pu (g) + 3 sigma:	2.92E+00		

Comments:

Net Wt.used.

Errors:

Analyst: Martin Winterrose

Date: 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0023

File Name: 905

Assay Date: 30-Oct-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.15E+02	5.77E+01		
Am-241	9.45E+02	8.37E+01		
Np-237	5.20E-01	2.52E-02		
U-238				
U-235				
Cs-137	1.05E-01	3.58E-03		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 219.85

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	9.45E+02	+/-	2.86E+03	Use Meas
Calculated	9.90E+02	+/-	1.07E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	2.90E+02	+/-	1.22E+02
Pu-239	7.15E+02	+/-	3.01E+02
Pu-240	3.73E+02	+/-	1.57E+02
Pu-241	1.39E+03	+/-	5.86E+02
Pu-242	3.76E-01	+/-	1.58E-01
Am-241	9.45E+02	+/-	2.86E+03
Np-237	5.20E-01	+/-	2.16E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.05E-01	+/-	4.34E-02
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.32E+03	+/-	2.88E+03	Calc from Pu-239 Act
Pu (g):	1.33E+00	**Pu (g) + 3 sigma TMU:**	3.01E+00	
		Pu(g) + 3 sigma:	1.65E+00	

Comments:

Net Wt. Used. Np-237 ratio does not affect final values

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 3/20/02

233-S Item Analysis

Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0023REP	**Assay Date:**	30-Oct-01
File Name:	906	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.21E+02	5.81E+01		
Am-241	1.02E+03	9.03E+01		
Np-237	5.38E-01	2.61E-02		
U-238				
U-235				
Cs-137	1.05E-01	3.55E-03		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	219.85	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.02E+03	+/-	3.09E+03	Use Meas
Calculated	9.98E+02	+/-	1.08E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	2.92E+02	+/-	1.23E+02
Pu-239	7.21E+02	+/-	3.03E+02
Pu-240	3.76E+02	+/-	1.58E+02
Pu-241	1.40E+03	+/-	5.90E+02
Pu-242	3.79E-01	+/-	1.60E-01
Am-241	1.02E+03	+/-	3.09E+03
Np-237	5.38E-01	+/-	2.23E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.05E-01	+/-	4.34E-02
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.41E+03	+/-	3.11E+03	Calc from Pu-239 Act
Pu (g):	1.34E+00	**Pu (g) + 3 sigma:**	3.03E+00	

Comments:

Net Wt. Used. Np-237 ratio does not affect final values

Errors:High Np-237 ratio,

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0024	**Assay Date:**	12-Nov-01
File Name:	948	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.01E+03	8.02E+01		
Am-241	3.68E+02	3.91E+01		
Np-237	6.74E-02	3.31E-03		
U-238				
U-235				
Cs-137	3.11E-03	1.50E-04		
Co-60				

Item Parameters:

Contamination: Internal | Item Type: Barrel | Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	355.12	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	3.68E+02	+/-	3.68E+03	Use Meas
Calculated	1.40E+03	+/-	2.84E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	4.10E+02	+/-	3.32E+02
Pu-239	1.01E+03	+/-	8.19E+02
Pu-240	5.27E+02	+/-	4.27E+02
Pu-241	1.97E+03	+/-	1.60E+03
Pu-242	5.32E-01	+/-	4.31E-01
Am-241	3.68E+02	+/-	3.68E+03
Np-237	6.74E-02	+/-	5.44E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.11E-03	+/-	2.51E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.32E+03	+/-	3.81E+03	Calc from Pu-239 Act
Pu (g):	3.04E+00	**Pu (g) + 3 sigma:**	1.04E+01	

Comments:

Corrected Wt. 1-8-02 MDW

Errors:

Analyst: Martin Winterrose

Date: 1/8/02

233-S Item Analysis

Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0025	**Assay Date:**	13-Nov-01
File Name:	955	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.75E+02	1.50E+01		
Am-241	9.19E+01	2.41E+01		
Np-237	3.89E-03	2.80E-04		
U-238				
U-235				
Cs-137	3.95E-04	1.37E-04		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	305.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	9.19E+01	+/-	9.20E+02	Use Meas
Calculated	2.42E+02	+/-	4.90E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	7.08E+01	+/-	5.74E+01
Pu-239	1.75E+02	+/-	1.42E+02
Pu-240	9.10E+01	+/-	7.38E+01
Pu-241	3.40E+02	+/-	2.76E+02
Pu-242	9.19E-02	+/-	7.45E-02
Am-241	9.19E+01	+/-	9.20E+02
Np-237	3.89E-03	+/-	3.15E-03
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.95E-04	+/-	3.46E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	4.28E+02	+/-	9.36E+02	Calc from Pu-239 Act
Pu (g):	4.52E-01	**Pu (g) + 3 sigma:**	1.55E+00	

Comments:

Net Wt. Used.

Errors:

Analyst: Martin Winterrose **Date:** 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0026	**Assay Date:**	31-Oct-01
File Name:	916	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	3.16E+02	2.60E+01		
Am-241	3.03E+02	3.58E+01		
Np-237	2.03E-01	9.78E-03		
U-238				
U-235				
Cs-137	5.07E-04	1.51E-04		
Co-60				

Item Parameters:

Contamination: Internal | Item Type: Barrel | Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	271.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	3.03E+02	+/-	9.18E+02	Use Meas
Calculated	4.37E+02	+/-	4.74E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	1.28E+02	+/-	5.39E+01
Pu-239	3.16E+02	+/-	1.33E+02
Pu-240	1.65E+02	+/-	6.93E+01
Pu-241	6.15E+02	+/-	2.59E+02
Pu-242	1.66E-01	+/-	7.00E-02
Am-241	3.03E+02	+/-	9.18E+02
Np-237	2.03E-01	+/-	8.43E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.07E-04	+/-	2.58E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	9.12E+02	+/-	9.31E+02	Calc from Pu-239 Act
Pu (g):	7.26E-01	**Pu (g) + 3 sigma:**	1.64E+00	

Comments:

Net Wt. Used. High Np ratio does not affect final results.

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0027	**Assay Date:**	31-Oct-01
File Name:	915	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)	2.04E+02	3.48E+01		
Pu-239 (414)				
Am-241	1.66E+02	1.48E+01		
Np-237	2.66E-01	1.28E-02		
U-238				
U-235				
Cs-137	1.59E-03	1.04E-04		
Co-60				

Item Parameters:

Contamination:	Internal	Item Type:	Barrel	Calcs:	Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	216.35	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.66E+02	+/-	5.02E+02	Use Meas
Calculated	2.82E+02	+/-	5.94E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	8.27E+01	+/-	6.96E+01
Pu-239	2.04E+02	+/-	1.72E+02
Pu-240	1.06E+02	+/-	8.95E+01
Pu-241	3.97E+02	+/-	3.35E+02
Pu-242	1.07E-01	+/-	9.04E-02
Am-241	1.66E+02	+/-	5.02E+02
Np-237	2.66E-01	+/-	1.10E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.59E-03	+/-	6.64E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	5.59E+02	+/-	5.42E+02	Calc from Pu-239 Act
Pu (g):	3.74E-01	**Pu (g) + 3 sigma:**	1.32E+00	

Comments:

Net Wt. Used. Np ratio does not affect final values.Pu-129 Kev value used due to high Np ratio.

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 12/20/01

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

29 mw 12/20/01

Sample Info:

Item ID:	233s-01-0021	**Assay Date:**	~~25~~-Oct-01
File Name:	900	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.03E+03	8.22E+01		
Am-241	7.43E+02	5.91E+01		
Np-237	2.26E-02	1.27E-03		
U-238				
U-235				
Cs-137				
Co-60				

Item Parameters:

Contamination:	Internal	Item Type:	Barrel	Calcs:	Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	235.1	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	7.43E+02	+/-	2.25E+03	Use Meas
Calculated	1.42E+03	+/-	1.54E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	4.17E+02	+/-	1.75E+02
Pu-239	1.03E+03	+/-	4.33E+02
Pu-240	5.36E+02	+/-	2.25E+02
Pu-241	2.00E+03	+/-	8.43E+02
Pu-242	5.42E-01	+/-	2.28E-01
Am-241	7.43E+02	+/-	2.25E+03
Np-237	2.26E-02	+/-	9.40E-03
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	0.00E+00	+/-	0.00E+00
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.73E+03	+/-	2.31E+03	Calc from Pu-239 Act	
Pu (g):	2.05E+00	**Pu (g) + 3 sigma:**	4.63E+00		

Comments:

Net Wt. Used.

Errors:

Analyst: Martin Winterrose

Date: 12/20/01

CANBERRA

January 9, 2002

To: Joan Kessner
Bechtel Hanford

From: Bruce Gillespie
Canberra Hanford

Subject: Corrections to the Drum Batch Report (CH002)

Attached are corrections to the 233S batch report (CH002). The corrections are on pages 3 and 89. The correction is to correct for the weight initially being entered in the wrong units on the spreadsheet for item number 233S-01-0024. This change also affected the results summary on page 3. The corrected pages are attached.

The attached pages were replaced by me per laboratory direction.
Dayes
1/21/02

JAN 2002
RECEIVED

Canberra Industries, Inc.
1050 Gillmore, Suite A
Richland, Washington 99352
Tel. 509-943-3442 Fax 509-943-0363

COGEMA GROUP

1000-010902-0002

the period from Oct 23, 2001 – Nov 17, 2001. All measurements for this period are in control.

A replicate count was performed on drum number 233S-01-0023. The original and replicate results agree within acceptable limits as shown below for the key measurement nuclide Pu-239.

Replicate Analysis	
Pu-239(orig) - Pu-239(rep)	5.5
1.96 * Sqrt(unc(orig)^2+unc(rep)^2)	160.4916

4. Summary of Results

Full data packages for each drum are included as an attachment. The following data is a summary of the total TRU activity results and plutonium gram values for each assay.

Drum ID		Drum Net Weight (kg)		TRU Act nCi/g		TMU Uncert (nCi/g)		Pu Mass (g)	Pu Mass(g) + 3 sigma
233S-01-0002		96.5		3.70E+04	+/-	3.13E+04		2.51E+01	5.68E+01
233S-01-0003		124.5		3.35E+02	+/-	2.96E+02		2.87E-01	6.52E-01
233S-01-0005		110.8		9.66E+02	+/-	1.01E+03		6.83E-01	1.55E+00
233S-01-0006		53.8		2.34E+02	+/-	5.94E+01		9.67E-02	1.68E-01
233S-01-0008		126.2		3.51E+03	+/-	3.41E+03		2.93E+00	6.63E+00
233S-01-0010		65.5		9.13E+02	+/-	5.41E+02		4.73E-01	1.07E+00
233S-01-0011		68		2.53E+03	+/-	1.21E+03		9.71E-01	2.20E+00
233S-01-0014		90		1.72E+03	+/-	8.26E+02		1.29E+00	2.92E+00
233S-01-0021		106.9		2.73E+03	+/-	2.31E+03		2.05E+00	4.63E+00
233S-01-0023		99.4		2.32E+03	+/-	2.88E+03		1.33E+00	3.01E+00
233S-01-0023		Replicate		2.41E+03	+/-	3.11E+03		1.34E+00	3.03E+00
233S-01-0024		161.4		2.32E+03	+/-	1.22E+03		1.39E+00	3.13E+00
233S-01-0025		138.9		4.28E+02	+/-	9.36E+02		4.52E-01	1.55E+00
233S-01-0026		123.5		9.12E+02	+/-	9.31E+02		7.26E-01	1.64E+00
233S-01-0027		98.3		5.59E+02	+/-	5.42E+02		3.74E-01	1.32E+00

233-S Item Analysis

Spreadsheet Version 3.0

12/12/01

Sample Info:

Item ID:	233s-01-0024	**Assay Date:**	12-Nov-01
File Name:	948	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.01E+03	8.02E+01		
Am-241	3.68E+02	3.91E+01		
Np-237	6.74E-02	3.31E-03		
U-238				
U-235				
Cs-137	3.11E-03	1.50E-04		
Co-60				

Item Parameters:

Contamination: Internal | Item Type: Barrel | Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	161.95	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	3.68E+02	+/-	1.11E+03	Use Meas
Calculated	1.40E+03	+/-	1.51E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	4.10E+02	+/-	1.72E+02
Pu-239	1.01E+03	+/-	4.25E+02
Pu-240	5.27E+02	+/-	2.21E+02
Pu-241	1.97E+03	+/-	8.28E+02
Pu-242	5.32E-01	+/-	2.24E-01
Am-241	3.68E+02	+/-	1.11E+03
Np-237	6.74E-02	+/-	2.80E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.11E-03	+/-	1.29E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.32E+03	+/-	1.22E+03	Calc from Pu-239 Act	
Pu (g):	1.39E+00	**Pu (g) + 3 sigma:**	3.13E+00		

Comments:

Net Wt. used

Errors:

Analyst: Martin Winterrose

Date: 12/20/01

CANBERRA

Dec 20, 2001

Joan Kessner
Bechtel Hanford Inc.
3350 George Washington Way
Richland, Wa 99352

Re: 233S Batch Data Report

Enclosed is our first batch report for 55 gallon drums from 233S as promised.

Please pass along so all can enjoy over the holidays

Happy Holidays,

Bruce M. Gillespie

Canberra Industries 800 Research Parkway Meriden, Connecticut 06450 Tel. 203-238-2351 Fax 203-235-1347
A Division of Packard BioScience Company

Batch Data Report
For
233-S ISOCS NDA Assays

Measurement and Analysis by: _____ **Date:** 12/20/01

Data Review by: Barnes M. Gillespie **Date:** 12/20/01

DEC 2001
RECEIVED

1. Introduction

This report covers 55 gallon drums assayed by Canberra Hanford using the In Situ Object Counting System (ISOCS). All measurements were performed in accordance with the "Sampling and Analysis Plan for the 233-S Plutonium Concentration Facility" (DOE/RL-97-87 Rev. 1) and the Canberra Hanford Quality Control Plan and procedures.

Measurements were performed at 233-S from Oct 25, 2001 through Nov 13, 2001.

All measurements in this batch are 55 gallon drums. The batch includes 14 drums and one replicate measurement. All drums are above the 100 nCi/g TRU/LLW sorting criteria.

2. Technical Information

All drums were assayed by performing four assay measurements in 90 degree increments around the drum. The detector was centered vertically on the drum and located at a distance of 24" from the side of the drum. The spectra from the four measurements were summed to provide a single spectrum that provides an average response for the drum.

The ISOCS efficiency calibration was created based on the assumption that the drum was full and had an average density based on the net weight of the drum (waste matrix only) divided by the drum volume (208 liters). Matrix material types were varied somewhat to improve the correlation of results between the low and high energy Pu-239 gamma lines.

Final results are calculated using the Analysis V3a spreadsheet.

Some measurements had Np-237 concentrations that exceeded the warning criteria on the spreadsheet. Most of these were very close to the warning level and were not significant enough to cause interference problems with the Pu-239 results. In some cases the 129 or 375 keV result was used in place of the 414 keV result if it appeared to provide a better result.

It should be noted that in all measurements performed as a part of this batch, the actual total measurement uncertainty should be significantly lower than the reported value since the uncertainty calculation for the Am-241 is based on the 59.5 keV gamma, and these drum assays all have good results for the higher energy Am-241 gammas.

3. Quality Control Results

Daily background and QC check source measurements are performed on the system. Charts for these measurements are on pages 4 - 8 of this report. The control charts cover

the period from Oct 23, 2001 – Nov 17, 2001. All measurements for this period are in control.

A replicate count was performed on drum number 233S-01-0023. The original and replicate results agree within acceptable limits as shown below for the key measurement nuclide Pu-239.

Replicate Analysis	
Pu-239(orig) - Pu-239(rep)	5.5
1.96 * Sqrt(unc(orig)^2+unc(rep)^2)	160.4916

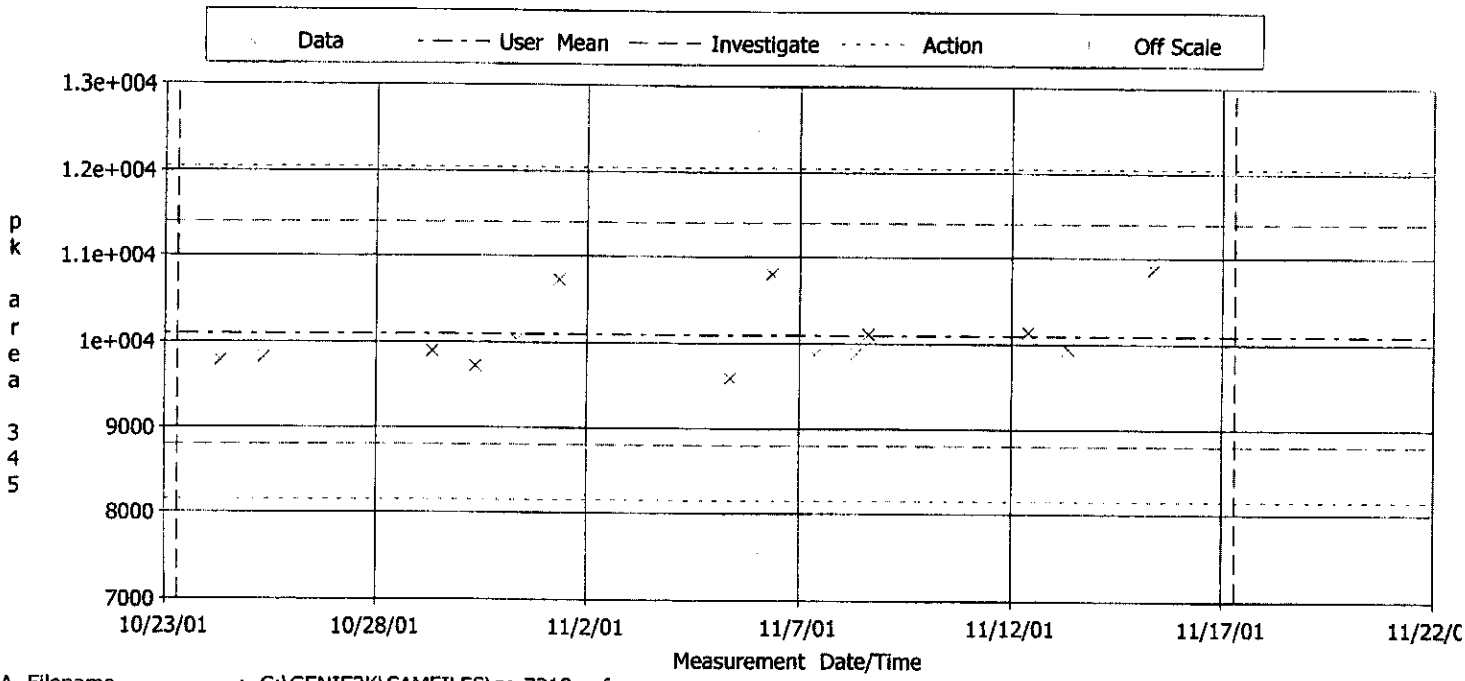
4. Summary of Results

Full data packages for each drum are included as an attachment. The following data is a summary of the total TRU activity results and plutonium gram values for each assay.

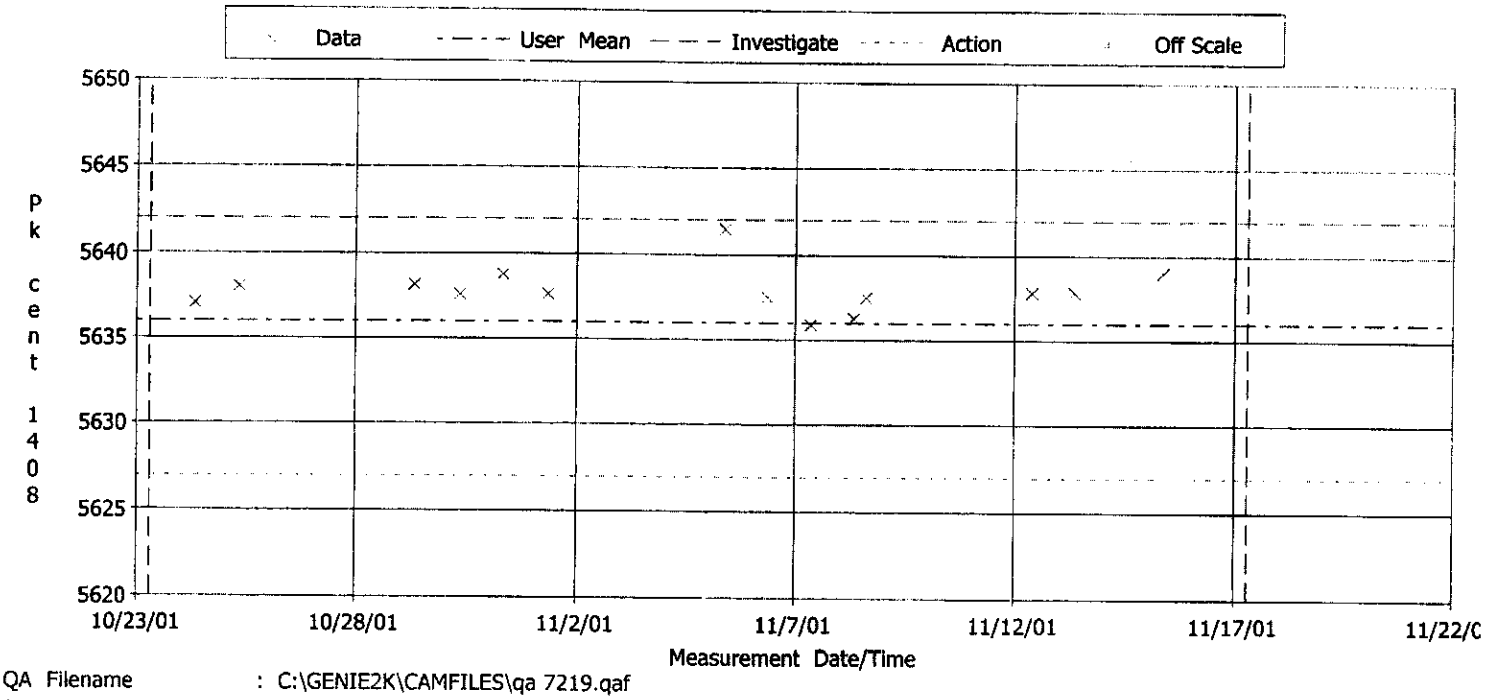
Drum ID		Drum Net Weight (kg)		TRU Act nCi/g		TMU Uncert (nCi/g)		Pu Mass (g)	Pu Mass(g) + 3 sigma
233S-01-0002		96.5		3.70E+04	+/-	3.13E+04		2.51E+01	5.68E+01
233S-01-0003		124.5		3.35E+02	+/-	2.96E+02		2.87E-01	6.52E-01
233S-01-0005		110.8		9.66E+02	+/-	1.01E+03		6.83E-01	1.55E+00
233S-01-0006		53.8		2.34E+02	+/-	5.94E+01		9.67E-02	1.68E-01
233S-01-0008		126.2		3.51E+03	+/-	3.41E+03		2.93E+00	6.63E+00
233S-01-0010		65.5		9.13E+02	+/-	5.41E+02		4.73E-01	1.07E+00
233S-01-0011		68		2.53E+03	+/-	1.21E+03		9.71E-01	2.20E+00
233S-01-0014		90		1.72E+03	+/-	8.26E+02		1.29E+00	2.92E+00
233S-01-0021		106.9		2.73E+03	+/-	2.31E+03		2.05E+00	4.63E+00
233S-01-0023		99.4		2.32E+03	+/-	2.88E+03		1.33E+00	3.01E+00
233S-01-0023		Replicate		2.41E+03	+/-	3.11E+03		1.34E+00	3.03E+00
233S-01-0024		161.4		2.32E+03	+/-	1.22E+03		3.04E+00	1.04E+01
233S-01-0025		138.9		4.28E+02	+/-	9.36E+02		4.52E-01	1.55E+00
233S-01-0026		123.5		9.12E+02	+/-	9.31E+02		7.26E-01	1.64E+00
233S-01-0027		98.3		5.59E+02	+/-	5.42E+02		3.74E-01	1.32E+00

↑ This table is replaced by Memo dated 4/2/02

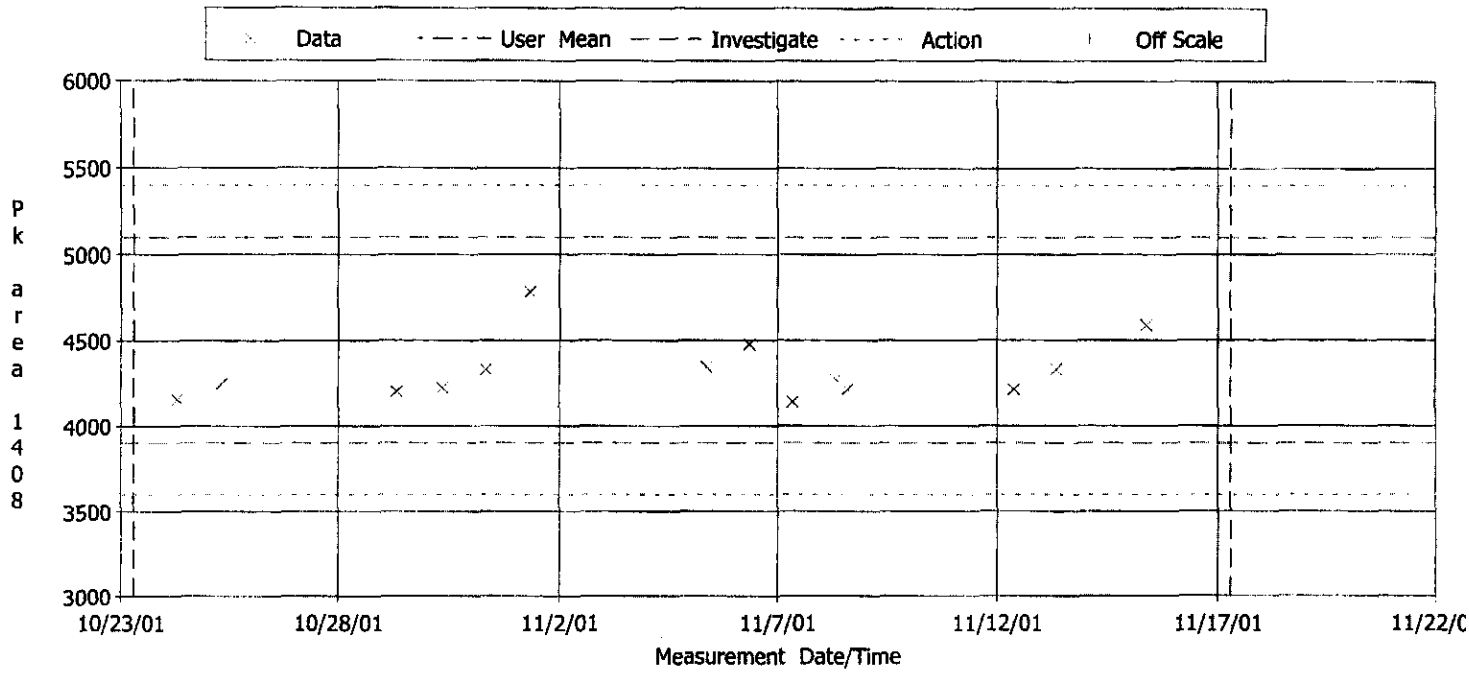
Control Charts



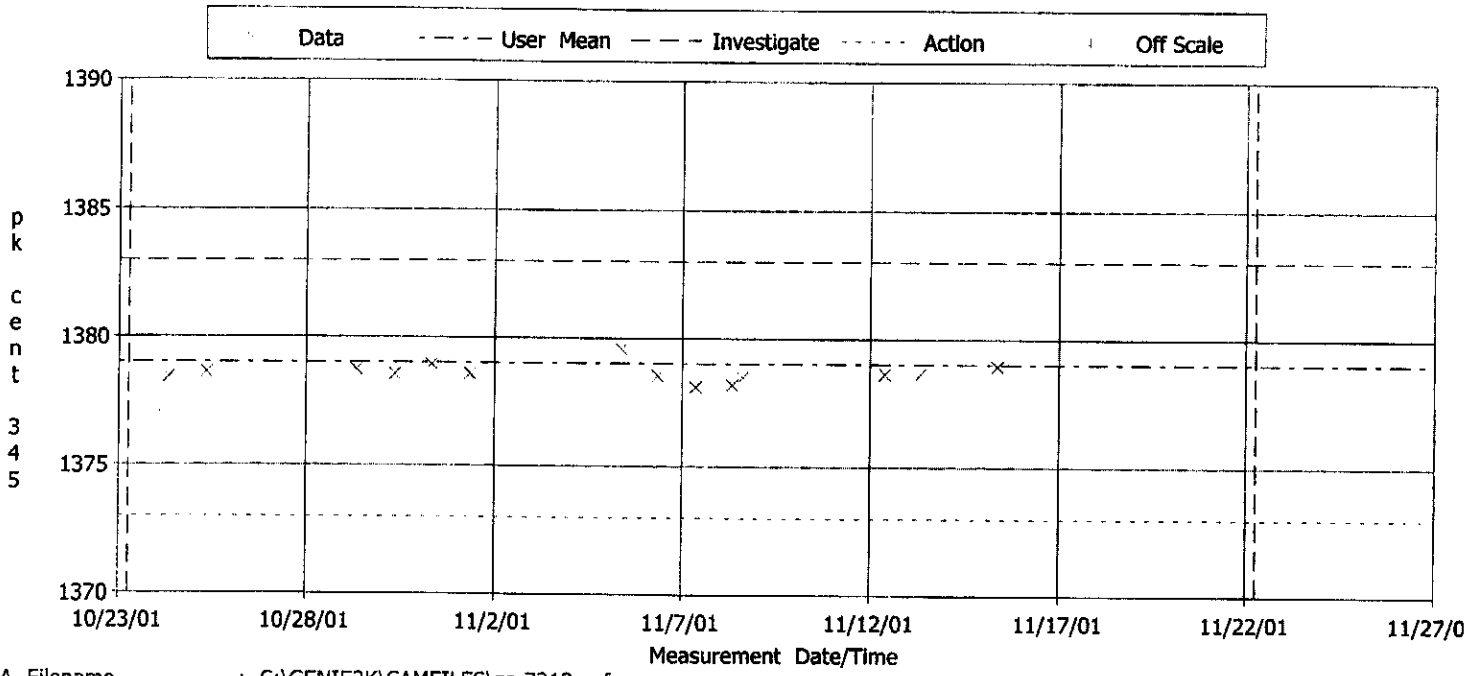
QA Filename : C:\GENIE2K\CAMFILES\qa 7219.qaf
Parameter Description : pk area 345 (counts)
Selection Dates : 10/23/01 7:00:00 AM - 11/17/01 7:00:00 AM
User Mean +/- Std Dev : 10100.000 +/- 6.50e+002



QA Filename : C:\GENIE2K\CAMFILES\qa 7219.qaf
Parameter Description : Pk cent 1408 (ch)
Selection Dates : 10/23/01 7:00:00 AM - 11/17/01 7:00:00 AM
User Mean +/- Std Dev : 5636.000 +/- 3.000



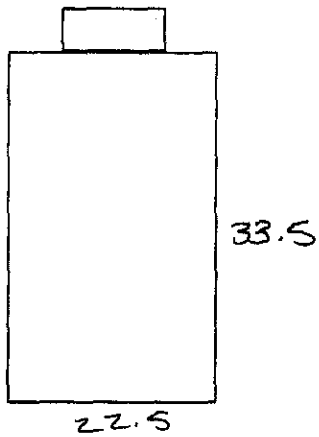
QA Filename : C:\GENIE2K\CAMFILES\qa 7219.qaf
Parameter Description : Pk area 1408 (counts)
Selection Dates : 10/23/01 7:00:00 AM - 11/17/01 7:00:00 AM
User Mean +/- Std Dev : 4500.000 +/- 3.00e+002



QA Filename : C:\GENIE2K\CAMFILES\qa 7219.qaf
Parameter Description : pk cent 345 (ch)
Selection Dates : 10/23/01 6:00:00 AM - 11/22/01 6:00:00 AM
User Mean +/- Std Dev : 1379.000 +/- 2.000

Data Packages

Bldg 233-S
NDA Item Description Sheet
Bottle or Cylinder Geometry
~~Data Packages~~



GROSS 122.77
TARE 26.308
NET 96.46
.41633

Put Dimensions on Bottle

Item ID: 233S-01-0002

Weight (kg): 270.1

Material Description: Samples in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24

Detector Filters: 1 CAD ~~NONE~~ MW 11-12-01

Dose Rate: <.5

Comments: 4 Counts 1800 Gal Total
00950

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0002

File Name: 950

Assay Date: 12-Nov-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.40E+04	1.10E+03		
Am-241	1.01E+04	3.98E+02		
Np-237	4.96E+00	2.38E-01		
U-238				
U-235				
Cs-137	1.63E-02	1.22E-03		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 212.2

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	1.01E+04	+/-	3.04E+04	Use Meas
Calculated	1.94E+04	+/-	2.09E+04	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	5.67E+03	+/-	2.38E+03
Pu-239	1.40E+04	+/-	5.87E+03
Pu-240	7.28E+03	+/-	3.06E+03
Pu-241	2.72E+04	+/-	1.14E+04
Pu-242	7.36E+00	+/-	3.09E+00
Am-241	1.01E+04	+/-	3.04E+04
Np-237	4.96E+00	+/-	2.06E+00
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.63E-02	+/-	6.83E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):		3.70E+04	+/-	3.13E+04	Calc from Pu-239 Act
Pu (g):	2.51E+01	**Pu (g) + 3 sigma TMU:**		5.68E+01	
		Pu(g) + 3 sigma:		3.10E+01	

Comments:

Weight is net. Gross wt. - Tare wt.

Errors:

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 08:56:37 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0002
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.4633    ~3con=1
~2Absor=0.0312    ~2Amater=CADMIUM  ~2Aden=8.642
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 9:00:45 AM

Sample Title : 233s-01-0002 @270
Spectrum Description :
Sample Identification : 0950
Sample Size : 96.5 kg

Sample Taken On : 11/12/01 2:24:00 PM
Acquisition Started : 11/12/01 2:24:18 PM

Live Time: 1800.0 seconds Real Time: 1925.0 seconds

ISOCS Calabration : 233S-01-0002
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.26	59.90	5.28E+005	17876.1	5.51E+004
2	292.03	73.09	3.53E+004	1605.04	5.94E+004
3	301.16	75.37	6.66E+004	2004.24	6.16E+004
4	340.16	85.12	2.38E+004	3256.94	6.91E+004
5	396.14	99.11	1.71E+005	5540.92	7.50E+004
6	413.90	103.55	1.00E+005	4817.48	7.59E+004
7	445.55	111.46	4.73E+004	2232.23	8.17E+004
8	460.01	115.07	2.68E+004	2406.94	8.13E+004
9	502.63	125.72	4.41E+004	2140.04	7.80E+004
10	518.72	129.74	1.39E+005	1055.96	7.67E+004
11	576.61	144.21	6.46E+003	730.11	7.44E+004
12	586.96	146.80	5.88E+003	1204.65	7.41E+004
13	595.79	149.00	2.00E+004	445.38	7.38E+004
14	610.76	152.75	2.94E+003	367.17	7.31E+004
15	644.20	161.10	6.03E+003	623.05	7.12E+004
16	660.18	165.10	6.96E+003	485.42	7.01E+004
17	680.23	170.11	3.54E+003	649.76	7.29E+004
18	718.37	179.64	2.01E+003	224.19	6.90E+004
19	758.41	189.65	2.93E+003	221.14	6.44E+004
20	783.32	195.87	5.93E+003	224.67	6.12E+004
21	815.53	203.92	2.34E+004	402.47	5.68E+004
22	833.50	208.41	1.09E+005	785.73	5.45E+004
23	953.60	238.43	1.77E+003	179.01	4.36E+004
24	974.65	243.69	1.19E+003	179.46	4.48E+004
25	1022.84	255.73	3.48E+003	177.49	4.13E+004
26	1058.54	264.65	1.35E+003	177.65	3.84E+004
27	1071.61	267.92	3.71E+003	196.88	3.72E+004
28	1087.58	271.91	4.53E+003	184.77	3.58E+004
29	1201.86	300.47	9.47E+004	1067.08	2.31E+004
30	1248.91	312.23	5.62E+005	2238.27	1.74E+004
31	1293.00	323.25	3.47E+003	416.11	1.36E+004
32	1332.26	333.06	2.77E+004	330.00	1.22E+004
33	1343.50	335.87	1.43E+004	390.69	1.17E+004

34	1363.39	340.84	6.56E+004	3366.78	1.07E+004
35	1378.45	344.60	1.06E+004	2765.32	9.90E+003
36	1474.36	368.58	8.31E+003	685.23	6.65E+003
37	1501.55	375.37	6.04E+004	1522.27	5.95E+003
38	1502.57	375.63	4.43E+004	7028.73	5.93E+003
39	1521.89	380.45	1.13E+004	1247.60	5.46E+003
40	1533.71	383.41	8.81E+003	947.40	5.17E+003
41	1572.99	393.22	2.15E+004	402.83	4.38E+003
42	1595.34	398.81	1.91E+004	152.32	4.01E+003

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
43	1656.18	414.02	5.94E+004	467.06	2.93E+003
44	1664.41	416.07	2.37E+004	411.02	2.79E+003
45	1691.67	422.88	4.37E+003	153.33	2.27E+003
46	1708.25	427.03	1.21E+003	78.99	1.93E+003
47	1784.71	446.14	3.52E+002	38.96	1.44E+003
48	1807.40	451.81	7.20E+003	104.47	1.37E+003
49	2046.08	511.46	4.60E+002	53.41	8.35E+002
50	2333.54	583.30	4.20E+002	29.71	5.41E+002
51	2391.63	597.82	1.88E+002	24.27	4.87E+002
52	2438.80	609.61	2.31E+002	25.01	4.84E+002
53	2476.88	619.12	1.09E+003	39.66	4.58E+002
54	2563.68	640.82	3.04E+002	40.53	3.72E+002
55	2584.45	646.01	4.29E+002	47.47	3.47E+002
56	2611.97	652.89	7.95E+002	46.75	3.17E+002
57	2647.59	661.79	3.46E+003	234.19	2.76E+002
58	2650.74	662.57	7.23E+003	218.13	2.71E+002
59	2756.12	688.91	4.99E+002	31.62	2.24E+002
60	2889.31	722.20	3.22E+003	80.26	1.88E+002
61	3025.68	756.28	2.11E+002	18.80	1.36E+002
62	3069.15	767.14	1.52E+002	43.95	1.24E+002
63	3484.99	871.07	1.50E+002	15.98	8.57E+001
64	4006.49	1001.40	7.59E+001	12.00	6.32E+001
65	4484.62	1120.90	6.33E+001	11.21	4.32E+001
66	5102.46	1275.30	2.80E+002	18.66	3.80E+001
67	5849.13	1461.91	5.29E+002	23.98	1.72E+001
68	7067.77	1766.47	8.37E+001	10.48	8.11E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.999	661.65*	85.12	1.62946E-002	1.21622E-003
PA-234M	0.995	1001.03*	0.59	5.54242E-002	8.89564E-003
NP-237	0.998	300.17*	6.20	4.77882E+000	2.36740E-001
		312.00*	36.00	4.95662E+000	2.37758E-001
		340.60*	4.20	5.14050E+000	3.55275E-001
		375.45*	0.68	3.04235E+001	1.54484E+000
		415.76*	1.75	4.84179E+000	2.16374E-001
Pu-239	0.993	129.28*	0.01	1.30680E+004	2.19635E+003
		375.00*	0.00	1.30744E+004	1.06072E+003
		413.70*	0.00	1.39852E+004	1.09730E+003
		451.50* @	0.00	1.39397E+004	5.82304E+002
AM-241	0.995	59.54*	35.70	1.37299E+004	1.18581E+003
		125.28*	0.00	7.14139E+003	4.89781E+002
		335.40*	0.00	9.44138E+003	5.10138E+002
		662.42* @	0.00	8.05620E+003	3.50441E+002
		722.70*	0.00	1.00650E+004	3.98453E+002
PU-241	0.959	114.00*	0.02	1.07338E+003	1.12567E+002
		332.60*	0.00	3.12735E+003	1.50915E+002

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.999	1.629459E-002	1.216222E-003
PA-234M	0.995	5.542416E-002	8.895642E-003
NP-237	0.998	4.864962E+000	1.239251E-001
Pu-239 @	0.993	1.280016E+004	3.588330E+002
AM-241 @	0.995	9.267636E+003	2.580182E+002
PU-241	0.959	1.807629E+003	9.023120E+001

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

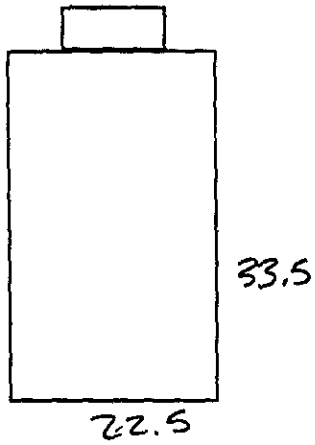
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.8154E-004	2.33E-004	1.3465E-004
		1332.49	100.00	2.3329E-004		-6.8874E-005
	CS-134	475.35	1.46	6.4131E-002	3.82E-004	-7.4872E-002
		563.23	8.38	8.5990E-003		5.8017E-004
		569.32	15.43	4.5817E-003		-1.7209E-003
		604.70	97.60	7.4116E-004		1.3962E-004
		795.84	85.40	3.8244E-004		1.0942E-005
		801.93	8.73	3.7727E-003		-8.9308E-004
		1038.57	1.00	2.8959E-002		1.0093E-002
		1167.94	1.80	1.5699E-002		7.8844E-003
		1365.15	3.04	7.1482E-003		-3.5654E-003
+	CS-137	661.65*	85.12	3.7665E-004	3.77E-004	1.6295E-002
+	NP-237	300.17*	6.20	3.5817E-002	5.45E-003	4.7788E+000
		312.00*	36.00	5.4454E-003		4.9566E+000
		340.60*	4.20	3.7841E-002		5.1405E+000
		375.45*	0.68	1.8225E-001		3.0424E+001
		415.76*	1.75	5.0659E-002		4.8418E+000
+	Pu-239	129.28*	0.01	1.2143E+002	5.99E+001	1.3068E+004
		375.00*	0.00	7.8323E+001		1.3074E+004
		413.70*	0.00	5.9929E+001		1.3985E+004
		451.50*	0.00	3.3927E+002		1.3940E+004
+	AM-241	59.54*	35.70	2.8474E+001	2.85E+001	1.3730E+004
		125.28*	0.00	2.1106E+002		7.1414E+003
		335.40*	0.00	3.3393E+002		9.4414E+003
		662.42*	0.00	8.8362E+001		8.0562E+003
		722.70*	0.00	2.0772E+002		1.0065E+004
+	PU-241	114.00*	0.02	5.3182E+001	5.32E+001	1.0734E+003
		332.60*	0.00	5.8339E+001		3.1274E+003
	CM-243	209.70	3.27	2.0973E-001	3.07E-002	9.7231E+000
		228.18	10.56	4.3595E-002		-1.9098E-002
		277.60	14.00	3.0660E-002		-2.4363E-002

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	1.99E+001 +/- 5.58E-001

Bldg 233-S
NDA Item Description Sheet
Bottle or Cylinder Geometry



Put Dimensions on Bottle

GROSS 150.81
TARE 26.308
WT 124.51
59 gal

Item ID: 2335-01-0003

Weight (kg): 331.8

Material Description: Samples in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24

Detector Filters: None

Dose Rate: 6.5

Comments: 4/Counts Total 1800 Size 0940

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0003

File Name: 940

Assay Date: 7-Nov-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)		
Pu-239 (414)	1.24E+02	1.11E+01
Am-241	9.57E+01	8.73E+00
Np-237	1.93E-02	1.00E-03
U-238		
U-235		
Cs-137	5.86E-04	5.86E-05
Co-60		

Activity (uCi/kg)	Meas Uncert

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Weight (lbs): 273.9

Width (in): 22.5

Depth for TMU (in): 4

Depth (in): 22.5

% Volume: 50

Am-241 Calcs:

Measured	9.57E+01	+/-	2.90E+02	Use Meas
Calculated	1.72E+02	+/-	1.87E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	5.03E+01	+/-	2.12E+01
Pu-239	1.24E+02	+/-	5.24E+01
Pu-240	6.46E+01	+/-	2.73E+01
Pu-241	2.41E+02	+/-	1.02E+02
Pu-242	6.53E-02	+/-	2.76E-02
Am-241	9.57E+01	+/-	2.90E+02
Np-237	1.93E-02	+/-	8.02E-03
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.86E-04	+/-	2.49E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	3.35E+02	+/-	2.96E+02	Calc from Pu-239 Act
Pu (g):	2.87E-01	**Pu (g) + 3 sigma TMU:**	6.52E-01	
		Pu(g) + 3 sigma:	3.64E-01	

Comments:

Weight is Net Wt. 331.8 lbs. - 57.9 lbs.= 273.9

Errors:

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 09:12:22 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0003
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.598     ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 9:13:49 AM

Sample Title : 233s-01-0003 @270
Spectrum Description :
Sample Identification : 0940
Sample Size : 124.5 kg

Sample Taken On : 11/07/01 2:39:00 PM
Acquisition Started : 11/07/01 2:40:01 PM

Live Time: 1800.0 seconds Real Time: 1820.3 seconds

ISOCS Calabration : 233S-01-0003
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.26	59.90	4.97E+005	18281.0	7.26E+003
2	340.53	85.21	1.11E+003	80.54	4.25E+003
3	348.82	87.28	3.89E+002	84.24	4.24E+003
4	379.70	95.00	1.16E+003	76.08	4.18E+003
5	396.08	99.09	4.21E+003	147.36	4.13E+003
6	413.68	103.49	2.08E+003	127.97	4.04E+003
7	445.39	111.42	8.26E+002	69.41	4.13E+003
8	460.82	115.27	4.81E+002	71.60	4.01E+003
9	502.82	125.77	6.44E+002	59.97	3.64E+003
10	518.82	129.77	2.53E+003	74.61	3.47E+003
11	815.82	203.99	3.13E+002	32.15	9.12E+002
12	833.59	208.43	9.01E+002	40.34	8.43E+002
13	1201.83	300.47	4.45E+002	28.87	3.77E+002
14	1248.85	312.22	2.67E+003	55.07	3.19E+002
15	1332.43	333.10	3.07E+002	24.09	2.82E+002
16	1343.68	335.91	1.28E+002	20.63	2.75E+002
17	1363.66	340.91	3.28E+002	38.42	2.63E+002
18	1379.34	344.83	2.23E+002	39.96	2.47E+002
19	1409.33	352.32	1.19E+002	17.08	2.14E+002
20	1501.65	375.40	7.49E+002	31.71	1.94E+002
21	1522.43	380.59	1.28E+002	17.99	1.84E+002
22	1532.28	383.05	1.17E+002	17.13	1.82E+002
23	1572.68	393.15	2.47E+002	20.21	1.65E+002
24	1656.17	414.01	6.52E+002	28.39	1.25E+002
25	1664.41	416.07	1.10E+002	15.92	1.23E+002
26	1807.06	451.72	7.98E+001	13.11	9.80E+001
27	2045.11	511.22	1.27E+002	14.82	8.25E+001
28	2334.57	583.56	7.11E+001	12.29	6.20E+001
29	2438.56	609.55	1.40E+002	14.61	5.85E+001
30	2649.05	662.15	1.50E+002	14.22	4.18E+001
31	3646.67	911.48	7.98E+001	11.05	3.26E+001
32	5848.96	1461.87	5.74E+002	24.67	8.42E+000
33	7066.17	1766.07	4.84E+001	7.98	3.32E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.990	661.65*	85.12	5.86931E-004	5.86999E-005
NP-237	0.998	300.17*	6.20	1.84608E-002	1.49161E-003
		312.00*	36.00	1.93091E-002	1.00519E-003
		340.60*	4.20	2.09127E-002	2.63722E-003
		375.45*	0.68	3.06220E-001	1.87090E-002
		415.76*	1.75	1.81217E-002	2.72940E-003
Pu-239	0.992	129.28*	0.01	1.27379E+002	2.17130E+001
		375.00*	0.00	1.31597E+002	1.15748E+001
		413.70*	0.00	1.24011E+002	1.10855E+001
		451.50* @	0.00	1.25095E+002	2.11184E+001
AM-241	0.995	59.54*	35.70	9.56752E+001	8.37864E+000
		125.28*	0.00	5.24802E+001	5.50626E+000
		335.40*	0.00	6.91366E+001	1.15765E+001
		662.42* @	0.00	1.38777E+002	1.38742E+001
		722.70	0.00		
PU-241	0.943	114.00*	0.02	7.84692E+000	1.24334E+000
		332.60*	0.00	2.82659E+001	2.58034E+000

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.990	3.077806E-004	6.140218E-005
NP-237	0.998	1.912185E-002	7.626670E-004
Pu-239 @	0.992	1.250979E+002	4.313355E+000
AM-241 @	0.995	6.600361E+001	4.276113E+000
PU-241	0.943	1.169446E+001	1.120087E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	1.9303E-004	1.71E-004	-8.7888E-005
		1332.49	100.00	1.7055E-004		3.3052E-005
	CS-134	475.35	1.46	1.6188E-002	2.37E-004	-2.1998E-004
		563.23	8.38	2.6563E-003		-3.6260E-004
		569.32	15.43	1.4832E-003		5.6146E-004
		604.70	97.60	2.8656E-004		6.1334E-005
		795.84	85.40	2.3746E-004		2.4499E-004
		801.93	8.73	2.3355E-003		1.2861E-005
		1038.57	1.00	1.9763E-002		1.8909E-003
		1167.94	1.80	1.0346E-002		-9.5630E-004
		1365.15	3.04	4.9219E-003		-3.7399E-004
+	CS-137	661.65*	85.12	1.2847E-004	1.28E-004	5.8693E-004
+	NP-237	300.17*	6.20	3.8558E-003	6.20E-004	1.8461E-002
		312.00*	36.00	6.2024E-004		1.9309E-002
		340.60*	4.20	4.9927E-003		2.0913E-002
		375.45*	0.68	2.7613E-002		3.0622E-001
		415.76*	1.75	8.9426E-003		1.8122E-002
+	Pu-239	129.28*	0.01	1.3931E+001	1.04E+001	1.2738E+002
		375.00*	0.00	1.1866E+001		1.3160E+002
		413.70*	0.00	1.0396E+001		1.2401E+002
		451.50*	0.00	7.6392E+001		1.2510E+002
+	AM-241	59.54*	35.70	7.6899E-002	7.69E-002	9.5675E+001
		125.28*	0.00	2.3080E+001		5.2480E+001
		335.40*	0.00	4.3057E+001		6.9137E+001
		662.42*	0.00	3.0376E+001		1.3878E+002
		722.70	0.00	1.8102E+002		2.2889E+002
+	PU-241	114.00*	0.02	4.8535E+000	4.85E+000	7.8469E+000
		332.60*	0.00	7.4292E+000		2.8266E+001
	CM-243	209.70	3.27	1.9013E-002	2.99E-003	5.1726E-002
		228.18	10.56	4.5372E-003		1.4038E-005
		277.60	14.00	2.9870E-003		2.2170E-003

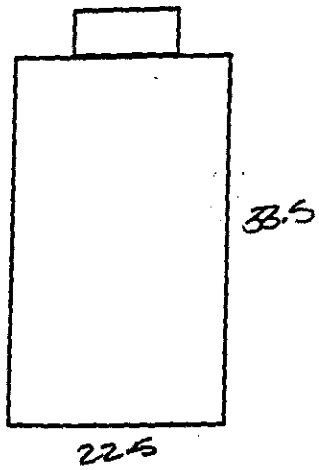
+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide		Mass (g)
Pu-239	2.51E-001 +/-	8.66E-003

Bldg 233s
NDA Item Description Sheet
Bottle Geometry

11-6-01



Put Dimensions on Bottle

GROSS 137.136
TARE 26.308
NET 110.82
.5323

Item ID: 2335-01-0005

Weight (kg): 301.70

Material Description: Samples in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24

Detector Filters: None

Dose Rate: <.5

Comments: 4 measurements Combined for a total of 1800 gal 0926

1000-122001-0001

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0005

File Name: 926

Assay Date: 5-Nov-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	3.31E+02	2.82E+01		
Am-241	3.28E+02	2.87E+01		
Np-237	1.94E-01	9.36E-03		
U-238				
U-235				
Cs-137	6.10E-03	7.51E-04		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 243.8

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	3.28E+02	+/-	9.93E+02	Use Meas
Calculated	4.58E+02	+/-	4.97E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	1.34E+02	+/-	5.65E+01
Pu-239	3.31E+02	+/-	1.39E+02
Pu-240	1.72E+02	+/-	7.27E+01
Pu-241	6.44E+02	+/-	2.72E+02
Pu-242	1.74E-01	+/-	7.34E-02
Am-241	3.28E+02	+/-	9.93E+02
Np-237	1.94E-01	+/-	8.05E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	6.10E-03	+/-	2.62E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	9.66E+02	+/-	1.01E+03	Calc from Pu-239 Act
Pu (g):	6.83E-01	**Pu (g) + 3 sigma TMU:**	1.55E+00	
		Pu(g) + 3 sigma:	8.57E-01	

Comments:

Net Wt.used. High Np-237 ratio does not affect final results.

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 09:26:23 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0005
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760        ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.5323    ~3con=1
~sd1=24
```

CANBERRA ISOCS ANALYSIS

Report Generated On : 12/20/01 9:28:59 AM

Sample Title : 233s-01-0005 @ 270
Spectrum Description :
Sample Identification : 0926
Sample Size : 110.8 kg

Sample Taken On : 11/05/01 10:00:00 AM
Acquisition Started : 11/05/01 10:00:52 AM

Live Time: 1800.0 seconds Real Time: 1869.8 seconds

ISOCS Calabration : 233S-01-0005
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

PEAK ANALYSIS REPORT

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.39	59.93	1.71E+006	61880.5	3.01E+004
2	292.21	73.13	3.53E+003	164.89	1.33E+004
3	301.32	75.41	7.02E+003	208.22	1.32E+004
4	340.52	85.21	2.58E+003	507.05	1.26E+004
5	380.02	95.08	4.20E+003	187.14	1.17E+004
6	396.37	99.17	1.60E+004	498.06	1.14E+004
7	413.93	103.55	8.57E+003	331.32	1.10E+004
8	445.90	111.54	2.89E+003	151.99	1.11E+004
9	460.27	115.14	1.52E+003	131.33	1.07E+004
10	476.54	119.20	5.28E+002	136.21	1.03E+004
11	503.06	125.83	2.71E+003	166.81	9.51E+003
12	518.99	129.81	5.86E+003	116.00	8.98E+003
13	577.26	144.37	3.50E+002	80.34	7.93E+003
14	834.17	208.58	3.60E+003	79.33	4.88E+003
15	1202.64	300.67	4.53E+003	84.21	2.49E+003
16	1249.70	312.43	2.60E+004	169.80	2.14E+003
17	1333.14	333.28	8.98E+002	49.62	1.85E+003
18	1344.36	336.08	5.05E+002	48.54	1.81E+003
19	1364.20	341.04	2.90E+003	95.37	1.73E+003
20	1378.95	344.73	3.10E+002	79.21	1.66E+003
21	1476.17	369.03	2.22E+002	43.34	1.44E+003
22	1503.02	375.74	2.19E+003	62.33	1.40E+003
23	1523.63	380.89	3.10E+002	44.89	1.35E+003
24	1534.24	383.54	3.11E+002	38.07	1.33E+003
25	1573.71	393.41	5.70E+002	40.15	1.28E+003
26	1596.45	399.09	8.68E+002	44.24	1.25E+003
27	1657.20	414.27	1.68E+003	56.84	1.24E+003
28	1665.45	416.33	1.15E+003	52.10	1.24E+003
29	1809.18	452.25	1.68E+002	33.53	1.14E+003
30	2646.83	661.60	1.49E+003	177.62	1.64E+002
31	2649.91	662.37	2.36E+004	250.32	1.60E+002
32	2890.96	722.61	1.40E+002	14.80	5.67E+001
33	5853.16	1462.92	5.50E+002	24.09	5.03E+000

34	7071.81	1767.48	4.47E+001	8.18	8.48E-001

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	1.000	661.65*	85.12	6.09676E-003	7.51865E-004
NP-237	0.992	300.17*	6.20	1.93398E-001	9.99811E-003
		312.00*	36.00	1.94130E-001	9.36409E-003
		340.60*	4.20	1.90959E-001	1.08495E-002
		375.45*	0.68	9.26453E-001	4.85771E-002
		415.76*	1.75	1.95675E-001	1.20076E-002
Pu-239	0.987	129.28*	0.01	2.98818E+002	5.05166E+001
		375.00*	0.00	3.98140E+002	3.27175E+001
		413.70*	0.00	3.30976E+002	2.81598E+001
		451.50* @	0.00	2.73359E+002	5.55489E+001
AM-241	0.994	59.54*	35.70	3.28483E+002	2.86837E+001
		125.28*	0.00	2.23544E+002	1.75081E+001
		335.40*	0.00	2.81154E+002	3.00142E+001
		662.42* @	0.00	2.28119E+004	7.55031E+002
		722.70*	0.00	3.84728E+002	4.23962E+001
PU-241	0.953	114.00*	0.02	2.52199E+001	2.56961E+000
		332.60*	0.00	8.52749E+001	6.17230E+000

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	1.000	6.096758E-003	7.518648E-004
NP-237	0.992	1.935433E-001	5.187192E-003
Pu-239 @	0.987	3.130111E+002	1.008289E+001
AM-241 @	0.994	2.693067E+002	1.275764E+001
PU-241	0.953	3.409092E+001	2.372244E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

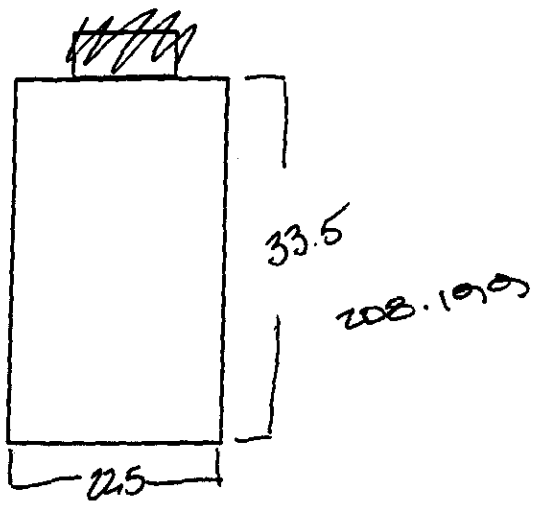
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.1794E-004	1.77E-004	-3.0510E-005
		1332.49	100.00	1.7691E-004		-7.2066E-005
	CS-134	475.35	1.46	5.4821E-002	2.36E-004	5.2559E-002
		563.23	8.38	6.6036E-003		-2.8523E-003
		569.32	15.43	3.5611E-003		6.1266E-004
		604.70	97.60	5.5141E-004		-1.1865E-004
		795.84	85.40	2.3579E-004		-2.0078E-004
		801.93	8.73	2.5616E-003		6.2315E-004
		1038.57	1.00	2.0286E-002		1.7063E-002
		1167.94	1.80	1.2384E-002		4.6722E-003
		1365.15	3.04	5.2136E-003		-1.0398E-003
+	CS-137	661.65*	85.12	2.5480E-004	2.55E-004	6.0968E-003
+	NP-237	300.17*	6.20	1.0037E-002	1.62E-003	1.9340E-001
		312.00*	36.00	1.6237E-003		1.9413E-001
		340.60*	4.20	1.2944E-002		1.9096E-001
		375.45*	0.68	7.4782E-002		9.2645E-001
		415.76*	1.75	2.8465E-002		1.9567E-001
+	Pu-239	129.28*	0.01	2.2633E+001	2.26E+001	2.9882E+002
		375.00*	0.00	3.2137E+001		3.9814E+002
		413.70*	0.00	3.2848E+001		3.3098E+002
		451.50*	0.00	2.5932E+002		2.7336E+002
+	AM-241	59.54*	35.70	1.5571E-001	1.56E-001	3.2848E+002
		125.28*	0.00	3.7676E+001		2.2354E+002
		335.40*	0.00	1.1162E+002		2.8115E+002
		662.42*	0.00	5.9579E+001		2.2812E+004
		722.70*	0.00	1.0383E+002		3.8473E+002
+	PU-241	114.00*	0.02	8.0173E+000	8.02E+000	2.5220E+001
		332.60*	0.00	1.9279E+001		8.5275E+001
	CM-243	209.70	3.27	4.4065E-002	7.85E-003	1.5292E-001
		228.18	10.56	1.1002E-002		-1.8540E-003
		277.60	14.00	7.8473E-003		-1.3374E-002

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	5.60E-001 +/- 1.80E-002

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

GROSS: 80.09
TARE: 26.308
NET: 53.78
.258

Item ID: 2335-01-0006

Weight (kg): 196.2 80.09 kg

Material Description: Samples in Drum

Packaging: Drum

Detector Distance (in): 24"

Detector Filters: None

Dose Rate: <.5

Comments: 4 Counts Combined to Total 1800 Secs 0904

1000-122001-0001

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0006

File Name: 904

Assay Date: 30-Oct-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	9.66E+01	9.67E+00		
Am-241	4.83E+01	4.23E+00		
Np-237	4.11E-03	3.22E-04		
U-238				
U-235				
Cs-137	7.08E-04	8.42E-05		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 118.3

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	4.83E+01	+/-	5.22E+01	Use Meas
Calculated	1.34E+02	+/-	9.06E+01	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	3.91E+01	+/-	9.62E+00
Pu-239	9.66E+01	+/-	2.37E+01
Pu-240	5.03E+01	+/-	1.24E+01
Pu-241	1.88E+02	+/-	4.62E+01
Pu-242	5.08E-02	+/-	1.25E-02
Am-241	4.83E+01	+/-	5.22E+01
Np-237	4.11E-03	+/-	9.74E-04
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	7.08E-04	+/-	1.79E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.34E+02	+/-	5.94E+01	Calc from Pu-239 Act
Pu (g):	9.67E-02	**Pu (g) + 3 sigma TMU:**	1.68E-01	
		Pu(g) + 3 sigma:	1.26E-01	

Comments:

Weight is Net Wt.176.2 lbs. - 57.9 lbs = 118.3

Errors:

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 09:45:08 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0006
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760        ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.258     ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 10:09:55 AM

Sample Title : 233S-01-0006 @ 270
Spectrum Description :
Sample Identification : 0904
Sample Size : 53.8 kg

Sample Taken On : 10/30/01 9:46:00 AM
Acquisition Started : 10/30/01 9:55:28 AM

Live Time: 1800.0 seconds Real Time: 1811.3 seconds

ISOCS Calabration : 233S-01-0006
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.27	59.90	2.42E+005	8941.53	4.58E+003
2	340.40	85.18	1.04E+003	76.35	3.56E+003
3	351.58	87.97	3.57E+002	64.86	3.57E+003
4	395.98	99.07	2.12E+003	100.32	3.53E+003
5	413.66	103.49	9.25E+002	78.48	3.47E+003
6	445.14	111.35	3.32E+002	58.51	3.56E+003
7	460.28	115.14	3.55E+002	57.07	3.47E+003
8	503.16	125.85	2.20E+002	53.07	3.15E+003
9	518.53	129.70	1.55E+003	65.17	3.02E+003
10	833.35	208.37	3.54E+002	29.10	6.27E+002
11	1202.47	300.62	9.55E+001	18.32	2.47E+002
12	1248.90	312.23	4.12E+002	25.54	2.36E+002
13	1333.09	333.27	1.37E+002	18.79	2.22E+002
14	1381.21	345.29	1.10E+002	17.00	2.07E+002
15	1408.81	352.19	1.43E+002	17.12	1.98E+002
16	1501.40	375.33	3.39E+002	23.91	1.57E+002
17	1532.21	383.03	5.42E+001	14.07	1.47E+002
18	1572.85	393.19	1.43E+002	16.59	1.36E+002
19	1656.43	414.08	3.55E+002	22.20	1.24E+002
20	1808.51	452.09	7.84E+001	12.69	9.06E+001
21	2044.81	511.14	1.20E+002	14.28	8.66E+001
22	2334.03	583.42	9.33E+001	12.71	7.65E+001
23	2439.05	609.67	2.24E+002	17.25	6.35E+001
24	2648.46	662.01	1.19E+002	13.65	5.13E+001
25	3646.61	911.46	9.28E+001	11.71	3.60E+001
26	4484.69	1120.91	8.54E+001	11.16	3.15E+001
27	5848.95	1461.87	5.70E+002	24.47	1.00E+001
28	7066.64	1766.19	7.03E+001	9.44	2.61E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.995	661.65*	85.12	7.08471E-004	8.41860E-005
NP-237	0.858	300.17*	6.20	5.43366E-003	1.07503E-003
		312.00*	36.00	4.11217E-003	3.21788E-004
		340.60	4.20		
		375.45*	0.68	1.95870E-001	1.62939E-002
		415.76*	1.75	8.36405E-002	6.27445E-003
Pu-239	0.994	129.28*	0.01	9.29745E+001	1.60954E+001
		375.00*	0.00	8.41745E+001	8.79763E+000
		413.70*	0.00	9.66574E+001	9.67201E+000
		451.50* @	0.00	1.77890E+002	2.96235E+001
AM-241	0.995	59.54*	35.70	4.83170E+001	4.23254E+000
		125.28*	0.00	2.12262E+001	5.23390E+000
		335.40	0.00		
		662.42* @	0.00	1.67514E+002	1.99002E+001
		722.70	0.00		
PU-241	0.953	114.00*	0.02	6.77514E+000	1.15053E+000
		332.60*	0.00	1.75251E+001	2.54239E+000

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.995	5.494246E-004	8.530745E-005
NP-237	0.858	4.219677E-003	3.080480E-004
Pu-239 @	0.994	8.949093E+001	3.818448E+000
AM-241 @	0.995	3.760556E+001	3.291082E+000
PU-241	0.953	8.602433E+000	1.048192E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

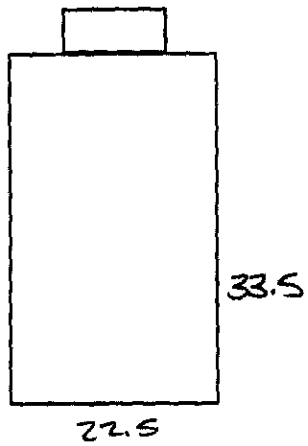
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	3.3212E-004	3.12E-004	7.2233E-005
		1332.49	100.00	3.1169E-004		6.4812E-005
	CS-134	475.35	1.46	2.4266E-002	3.66E-004	1.1922E-002
		563.23	8.38	4.1028E-003		4.3740E-004
		569.32	15.43	2.1859E-003		-1.3150E-003
		604.70	97.60	4.7908E-004		-4.3588E-005
		795.84	85.40	3.6599E-004		6.0958E-005
		801.93	8.73	3.9003E-003		6.4925E-004
		1038.57	1.00	3.2870E-002		1.1486E-002
		1167.94	1.80	1.8174E-002		-9.8090E-003
		1365.15	3.04	8.8894E-003		-7.1408E-003
+	CS-137	661.65*	85.12	2.1420E-004	2.14E-004	7.0847E-004
+	NP-237	300.17*	6.20	4.3153E-003	7.41E-004	5.4337E-003
		312.00*	36.00	7.4061E-004		4.1122E-003
		340.60	4.20	1.1660E-002		1.1340E-002
		375.45*	0.68	3.5266E-002		1.9587E-001
		415.76*	1.75	1.2860E-002		8.3641E-002
+	Pu-239	129.28*	0.01	1.5542E+001	1.49E+001	9.2974E+001
		375.00*	0.00	1.5155E+001		8.4174E+001
		413.70*	0.00	1.4861E+001		9.6657E+001
		451.50*	0.00	1.0665E+002		1.7789E+002
+	AM-241	59.54*	35.70	6.3276E-002	6.33E-002	4.8317E+001
		125.28*	0.00	2.5512E+001		2.1226E+001
		335.40	0.00	1.0255E+002		1.2231E+002
		662.42*	0.00	5.0645E+001		1.6751E+002
		722.70	0.00	2.7300E+002		-1.6031E+000
+	PU-241	114.00*	0.02	5.2851E+000	5.29E+000	6.7751E+000
		332.60*	0.00	9.2241E+000		1.7525E+001
	CM-243	209.70	3.27	1.9540E-002	3.33E-003	1.6045E-002
		228.18	10.56	4.9195E-003		1.8223E-003
		277.60	14.00	3.3275E-003		5.7423E-004

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	7.76E-002 +/- 3.31E-003

Bldg 233-S
NDA Item Description Sheet
Bottle or Cylinder Geometry



GROSS 152.5
TARE 26.302
NET 126.19

Put Dimensions on Bottle

Item ID: 2335-01-0008 1606'

Weight (kg): 335.5

Material Description: Samples in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24

Detector Filters: None

Dose Rate: <.5

Comments: 4 Counts Total 1800 Sec 0939

233-S Item Analysis Spreadsheet Version 3.0b 1/14/02

Sample Info:

Item ID:	233s-01-0008	**Assay Date:**	7-Nov-01
File Name:	939	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.25E+03	9.91E+01		
Am-241	1.11E+03	7.05E+01		
Np-237	1.23E-01	6.03E-03		
U-238				
U-235				
Cs-137	5.52E-04	3.09E-04		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	277.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	1.11E+03	+/-	3.35E+03	Use Meas
Calculated	1.73E+03	+/-	1.87E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	5.06E+02	+/-	2.13E+02
Pu-239	1.25E+03	+/-	5.25E+02
Pu-240	6.50E+02	+/-	2.73E+02
Pu-241	2.43E+03	+/-	1.02E+03
Pu-242	6.57E-01	+/-	2.76E-01
Am-241	1.11E+03	+/-	3.35E+03
Np-237	1.23E-01	+/-	5.11E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.52E-04	+/-	3.84E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	3.51E+03	+/-	3.41E+03	Calc from Pu-239 Act
Pu (g):	2.93E+00	**Pu (g) + 3 sigma TMU:**	6.63E+00	
		Pu(g) + 3 sigma:	3.63E+00	

Comments:

Weight is Net Wt. 335.5 lbs. - 57.9 lbs.

Errors:

Analyst: Martin Winterrose **Date:** 3/20/02

```
#Date & Time: Thu Dec 20 09:47:24 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0008
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.6061    ~3con=1
~1Absor=0.0312    ~1Amater=CADMIUM  ~1Aden=8.642
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 10:12:00 AM

Sample Title : 233s-01-0008 @270
Spectrum Description :
Sample Identification : 0939
Sample Size : 126.2 kg

Sample Taken On : 11/07/01 1:25:00 PM
Acquisition Started : 11/07/01 1:25:52 PM

Live Time: 1800.0 seconds Real Time: 1812.2 seconds

ISOCS Calabration : 233S-01-0008
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.24	59.89	1.04E+005	3875.49	4.48E+003
2	292.84	73.29	3.07E+003	172.68	4.71E+003
3	300.98	75.33	5.63E+003	174.31	4.92E+003
4	340.31	85.16	2.04E+003	133.85	5.75E+003
5	396.33	99.15	1.64E+004	575.92	6.37E+003
6	413.61	103.47	1.17E+004	476.60	6.47E+003
7	445.65	111.48	3.05E+003	190.90	7.03E+003
8	459.17	114.86	2.02E+003	205.56	7.03E+003
9	502.68	125.73	5.14E+003	283.25	6.78E+003
10	518.73	129.75	1.25E+004	247.81	6.67E+003
11	575.79	144.01	3.74E+002	127.31	6.26E+003
12	587.87	147.02	7.64E+002	117.51	6.18E+003
13	595.67	148.97	2.23E+003	124.33	6.12E+003
14	644.36	161.14	6.37E+002	74.35	5.74E+003
15	660.41	165.15	6.66E+002	74.86	5.60E+003
16	679.34	169.88	3.45E+002	81.28	5.77E+003
17	784.35	196.13	5.15E+002	66.76	4.55E+003
18	833.51	208.41	1.14E+004	250.66	3.88E+003
19	1071.37	267.86	2.66E+002	48.48	2.61E+003
20	1201.72	300.44	2.50E+003	90.60	1.96E+003
21	1248.89	312.23	1.51E+004	156.02	1.68E+003
22	1293.59	323.40	4.11E+002	56.08	1.44E+003
23	1332.10	333.02	2.76E+003	89.44	1.35E+003
24	1343.40	335.85	1.63E+003	75.33	1.30E+003
25	1363.40	340.84	1.82E+003	204.29	1.21E+003
26	1380.27	345.06	1.94E+003	244.90	1.14E+003
27	1474.63	368.64	1.01E+003	68.97	8.21E+002
28	1486.83	371.69	1.23E+002	53.21	7.73E+002
29	1501.45	375.35	5.18E+003	220.91	7.23E+002
30	1502.63	375.64	3.59E+003	780.23	7.22E+002
31	1521.89	380.45	1.13E+003	134.09	6.55E+002
32	1533.69	383.40	9.94E+002	93.05	6.05E+002
33	1572.98	393.22	2.02E+003	63.79	5.21E+002

34	1595.67	398.89	5.12E+002	30.90	4.83E+002
35	1656.23	414.03	5.78E+003	82.40	4.00E+002
36	1664.48	416.09	5.79E+002	34.36	3.86E+002
37	1691.57	422.86	4.36E+002	25.29	3.26E+002
38	1707.42	426.82	1.17E+002	19.78	2.75E+002
39	1807.06	451.72	7.72E+002	32.02	2.25E+002
40	2045.24	511.25	2.25E+002	25.59	1.53E+002
41	2333.27	583.23	1.36E+002	15.83	1.16E+002
42	2438.94	609.64	1.23E+002	15.30	1.12E+002

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
43	2476.13	618.94	1.38E+002	15.56	1.07E+002
44	2612.27	652.96	9.15E+001	13.42	8.88E+001
45	2647.64	661.80	1.30E+002	72.76	8.48E+001
46	2650.76	662.58	7.80E+002	74.31	8.42E+001
47	2889.29	722.19	3.95E+002	22.00	6.58E+001
48	5101.86	1275.16	1.42E+002	13.52	2.67E+001
49	5849.00	1461.88	5.42E+002	24.03	9.44E+000
50	7066.58	1766.17	5.54E+001	8.85	4.02E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.999	661.65*	85.12	5.51818E-004	3.08972E-004
NP-237	0.998	300.17*	6.20	1.16401E-001	7.02551E-003
		312.00*	36.00	1.23234E-001	6.02637E-003
		340.60*	4.20	1.31753E-001	1.59708E-002
		375.45*	0.68	2.39989E+000	1.47254E-001
		415.76*	1.75	1.08285E-001	7.82719E-003
Pu-239	0.993	129.28*	0.01	1.04696E+003	1.76999E+002
		375.00*	0.00	1.03135E+003	9.09017E+001
		413.70*	0.00	1.24857E+003	9.90828E+001
		451.50* @	0.00	1.36833E+003	7.80737E+001
AM-241	0.995	59.54*	35.70	2.08817E+003	1.83420E+002
		125.28*	0.00	7.37138E+002	5.40721E+001
		335.40*	0.00	9.90042E+002	6.50791E+001
		662.42* @	0.00	7.82195E+002	7.84387E+001
		722.70*	0.00	1.10857E+003	7.04765E+001
PU-241	0.973	114.00*	0.02	7.14129E+001	8.23696E+000
		332.60*	0.00	2.87324E+002	1.63419E+001

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.999	5.518181E-004	3.089719E-004
NP-237	0.998	1.179134E-001	3.832755E-003
Pu-239 @	0.993	1.101258E+003	3.260468E+001
AM-241 @	0.995	9.529753E+002	3.515404E+001
PU-241	0.973	1.151540E+002	7.355437E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

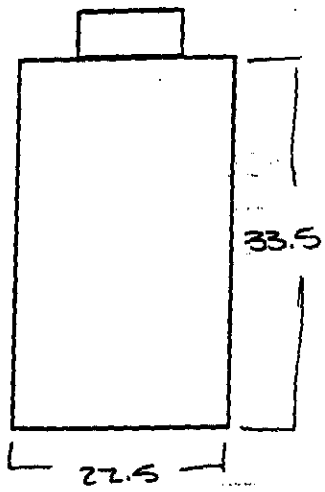
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.0850E-004	1.66E-004	2.4306E-005
		1332.49	100.00	1.6592E-004		-8.1842E-005
	CS-134	475.35	1.46	2.6583E-002	2.84E-004	1.6174E-002
		563.23	8.38	4.0157E-003		3.7399E-003
		569.32	15.43	2.1254E-003		3.6803E-004
		604.70	97.60	3.7214E-004		-7.0218E-005
		795.84	85.40	2.8448E-004		8.3796E-005
		801.93	8.73	2.6825E-003		2.2161E-004
		1038.57	1.00	2.0307E-002		-1.8275E-002
		1167.94	1.80	1.1466E-002		-6.7433E-003
		1365.15	3.04	5.8257E-003		3.5293E-003
+	CS-137	661.65*	85.12	1.9317E-004	1.93E-004	5.5182E-004
+	NP-237	300.17*	6.20	9.7139E-003	1.58E-003	1.1640E-001
		312.00*	36.00	1.5758E-003		1.2323E-001
		340.60*	4.20	1.1908E-002		1.3175E-001
		375.45*	0.68	5.9284E-002		2.3999E+000
		415.76*	1.75	1.7624E-002		1.0828E-001
+	Pu-239	129.28*	0.01	3.2000E+001	2.07E+001	1.0470E+003
		375.00*	0.00	2.5477E+001		1.0313E+003
		413.70*	0.00	2.0680E+001		1.2486E+003
		451.50*	0.00	1.2856E+002		1.3683E+003
+	AM-241	59.54*	35.70	6.3346E+000	6.33E+000	2.0882E+003
		125.28*	0.00	5.5348E+001		7.3714E+002
		335.40*	0.00	1.0392E+002		9.9004E+002
		662.42*	0.00	4.5512E+001		7.8220E+002
		722.70*	0.00	1.1344E+002		1.1086E+003
+	PU-241	114.00*	0.02	1.3881E+001	1.39E+001	7.1413E+001
		332.60*	0.00	1.8083E+001		2.8732E+002
	CM-243	209.70	3.27	5.7336E-002	7.40E-003	5.8725E-001
		228.18	10.56	1.0693E-002		-1.5581E-002
		277.60	14.00	7.3964E-003		-5.6144E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	2.24E+000 +/- 6.64E-002

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

GROSS 91.81
TARE 26.308
NET 65.51
.314

Item ID: 233S-01-0010

Weight (kg): 202

Material Description: SAMPLES IN DRUM

Packaging: 55 DRUM.

Detector Distance (in): 24"

Detector Filters: NONE

Dose Rate: <1.5

Comments: 4 COUNTS FOR TOTAL OF 1800SEC 0922

1000-122001-0001

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0010

File Name: 922

Assay Date: 1-Nov-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	3.88E+02	3.29E+01		
Am-241	1.66E+02	3.78E+01		
Np-237	2.03E-01	9.82E-03		
U-238				
U-235				
Cs-137	3.18E-01	1.05E-02		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 144.1

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	1.66E+02	+/-	5.04E+02	Use Meas
Calculated	5.37E+02	+/-	5.82E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	1.57E+02	+/-	6.62E+01
Pu-239	3.88E+02	+/-	1.63E+02
Pu-240	2.02E+02	+/-	8.52E+01
Pu-241	7.55E+02	+/-	3.18E+02
Pu-242	2.04E-01	+/-	8.60E-02
Am-241	1.66E+02	+/-	5.04E+02
Np-237	2.03E-01	+/-	8.43E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.18E-01	+/-	1.31E-01
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	9.13E+02	+/-	5.41E+02	Calc from Pu-239 Act
Pu (g):	4.73E-01	**Pu (g) + 3 sigma TMU:**	1.07E+00	
		Pu(g) + 3 sigma:	5.93E-01	

Comments:

Net Wt. Used. Error condition does not affect the results.
Pu values are for the 375Kev peak.

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 12:11:38 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0010
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.314     ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 12:13:53 PM

Sample Title : 233s-01-0010 @ 270
Spectrum Description :
Sample Identification : 0922
Sample Size : 65.5 kg

Sample Taken On : 11/01/01 3:19:00 PM
Acquisition Started : 11/01/01 3:19:42 PM

Live Time: 1800.0 seconds Real Time: 1818.1 seconds

ISOCS Calabration : 233S-01-0010
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.28	59.91	1.64E+005	5497.78	7.80E+003
2	292.04	73.09	3.58E+003	188.17	7.86E+003
3	301.16	75.37	6.74E+003	225.85	8.03E+003
4	340.20	85.13	2.42E+003	304.56	8.63E+003
5	379.76	95.01	1.66E+003	134.03	9.01E+003
6	395.80	99.02	5.52E+003	150.06	9.11E+003
7	414.09	103.59	1.76E+003	148.09	9.18E+003
8	445.59	111.47	1.85E+003	121.26	9.88E+003
9	460.14	115.10	9.66E+002	100.21	9.87E+003
10	502.38	125.66	8.64E+002	91.71	9.70E+003
11	518.68	129.73	3.89E+003	124.48	9.60E+003
12	593.58	148.45	2.52E+002	83.89	8.88E+003
13	815.61	203.94	5.51E+002	74.70	6.72E+003
14	833.54	208.42	1.85E+003	86.87	6.51E+003
15	1201.80	300.46	3.75E+003	84.84	3.59E+003
16	1248.95	312.24	2.24E+004	163.76	3.14E+003
17	1332.41	333.10	6.21E+002	54.07	2.93E+003
18	1343.34	335.83	1.77E+002	50.49	2.91E+003
19	1363.38	340.84	2.54E+003	102.05	2.86E+003
20	1378.21	344.54	2.56E+002	82.47	2.80E+003
21	1501.88	375.45	1.73E+003	61.80	2.62E+003
22	1572.60	393.13	3.92E+002	47.18	2.49E+003
23	1595.22	398.78	7.55E+002	50.87	2.47E+003
24	1656.29	414.04	1.25E+003	57.77	2.43E+003
25	1664.56	416.11	9.72E+002	54.96	2.43E+003
26	1807.10	451.73	1.32E+002	44.07	2.29E+003
27	2648.10	661.91	6.03E+004	600.98	1.80E+002
28	2889.75	722.31	4.65E+001	10.50	4.60E+001
29	3648.04	911.82	7.28E+001	10.66	2.81E+001
30	5849.23	1461.94	6.15E+002	25.44	8.40E+000
31	7067.19	1766.33	3.79E+001	7.51	2.42E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.997	661.65*	85.12	3.17826E-001	1.04914E-002
NP-237	0.998	300.17*	6.20	1.94248E-001	1.03518E-002
		312.00*	36.00	2.03170E-001	9.82472E-003
		340.60*	4.20	2.04767E-001	1.25589E-002
		375.45*	0.68	9.02521E-001	5.11607E-002
		415.76*	1.75	2.06154E-001	1.44190E-002
Pu-239	0.993	129.28*	0.01	2.36614E+002	4.04427E+001
		375.00*	0.00	3.87856E+002	3.29494E+001
		413.70*	0.00	3.05658E+002	2.77279E+001
		451.50* @	0.00	2.68608E+002	9.00610E+001
AM-241	0.995	59.54*	35.70	4.08961E+001	3.52858E+000
		125.28*	0.00	8.52269E+001	9.94692E+000
		335.40*	0.00	1.20093E+002	3.47913E+001
		662.42* @	0.00	7.51483E+004	2.47231E+003
		722.70*	0.00	1.66038E+002	3.78185E+001
PU-241	0.957	114.00*	0.02	1.91517E+001	2.24318E+000
		332.60*	0.00	7.20455E+001	7.11936E+000

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.997	3.176256E-001	1.045621E-002
NP-237	0.998	2.022206E-001	5.666050E-003
Pu-239 @	0.993	2.677993E+002	9.800595E+000
AM-241 @	0.995	4.743151E+001	3.297668E+000
PU-241	0.957	2.392858E+001	2.139494E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.8336E-004	2.14E-004	3.5114E-004
		1332.49	100.00	2.1438E-004		-2.0197E-004
	CS-134	475.35	1.46	9.6546E-002	3.30E-004	5.6950E-002
		563.23	8.38	1.0897E-002		6.4417E-003
		569.32	15.43	5.8628E-003		-3.0700E-003
		604.70	97.60	9.4554E-004		1.9544E-004
		795.84	85.40	3.3004E-004		6.1145E-005
		801.93	8.73	3.1831E-003		-5.6533E-004
		1038.57	1.00	2.8549E-002		8.9704E-003
		1167.94	1.80	1.5426E-002		4.6901E-003
		1365.15	3.04	7.5153E-003		2.2347E-003
+	CS-137	661.65*	85.12	3.4320E-004	3.43E-004	3.1783E-001
+	NP-237	300.17*	6.20	1.4602E-002	2.39E-003	1.9425E-001
		312.00*	36.00	2.3903E-003		2.0317E-001
		340.60*	4.20	2.0306E-002		2.0477E-001
		375.45*	0.68	1.2545E-001		9.0252E-001
		415.76*	1.75	4.9175E-002		2.0615E-001
+	Pu-239	129.28*	0.01	2.7896E+001	2.79E+001	2.3661E+002
		375.00*	0.00	5.3912E+001		3.8786E+002
		413.70*	0.00	5.6729E+001		3.0566E+002
		451.50*	0.00	4.5705E+002		2.6861E+002
+	AM-241	59.54*	35.70	1.0346E-001	1.03E-001	4.0896E+001
		125.28*	0.00	4.5481E+001		8.5227E+001
		335.40*	0.00	1.7258E+002		1.2009E+002
		662.42*	0.00	8.1148E+001		7.5148E+004
		722.70*	0.00	1.2229E+002		1.6604E+002
+	PU-241	114.00*	0.02	9.2209E+000	9.22E+000	1.9152E+001
		332.60*	0.00	2.9523E+001		7.2046E+001
	CM-243	209.70	3.27	5.6662E-002	1.12E-002	1.2373E-001
		228.18	10.56	1.5787E-002		1.2023E-002
		277.60	14.00	1.1193E-002		-8.5661E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	2.83E-001 +/- 1.04E-002

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0011

File Name: 890

Assay Date: 25-Oct-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.64E+02	6.31E+01		
Am-241	1.17E+03	8.39E+01		
Np-237	2.63E-01	1.28E-02		
U-238				
U-235				
Cs-137	5.84E-01	2.02E-02		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 150.1

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	1.17E+03	+/-	3.54E+03	Calc from Pu-239
Calculated	1.06E+03	+/-	1.15E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	3.10E+02	+/-	1.30E+02
Pu-239	7.64E+02	+/-	3.22E+02
Pu-240	3.98E+02	+/-	1.68E+02
Pu-241	1.49E+03	+/-	6.26E+02
Pu-242	4.02E-01	+/-	1.69E-01
Am-241	1.06E+03	+/-	1.15E+03
Np-237	2.63E-01	+/-	1.09E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.84E-01	+/-	2.42E-01
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.53E+03	+/-	1.21E+03	Calc from Pu-239 Act
Pu (g):	9.71E-01	**Pu (g) + 3 sigma TMU:**	2.20E+00	
		Pu(g) + 3 sigma:	1.21E+00	

Comments:

Net Wt. Used.

Errors:

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 09:54:05 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0011
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760        ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.3268    ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 10:20:03 AM

Sample Title : 233S-01-0011 @ 270
Spectrum Description :
Sample Identification : 0890
Sample Size : 68.0 kg

Sample Taken On : 10/25/01 2:11:00 PM
Acquisition Started : 10/25/01 2:11:15 PM

Live Time: 1800.0 seconds Real Time: 1873.3 seconds

ISOCS Calabration : 233S-01-0011
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.13	59.87	1.51E+006	62849.2	3.54E+004
2	291.98	73.07	6.54E+003	366.54	2.06E+004
3	301.08	75.35	1.27E+004	442.29	2.06E+004
4	339.90	85.05	4.62E+003	543.17	2.04E+004
5	396.10	99.10	2.07E+004	700.15	1.97E+004
6	413.52	103.45	1.15E+004	377.04	1.94E+004
7	445.47	111.44	4.54E+003	221.63	2.00E+004
8	459.96	115.06	2.16E+003	199.03	1.96E+004
9	502.64	125.72	3.59E+003	170.96	1.84E+004
10	518.68	129.73	9.84E+003	156.95	1.78E+004
11	783.54	195.93	4.67E+002	104.68	1.34E+004
12	815.08	203.81	1.20E+003	107.01	1.27E+004
13	833.52	208.42	5.38E+003	123.96	1.23E+004
14	977.33	244.36	2.20E+002	72.80	1.03E+004
15	1201.87	300.48	5.08E+003	105.42	7.39E+003
16	1248.84	312.21	2.95E+004	261.94	6.77E+003
17	1332.01	333.00	1.58E+003	69.36	6.30E+003
18	1343.15	335.78	9.04E+002	79.92	6.26E+003
19	1363.26	340.81	3.32E+003	128.86	6.12E+003
20	1378.13	344.52	6.02E+002	165.85	5.99E+003
21	1475.66	368.90	4.81E+002	65.74	5.45E+003
22	1501.47	375.35	2.76E+003	160.95	5.39E+003
23	1503.27	375.80	9.40E+002	156.46	5.39E+003
24	1522.42	380.59	6.01E+002	84.94	5.34E+003
25	1532.83	383.19	5.71E+002	57.45	5.31E+003
26	1572.84	393.19	1.01E+003	70.23	5.24E+003
27	1595.49	398.85	8.09E+002	68.36	5.17E+003
28	1656.33	414.05	3.18E+003	86.42	5.08E+003
29	1664.60	416.12	1.26E+003	76.28	5.07E+003
30	1806.73	451.64	3.95E+002	66.51	4.76E+003
31	1824.30	456.03	1.72E+002	65.96	4.64E+003
32	1842.75	460.64	2.46E+002	67.16	4.52E+003
33	1856.25	464.02	2.18E+002	73.72	4.41E+003

34	2648.02	661.90	1.13E+005	1638.44	6.16E+002
35	2667.12	666.67	1.84E+002	36.10	5.09E+002
36	2782.04	695.39	2.38E+002	19.81	1.72E+002
37	2887.77	721.81	3.35E+002	21.70	9.97E+001
38	3646.91	911.54	7.14E+001	11.06	3.54E+001
39	4007.18	1001.57	4.06E+001	8.90	3.40E+001
40	5849.40	1461.98	5.92E+002	30.12	1.07E+001
41	7068.03	1766.54	3.37E+001	7.02	2.18E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.998	661.65*	85.12	5.84759E-001	2.02546E-002
PA-234M	0.988	1001.03*	0.59	3.54291E-002	7.82427E-003
NP-237	0.998	300.17*	6.20	2.59324E-001	1.36187E-002
		312.00*	36.00	2.63315E-001	1.28025E-002
		340.60*	4.20	2.63104E-001	1.59080E-002
		375.45*	0.68	1.41332E+000	1.03261E-001
		415.76*	1.75	2.61537E-001	1.91987E-002
Pu-239	0.993	129.28*	0.01	5.93990E+002	1.00180E+002
		375.00*	0.00	6.07372E+002	5.87042E+001
		413.70*	0.00	7.64166E+002	6.31638E+001
		451.50* @	0.00	7.87680E+002	1.36089E+002
AM-241	0.996	59.54*	35.70	3.80526E+002	3.41206E+001
		125.28*	0.00	3.51606E+002	2.38738E+001
		335.40*	0.00	6.04446E+002	6.04292E+001
		662.42* @	0.00	1.38263E+005	4.77450E+003
		722.70*	0.00	1.16953E+003	8.39420E+001
PU-241	0.960	114.00*	0.02	4.25937E+001	4.55840E+000
		332.60*	0.00	1.80254E+002	1.15636E+001

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.998	5.829790E-001	2.019303E-002
PA-234M	0.988	3.542909E-002	7.824275E-003
NP-237	0.998	2.602843E-001	7.406120E-003
Pu-239 @	0.993	6.230924E+002	2.053432E+001
AM-241 @	0.996	4.209832E+002	1.816913E+001
PU-241	0.960	6.110841E+001	4.240794E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

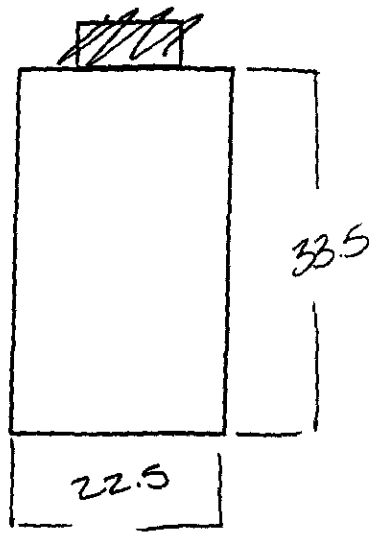
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.9611E-004	2.46E-004	3.6909E-004
		1332.49	100.00	2.4577E-004		3.0182E-005
	CS-134	475.35	1.46	1.3334E-001	3.33E-004	2.0208E-002
		563.23	8.38	1.5719E-002		1.5514E-002
		569.32	15.43	8.4367E-003		-9.3132E-003
		604.70	97.60	1.2985E-003		-1.2614E-003
		795.84	85.40	3.3253E-004		-3.4983E-004
		801.93	8.73	3.4014E-003		4.5470E-004
		1038.57	1.00	2.7231E-002		-2.1793E-003
		1167.94	1.80	1.5142E-002		-3.4770E-003
		1365.15	3.04	7.7963E-003		2.1197E-003
+	CS-137	661.65*	85.12	6.1058E-004	6.11E-004	5.8476E-001
+	NP-237	300.17*	6.20	2.0562E-002	3.44E-003	2.5932E-001
		312.00*	36.00	3.4422E-003		2.6331E-001
		340.60*	4.20	2.9088E-002		2.6310E-001
		375.45*	0.68	1.7624E-001		1.4133E+000
		415.76*	1.75	6.9552E-002		2.6154E-001
+	Pu-239	129.28*	0.01	3.7661E+001	3.77E+001	5.9399E+002
		375.00*	0.00	7.5740E+001		6.0737E+002
		413.70*	0.00	8.0313E+001		7.6417E+002
		451.50*	0.00	6.4546E+002		7.8768E+002
+	AM-241	59.54*	35.70	2.2084E-001	2.21E-001	3.8053E+002
		125.28*	0.00	6.2022E+001		3.5161E+002
		335.40*	0.00	2.4805E+002		6.0445E+002
		662.42*	0.00	1.4437E+002		1.3826E+005
		722.70*	0.00	1.7182E+002		1.1695E+003
+	PU-241	114.00*	0.02	1.2919E+001	1.29E+001	4.2594E+001
		332.60*	0.00	4.2458E+001		1.8025E+002
	CM-243	209.70	3.27	7.8913E-002	1.48E-002	4.9262E-001
		228.18	10.56	2.1040E-002		-1.4280E-002
		277.60	14.00	1.4831E-002		-1.8247E-002

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	6.84E-001 +/- 2.25E-002

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

Item ID: 2335-01-0014

Weight (kg): 256.5

Material Description: Samples in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24'

Detector Filters: 1 Cad

Dose Rate: 1/5

	Kg
GROSS	116.347
TARE	26.308
NET	090.038

Density = .4824

Comments: Four Combined Counts of 450 SEC for a total of 1800 SEC 1@0° 0889
2@90°
3@180°
4@270°

233-S Item Analysis Spreadsheet Version 3.0b 1/14/02

Sample Info:

Item ID:	233s-01-0014	**Assay Date:**	25-Oct-01
File Name:	889	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.67E+02	6.13E+01		
Am-241	2.41E+02	5.92E+01		
Np-237	9.91E-02	4.87E-03		
U-238				
U-235				
Cs-137	1.93E-03	1.57E-04		
Co-60				

Item Parameters:

Contamination:	Internal	Item Type:	Barrel	Calcs:	Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	198.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	2.41E+02	+/-	7.31E+02	Use Meas
Calculated	1.06E+03	+/-	1.15E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	3.11E+02	+/-	1.31E+02
Pu-239	7.67E+02	+/-	3.22E+02
Pu-240	4.00E+02	+/-	1.68E+02
Pu-241	1.49E+03	+/-	6.28E+02
Pu-242	4.04E-01	+/-	1.70E-01
Am-241	2.41E+02	+/-	7.31E+02
Np-237	9.91E-02	+/-	4.11E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.93E-03	+/-	8.11E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	1.72E+03	+/-	8.26E+02	Calc from Pu-239 Act
Pu (g):	1.29E+00	**Pu (g) + 3 sigma TMU:**	2.92E+00	
		Pu(g) + 3 sigma:	1.60E+00	

Comments:

Net Wt.used.

Errors:

Analyst: Martin Winterrose **Date:** 3/20/02

```
#Date & Time: Thu Dec 20 09:57:44 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0014
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.4324    ~3con=1
~2Absor=0.0312    ~2Amater=CADMIUM  ~2Aden=8.642
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 10:28:11 AM

Sample Title : 233S-01-0014 @ 270
Spectrum Description :
Sample Identification : 0889
Sample Size : 90.0 kg

Sample Taken On : 10/25/01 12:54:00 PM
Acquisition Started : 10/25/01 1:04:11 PM

Live Time: 1800.0 seconds Real Time: 1804.8 seconds

ISOCS Calabration : 233S-01-0014
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

	Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
	1	237.82	59.54	5.12E+003	122.08	2.87E+003
M	2	292.51	73.21	1.51E+003	152.93	2.61E+003
m	3	301.09	75.35	2.57E+003	214.43	2.72E+003
	4	340.00	85.08	8.94E+002	116.48	3.86E+003
M	5	396.14	99.11	4.02E+003	268.83	5.30E+003
m	6	414.28	103.64	2.32E+003	159.61	6.06E+003
M	7	445.60	111.47	1.52E+003	65.42	5.91E+003
m	8	461.15	115.35	1.17E+003	63.96	7.75E+003
M	9	502.78	125.76	1.20E+003	76.04	5.21E+003
m	10	518.73	129.75	5.71E+003	258.13	5.23E+003
	11	643.00	160.80	3.71E+002	129.84	4.71E+003
M	12	815.63	203.95	1.01E+003	48.33	2.40E+003
m	13	833.54	208.42	3.01E+003	64.68	2.62E+003
	14	1200.67	300.17	1.62E+003	78.92	1.40E+003
	15	1247.99	312.00	1.10E+004	126.67	1.26E+003
M	16	1332.57	333.14	1.29E+003	78.49	8.10E+002
m	17	1344.40	336.10	4.92E+002	38.43	7.62E+002
m	18	1363.69	340.92	1.33E+003	79.55	7.05E+002
m	19	1381.50	345.37	1.14E+003	70.10	5.81E+002
M	20	1474.89	368.71	3.81E+002	29.19	6.04E+002
m	21	1501.81	375.44	3.45E+003	131.48	5.10E+002
m	22	1522.32	380.56	6.62E+002	38.64	4.21E+002
m	23	1532.60	383.13	5.45E+002	33.52	3.96E+002
M	24	1573.14	393.26	1.10E+003	33.88	4.14E+002
m	25	1595.59	398.87	3.85E+002	22.47	3.58E+002
M	26	1656.84	414.18	3.18E+003	53.61	3.38E+002
m	27	1691.81	422.92	2.28E+002	17.71	2.53E+002
	28	1806.17	451.50	3.40E+002	29.78	1.62E+002
	29	2045.00	511.19	2.21E+002	29.15	1.47E+002
	30	2335.00	583.66	9.32E+001	23.60	1.15E+002
	31	2438.00	609.41	1.21E+002	22.40	9.53E+001
	32	2650.12	662.42	3.97E+002	29.77	1.19E+002
	33	2891.32	722.70	7.45E+001	18.17	7.05E+001

34	3647.00	911.56	4.13E+001	16.64	6.27E+001
35	7066.00	1766.03	3.16E+001	9.56	1.54E+001

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.977	661.65*	85.12	1.93166E-003	1.57048E-004
NP-237	1.000	300.17*	6.20	8.35713E-002	5.73022E-003
		312.00*	36.00	9.90642E-002	4.87255E-003
		340.60*	4.20	1.06814E-001	8.07823E-003
Pu-239	0.992	129.28*	0.01	5.42433E+002	9.43222E+001
		375.00*	0.00	7.66040E+002	6.58987E+001
		413.70*	0.00	7.67965E+002	6.13322E+001
		451.50* @	0.00	6.77907E+002	6.49890E+001
AM-241	1.000	59.54*	35.70	1.49136E+002	1.23848E+001
		125.28*	0.00	1.96517E+002	1.56536E+001
		335.40*	0.00	3.33076E+002	3.02936E+001
		662.42* @	0.00	4.56729E+002	3.71127E+001
		722.70*	0.00	2.40641E+002	5.91862E+001
PU-241	0.936	114.00*	0.02	4.67302E+001	3.59319E+000
		332.60*	0.00	1.48955E+002	1.14307E+001

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.977	1.152615E-003	1.616494E-004
NP-237	1.000	9.504739E-002	3.372940E-003
Pu-239 @	0.992	7.255778E+002	4.053809E+001
AM-241 @	1.000	1.842001E+002	9.137926E+000
PU-241	0.936	5.592287E+001	3.427819E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

NUCLIDE TOTALS

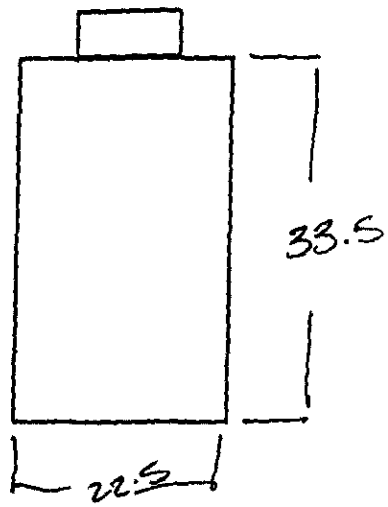
Nuclide	Mass (g)
Pu-239	1.05E+000 +/- 5.89E-002

****
***** N U C L I D E M D A R E P O R T *****
****

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.3467E-004	2.03E-004	-4.2785E-005
		1332.49	100.00	2.0260E-004		2.5823E-005
	CS-134	475.35	1.46	2.3104E-002	2.56E-004	1.0346E-002
		563.23	8.38	3.6324E-003		3.7886E-003
		569.32	15.43	1.9354E-003		-4.0519E-004
		604.70	97.60	3.7065E-004		1.3762E-004
		795.84	85.40	2.5624E-004		-2.9153E-004
		801.93	8.73	2.8090E-003		-4.4018E-004
		1038.57	1.00	2.3512E-002		1.9944E-002
		1167.94	1.80	1.2351E-002		9.2117E-005
		1365.15	3.04	6.2068E-003		-2.7141E-003
+	CS-137	661.65*	85.12	3.6713E-004	3.67E-004	1.9317E-003
+	NP-237	300.17*	6.20	1.1661E-002	2.14E-003	8.3571E-002
		312.00*	36.00	2.1400E-003		9.9064E-002
		340.60*	4.20	1.0134E-002		1.0681E-001
+	Pu-239	129.28*	0.01	3.2259E+001	2.13E+001	5.4243E+002
		375.00*	0.00	2.3952E+001		7.6604E+002
		413.70*	0.00	2.1327E+001		7.6797E+002
		451.50*	0.00	1.5856E+002		6.7791E+002
+	AM-241	59.54*	35.70	9.5672E+000	9.57E+000	1.4914E+002
		125.28*	0.00	5.5360E+001		1.9652E+002
		335.40*	0.00	8.8789E+001		3.3308E+002
		662.42*	0.00	8.6807E+001		4.5673E+002
		722.70*	0.00	1.7876E+002		2.4064E+002
+	PU-241	114.00*	0.02	1.6453E+001	1.56E+001	4.6730E+001
		332.60*	0.00	1.5603E+001		1.4895E+002
	CM-243	209.70	3.27	3.9139E-002	5.97E-003	2.7013E-003
		228.18	10.56	8.7678E-003		2.4493E-003
		277.60	14.00	5.9692E-003		-4.2493E-004

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

GROSS 133.18
TARE 26.308
NET 106.87
÷ (208197.6 ÷ 1000)
208.197
[.5133]

Item ID: 2335-01-0021

Weight (kg): 293 133.18

Material Description: DRUM - CADMIUM ONLY

Packaging: ~~3 LAYERS~~ MW 10/29/01 DRUM

Detector Distance (in): 24"

Detector Filters: None

Dose Rate: <.5

Comments: Combined Count & with 90° Rotation
@ 450°

1	450	90
2	900	180
3	1350	180
4	1800	270

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

29 RLWeiss 4-9-02 original PS revised by OMW on 12/20/01

Sample Info:

Item ID:	233s-01-0021	**Assay Date:**	25-Oct-01
File Name:	900	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.03E+03	8.22E+01		
Am-241	7.43E+02	5.91E+01		
Np-237	2.26E-02	1.27E-03		
U-238				
U-235				
Cs-137				
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	235.1	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	7.43E+02	+/-	2.25E+03	Use Meas
Calculated	1.42E+03	+/-	1.54E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	4.17E+02	+/-	1.75E+02
Pu-239	1.03E+03	+/-	4.33E+02
Pu-240	5.36E+02	+/-	2.25E+02
Pu-241	2.00E+03	+/-	8.43E+02
Pu-242	5.42E-01	+/-	2.28E-01
Am-241	7.43E+02	+/-	2.25E+03
Np-237	2.26E-02	+/-	9.40E-03
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	0.00E+00	+/-	0.00E+00
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.73E+03	+/-	2.31E+03	Calc from Pu-239 Act
Pu (g):	2.05E+00	**Pu (g) + 3 sigma TMU:**	4.63E+00	
		Pu(g) + 3 sigma:	2.54E+00	

Comments: Net Wt. Used.

Errors:

Analyst: Martin Winterrose **Date:** 3/20/02

```
#Date & Time: Thu Dec 20 10:01:12 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0021
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.5133    ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 12:45:37 PM

Sample Title : 233s-01-0021 @ 270
Spectrum Description :
Sample Identification : 0900
Sample Size : 106.9 kg

Sample Taken On : 10/29/01 1:46:00 PM
Acquisition Started : 10/29/01 1:47:25 PM

Live Time: 1800.0 seconds Real Time: 1944.8 seconds

ISOCS Calabration : 233S-01-0021
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

	Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
	1	237.82	59.54	3.67E+006	2475.76	6.83E+005
M	2	292.26	73.15	4.08E+003	159.80	3.65E+004
m	3	300.96	75.32	8.02E+003	175.28	4.51E+004
	4	340.00	85.08	5.03E+003	516.84	5.82E+004
M	5	380.11	95.10	1.28E+004	285.88	3.84E+004
m	6	396.06	99.09	4.19E+004	696.60	4.87E+004
m	7	413.90	103.55	2.19E+004	381.90	3.80E+004
M	8	445.72	111.50	8.16E+003	195.97	1.93E+004
m	9	461.78	115.51	6.39E+003	160.95	2.10E+004
m	10	476.84	119.28	5.21E+003	139.88	1.88E+004
m	11	502.59	125.71	4.92E+003	134.91	1.60E+004
m	12	518.78	129.76	2.17E+004	418.80	1.31E+004
M	13	578.33	144.64	9.90E+002	71.17	7.69E+003
m	14	586.97	146.80	8.21E+002	68.15	8.68E+003
m	15	595.84	149.02	1.12E+003	69.92	8.69E+003
	16	758.00	189.54	2.74E+002	91.02	3.04E+003
M	17	815.78	203.98	2.10E+003	61.55	3.74E+003
m	18	833.51	208.42	4.34E+003	75.99	3.35E+003
	19	1023.00	255.77	3.03E+002	64.41	1.40E+003
	20	1200.67	300.17	3.95E+002	69.24	1.40E+003
	21	1247.99	312.00	3.01E+003	87.47	1.36E+003
	22	1295.00	323.75	1.17E+002	66.86	1.33E+003
M	23	1332.59	333.14	2.07E+003	150.07	1.27E+003
m	24	1344.14	336.03	8.42E+002	66.16	1.27E+003
	25	1377.12	344.27	1.84E+003	68.84	9.50E+002
M	26	1474.67	368.65	7.03E+002	38.19	7.78E+002
m	27	1501.77	375.42	5.53E+003	157.66	7.42E+002
m	28	1522.31	380.56	1.06E+003	47.09	5.98E+002
m	29	1532.52	383.11	8.92E+002	41.59	5.68E+002
	30	1574.00	393.48	1.83E+003	67.93	6.53E+002
	31	1654.92	413.70	5.17E+003	84.96	4.75E+002
	32	1692.00	422.97	3.87E+002	39.37	3.19E+002
	33	1806.17	451.50	5.94E+002	36.71	2.15E+002

34	2047.00	511.69	1.89E+002	28.06	1.54E+002
35	2336.00	583.91	9.01E+001	27.44	1.56E+002
36	2438.00	609.41	2.24E+002	26.70	1.08E+002
37	2650.12	662.42	3.08E+002	29.21	1.46E+002
38	2891.32	722.70	1.00E+002	23.49	1.13E+002
39	3645.00	911.06	7.43E+001	14.83	4.07E+001
40	4487.00	1121.49	7.99E+001	17.74	5.51E+001
41	7068.00	1766.53	7.05E+001	11.08	1.25E+001

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
NP-237	0.857	300.17*	6.20	1.70292E-002	3.09629E-003
		312.00*	36.00	2.26603E-002	1.26774E-003
		340.60	4.20		
Pu-239	0.993	129.28*	0.01	1.11561E+003	1.88535E+002
		375.00*	0.00	1.01558E+003	8.34914E+001
		413.70*	0.00	1.02995E+003	8.21806E+001
		451.50* @	0.00	9.77469E+002	7.15194E+001
AM-241	1.000	59.54*	35.70	7.42825E+002	5.90874E+001
		125.28*	0.00	4.08924E+002	2.27528E+001
		335.40*	0.00	4.73595E+002	4.32539E+001
		662.42* @	0.00	3.02093E+002	3.01950E+001
		722.70*	0.00	2.80543E+002	6.61560E+001
PU-241	0.921	114.00*	0.02	1.05540E+002	6.29293E+000
		332.60*	0.00	1.98154E+002	1.71211E+001

INTERFERENCE CORRECTED REPORT

	Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
X	CS-137	0.977		
	NP-237	0.857	2.185180E-002	1.173211E-003
	Pu-239 @	0.993	1.031038E+003	5.593173E+001
	AM-241 @	1.000	4.427609E+002	1.831528E+001
	PU-241	0.921	1.165626E+002	5.906591E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

NUCLIDE TOTALS

Nuclide	Mass (g)
Pu-239	1.78E+000 +/- 9.64E-002

****
***** N U C L I D E M D A R E P O R T *****
****

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.0143E-004	1.88E-004	-2.8578E-005
		1332.49	100.00	1.8765E-004		-4.8729E-005
	CS-134	475.35	1.46	2.1050E-002	2.74E-004	-2.2947E-003
		563.23	8.38	3.1715E-003		-4.4677E-003
		569.32	15.43	1.6908E-003		-6.4754E-004
		604.70	97.60	3.4032E-004		-3.6794E-005
		795.84	85.40	2.7413E-004		3.6332E-004
		801.93	8.73	2.5447E-003		-1.0373E-003
		1038.57	1.00	2.1523E-002		-2.7394E-003
		1167.94	1.80	1.1288E-002		-4.4628E-003
		1365.15	3.04	5.6837E-003		-2.5973E-003
	CS-137	661.65*	85.12	3.3021E-004	3.30E-004	1.2777E-003
+	NP-237	300.17*	6.20	9.5250E-003	1.71E-003	1.7029E-002
		312.00*	36.00	1.7070E-003		2.2660E-002
		340.60	4.20	2.1510E-002		2.7688E-002
+	Pu-239	129.28*	0.01	2.7504E+001	2.38E+001	1.1156E+003
		375.00*	0.00	2.3775E+001		1.0156E+003
		413.70*	0.00	3.0229E+001		1.0299E+003
		451.50*	0.00	1.5304E+002		9.7747E+002
+	AM-241	59.54*	35.70	1.0468E+000	1.05E+000	7.4282E+002
		125.28*	0.00	4.9121E+001		4.0892E+002
		335.40*	0.00	9.4577E+001		4.7360E+002
		662.42*	0.00	7.8075E+001		3.0209E+002
		722.70*	0.00	2.0272E+002		2.8054E+002
+	PU-241	114.00*	0.02	1.1193E+001	1.12E+001	1.0554E+002
		332.60*	0.00	1.6196E+001		1.9815E+002
	CM-243	209.70	3.27	3.7415E-002	5.19E-003	-8.1732E-004
		228.18	10.56	7.9919E-003		5.9263E-004
		277.60	14.00	5.1877E-003		-3.0004E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

233-S Item Analysis

Spreadsheet Version 3.0 12/12/01

Sample Info:

Item ID:	233s-01-0023	**Assay Date:**	30-Oct-01
File Name:	905	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	7.15E+02	5.77E+01		
Am-241	9.45E+02	8.37E+01		
Np-237	5.20E-01	2.52E-02		
U-238				
U-235				
Cs-137	1.05E-01	3.58E-03		
Co-60				

Item Parameters:

Contamination: Internal Item Type: Barrel Calcs: Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	219.85	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	9.45E+02	+/-	2.86E+03	Use Meas
Calculated	9.90E+02	+/-	1.07E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	2.90E+02	+/-	1.22E+02
Pu-239	7.15E+02	+/-	3.01E+02
Pu-240	3.73E+02	+/-	1.57E+02
Pu-241	1.39E+03	+/-	5.86E+02
Pu-242	3.76E-01	+/-	1.58E-01
Am-241	9.45E+02	+/-	2.86E+03
Np-237	5.20E-01	+/-	2.16E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.05E-01	+/-	4.34E-02
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.32E+03	+/-	2.88E+03	Calc from Pu-239 Act
Pu (g):	1.33E+00	**Pu (g) + 3 sigma:**	3.01E+00	

Comments:

Net Wt. Used. Np-237 ratio does not affect final values

Errors:High Np-237 ratio,

Analyst: Martin Winterrose **Date:** 12/20/01

```
#Date & Time: Thu Dec 20 10:06:29 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0023
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.48      ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 10:34:17 AM

Sample Title : 233S-01-0023 @ 270
Spectrum Description :
Sample Identification : 0905
Sample Size : 99.4 kg

Sample Taken On : 10/30/01 10:57:00 AM
Acquisition Started : 10/30/01 10:57:58 AM

Live Time: 1800.0 seconds Real Time: 1938.9 seconds

ISOCS Calabration : 233S-01-0023
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.07	59.85	3.76E+006	146813.	8.75E+004
2	292.02	73.09	5.68E+003	320.94	4.03E+004
3	301.08	75.35	1.18E+004	376.04	3.85E+004
4	347.30	86.90	7.64E+003	859.94	3.13E+004
5	396.12	99.10	3.82E+004	1202.79	2.48E+004
6	413.46	103.44	2.38E+004	650.93	2.26E+004
7	445.65	111.48	7.05E+003	381.48	2.07E+004
8	459.19	114.86	3.76E+003	275.31	1.98E+004
9	476.78	119.26	4.22E+003	359.21	1.84E+004
10	502.46	125.68	7.47E+003	389.85	1.63E+004
11	518.59	129.71	1.06E+004	151.59	1.53E+004
12	575.42	143.91	4.89E+002	108.79	1.30E+004
13	590.95	147.79	5.67E+002	292.72	1.26E+004
14	646.32	161.63	4.48E+002	105.32	1.14E+004
15	660.34	165.14	6.65E+002	110.73	1.11E+004
16	679.08	169.82	4.85E+002	93.93	1.13E+004
17	815.35	203.88	1.22E+003	87.31	8.31E+003
18	833.40	208.39	9.75E+003	129.89	7.88E+003
19	1087.40	271.87	5.05E+002	78.90	5.22E+003
20	1201.73	300.44	1.14E+004	154.37	3.94E+003
21	1248.82	312.21	6.70E+004	573.64	3.31E+003
22	1332.11	333.02	1.80E+003	68.43	2.55E+003
23	1343.19	335.79	1.39E+003	68.94	2.50E+003
24	1363.19	340.79	7.35E+003	244.27	2.37E+003
25	1378.02	344.50	5.64E+002	173.66	2.27E+003
26	1473.93	368.47	5.71E+002	88.19	1.80E+003
27	1501.59	375.38	3.68E+003	188.18	1.72E+003
28	1503.34	375.82	1.27E+003	179.44	1.71E+003
29	1522.37	380.57	5.63E+002	105.55	1.66E+003
30	1533.63	383.39	5.69E+002	84.44	1.62E+003
31	1572.66	393.14	1.22E+003	50.00	1.52E+003
32	1595.22	398.78	2.24E+003	59.87	1.49E+003
33	1656.01	413.97	3.49E+003	71.44	1.39E+003

34	1664.26	416.03	3.03E+003	68.21	1.39E+003
35	1807.16	451.75	4.20E+002	38.84	1.19E+003
36	2438.53	609.54	2.30E+002	23.91	4.04E+002
37	2477.59	619.30	1.34E+002	21.58	3.74E+002
38	2612.20	652.94	7.26E+001	20.85	2.68E+002
39	2648.10	661.91	2.45E+004	314.30	2.32E+002
40	2667.23	666.69	2.68E+002	27.93	2.12E+002
41	2781.88	695.35	2.17E+002	18.13	1.16E+002
42	2889.06	722.13	4.06E+002	26.68	7.80E+001

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
43	3647.90	911.78	7.14E+001	10.78	4.27E+001
44	4484.08	1120.76	8.41E+001	11.34	3.14E+001
45	5849.33	1461.96	5.82E+002	24.93	1.44E+001
46	7068.24	1766.59	7.34E+001	9.86	4.38E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.997	661.65*	85.12	1.05250E-001	3.57609E-003
NP-237	0.998	300.17*	6.20	5.06480E-001	2.53818E-002
		312.00*	36.00	5.19947E-001	2.52508E-002
		340.60*	4.20	5.03952E-001	2.87339E-002
		375.45*	0.68	1.61957E+000	1.09257E-001
		415.76*	1.75	5.38318E-001	2.52765E-002
Pu-239	0.994	129.28*	0.01	5.99811E+002	1.01075E+002
		375.00*	0.00	6.96007E+002	6.43739E+001
		413.70*	0.00	7.15388E+002	5.77382E+001
		451.50* @	0.00	7.11305E+002	7.13880E+001
AM-241	0.996	59.54*	35.70	9.44519E+002	8.36503E+001
		125.28*	0.00	6.87904E+002	4.89812E+001
		335.40*	0.00	8.04689E+002	5.47678E+001
		662.42* @	0.00	2.48858E+004	8.42869E+002
		722.70*	0.00	1.17258E+003	8.51033E+001
PU-241	0.973	114.00*	0.02	7.04896E+001	6.43711E+000
		332.60*	0.00	1.77586E+002	1.07091E+001

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.997	1.017562E-001	3.567196E-003
NP-237	0.998	5.132338E-001	1.294663E-002
Pu-239 @	0.994	6.193746E+002	1.986988E+001
AM-241 @	0.996	8.261222E+002	3.114094E+001
PU-241	0.973	9.891422E+001	5.517133E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

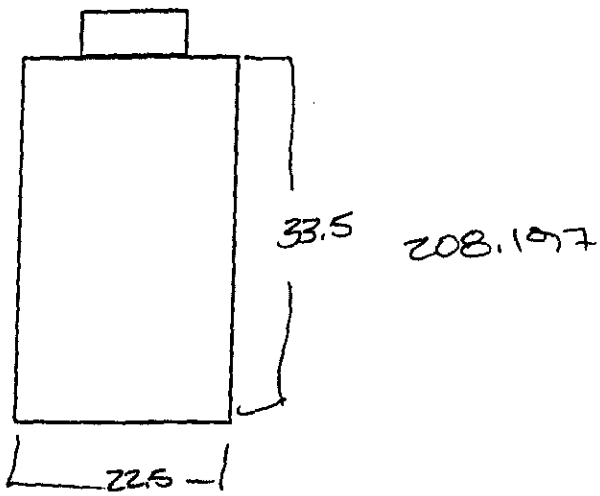
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.3889E-004	1.96E-004	1.2882E-004
		1332.49	100.00	1.9599E-004		1.7067E-005
	CS-134	475.35	1.46	5.7260E-002	2.96E-004	4.7624E-002
		563.23	8.38	6.8066E-003		6.5726E-004
		569.32	15.43	3.7355E-003		7.7214E-004
		604.70	97.60	6.2005E-004		-1.2253E-004
		795.84	85.40	2.9616E-004		1.8555E-004
		801.93	8.73	2.8655E-003		-1.1118E-004
		1038.57	1.00	2.3642E-002		-1.1236E-002
		1167.94	1.80	1.2934E-002		-8.2705E-003
		1365.15	3.04	5.3425E-003		-8.1392E-003
+	CS-137	661.65*	85.12	3.1585E-004	3.16E-004	1.0525E-001
+	NP-237	300.17*	6.20	1.3126E-002	2.10E-003	5.0648E-001
		312.00*	36.00	2.0995E-003		5.1995E-001
		340.60*	4.20	1.5727E-002		5.0395E-001
		375.45*	0.68	8.5913E-002		1.6196E+000
		415.76*	1.75	3.1293E-002		5.3832E-001
+	Pu-239	129.28*	0.01	3.2740E+001	3.27E+001	5.9981E+002
		375.00*	0.00	3.6921E+001		6.9601E+002
		413.70*	0.00	3.6180E+001		7.1539E+002
		451.50*	0.00	2.7609E+002		7.1131E+002
+	AM-241	59.54*	35.70	3.4679E-001	3.47E-001	9.4452E+002
		125.28*	0.00	5.5019E+001		6.8790E+002
		335.40*	0.00	1.3614E+002		8.0469E+002
		662.42*	0.00	7.4682E+001		2.4886E+004
		722.70*	0.00	1.2655E+002		1.1726E+003
+	PU-241	114.00*	0.02	1.2353E+001	1.24E+001	7.0490E+001
		332.60*	0.00	2.3474E+001		1.7759E+002
	CM-243	209.70	3.27	6.3867E-002	1.02E-002	7.4071E-001
		228.18	10.56	1.4624E-002		1.9193E-003
		277.60	14.00	1.0236E-002		-6.5087E-004

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	9.93E-001 +/- 3.19E-002

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

Kg
GROSS 126.25
TARE 26.308
NET 99.42
DENSITY .4800

Item ID: 2335-01-0023 REPLICATE

Weight (kg): 277.75 LBS

Material Description: SAMPLES IN DRUM

Packaging: 55 GAL DRUM

Detector Distance (in): 24"

Detector Filters: NONE

Dose Rate: 0/5

Comments: FOUR COUNTS COMBINED TO TOTAL 1800 SEC ~~0905~~ 0906 MW

1000-122001-0001

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0023REP

File Name: 906

Assay Date: 30-Oct-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)		
Pu-239 (414)	7.21E+02	5.81E+01
Am-241	1.02E+03	9.03E+01
Np-237	5.38E-01	2.61E-02
U-238		
U-235		
Cs-137	1.05E-01	3.55E-03
Co-60		

Activity (uCi/kg)	Meas Uncert

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Weight (lbs): 219.85

Width (in): 22.5

Depth for TMU (in): 4

Depth (in): 22.5

% Volume: 50

Am-241 Calcs:

Measured	1.02E+03	+/-	3.09E+03	Use Meas
Calculated	9.98E+02	+/-	1.08E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	2.92E+02	+/-	1.23E+02
Pu-239	7.21E+02	+/-	3.03E+02
Pu-240	3.76E+02	+/-	1.58E+02
Pu-241	1.40E+03	+/-	5.90E+02
Pu-242	3.79E-01	+/-	1.60E-01
Am-241	1.02E+03	+/-	3.09E+03
Np-237	5.38E-01	+/-	2.23E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.05E-01	+/-	4.34E-02
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.41E+03	+/-	3.11E+03	Calc from Pu-239 Act
Pu (g):	1.34E+00	**Pu (g) + 3 sigma TMU:**	3.03E+00	
		Pu(g) + 3 sigma:	1.67E+00	

Comments:

Net Wt. Used. Np-237 ratio does not affect final values

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 10:06:29 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0023
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.48      ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 1:25:21 PM

Sample Title : 233S-01-0023 REP @ 270
Spectrum Description :
Sample Identification : 0906
Sample Size : 99.4 kg

Sample Taken On : 10/30/01 12:36:00 PM
Acquisition Started : 10/30/01 12:36:35 PM

Live Time: 1800.0 seconds Real Time: 1954.0 seconds

ISOCS Calabration : 233S-01-0023
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.09	59.86	4.07E+006	156346.	9.85E+004
2	292.89	73.30	5.94E+003	360.61	4.53E+004
3	300.96	75.32	1.20E+004	368.22	4.28E+004
4	347.44	86.94	8.26E+003	881.46	3.40E+004
5	396.10	99.10	4.02E+004	1302.72	2.64E+004
6	413.40	103.42	2.49E+004	669.37	2.38E+004
7	445.56	111.46	7.24E+003	336.22	2.16E+004
8	459.00	114.82	3.77E+003	221.38	2.07E+004
9	477.18	119.36	5.59E+003	177.77	1.89E+004
10	494.55	123.70	1.58E+003	242.99	1.72E+004
11	502.52	125.70	7.96E+003	216.04	1.68E+004
12	518.59	129.71	1.07E+004	138.89	1.57E+004
13	575.50	143.93	4.24E+002	131.27	1.32E+004
14	643.92	161.03	6.52E+002	105.08	1.17E+004
15	651.29	162.87	3.86E+002	121.95	1.15E+004
16	659.84	165.01	7.48E+002	123.06	1.13E+004
17	678.79	169.75	4.90E+002	94.55	1.15E+004
18	815.19	203.84	1.44E+003	89.58	8.28E+003
19	833.38	208.38	9.94E+003	170.86	7.88E+003
20	1087.63	271.92	5.86E+002	66.73	5.33E+003
21	1201.70	300.43	1.19E+004	174.52	3.97E+003
22	1248.81	312.21	6.93E+004	548.65	3.32E+003
23	1291.27	322.82	4.61E+002	49.92	2.73E+003
24	1331.89	332.97	1.82E+003	64.04	2.54E+003
25	1343.03	335.75	1.32E+003	62.10	2.47E+003
26	1363.27	340.81	7.65E+003	246.92	2.34E+003
27	1378.08	344.51	5.02E+002	167.62	2.21E+003
28	1475.03	368.74	7.72E+002	48.85	1.78E+003
29	1486.52	371.61	2.58E+002	50.08	1.75E+003
30	1501.47	375.35	3.28E+003	217.09	1.71E+003
31	1503.17	375.77	1.89E+003	212.20	1.71E+003
32	1522.41	380.58	5.19E+002	88.20	1.64E+003
33	1533.68	383.40	5.45E+002	47.16	1.62E+003

34	1572.93	393.21	1.20E+003	49.63	1.51E+003
35	1595.26	398.79	2.13E+003	59.00	1.47E+003
36	1656.13	414.00	3.52E+003	71.23	1.36E+003
37	1664.38	416.06	2.96E+003	67.15	1.36E+003
38	1807.96	451.95	4.33E+002	37.32	1.19E+003
39	1899.30	474.77	9.50E+001	30.48	1.00E+003
40	2438.28	609.48	1.62E+002	22.47	3.97E+002
41	2611.35	652.73	1.12E+002	23.07	2.74E+002
42	2648.13	661.92	2.45E+004	301.58	2.41E+002

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
43	2667.25	666.70	2.76E+002	29.00	2.20E+002
44	2781.67	695.30	2.34E+002	18.80	1.20E+002
45	2888.73	722.05	4.66E+002	30.26	7.68E+001
46	3647.48	911.68	6.75E+001	10.54	3.83E+001
47	4484.68	1120.91	8.07E+001	11.16	2.87E+001
48	5849.17	1461.92	5.71E+002	24.63	1.24E+001
49	7066.93	1766.26	6.56E+001	9.14	2.51E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.997	661.65*	85.12	1.05134E-001	3.55239E-003
NP-237	0.998	300.17*	6.20	5.30920E-001	2.67653E-002
		312.00*	36.00	5.38194E-001	2.60776E-002
		340.60*	4.20	5.24680E-001	2.96214E-002
		375.45*	0.68	1.44205E+000	1.14668E-001
		415.76*	1.75	5.25635E-001	2.47278E-002
Pu-239	0.994	129.28*	0.01	6.06008E+002	1.02054E+002
		375.00*	0.00	6.19717E+002	6.29756E+001
		413.70*	0.00	7.20823E+002	5.81370E+001
		451.50* @	0.00	7.32599E+002	6.93695E+001
AM-241	0.996	59.54*	35.70	1.02308E+003	9.03007E+001
		125.28*	0.00	7.32470E+002	4.06694E+001
		335.40*	0.00	7.64492E+002	5.06186E+001
		662.42* @	0.00	2.48583E+004	8.37254E+002
		722.70*	0.00	1.34676E+003	9.67102E+001
PU-241	0.976	114.00*	0.02	7.08238E+001	5.67315E+000
		332.60*	0.00	1.80158E+002	1.05378E+001

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.997	1.016430E-001	3.543080E-003
NP-237	0.998	5.231799E-001	1.323928E-002
Pu-239 @	0.994	6.129799E+002	2.009742E+001
AM-241 @	0.996	8.254243E+002	2.857803E+001
PU-241	0.976	9.539195E+001	4.995251E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

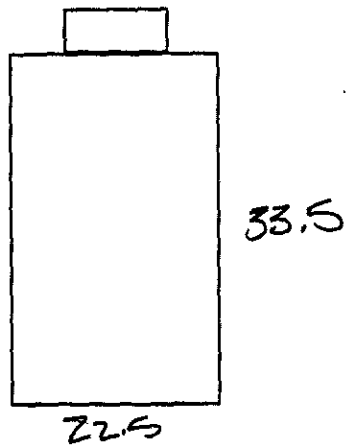
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.3324E-004	2.03E-004	1.1173E-005
		1332.49	100.00	2.0348E-004		8.1301E-006
	CS-134	475.35	1.46	5.7696E-002	2.75E-004	-1.9539E-002
		563.23	8.38	6.8342E-003		-2.0596E-003
		569.32	15.43	3.6171E-003		-3.7833E-004
		604.70	97.60	5.9862E-004		-3.8178E-004
		795.84	85.40	2.7498E-004		-3.0689E-004
		801.93	8.73	2.8024E-003		1.9868E-004
		1038.57	1.00	2.2314E-002		-9.4165E-003
		1167.94	1.80	1.2393E-002		-7.4850E-004
		1365.15	3.04	6.7212E-003		-4.4828E-003
+	CS-137	661.65*	85.12	3.2156E-004	3.22E-004	1.0513E-001
+	NP-237	300.17*	6.20	1.3165E-002	2.10E-003	5.3092E-001
		312.00*	36.00	2.1035E-003		5.3819E-001
		340.60*	4.20	1.5616E-002		5.2468E-001
		375.45*	0.68	8.5794E-002		1.4421E+000
		415.76*	1.75	3.0964E-002		5.2564E-001
+	Pu-239	129.28*	0.01	3.3209E+001	3.32E+001	6.0601E+002
		375.00*	0.00	3.6870E+001		6.1972E+002
		413.70*	0.00	3.5778E+001		7.2082E+002
		451.50*	0.00	2.7668E+002		7.3260E+002
+	AM-241	59.54*	35.70	3.6764E-001	3.68E-001	1.0231E+003
		125.28*	0.00	5.5766E+001		7.3247E+002
		335.40*	0.00	1.3553E+002		7.6449E+002
		662.42*	0.00	7.6031E+001		2.4858E+004
		722.70*	0.00	1.2559E+002		1.3468E+003
+	PU-241	114.00*	0.02	1.2630E+001	1.26E+001	7.0824E+001
		332.60*	0.00	2.3415E+001		1.8016E+002
	CM-243	209.70	3.27	6.4084E-002	1.03E-002	8.0268E-001
		228.18	10.56	1.4661E-002		-3.1777E-003
		277.60	14.00	1.0326E-002		-5.3139E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	9.83E-001 +/- 3.22E-002

Bldg 233-S
NDA Item Description Sheet
Bottle or Cylinder Geometry



Put Dimensions on Bottle

GROSS 187.727
TARE 26.308
NET 161.419
.7753

Item ID: 2335-01-0024

Weight (kg): 4/3 LBS

Material Description: Samples in Prism

Packaging: 55 GAL

Detector Distance (in): 22"

Detector Filters: NONE

Dose Rate: <.5

Comments: 4 COUNTS FOR A TOTAL OF 1800 SEC
0948

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0024

File Name: 948

Assay Date: 12-Nov-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.01E+03	8.02E+01		
Am-241	3.68E+02	3.91E+01		
Np-237	6.74E-02	3.31E-03		
U-238				
U-235				
Cs-137	3.11E-03	1.50E-04		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 355.12

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	3.68E+02	+/-	3.68E+03	Use Meas
Calculated	1.40E+03	+/-	2.84E+03	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	4.10E+02	+/-	3.32E+02
Pu-239	1.01E+03	+/-	8.19E+02
Pu-240	5.27E+02	+/-	4.27E+02
Pu-241	1.97E+03	+/-	1.60E+03
Pu-242	5.32E-01	+/-	4.31E-01
Am-241	3.68E+02	+/-	3.68E+03
Np-237	6.74E-02	+/-	5.44E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.11E-03	+/-	2.51E-03
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	2.32E+03	+/-	3.81E+03	Calc from Pu-239 Act
Pu (g):	3.04E+00	**Pu (g) + 3 sigma TMU:**	1.04E+01	
		Pu(g) + 3 sigma:	3.76E+00	

Comments:

Corrected Wt. 1-8-02 MDW

Errors:

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 14:20:26 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0024
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.7753    ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 2:44:24 PM

Sample Title : 233s-01-0024 @ 270
Spectrum Description :
Sample Identification : 0948
Sample Size : 161.4 kg

Sample Taken On : 11/12/01 10:45:00 AM
Acquisition Started : 11/12/01 10:45:48 AM

Live Time: 1800.0 seconds Real Time: 1832.5 seconds

ISOCS Calabration : 233S-01-0024
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.25	59.90	7.06E+005	26796.4	1.28E+004
2	292.89	73.30	3.29E+003	152.64	8.19E+003
3	300.96	75.32	5.94E+003	161.82	8.32E+003
4	340.30	85.15	2.22E+003	106.47	8.75E+003
5	348.65	87.24	9.39E+002	99.73	8.80E+003
6	379.66	94.99	3.54E+003	183.98	8.82E+003
7	395.93	99.06	1.28E+004	392.95	8.76E+003
8	414.07	103.59	5.84E+003	361.19	8.63E+003
9	445.77	111.51	3.01E+003	192.19	8.89E+003
10	461.56	115.46	1.93E+003	209.17	8.67E+003
11	502.60	125.71	2.24E+003	139.19	8.00E+003
12	518.75	129.75	1.21E+004	165.59	7.71E+003
13	577.03	144.32	4.77E+002	100.02	6.73E+003
14	587.54	146.94	4.14E+002	120.62	6.60E+003
15	595.56	148.95	6.88E+002	77.46	6.49E+003
16	645.33	161.39	3.18E+002	71.79	5.77E+003
17	687.06	171.81	4.78E+002	65.32	5.46E+003
18	783.31	195.87	4.44E+002	57.30	4.11E+003
19	816.05	204.05	1.81E+003	69.94	3.77E+003
20	833.41	208.39	3.47E+003	80.88	3.54E+003
21	1201.89	300.48	1.51E+003	60.14	1.76E+003
22	1248.89	312.23	9.76E+003	106.99	1.55E+003
23	1295.26	323.82	1.78E+002	42.81	1.34E+003
24	1332.64	333.16	2.16E+003	65.94	1.30E+003
25	1343.87	335.96	7.83E+002	52.59	1.27E+003
26	1364.27	341.06	1.24E+003	139.21	1.22E+003
27	1380.82	345.20	1.97E+003	159.43	1.15E+003
28	1473.91	368.46	5.35E+002	65.58	8.44E+002
29	1501.78	375.43	6.05E+003	83.78	7.62E+002
30	1521.79	380.43	1.06E+003	112.32	6.99E+002
31	1533.90	383.45	7.34E+002	90.85	6.67E+002
32	1573.03	393.23	1.99E+003	50.88	5.77E+002
33	1595.04	398.73	3.11E+002	27.26	5.18E+002

34	1645.96	411.46	5.70E+001	21.25	4.09E+002
35	1656.33	414.05	5.66E+003	77.55	3.84E+002
36	1664.58	416.11	3.49E+002	29.08	3.53E+002
37	1691.78	422.91	3.85E+002	29.56	2.87E+002
38	1807.40	451.81	6.94E+002	30.46	2.14E+002
39	2045.38	511.28	1.67E+002	17.72	1.40E+002
40	2334.94	583.65	1.06E+002	14.79	1.06E+002
41	2438.52	609.54	2.36E+002	18.80	1.02E+002
42	2648.93	662.12	8.58E+002	31.54	7.39E+001

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
43	2889.74	722.31	1.52E+002	15.44	5.73E+001
44	3647.02	911.56	5.31E+001	10.30	3.40E+001
45	4484.58	1120.89	8.06E+001	11.03	3.39E+001
46	5849.53	1462.01	5.71E+002	24.62	4.41E+000
47	7067.28	1766.35	1.02E+002	10.90	3.25E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.991	661.65*	85.12	3.10595E-003	1.50285E-004
NP-237	0.997	300.17*	6.20	6.01377E-002	3.75768E-003
		312.00*	36.00	6.74101E-002	3.30597E-003
		340.60*	4.20	7.52898E-002	9.13579E-003
		375.45*	0.68	2.33644E+000	1.07934E-001
		415.76*	1.75	5.40171E-002	5.02656E-003
Pu-239	0.992	129.28*	0.01	6.47243E+002	1.09033E+002
		375.00*	0.00	1.00408E+003	7.86627E+001
		413.70*	0.00	1.01140E+003	8.01646E+001
		451.50* @	0.00	1.01791E+003	5.98890E+001
AM-241	0.995	59.54*	35.70	1.74284E+002	1.53486E+001
		125.28*	0.00	1.96176E+002	1.54423E+001
		335.40*	0.00	4.01180E+002	3.27998E+001
		662.42* @	0.00	7.34386E+002	3.54785E+001
		722.70*	0.00	3.67715E+002	3.90534E+001
PU-241	0.926	114.00*	0.02	3.42344E+001	4.15007E+000
		332.60*	0.00	1.89276E+002	1.05658E+001

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.991	2.187614E-003	1.558832E-004
NP-237	0.997	6.311297E-002	2.161974E-003
Pu-239 @	0.992	8.185980E+002	2.241394E+001
AM-241 @	0.995	2.171365E+002	9.988234E+000
PU-241	0.926	5.495704E+001	3.862782E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

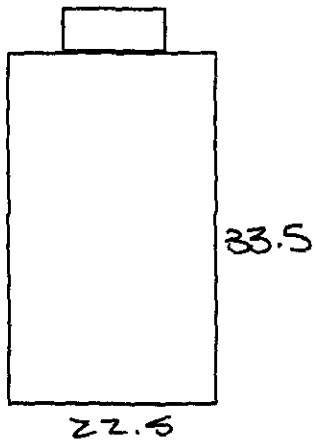
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	1.9411E-004	1.64E-004	-1.5132E-005
		1332.49	100.00	1.6424E-004		-6.7256E-005
	CS-134	475.35	1.46	2.0619E-002	2.52E-004	-2.4839E-002
		563.23	8.38	2.9354E-003		-1.6469E-003
		569.32	15.43	1.6399E-003		-5.8279E-004
		604.70	97.60	3.3774E-004		-6.2798E-005
		795.84	85.40	2.5152E-004		2.1196E-004
		801.93	8.73	2.4592E-003		-2.2328E-003
		1038.57	1.00	1.8549E-002		-8.4073E-003
		1167.94	1.80	1.0767E-002		-5.1511E-003
		1365.15	3.04	4.6889E-003		-1.1722E-003
+	CS-137	661.65*	85.12	1.5455E-004	1.55E-004	3.1060E-003
+	NP-237	300.17*	6.20	7.8513E-003	1.28E-003	6.0138E-002
		312.00*	36.00	1.2836E-003		6.7410E-002
		340.60*	4.20	1.0026E-002		7.5290E-002
		375.45*	0.68	5.0625E-002		2.3364E+000
		415.76*	1.75	1.3971E-002		5.4017E-002
+	Pu-239	129.28*	0.01	2.2064E+001	1.68E+001	6.4724E+002
		375.00*	0.00	2.1756E+001		1.0041E+003
		413.70*	0.00	1.6781E+001		1.0114E+003
		451.50*	0.00	1.0374E+002		1.0179E+003
+	AM-241	59.54*	35.70	1.3048E-001	1.30E-001	1.7428E+002
		125.28*	0.00	3.6635E+001		1.9618E+002
		335.40*	0.00	8.6476E+001		4.0118E+002
		662.42*	0.00	3.6541E+001		7.3439E+002
		722.70*	0.00	9.1818E+001		3.6771E+002
+	PU-241	114.00*	0.02	7.7423E+000	7.74E+000	3.4234E+001
		332.60*	0.00	1.4904E+001		1.8928E+002
	CM-243	209.70	3.27	3.7877E-002	5.94E-003	2.3627E-001
		228.18	10.56	8.8031E-003		-4.8809E-003
		277.60	14.00	5.9371E-003		-5.4327E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	2.13E+000 +/- 5.84E-002

Bldg 233-S
NDA Item Description Sheet
Bottle or Cylinder Geometry



Put Dimensions on Bottle

GROSS 165.227
TARE 26.308
NET 138.91
.16672

Item ID: 2335-10-0025

Weight (kg): 363.5

Material Description: SAMPLES 10 DRUM

Packaging: 55 GAL DRUM

Detector Distance (in): 24

Detector Filters: NONE

Dose Rate: <.5

Comments: 4 COUNTS TOTAL 1800 SEC
0955

233-S Item Analysis Spreadsheet Version 3.0b 1/14/02

Sample Info:

Item ID:	233s-01-0025	**Assay Date:**	13-Nov-01
File Name:	955	**File Name:**	

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	1.75E+02	1.50E+01		
Am-241	9.19E+01	2.41E+01		
Np-237	3.89E-03	2.80E-04		
U-238				
U-235				
Cs-137	3.95E-04	1.37E-04		
Co-60				

Item Parameters:

Contamination:	Internal	Item Type:	Barrel	Calcs:	Use 1st

Dimensions:

Length (in):	33.5	Width (in):	22.5	Depth (in):	22.5
Weight (lbs):	305.6	Depth for TMU (in):	4	% Volume:	50

Am-241 Calcs:

Measured	9.19E+01	+/-	9.20E+02	Use Meas
Calculated	2.42E+02	+/-	4.90E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	7.08E+01	+/-	5.74E+01
Pu-239	1.75E+02	+/-	1.42E+02
Pu-240	9.10E+01	+/-	7.38E+01
Pu-241	3.40E+02	+/-	2.76E+02
Pu-242	9.19E-02	+/-	7.45E-02
Am-241	9.19E+01	+/-	9.20E+02
Np-237	3.89E-03	+/-	3.15E-03
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	3.95E-04	+/-	3.46E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):		4.28E+02	+/-	9.36E+02	Calc from Pu-239 Act
Pu (g):	4.52E-01	**Pu (g) + 3 sigma TMU:**		1.55E+00	
		Pu(g) + 3 sigma:		5.68E-01	

Comments:

Net Wt. Used.

Errors:

Analyst: Martin Winterrose **Date:** 3/20/02

```
#Date & Time: Thu Dec 20 14:23:08 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0025
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLEHS ~3den=0.6672    ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 2:46:19 PM

Sample Title : 233s-01-0025 @270
Spectrum Description :
Sample Identification : 0955
Sample Size : 138.9 kg

Sample Taken On : 11/13/01 11:22:00 AM
Acquisition Started : 11/13/01 11:22:53 AM

Live Time: 1800.0 seconds Real Time: 1810.4 seconds

ISOCS Calabration : 233S-01-0025
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.27	59.90	2.01E+005	7321.51	4.24E+003
2	340.60	85.23	9.57E+002	75.38	3.52E+003
3	349.86	87.54	2.72E+002	75.16	3.56E+003
4	396.01	99.08	2.43E+003	109.93	3.59E+003
5	414.07	103.59	1.21E+003	87.05	3.56E+003
6	445.61	111.47	4.30E+002	61.75	3.69E+003
7	460.76	115.26	4.41E+002	61.44	3.61E+003
8	502.54	125.70	5.44E+002	60.37	3.33E+003
9	518.80	129.76	2.40E+003	73.25	3.20E+003
10	815.84	204.00	4.30E+002	34.00	8.91E+002
11	833.59	208.43	8.27E+002	39.26	8.21E+002
12	1201.40	300.36	1.17E+002	20.98	3.63E+002
13	1249.07	312.27	5.47E+002	29.50	3.49E+002
14	1332.51	333.12	4.06E+002	26.90	3.29E+002
15	1343.76	335.94	1.07E+002	20.52	3.24E+002
16	1381.55	345.38	4.05E+002	26.13	2.97E+002
17	1501.59	375.38	1.04E+003	36.23	2.25E+002
18	1522.65	380.64	1.95E+002	32.39	2.11E+002
19	1573.15	393.26	3.43E+002	22.66	1.86E+002
20	1656.33	414.05	9.44E+002	33.38	1.51E+002
21	1807.63	451.87	1.23E+002	14.74	9.77E+001
22	2044.89	511.16	1.39E+002	16.17	8.04E+001
23	2334.13	583.45	9.42E+001	12.43	6.44E+001
24	2438.82	609.61	1.56E+002	14.92	6.53E+001
25	2646.79	661.59	1.04E+002	36.20	5.68E+001
26	2649.59	662.29	1.07E+002	36.07	5.67E+001
27	2889.23	722.18	3.63E+001	9.45	5.01E+001
28	3648.12	911.84	6.86E+001	10.38	3.25E+001
29	4483.93	1120.72	6.23E+001	9.81	3.14E+001
30	5848.93	1461.86	5.23E+002	23.56	8.96E+000
31	7065.67	1765.95	5.17E+001	8.29	3.31E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	1.000	661.65*	85.12	3.94584E-004	1.37395E-004
NP-237	0.857	300.17*	6.20	4.76896E-003	8.86575E-004
		312.00*	36.00	3.89026E-003	2.80232E-004
		340.60	4.20		
		375.45*	0.68	4.16123E-001	2.33449E-002
		415.76*	1.75	1.51112E-001	8.22109E-003
Pu-239	0.992	129.28*	0.01	1.30284E+002	2.22327E+001
		375.00*	0.00	1.78828E+002	1.51222E+001
		413.70*	0.00	1.74629E+002	1.49665E+001
		451.50* @	0.00	1.87010E+002	2.35736E+001
AM-241	0.995	59.54*	35.70	4.98352E+001	4.35658E+000
		125.28*	0.00	4.81501E+001	5.82964E+000
		335.40*	0.00	5.65186E+001	1.11510E+001
		662.42* @	0.00	9.57598E+001	3.23946E+001
		722.70*	0.00	9.19236E+001	2.41165E+001
PU-241	0.944	114.00*	0.02	7.94903E+000	1.18724E+000
		332.60*	0.00	3.65541E+001	2.96651E+000

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	1.000	3.945843E-004	1.373947E-004
NP-237	0.857	3.993061E-003	2.671129E-004
Pu-239 @	0.992	1.529353E+002	5.001959E+000
AM-241 @	0.995	5.066817E+001	3.299159E+000
PU-241	0.944	1.189822E+001	1.102245E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

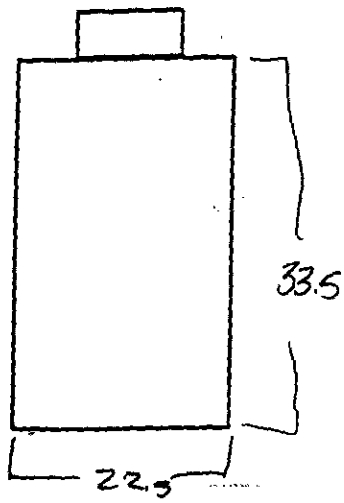
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	1.8393E-004	1.47E-004	-1.9467E-004
		1332.49	100.00	1.4657E-004		5.0846E-006
	CS-134	475.35	1.46	1.6739E-002	2.29E-004	1.6503E-002
		563.23	8.38	2.7221E-003		-1.2387E-003
		569.32	15.43	1.5273E-003		2.1336E-004
		604.70	97.60	2.8124E-004		-1.7521E-004
		795.84	85.40	2.2937E-004		2.3078E-004
		801.93	8.73	2.1552E-003		-4.3274E-003
		1038.57	1.00	1.8882E-002		8.6573E-003
		1167.94	1.80	1.0497E-002		6.3070E-003
		1365.15	3.04	5.1040E-003		2.9862E-003
+	CS-137	661.65*	85.12	1.4278E-004	1.43E-004	3.9458E-004
+	NP-237	300.17*	6.20	3.7314E-003	6.37E-004	4.7690E-003
		312.00*	36.00	6.3710E-004		3.8903E-003
		340.60	4.20	1.0517E-002		1.1904E-003
		375.45*	0.68	2.8876E-002		4.1612E-001
		415.76*	1.75	9.5779E-003		1.5111E-001
+	Pu-239	129.28*	0.01	1.4436E+001	1.11E+001	1.3028E+002
		375.00*	0.00	1.2409E+001		1.7883E+002
		413.70*	0.00	1.1069E+001		1.7463E+002
		451.50*	0.00	7.4017E+001		1.8701E+002
+	AM-241	59.54*	35.70	7.5816E-002	7.58E-002	4.9835E+001
		125.28*	0.00	2.3997E+001		4.8150E+001
		335.40*	0.00	4.5624E+001		5.6519E+001
		662.42*	0.00	3.3742E+001		9.5760E+001
		722.70*	0.00	9.0328E+001		9.1924E+001
+	PU-241	114.00*	0.02	5.0831E+000	5.08E+000	7.9490E+000
		332.60*	0.00	7.8516E+000		3.6554E+001
	CM-243	209.70	3.27	1.9091E-002	2.76E-003	6.7426E-002
		228.18	10.56	4.4549E-003		-4.6562E-003
		277.60	14.00	2.7554E-003		-1.0611E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	3.43E-001 +/- 1.12E-002

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

Kg
GROSS 149.77
TARE 26.308
NET 123.46
.5930

Item ID: 2335-01-0026

Weight (kg): 329.5

Material Description: Samples in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24

Detector Filters: None

Dose Rate: <.5

Comments: 4 Counts For a Total of 1800 Sec
09160

1000-122001-0001

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0026

File Name: 916

Assay Date: 31-Oct-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)				
Pu-239 (414)	3.16E+02	2.60E+01		
Am-241	3.03E+02	3.58E+01		
Np-237	2.03E-01	9.78E-03		
U-238				
U-235				
Cs-137	5.07E-04	1.51E-04		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 271.6

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	3.03E+02	+/-	9.18E+02	Use Meas
Calculated	4.37E+02	+/-	4.74E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	1.28E+02	+/-	5.39E+01
Pu-239	3.16E+02	+/-	1.33E+02
Pu-240	1.65E+02	+/-	6.93E+01
Pu-241	6.15E+02	+/-	2.59E+02
Pu-242	1.66E-01	+/-	7.00E-02
Am-241	3.03E+02	+/-	9.18E+02
Np-237	2.03E-01	+/-	8.43E-02
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	5.07E-04	+/-	2.58E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	9.12E+02	+/-	9.31E+02	Calc from Pu-239 Act
Pu (g):	7.26E-01	**Pu (g) + 3 sigma TMU:**	1.64E+00	
		Pu(g) + 3 sigma:	9.06E-01	

Comments:

Net Wt. Used. High Np ratio does not affect final results.

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Wed Oct 31 10:30:45 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0026
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760        ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0416    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.593     ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 2:47:27 PM

Sample Title : 233s-01-0026 @ 270
Spectrum Description :
Sample Identification : 0916
Sample Size : 123.5 kg

Sample Taken On : 10/31/01 11:32:00 AM
Acquisition Started : 10/31/01 11:33:00 AM

Live Time: 1800.0 seconds Real Time: 1865.2 seconds

ISOCS Calabration : 233S-01-0026
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 10/31/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.26	59.90	1.65E+006	59420.7	2.76E+004
2	292.97	73.32	3.05E+003	177.61	1.25E+004
3	301.07	75.35	6.11E+003	185.04	1.24E+004
4	379.90	95.05	4.77E+003	196.23	1.07E+004
5	396.12	99.10	1.61E+004	497.54	1.03E+004
6	413.79	103.52	7.95E+003	380.18	9.86E+003
7	445.84	111.53	3.46E+003	188.53	9.65E+003
8	460.29	115.14	1.68E+003	137.38	9.25E+003
9	502.79	125.76	2.36E+003	134.44	8.15E+003
10	518.80	129.76	5.76E+003	110.58	7.64E+003
11	575.68	143.98	4.98E+002	81.84	6.52E+003
12	587.09	146.83	2.84E+002	86.02	6.36E+003
13	595.74	148.99	8.85E+002	83.87	6.24E+003
14	833.69	208.46	3.87E+003	97.90	3.12E+003
15	1087.38	271.86	2.82E+002	42.10	1.96E+003
16	1201.99	300.51	4.99E+003	82.30	1.28E+003
17	1249.07	312.27	2.99E+004	177.38	9.81E+002
18	1332.40	333.10	8.32E+002	38.67	6.89E+002
19	1343.49	335.87	4.95E+002	35.77	6.64E+002
20	1363.42	340.85	3.40E+003	129.82	6.15E+002
21	1378.33	344.58	2.80E+002	83.02	5.53E+002
22	1475.27	368.80	2.85E+002	27.52	3.80E+002
23	1502.19	375.53	2.38E+003	61.13	3.49E+002
24	1522.04	380.49	3.29E+002	47.59	3.30E+002
25	1534.03	383.49	2.40E+002	37.43	3.13E+002
26	1573.24	393.29	6.89E+002	31.26	2.74E+002
27	1595.75	398.91	9.90E+002	35.71	2.54E+002
28	1656.42	414.07	1.76E+003	46.18	2.02E+002
29	1664.67	416.14	1.29E+003	40.77	1.95E+002
30	1692.10	422.99	1.37E+002	17.29	1.72E+002
31	1807.60	451.86	2.65E+002	19.74	1.34E+002
32	2045.36	511.28	1.75E+002	22.57	7.13E+001
33	2333.22	583.22	8.70E+001	13.09	7.49E+001

34	2438.82	609.61	9.91E+001	13.68	6.85E+001
35	2648.11	661.92	1.35E+002	40.00	5.19E+001
36	2651.23	662.70	2.10E+002	40.88	5.14E+001
37	2890.09	722.39	1.20E+002	13.68	5.13E+001
38	3647.60	911.71	6.45E+001	10.15	2.74E+001
39	5850.08	1462.15	5.34E+002	23.74	6.55E+000
40	7069.07	1766.80	3.68E+001	7.49	1.59E+000

NUCLIDE IDENTIFICATION REPORT

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.997	661.65*	85.12	5.07436E-004	1.50947E-004
NP-237	0.997	300.17*	6.20	1.94619E-001	9.92176E-003
		312.00*	36.00	2.03113E-001	9.78354E-003
		340.60*	4.20	2.04261E-001	1.22648E-002
		375.45*	0.68	9.17196E-001	4.67811E-002
		415.76*	1.75	2.00819E-001	1.04292E-002
Pu-239	0.991	129.28*	0.01	2.57410E+002	4.34996E+001
		375.00*	0.00	3.94162E+002	3.20342E+001
		413.70*	0.00	3.16233E+002	2.60441E+001
		451.50* @	0.00	3.93561E+002	3.30803E+001
AM-241	0.995	59.54*	35.70	1.71739E+002	1.49807E+001
		125.28*	0.00	1.69550E+002	1.26728E+001
		335.40*	0.00	2.51146E+002	2.15963E+001
		662.42* @	0.00	1.86257E+002	3.67622E+001
		722.70*	0.00	3.03177E+002	3.58031E+001
PU-241	0.954	114.00*	0.02	2.37010E+001	2.32300E+000
		332.60*	0.00	7.20808E+001	4.75119E+000

INTERFERENCE CORRECTED REPORT

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.997	5.074356E-004	1.509475E-004
NP-237	0.997	2.009881E-001	5.211737E-003
Pu-239 @	0.991	2.868258E+002	8.925541E+000
AM-241 @	0.995	1.907857E+002	8.572820E+000
PU-241	0.954	3.303498E+001	2.086914E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

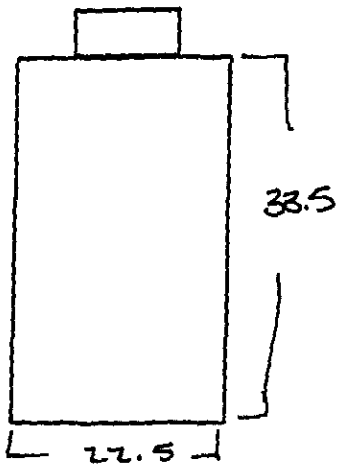
	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	1.8920E-004	1.54E-004	-1.0933E-004
		1332.49	100.00	1.5374E-004		2.0502E-005
	CS-134	475.35	1.46	1.7029E-002	2.23E-004	-6.2486E-004
		563.23	8.38	2.7727E-003		-2.0786E-004
		569.32	15.43	1.4792E-003		8.3235E-004
		604.70	97.60	2.8485E-004		-3.1541E-004
		795.84	85.40	2.2264E-004		1.1481E-004
		801.93	8.73	2.2141E-003		-1.4361E-004
		1038.57	1.00	1.8056E-002		3.2242E-003
		1167.94	1.80	1.0242E-002		-8.9094E-003
		1365.15	3.04	5.3851E-003		-6.7083E-003
+	CS-137	661.65*	85.12	1.3600E-004	1.36E-004	5.0744E-004
+	NP-237	300.17*	6.20	6.6027E-003	1.01E-003	1.9462E-001
		312.00*	36.00	1.0097E-003		2.0311E-001
		340.60*	4.20	7.1020E-003		2.0426E-001
		375.45*	0.68	3.4534E-002		9.1720E-001
		415.76*	1.75	1.0544E-002		2.0082E-001
+	Pu-239	129.28*	0.01	1.8290E+001	1.24E+001	2.5741E+002
		375.00*	0.00	1.4841E+001		3.9416E+002
		413.70*	0.00	1.2355E+001		3.1623E+002
		451.50*	0.00	8.3990E+001		3.9356E+002
+	AM-241	59.54*	35.70	8.0669E-002	8.07E-002	1.7174E+002
		125.28*	0.00	3.0361E+001		1.6955E+002
		335.40*	0.00	6.2209E+001		2.5115E+002
		662.42*	0.00	3.2028E+001		1.8626E+002
		722.70*	0.00	9.1040E+001		3.0318E+002
+	PU-241	114.00*	0.02	6.3404E+000	6.34E+000	2.3701E+001
		332.60*	0.00	1.0813E+001		7.2081E+001
	CM-243	209.70	3.27	3.5107E-002	5.65E-003	1.6165E-001
		228.18	10.56	8.0377E-003		-5.1104E-003
		277.60	14.00	5.6460E-003		1.5074E-004

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	5.71E-001 +/- 1.78E-002

Bldg 233s
NDA Item Description Sheet
Bottle Geometry



Put Dimensions on Bottle

Gross 124.65
Tare 26.308
Net 98.35

Item ID: 2335-01-0027

.4723

Weight (kg): 274.25

.4505 #/in

Material Description: Granules in Drum

Packaging: 55 Gal Drum

Detector Distance (in): 24

Detector Filters: None

Dose Rate: 2.5

Comments: 4 Counts 1800 sec TOTAL:
1800 sec 00715

1000-122001-0001

233-S Item Analysis

Spreadsheet Version 3.0b

1/14/02

Sample Info:

Item ID: 233s-01-0027

File Name: 915

Assay Date: 31-Oct-01

File Name:

Data Input:

Isotope	Activity (uCi/kg)	Meas Uncert	Activity (uCi/kg)	Meas Uncert
Pu-239 (129)	2.04E+02	3.48E+01		
Pu-239 (414)				
Am-241	1.66E+02	1.48E+01		
Np-237	2.66E-01	1.28E-02		
U-238				
U-235				
Cs-137	1.59E-03	1.04E-04		
Co-60				

Item Parameters:

Contamination: Internal

Item Type: Barrel

Calcs: Use 1st

Dimensions:

Length (in): 33.5

Width (in): 22.5

Depth (in): 22.5

Weight (lbs): 216.35

Depth for TMU (in): 4

% Volume: 50

Am-241 Calcs:

Measured	1.66E+02	+/-	5.02E+02	Use Meas
Calculated	2.82E+02	+/-	5.94E+02	

Nuclide Activities:

Isotope	Activity (nCi/g)		Total Unc 1 sigma
Pu-238	8.27E+01	+/-	6.96E+01
Pu-239	2.04E+02	+/-	1.72E+02
Pu-240	1.06E+02	+/-	8.95E+01
Pu-241	3.97E+02	+/-	3.35E+02
Pu-242	1.07E-01	+/-	9.04E-02
Am-241	1.66E+02	+/-	5.02E+02
Np-237	2.66E-01	+/-	1.10E-01
U-238	0.00E+00	+/-	0.00E+00
U-235	0.00E+00	+/-	0.00E+00
Cs-137	1.59E-03	+/-	6.64E-04
Co-60	0.00E+00	+/-	0.00E+00

Results:

Total TRU Activity(nCi/g):	5.59E+02	+/-	5.42E+02	Calc from Pu-239 Act
Pu (g):	3.74E-01	**Pu (g) + 3 sigma TMU:**	1.32E+00	
		Pu(g) + 3 sigma:	5.65E-01	

Comments:

Net Wt. Used. Np ratio does not affect final values.Pu-129 Kev value used due to high Np ratio.

Errors:High Np-237 ratio,

Analyst: Martin Winterrose

Date: 3/20/02

```
#Date & Time: Thu Dec 20 14:26:56 2001
~g=SIMPLE_CYLINDER
~description=233S-01-0027
~comment=DRUM_WITH_SAMPLES
~Ccollimator=50MM-180D
~crpn=4
~Detector=7219
~Convergence in %=1            ~MDRPN=4
~Lunit=IN  ~Tunit=C  ~Dunit=G/CU.C    ~Punit=MM.HG
~at=20        ~ap=760       ~rh=50
~Energies kev=   50.000,  100.000,  128.000,  130.000,  150.000,  200.000,#
                300.000,  500.000,  700.000, 1000.000, 1400.000, 2000.000,#
               4000.000,
~Error in %=     10.000,   10.000,   10.000,   10.000,   10.000,    8.000,#
                  8.000,    6.000,    6.000,    4.000,    4.000,    4.000,#
                  4.000,
~d1.1=0.0625    ~d1.2=22.5      ~d1.3=33.5      ~1mater=CSTEEL   ~1den=7.86
~d3.1=33        ~3mater=SAMPLES  ~3den=0.45054   ~3con=1
~sd1=24
```

C A N B E R R A I S O C S A N A L Y S I S

Report Generated On : 12/20/01 2:54:00 PM

Sample Title : 233s-01-0027 @ 270
Spectrum Description :
Sample Identification : 0915
Sample Size : 98.3 kg

Sample Taken On : 10/31/01 10:01:00 AM
Acquisition Started : 10/31/01 10:01:56 AM

Live Time: 1800.0 seconds Real Time: 1834.2 seconds

ISOCS Calabration : 233S-01-0027
Energy Calibration Used Done On : 2/27/01
Efficiency Calibration Used Done On : 12/20/01

P E A K A N A L Y S I S R E P O R T

Peak No.	Peak centroid	Energy (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	239.26	59.90	6.99E+005	28119.5	1.33E+004
2	292.19	73.13	3.17E+003	148.64	8.28E+003
3	301.27	75.40	5.90E+003	177.37	8.41E+003
4	340.12	85.11	1.92E+003	481.32	8.64E+003
5	395.96	99.06	8.58E+003	323.34	8.64E+003
6	413.83	103.53	3.41E+003	162.35	8.56E+003
7	445.91	111.55	2.15E+003	130.29	8.95E+003
8	459.42	114.92	1.02E+003	97.34	8.83E+003
9	502.66	125.73	1.30E+003	88.26	8.37E+003
10	518.76	129.75	3.78E+003	101.42	8.11E+003
11	575.75	144.00	3.41E+002	77.00	7.38E+003
12	596.72	149.24	4.14E+002	84.13	7.06E+003
13	607.22	151.86	2.32E+002	77.74	6.89E+003
14	833.60	208.44	2.09E+003	71.23	3.84E+003
15	1088.22	272.07	2.34E+002	49.44	2.53E+003
16	1202.01	300.51	5.84E+003	89.46	1.46E+003
17	1249.07	312.27	3.54E+004	224.15	9.73E+002
18	1332.60	333.15	5.24E+002	33.77	6.45E+002
19	1343.70	335.92	2.65E+002	31.43	6.11E+002
20	1363.42	340.85	3.99E+003	113.78	5.63E+002
21	1378.21	344.54	1.12E+002	50.72	5.13E+002
22	1474.84	368.69	1.34E+002	21.19	3.34E+002
23	1502.32	375.56	1.71E+003	45.98	3.06E+002
24	1522.68	380.65	2.09E+002	36.33	2.80E+002
25	1533.47	383.35	1.98E+002	25.26	2.68E+002
26	1573.24	393.29	3.92E+002	25.45	2.34E+002
27	1595.45	398.84	1.16E+003	37.64	2.24E+002
28	1656.32	414.05	9.81E+002	37.35	1.75E+002
29	1664.58	416.11	1.67E+003	43.46	1.66E+002
30	1808.16	452.00	1.47E+002	16.19	1.16E+002
31	2044.92	511.17	1.60E+002	15.81	8.39E+001
32	2334.60	583.56	8.70E+001	12.59	7.22E+001
33	2438.43	609.51	1.19E+002	14.07	6.58E+001

34	2649.34	662.23	3.81E+002	21.67	5.32E+001
35	2890.17	722.41	6.27E+001	11.24	5.04E+001
36	3647.80	911.76	6.13E+001	10.05	2.94E+001
37	5849.98	1462.12	5.67E+002	24.43	9.36E+000
38	7067.21	1766.33	3.86E+001	7.47	1.84E+000

N U C L I D E I D E N T I F I C A T I O N R E P O R T

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (uCi)	Activity Uncertainty
CS-137	0.987	661.65*	85.12	1.59363E-003	1.03665E-004
NP-237	0.997	300.17*	6.20	2.51827E-001	1.27451E-002
		312.00*	36.00	2.66390E-001	1.28444E-002
		340.60*	4.20	2.64917E-001	1.44134E-002
		375.45*	0.68	7.30500E-001	3.76930E-002
		415.76*	1.75	2.88449E-001	1.40526E-002
Pu-239	0.991	129.28*	0.01	2.04964E+002	3.48488E+001
		375.00*	0.00	3.13930E+002	2.56311E+001
		413.70*	0.00	1.95219E+002	1.69568E+001
		451.50* @	0.00	2.42524E+002	2.82785E+001
AM-241	0.995	59.54*	35.70	1.65785E+002	1.47672E+001
		125.28*	0.00	1.14806E+002	9.55617E+000
		335.40*	0.00	1.48409E+002	1.89395E+001
		662.42* @	0.00	3.76805E+002	2.44898E+001
		722.70*	0.00	1.76795E+002	3.21690E+001
PU-241	0.969	114.00*	0.02	1.82913E+001	2.00889E+000
		332.60*	0.00	5.01544E+001	3.99355E+000

I N T E R F E R E N C E C O R R E C T E D R E P O R T

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (uCi/kg)	Wt mean Activity Uncertainty
CS-137	0.987	1.023154E-003	1.079590E-004
NP-237	0.997	2.670143E-001	6.641888E-003
Pu-239 @	0.991	1.999018E+002	7.030912E+000
AM-241 @	0.995	1.348864E+002	7.199967E+000
PU-241	0.969	2.472582E+001	1.794622E+000

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (uCi/kg)	Nuclide MDA (uCi/kg)	Activity (uCi/kg)
	CO-60	1173.22	100.00	2.1624E-004	1.92E-004	-1.6194E-004
		1332.49	100.00	1.9247E-004		1.1977E-004
	CS-134	475.35	1.46	1.7993E-002	2.50E-004	-1.6499E-004
		563.23	8.38	3.0200E-003		-2.2612E-003
		569.32	15.43	1.5621E-003		-2.3027E-003
		604.70	97.60	3.2514E-004		-1.2430E-004
		795.84	85.40	2.4983E-004		-5.8396E-005
		801.93	8.73	2.4057E-003		-1.3302E-003
		1038.57	1.00	1.9193E-002		-3.2891E-003
		1167.94	1.80	1.1717E-002		-6.2703E-003
		1365.15	3.04	5.7395E-003		4.0202E-003
+	CS-137	661.65*	85.12	1.5337E-004	1.53E-004	1.5936E-003
+	NP-237	300.17*	6.20	7.7798E-003	1.11E-003	2.5183E-001
		312.00*	36.00	1.1110E-003		2.6639E-001
		340.60*	4.20	7.5197E-003		2.6492E-001
		375.45*	0.68	3.5894E-002		7.3050E-001
		415.76*	1.75	1.0811E-002		2.8845E-001
+	Pu-239	129.28*	0.01	2.2844E+001	1.28E+001	2.0496E+002
		375.00*	0.00	1.5425E+001		3.1393E+002
		413.70*	0.00	1.2806E+001		1.9522E+002
		451.50*	0.00	8.6877E+001		2.4252E+002
+	AM-241	59.54*	35.70	1.2813E-001	1.28E-001	1.6578E+002
		125.28*	0.00	3.7737E+001		1.1481E+002
		335.40*	0.00	6.6027E+001		1.4841E+002
		662.42*	0.00	3.6263E+001		3.7681E+002
		722.70*	0.00	1.0080E+002		1.7679E+002
+	PU-241	114.00*	0.02	7.8877E+000	7.89E+000	1.8291E+001
		332.60*	0.00	1.1566E+001		5.0154E+001
	CM-243	209.70	3.27	3.8717E-002	7.25E-003	8.1542E-002
		228.18	10.56	1.0061E-002		5.3375E-003
		277.60	14.00	7.2464E-003		4.0017E-003

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction

N U C L I D E T O T A L S

Nuclide	Mass (g)
Pu-239	3.17E-001 +/- 1.12E-002