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Subject: INTERIM RESULTS FOR THE 233-S PLUTONIUM CONCENTRATION FACILITY (233-S) SAMPLES – SDG 4

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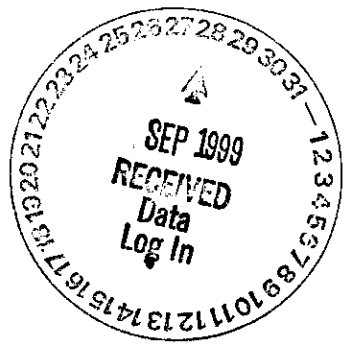

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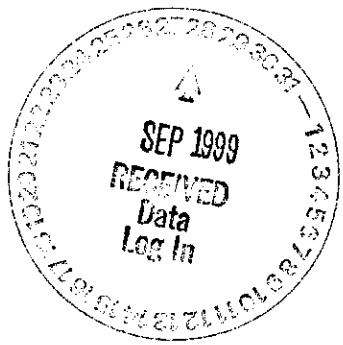

J. H. Kessner, Program Manager
Analytical Services
Bechtel Hanford H9-03
Richland, Washington 99352

Dear Ms. Kessner:

INTERIM RESULTS FOR THE 233-S PLUTONIUM CONCENTRATION FACILITY (233-S) SAMPLES – SDG 4

Reference: Letter, T. E. Logan, BHI to J. L. Jacobsen FDH "Letter of Instruction for the 233-S Plutonium Concentration Facility Sample Analysis, " 047467, dated November 24, 1998.

HNF-SD-CD-QAPP-016, Rev. 3C, *222-S Laboratory Quality Assurance Plan*, Waste Management Hanford, Richland, Washington.

This letter presents the interim results for the four samples that were received from the 233-S Facility on May 26, 1999. Samples B0VKN5, B0VKN6, B0VKN7 and B0VKN8 were analyzed for the limited set of radionuclides as indicated on the attached copies of the chain of custody (COC) forms in accordance with the *Letter of Instruction for the 233-S Plutonium Concentration Facility Sample Analysis* (LOI), referenced above. The Interim Data Summary report is included as Attachment 1.

Results for SDG3 samples B0VCW3 (S99M000210) and B0VFB6 (S99M000224) requiring reanalysis for strontium-90 (^{90}Sr), and sample B0TW23 (S99M000217) requiring reanalysis for neptunium-237 (^{237}Np) are included in this report.

Attachment 2 provides the sample breakdown diagrams. The chain-of-custody and Request for Sample Analysis forms are included in Attachment 3.

Sample Appearance

All four samples received for SDG4 were technical (tech) smears taken using an adhesive backed material. Two of the tech smears were adhered to a piece of white plastic and two were attached to black plastic. The plastic was about as thick and firm as a poly squeeze bottle.

The chain of custody form indicated the following levels of alpha contamination on the tech smears.

B0VKN5 – 12.6 million dpm alpha
B0VKN6 – 9 million dpm alpha
B0VKN7 – 5.4 million dpm alpha
B0VKN8 – 5.8 million dpm alpha

Sample Handling

To avoid major alpha contamination in the hood by trying to pull the smears off of the plastic, the smears were first placed in a beaker and acid was added and they were slowly heated on a hotplate. The samples were slowly heated with subsequent acid additions for about 1-1/2 to 2 weeks, making little progress. At that time, hydrogen peroxide additions were started. With each addition, the sample foamed. Small amounts of sample were inadvertently lost during these additions, but not enough to void the Radiological Work Permit (RWP) from alpha contamination. The peroxide was slightly more effective in the digest, but the samples were still "gelling" when the hotplate was turned off for the night. The beakers were transferred to the fusion oven to try to ash them. We noted low levels of alpha contamination on the outside of the beakers when they were removed from the oven. Acid was added and the samples were again heated.

The samples that were on the black plastic went into solution with only slight traces of solids on the bottom of the beakers. These were samples BOVKN5 and BOVKN8. They were diluted to a final volume of 100 mL that was already accounted for in the final results, reported as μCi/sample.

The samples that were on the white plastic still did not go into solution very well. The solids were filtered and rinsed and the filter paper was counted with a PAM to see if residual alpha could be considered insignificant. It appeared that with the filter paper used, most of the solids rinsed back into the solution for sample BOVKN6. At that time, 750 mL of acid had been collected, and the solution was still cloudy. The sample was heated slowly to reduce the volume to 250 mL. The solution cleared slightly, but there were still some solids on the bottom of the bottle. The technicians were instructed to sample the liquid only for analysis. The final volume of 250 mL was already accounted for in the final results.

For sample BOVKN7, after collecting about 250 mL of filtrate when attempting to filter the solids, there was still a very high alpha count on the solids. The volume of the filtrate was reduced and the filtered solids were re-ashed and dissolved in acid. The new solution was added to the original filtrate and brought to a final volume of 250 mL. Again, there was a small amount of white solids left on the bottom of the bottle that were not sampled for analysis. The chemist's opinion was that the white solids were from the pigment used in the plastic.

Analytical Results

Note that for all samples, the sum of the alpha emitters is about 8% to 20% higher than the total alpha result. This might be caused by the cloudiness of the samples or the presence of traces of solids in the samples. We believe that these are the best results that we can get based on the work involved with digesting the samples that we received.

Quality Control Results

All standard recoveries were acceptable in accordance with the 222-S Laboratory Quality Assurance Plan (Markel 1999) except for those reported for the ICP/MS analysis.

The standard recovery for Np-237 by the TTA extraction is 75.33%. This falls within the historical statistical 3-sigma range for that standard, so the results were accepted.

For the ICP/MS analysis, the standards (both ICV and CCV) and the spike recoveries were high. The chemist explained that this was because of the semi-quantitative nature of the indirect calibration that is used. For comparison of results to those obtained from the radionuclide analyses, it is recommended that the sample results be corrected based on the high spike recoveries. When this correction is made, the results from ICP/MS are comparable with the radionuclide analysis results.

A low level of contamination from strontium-90 (^{90}Sr) was detected in method blank for the tech smears and for the reanalysis of the two samples from SDG3. The activity was less than 1% of the sample results for the tech smears and was considered insignificant.

For the reanalysis, the samples were analyzed with the largest possible sample size. Again, the blank result was calculated based on the dilution used for the first sample analyzed in the batch (S99M000210). Due to the high activity of americium in sample S99M000210, a large dilution (101 times) and a small sample aliquot (0.25 mL) were used to reduce the number of precipitation steps required to remove the alpha. To evaluate the significance of the blank contamination, the total counts of beta activity should be considered. The blank had 86 counts total compared with 109 counts for sample S99M000210 and 16626 counts for sample S99M000224. This indicates that the blank contamination is significant when compared to the results for S99M000210. Unfortunately, due to the nature of this sample and the large dilution required, these are the best results that we can provide.

Practical Quantitation Limits (PQL)

For the GEA analytes, the laboratory was unable to meet the practical quantitation limits (PQLs) listed in the LOI. The presence of Am-241 and the limited volume of sample

available for analysis resulted in high detection limits. A 22-mL sample size was used. A larger dilution of the tech smear digestate would be required to provide enough liquid to run a larger sample size for the GEA. This dilution would increase detection limits for all analyses.

The requested PQL for curium-243/244 was not met because of the dilution required to reduce the high activity of plutonium and americium.

Attachments

Attachment 1: Interim Data Summary Report
Attachment 2: Sample Breakdown Diagrams
Attachment 3: Chain-of-Custody and Request for Sample Analysis forms

If you have any questions, please call me at 373-4314.

Sincerely,

R. A. Esch, Project Coordinator
222-S Laboratory Analytical Production
Waste Management Laboratory

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Attachments (3)

WMH-9956973

ATTACHMENT 1

Interim Data Summary Report

Consisting of 8 pages,
Including cover page

INTERIM

Interim Data Summary Report
233S SCREEN

CORE NUMBER: n/a
SEGMENT #: B0VCW3

SEGMENT PORTION: Liquid

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000210			Strontium-89/90 High Level	uCi/mL	100.8	1.00e-03	2.33e-03	n/a	n/a	n/a	n/a	2.00e-03	5.59E+01

INTERIM

Interim Data Summary Report
233S SCREEN

CORE NUMBER: n/a
SEGMENT #: B0VFB6

SEGMENT PORTION: Liquid

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000224			Strontium-89/90 High Level	uCi/mL	100.8	1.00e-03	1.97e-03	n/a	n/a	n/a	n/a	3.70e-06	1.53E+00

INTERIM

Interim Data Summary Report
233-S

CORE NUMBER: n/a
SEGMENT #: B0TW23

SEGMENT PORTION: Coupon Acid Leachate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000217		A	Np237 by TTA Extraction	uCi/mL	76.62	<1.27e-03	<1.58e-03	n/a	n/a	n/a	n/a	3.00e-03	5.00E+02

INTERIM

Interim Data Summary Report
233S SDG4

CORE NUMBER: n/a
SEGMENT #: BOVKN5

SEGMENT PORTION: Digested Tech Smear

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000256			Strontium-89/90 High Level	uCi/Sample	110.2	1.43e-05	2.40e-03	n/a	n/a	n/a	n/a	3.86e-04	1.70E+01
S99M000256			Pu-239/240 by TRU-SPEC Resin	uCi/Sample	101.6	<1.870	25.70	n/a	n/a	n/a	n/a	2.970	2.92E+00
S99M000256			Pu-238 by Ion Exchange	uCi/Sample	n/a	<1.870	7.250	n/a	n/a	n/a	n/a	2.970	4.81E+00
S99M000256			Np237 by TTA Extraction	uCi/Sample	75.33	<2.17e-03	7.86e-03	n/a	n/a	n/a	n/a	3.00e-03	2.65E+01
S99M000256		D	Neptunium-237 by ICP/MS	ug/Sample	148.4	<4.06e-05	14.58	14.30	14.44	2.08	131.6	1.829	n/a
S99M000256		D	Plutonium-239 by ICP/MS	ug/Sample	166.0	<4.22e-05	4.58e+02	460.0	458.9	0.44	141.9	1.902	n/a
S99M000256		D	Plutonium-240 by ICP/MS	ug/Sample	n/a	<2.50e-05	55.44	55.70	55.57	0.54	n/a	1.126	n/a
S99M000256		D	Plutonium-242 by ICP/MS	ug/Sample	n/a	<1.91e-05	3.200	3.470	3.335	8.10	n/a	8.61e-01	n/a
S99M000256		D	Pu/Am-241 by ICP/MS	ug/Sample	210.5	<2.39e-05	14.20	14.20	14.20	0.00	185.7	1.080	n/a
S99M000256		D	Am 243/Cm 243 by ICP/MS	ug/Sample	n/a	<2.61e-05	< 1.176	<1.18e0	n/a	n/a	n/a	1.176	n/a
S99M000256		D	Pu 244/Cm 244 by ICP/MS	ug/Sample	n/a	<1.05e-05	<4.74e-01	<4.74e-1	n/a	n/a	n/a	4.74e-01	n/a
S99M000256			Cobalt-60 by GEA	uCi/Sample	108.6	<8.20e-05	<7.69e-05	n/a	n/a	n/a	n/a	7.69e-05	n/a
S99M000256			Antimony-125 by GEA	uCi/Sample	n/a	<2.07e-04	<2.40e-04	n/a	n/a	n/a	n/a	2.40e-04	n/a
S99M000256			Cesium-134 by GEA	uCi/Sample	n/a	<6.88e-05	<6.69e-05	n/a	n/a	n/a	n/a	6.69e-05	n/a
S99M000256			Cesium-137 by GEA	uCi/Sample	101.2	<1.81e-04	<1.37e-04	n/a	n/a	n/a	n/a	1.37e-04	n/a
S99M000256			Europium-152 by GEA	uCi/Sample	n/a	<1.60e-04	<3.21e-04	n/a	n/a	n/a	n/a	3.21e-04	n/a
S99M000256			Europium-154 by GEA	uCi/Sample	n/a	<2.84e-04	<2.67e-04	n/a	n/a	n/a	n/a	2.67e-04	n/a
S99M000256			Europium-155 by GEA	uCi/Sample	n/a	<1.81e-04	<9.25e-04	n/a	n/a	n/a	n/a	9.25e-04	n/a
S99M000256			Radium-226 by GEA	uCi/Sample	n/a	<1.38e-03	<1.75e-03	n/a	n/a	n/a	n/a	2.00e-03	n/a
S99M000256			Actinium-228 by GEA	uCi/Sample	n/a	<4.29e-04	<4.15e-04	n/a	n/a	n/a	n/a	4.15e-04	n/a
S99M000256			Americium-241 by GEA	uCi/Sample	n/a	<4.19e-04	18.70	n/a	n/a	n/a	n/a	n/a	0.130
S99M000256			Am-241 by Extraction	uCi/Sample	111.2	<1.420	21.60	n/a	n/a	n/a	n/a	2.620	2.71E+00
S99M000256			Cm-243/244 by Extraction	uCi/Sample	n/a	<1.420	< 2.620	n/a	n/a	n/a	n/a	2.620	1.00E+02
S99M000256			Alpha Env: Solid/Misc (Each)	uCi/Sample	100.0	<4.35e-02	50.60	n/a	n/a	n/a	n/a	9.00e-02	2.07E+00
S99M000256			Beta in Env. Samples (Each)	uCi/Sample	108.7	<2.19e-01	4.850	n/a	n/a	n/a	n/a	3.51e-01	6.93E+00

INTERIM

Interim Data Summary Report
233S SDG4

CORE NUMBER: n/a
SEGMENT #: BOVKN6

SEGMENT PORTION: Digested Tech Smear

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000257			Strontium-89/90 High Level	uCi/Sample	100.4	<1.40e-04	5.55e-03	n/a	n/a	n/a	n/a	2.10e-04	6.89E+00
S99M000257			Pu-239/240 by TRU-SPEC Resin	uCi/Sample	101.6	<1.870	9.28e-01	n/a	n/a	n/a	n/a	5.50e-02	2.13E+00
S99M000257			Pu-238 by Ion Exchange	uCi/Sample	n/a	<1.870	1.31e-01	n/a	n/a	n/a	n/a	5.50e-02	3.82E+00
S99M000257			Np237 by TTA Extraction	uCi/Sample	75.33	<2.17e-03	<4.84e-03	n/a	n/a	n/a	n/a	7.00e-03	2.36E+02
S99M000257		D	Neptunium-237 by ICP/MS	ug/Sample	148.4	<4.06e-05	1.388	n/a	n/a	n/a	n/a	2.13e-01	n/a
S99M000257		D	Plutonium-239 by ICP/MS	ug/Sample	166.0	<4.22e-05	29.39	n/a	n/a	n/a	n/a	2.21e-01	n/a
S99M000257		D	Plutonium-240 by ICP/MS	ug/Sample	n/a	<2.50e-05	2.662	n/a	n/a	n/a	n/a	1.31e-01	n/a
S99M000257		D	Plutonium-242 by ICP/MS	ug/Sample	n/a	<1.91e-05	<1.00e-01	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99M000257		D	Pu/Am-241 by ICP/MS	ug/Sample	210.5	<2.39e-05	7.35e-01	n/a	n/a	n/a	n/a	1.26e-01	n/a
S99M000257		D	Am 243/Cm 243 by ICP/MS	ug/Sample	n/a	<2.61e-05	<1.37e-01	n/a	n/a	n/a	n/a	1.37e-01	n/a
S99M000257		D	Pu 244/Cm 244 by ICP/MS	ug/Sample	n/a	<1.05e-05	<5.51e-02	n/a	n/a	n/a	n/a	5.50e-02	n/a
S99M000257			Cobalt-60 by GEA	uCi/Sample	110.2	<2.08e-05	<2.26e-05	n/a	n/a	n/a	n/a	2.26e-05	n/a
S99M000257			Antimony-125 by GEA	uCi/Sample	n/a	<5.24e-05	<6.68e-05	n/a	n/a	n/a	n/a	6.68e-05	n/a
S99M000257			Cesium-134 by GEA	uCi/Sample	n/a	<1.87e-05	<1.97e-05	n/a	n/a	n/a	n/a	1.97e-05	n/a
S99M000257			Cesium-137 by GEA	uCi/Sample	104.7	<3.20e-05	2.14e-03	n/a	n/a	n/a	n/a	n/a	2.48
S99M000257			Europium-152 by GEA	uCi/Sample	n/a	<3.71e-05	<4.62e-05	n/a	n/a	n/a	n/a	4.62e-05	n/a
S99M000257			Europium-154 by GEA	uCi/Sample	n/a	<6.25e-05	<6.67e-05	n/a	n/a	n/a	n/a	6.67e-05	n/a
S99M000257			Europium-155 by GEA	uCi/Sample	n/a	<4.89e-05	<7.60e-05	n/a	n/a	n/a	n/a	7.60e-05	n/a
S99M000257			Radium-226 by GEA	uCi/Sample	n/a	<3.49e-04	<4.04e-04	n/a	n/a	n/a	n/a	4.04e-04	n/a
S99M000257			Actinium-228 by GEA	uCi/Sample	n/a	<1.12e-04	<1.10e-04	n/a	n/a	n/a	n/a	1.10e-04	n/a
S99M000257			Americium-241 by GEA	uCi/Sample	n/a	<1.49e-04	7.04e-01	n/a	n/a	n/a	n/a	n/a	0.310
S99M000257			Am-241 by Extraction	uCi/Sample	111.2	<1.420	7.53e-01	n/a	n/a	n/a	n/a	5.40e-02	2.14E+00
S99M000257			Cm-243/244 by Extraction	uCi/Sample	n/a	<1.420	<5.36e-02	n/a	n/a	n/a	n/a	5.40e-02	1.00E+02
S99M000257			Alpha Env: Solid/Misc (Each)	uCi/Sample	84.40	<1.28e-03	1.460	n/a	n/a	n/a	n/a	2.00e-03	1.97E+00
S99M000257			Beta in Env. Samples (Each)	uCi/Sample	98.76	<8.20e-03	1.38e-01	n/a	n/a	n/a	n/a	7.00e-03	5.59E+00

INTERIM

Interim Data Summary Report
233S SDG4

CORE NUMBER: n/a
SEGMENT #: B0VKN7

SEGMENT PORTION: Digested Tech Smear

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000258			Strontium-89/90 High Level	uCi/Sample	100.4	<1.40e-04	2.50e-03	n/a	n/a	n/a	n/a	1.93e-04	1.06E+01
S99M000258			Pu-239/240 by TRU-SPEC Resin	uCi/Sample	101.6	<1.870	10.10	n/a	n/a	n/a	n/a	5.14e-01	1.67E+00
S99M000258			Pu-238 by Ion Exchange	uCi/Sample	n/a	<1.870	2.520	n/a	n/a	n/a	n/a	5.14e-01	2.11E+00
S99M000258			Np237 by TTA Extraction	uCi/Sample	75.33	<2.17e-03	4.68e-03	n/a	n/a	n/a	n/a	7.00e-03	8.73E+01
S99M000258		D	Neptunium-237 by ICP/MS	ug/Sample	148.4	<4.06e-05	10.85	n/a	n/a	n/a	n/a	1.024	n/a
S99M000258		D	Plutonium-239 by ICP/MS	ug/Sample	166.0	<4.22e-05	2.52e+02	n/a	n/a	n/a	n/a	1.065	n/a
S99M000258		D	Plutonium-240 by ICP/MS	ug/Sample	n/a	<2.50e-05	32.92	n/a	n/a	n/a	n/a	6.30e-01	n/a
S99M000258		D	Plutonium-242 by ICP/MS	ug/Sample	n/a	<1.91e-05	1.780	n/a	n/a	n/a	n/a	4.82e-01	n/a
S99M000258		D	Pu/Am-241 by ICP/MS	ug/Sample	210.5	<2.39e-05	8.095	n/a	n/a	n/a	n/a	6.05e-01	n/a
S99M000258		D	Am 243/Cm 243 by ICP/MS	ug/Sample	n/a	<2.61e-05	<6.58e-01	n/a	n/a	n/a	n/a	6.58e-01	n/a
S99M000258		D	Pu 244/Cm 244 by ICP/MS	ug/Sample	n/a	<1.05e-05	<2.65e-01	n/a	n/a	n/a	n/a	2.65e-01	n/a
S99M000258			Cobalt-60 by GEA	uCi/Sample	110.2	<2.08e-05	<2.27e-05	n/a	n/a	n/a	n/a	2.27e-05	n/a
S99M000258			Antimony-125 by GEA	uCi/Sample	n/a	<5.24e-05	<6.66e-05	n/a	n/a	n/a	n/a	6.66e-05	n/a
S99M000258			Cesium-134 by GEA	uCi/Sample	n/a	<1.87e-05	<1.93e-05	n/a	n/a	n/a	n/a	1.93e-05	n/a
S99M000258			Cesium-137 by GEA	uCi/Sample	104.7	<3.20e-05	1.68e-03	n/a	n/a	n/a	n/a	n/a	3.02
S99M000258			Europium-152 by GEA	uCi/Sample	n/a	<3.71e-05	<7.18e-05	n/a	n/a	n/a	n/a	7.18e-05	n/a
S99M000258			Europium-154 by GEA	uCi/Sample	n/a	<6.25e-05	<1.94e-04	n/a	n/a	n/a	n/a	1.94e-04	n/a
S99M000258			Europium-155 by GEA	uCi/Sample	n/a	<4.89e-05	<1.99e-04	n/a	n/a	n/a	n/a	1.99e-04	n/a
S99M000258			Radium-226 by GEA	uCi/Sample	n/a	<3.49e-04	<4.65e-04	n/a	n/a	n/a	n/a	4.65e-04	n/a
S99M000258			Actinium-228 by GEA	uCi/Sample	n/a	<1.12e-04	<1.08e-04	n/a	n/a	n/a	n/a	1.08e-04	n/a
S99M000258			Americium-241 by GEA	uCi/Sample	n/a	<1.49e-04	7.300	n/a	n/a	n/a	n/a	n/a	0.0900
S99M000258			Am-241 by Extraction	uCi/Sample	111.2	<1.420	7.920	n/a	n/a	n/a	n/a	4.86e-01	1.91E+00
S99M000258			Cm-243/244 by Extraction	uCi/Sample	n/a	<1.420	<4.86e-01	n/a	n/a	n/a	n/a	4.86e-01	1.00E+02
S99M000258			Alpha Env: Solid/Misc (Each)	uCi/Sample	84.40	<1.28e-03	17.10	n/a	n/a	n/a	n/a	2.00e-03	5.69E-01
S99M000258			Beta in Env. Samples (Each)	uCi/Sample	98.76	<8.20e-03	1.340	n/a	n/a	n/a	n/a	7.00e-03	1.58E+00

INTERIM

Interim Data Summary Report
233S SDG4

CORE NUMBER: n/a
SEGMENT #: B0VKN8

SEGMENT PORTION: Digested Tech Smear

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99M000259			Strontium-89/90 High Level	uCi/Sample	110.2	1.43e-05	1.72e-03	n/a	n/a	n/a	n/a	3.78e-04	2.15E+01
S99M000259			Pu-239/240 by TRU-SPEC Resin	uCi/Sample	101.6	<1.870	1.330	n/a	n/a	n/a	n/a	1.25e-01	2.19E+00
S99M000259			Pu-238 by Ion Exchange	uCi/Sample	n/a	<1.870	5.44e-01	n/a	n/a	n/a	n/a	1.25e-01	2.99E+00
S99M000259			Np237 by TTA Extraction	uCi/Sample	75.33	<2.17e-03	<1.78e-03	n/a	n/a	n/a	n/a	3.00e-03	3.00E+02
S99M000259		D	Neptunium-237 by ICP/MS	ug/Sample	148.4	<4.06e-05	<4.10e-01	n/a	n/a	n/a	n/a	4.10e-01	n/a
S99M000259		D	Plutonium-239 by ICP/MS	ug/Sample	166.0	<4.22e-05	31.39	n/a	n/a	n/a	n/a	4.26e-01	n/a
S99M000259		D	Plutonium-240 by ICP/MS	ug/Sample	n/a	<2.50e-05	3.667	n/a	n/a	n/a	n/a	2.52e-01	n/a
S99M000259		D	Plutonium-242 by ICP/MS	ug/Sample	n/a	<1.91e-05	<1.93e-01	n/a	n/a	n/a	n/a	1.93e-01	n/a
S99M000259		D	Pu/Am-241 by ICP/MS	ug/Sample	210.5	<2.39e-05	8.45e-01	n/a	n/a	n/a	n/a	2.42e-01	n/a
S99M000259		D	Am 243/Cm 243 by ICP/MS	ug/Sample	n/a	<2.61e-05	<2.63e-01	n/a	n/a	n/a	n/a	2.63e-01	n/a
S99M000259		D	Pu 244/Cm 244 by ICP/MS	ug/Sample	n/a	<1.05e-05	<1.06e-01	n/a	n/a	n/a	n/a	1.06e-01	n/a
S99M000259			Cobalt-60 by GEA	uCi/Sample	108.6	<8.20e-05	<8.83e-05	n/a	n/a	n/a	n/a	8.83e-05	n/a
S99M000259			Antimony-125 by GEA	uCi/Sample	n/a	<2.07e-04	<2.24e-04	n/a	n/a	n/a	n/a	2.24e-04	n/a
S99M000259			Cesium-134 by GEA	uCi/Sample	n/a	<6.88e-05	<7.10e-05	n/a	n/a	n/a	n/a	7.10e-05	0.000e+00
S99M000259			Cesium-137 by GEA	uCi/Sample	101.2	<1.83e-04	<2.21e-04	n/a	n/a	n/a	n/a	2.21e-04	n/a
S99M000259			Europium-152 by GEA	uCi/Sample	n/a	<1.60e-04	<1.62e-04	n/a	n/a	n/a	n/a	1.62e-04	n/a
S99M000259			Europium-154 by GEA	uCi/Sample	n/a	<2.84e-04	<2.59e-04	n/a	n/a	n/a	n/a	2.59e-04	n/a
S99M000259			Europium-155 by GEA	uCi/Sample	n/a	<1.83e-04	<2.55e-04	n/a	n/a	n/a	n/a	2.55e-04	n/a
S99M000259			Radium-226 by GEA	uCi/Sample	n/a	<1.38e-03	<1.35e-03	n/a	n/a	n/a	n/a	1.00e-03	n/a
S99M000259			Actinium-228 by GEA	uCi/Sample	n/a	<4.29e-04	<4.07e-04	n/a	n/a	n/a	n/a	4.07e-04	n/a
S99M000259			Americium-241 by GEA	uCi/Sample	n/a	<4.19e-04	1.170	n/a	n/a	n/a	n/a	n/a	0.600
S99M000259			Am-241 by Extraction	uCi/Sample	111.2	<1.420	1.240	n/a	n/a	n/a	n/a	1.20e-01	2.44E+00
S99M000259			Cm-243/244 by Extraction	uCi/Sample	n/a	<1.420	<1.20e-01	n/a	n/a	n/a	n/a	1.20e-01	1.00E+02
S99M000259			Alpha Env: Solid/Misc (Each)	uCi/Sample	90.00	<1.17e-02	2.640	n/a	n/a	n/a	n/a	1.84e-04	4.11E-01
S99M000259			Beta in Env. Samples (Each)	uCi/Sample	102.1	7.80e-02	2.13e-01	n/a	n/a	n/a	n/a	4.93e-04	1.11E+00

WMH-9956973

ATTACHMENT 2

Sample Breakdown Diagram

Consisting of 2 pages,
Including cover page

233-S Pu Concentration Facility Samples - SDG4

Technical Smears

B0VKN5	B0VKN6	B0VKN7	B0VKN8
12.6 million dpm	9 million dpm	5.4 million dpm	5.8 million dpm
S99M000252	S99M000253	S99M000254	S99M000255
Acid Digest	Acid Digest	Acid Digest	Acid Digest
S99M000256	S99M000257	S99M000258	S99M000259
Total Alpha/Total Beta	Total Alpha/Total Beta	Total Alpha/Total Beta	Total Alpha/Total Beta
GEA: Am-241, Sb-125, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, Ra-226, Ac-228	GEA: Am-241, Sb-125, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, Ra-226, Ac-228	GEA: Am-241, Sb-125, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, Ra-226, Ac-228	GEA: Am-241, Sb-125, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Eu-155, Ra-226, Ac-228
Sr-90	Sr-90	Sr-90	Sr-90
ICP/MS: actinides; (isotopic Pu, Am-241, Cm-244, Np-237)	ICP/MS: actinides; (isotopic Pu, Am-241, Cm-244, Np-237)	ICP/MS: actinides; (isotopic Pu, Am-241, Cm-244, Np-237)	ICP/MS: actinides; (isotopic Pu, Am-241, Cm-244, Np-237)

WMH-9956973

ATTACHMENT 3

Chain-of–Custody and Request for Sample Analysis Forms

Consisting of 3 pages,
Including cover page

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B99-024-05	Page 1 of 1
Collector ~~B303-26-99~~ Doug Bowers/Steve Huddleston		Company Contact: Dave Encke	Telephone No.: 373-3461	Project Coordinator: TRENT, SJ	Price Code: IV/FE
Project Designation: 233-S Plutonium Concentration Facility Process Areas - Ot		Sampling Location: 233-S 200 west		SAF No.: B99-024	Data Turnaround
Ice Chest No.: ERC 97-079		Field Logbook No.: EFL 1133-7		Method of Shipment: hand carry	
Shipped To: 222-S Lab Operations		Offsite Property No.: N/A		Bill of Lading/Air Bill No.: N/A	
				COA: B233T200C	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	none								
	Type of Container	P	P								
	No. of Container(s)	1	1								
Special Handling and/or Storage	Volume	2g	2g								
SAMPLE ANALYSIS	See item (1) in Special Instructions.		See Item #1 below								

Sample No.	Matrix *	Sample Date	Sample Time								
B0VKN5	Other Solid	5-17-99	0930		X			12.6 million dpm/g			
B0VKN6	Other Solid	5-17-99	0950		X			9 million dpm/g			
B0VKN7	Other Solid	5-17-99	1000		X			5.7 million dpm/g			
B0VKN8	Other Solid	5-17-99	1023		X			5.8 million dpm/g			

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	SJTrent/SJTrent	05-26-99/1126
Received By	Doug Bowers	5-26-99/1126
Relinquished By	Doug Bowers	5-26-99/1159
Received By	RLChambers/RLChambers	5-26-99/1159
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

Item # 1 GEA, gross alpha, gross beta, Sr-90. Analysis by ICP-MS Isotopic Pu, Np-237, Am-241/Cm-244

~~(1) Gamma Spectroscopy (Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Radium-226)~~ B2B5-26-99

Matrix *: Soil; Water; Vapor; Other Solid; Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

REQUEST FOR SAMPLE ANALYSIS (RSA)

Group ID No. (For lab use only)

1. Sample Origin	2. Date Sampled	4. Requestor's Name	6. CACN/COA	7. Cost Center
233-S Facility	5/26/99	Steve Trent	108798	EH00

Customer/Project Code	3. Submitted By	5. Requestor's Phone/MSIN/FAX
Bechtel Hanford Inc.	Doug Bowers	372-9651/H9-03/372-9487

8. Customer ID No.	9. Laboratory Sample No.	10. Volume of Sample	11. Matrix of Sample	12. Requested Analyses	13. ~~Expected Range~~ Pu estimate
BOVKN5		Tech.	Smear	See chain of custody	0.029g
BOVKN6		Tech.	Smear	See chain of custody	0.017g
BOVKN7		Tech.	Smear	See chain of custody	0.010g
BOVKN8		Tech.	Smear	See chain of custody	0.024g

14. Does sample have a MSDS?

○ Yes HEHF assigned MSDS No. _____

○ No Description of process that produced waste/sample:

BOVKN5 0.65 CES BOVKN8 0.65 CES
BOVKN6 0.46 CES
BOVKN7 0.27 CES

233-S facility characterization

Will radiochemistry results be used for unconditional release? ○ Yes ◉ No

15. Is this sample RCRA listed? ○ Yes ◉ No

Applicable Listed Waste Codes:

○ Yes ○ No P Codes: (list) _____
○ Yes ○ No U Codes: (list) _____
○ Yes ○ No K Codes: (list) _____
○ Yes ○ No F Codes: (list) _____

Applicable Characteristic Codes:

○ Yes ○ No D001: (how determined) _____ Ignitable
○ Yes ○ No D002: (how determined) _____ Corrosive
○ Yes ○ No D003: (how determined) _____ Reactive
○ Yes ○ No Toxic: (list codes) _____

PCB: Does this waste/sample contain PCBs?

☐ Yes Over 500 ppm
☐ Yes Over 50 ppm
☐ Yes PCBs are suspected
☒ No PCBs are suspected

If YES, what is the source of the PCBs?

☐ Transformer, capacitor, or ballast
☐ Other, specify _____
☐ Unknown

16. Sample Disposition

☐ Return to Customer
☐ Samples found to contain PCBs will be returned to the customer
☐ Dispose of per facility procedures with applied charges for analyses and disposal

No sample residuals expected

Sample(s) Dose Rate at Contact

HPT Signature _____

17. QC Required ☐ Per 222-S Laboratory Quality Assurance Plan (HNF-SD-CP-QAPP-016)

☒ Other (list reference document or attach) 233-S Analytical Instructions

18. Special Instructions (Special Storage Requirements, Reporting format, holding times, etc.)

report results on a per sample basis

19. Requested Turnaround Time

☐ 2 Weeks ☐ 4 Weeks
☒ Other 233-S Analytical Instructions

20. Sample Received By:

RL Chandler

Date. Time

21. Chain of Custody

○ No ○ Yes
Number: _____