McCraw

eberline

407906

April 21, 1978

EI-916124

Mr. Dick Gilbert
Battelle Northwest
P. O. Box 999
Richland, Washington 99352

Dear Mr. Gilbert:

Enclosed herewith is a copy of Quality Control Procedure regarding the Enewetak CleanUp Project. Also enclosed is a copy of the Quality Assurance Audit, Enewetak CleanUp.

If you require anything further, please contact us.

Sincerely,

Michael Ortiz for

MICHAEL A. ORTIZ
Laboratory Manager

MAO/jm

Encls.

DOE/ERSP PROCEDURE NO _____

Date Drafted _____

APPROVED: _____

Date _____

QUALITY CONTROL PROCEDURE

1. Purpose

To assure quality of results.

2. Applicability

This procedure applies to the Eberline Pacific Lab (DOE Element) on Enewetak Atoll.

3. Responsibility

The Eberline Pacific Lab chemist is responsible for the conduct of the Quality Control program. He will prepare blind spikes that will be processed in the normal procedure. At completion, the letters "QC" will be suffixed to the assigned sample number, and a comparison will be made between the known and obtained values.

4. Procedure

A. Plutonium and americium by alpha spectroscopy.

1. Tracers:

a. Appropriate tracers will be added to determine the chemical recovery of plutonium and americium.

b. The plutonium tracer will be cross checked by alpha counting against a NBS standard, at time of preparation. The americium tracer will be a NBS standard.

c. Purity or tracer will be determined by alpha spectrometry at time of preparation.

2. Duplicate analysis:

   a. A duplicate field sample will be run using the normal procedure once a week.

3. A reagent and glassware blank will be run after a high level (this to be determined by the chemist) sample has been processed.

4. Background soil:

   a. Soil from Enewetak Island will be used as a "background" soil.

   c. This soil will be used to prepare the blind spikes.

5. Spiked soil samples: Enewetak soil used.

   a. A blind spike will be analyzed each week. This blind spike will have a known amount of Pu and/or americium comparable to amounts found in soil and the amounts of each will vary from week to week.

6. Results:

   a. Quality control data will be evaluated each month.

B. Radiation Detection Instruments

1. All gross alpha counters will be calibrated daily with a plutonium standard, and a background determined daily.

2. All gross Beta counters will be calibrated daily with a strontium-yttrium standard, and a background determined as well as a calibration run daily when in use.

4. The alpha spectrometer (s) will have a background, energy and efficiency determination weekly using sources traceable to NBS.

5. The gamma spectrometer (s) will have a background, energy and efficiency determined weekly, using solution traceable to NBS.

Reports:

All calibration data will be recorded and filed. Logged QC will be available each month. A monthly quality control report will be compiled and reported to DOE/ERSP manager. With carbon copy to EIC.

BY: [illegible]	PROJECT: Enewetak Cleanup
DATE: 2-3-78	SUBJECT: Quality Assurance Audit

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A. Sample Preparation Trailer

1. QA audit conducted proved sample processing was completed according to schedule but the following are being completed or added:
   (a) Log of instrument calibration data must be kept up weekly.
   (b) In-situ van samples must be ball milled and have alpha, gamma, plutonium and americium performed.
   (c) 10% of ground zero and sub-surface samples also need ball milling, gamma, plutonium and americium run.
   (d) All work with dry soil samples should be completed under hoods.
   (e) Balances in labs should be checked and log results weekly.

B. Chemistry Lab

1. Chemistry lab is following all procedures properly.
2. Procedures need to have final documentation and approval by DOE.
3. Urine samples have been processed to varify procedure has be done on island.
4. Uranium samples have been picked and will be processed by 2/78.
5. Samples flamed for alpha counting must be done in a consistant manner possible usually just one person.

C. Count Trailer

1. Instrument log of calibration and backgrounds is up to date. (But a system must be worked out to store this information on mag tape).
2. Gamma calibration had been changed, but we are back at the original calibration place.
3. Windows have been set on liquid scintillation counter to take care of alpha plutonium ^{239}, americium ^{241} counting.
4. Backgrounds on alpha spectrometer and gamma spectrometer need to be taken and recorded weekly.

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BY:	PROJECT: Enewetak Cleanup
DATE: 2-3-78	SUBJECT: Quality Assurance Audit

D. Quality Control

1. Need to make sure a monthly report is tabulated, an filed each month with report going to EIC Manager at Pacific Lab.
2. Must have at least 5% of the total samples processed data on spikes, blanks and blind duplicates.

E. Sample Collection

1. Sample collection is being done according to procedures.

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QUALITY CONTROL REPORT
Month-August 1977

Enewetak Surface Soil

Data on soil used for blank and Spike soil samples run in the quality control reports.

ID#					pci/total 239Pu240	241Am
1	"	"	"	"	0.017 ± 0.006	0.020 ± 0.010
2	"	"	"	"	0.013 ± 0.005	0.010 ± 0.013
3	"	"	"	"	0.006 ± 0.004	0.014 ± 0.010
4	"	"	"	"	0.007 ± 0.005	0.014 ± 0.014
5	"	"	"	"	0.008 ± 0.005	0.036 ± 0.024
6	"	"	"	"	0.009 ± 0.005	
7	"	"	"	"	0.008 ± 0.005	
8	"	"	"	"	0.005 ± 0.004	
9	"	"	"	"	0.009 ± 0.009	
10	"	"	"	"	0.014 ± 0.006	

				pci total True value	Observed
00032	QC-FJ-K-S-99	8/29/'77	239Pu	54	60 ± 8%
"	"	"	241Am	109	115 ± 19%
"	"	"	gamma241Am	109	88 ± 18%
00032	"	"	gamma241Am	1096	874 ± 5%

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2/3/78

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QUALITY CONTROL REPORT
Month Sept. 1977

ID#	IDENTIFICATION (FALSE)	DATE	TYPE	pci/total TRUE	OBSERVED
OS-00088	QC-FJ-NW-26-5-S	9/11/77	gamma 241Am	548	493 ± 11%
"	A- "	"	241Am	548	632 ± 14%
"	"	"	239Pu	108	174 ± 31%
OS-00089	QC-FJ-NW-26-5-S	"	gamma 241Am	1096	1119 ± 7%
"	B- "	"	241Am	1096	1130 ± 9%
"	"	"	239Pu	108	173 ± 33%
OS-00090	QC-FJ-NW-23-4-S	"	gamma 241Am	548	470 ± 13%
"	"	"	241Am	548	712 ± 16%
"	"	"	239Pu	108	251 ± 28%

NOTE: This data was generated to prove the need of ball milling in order to accomplish homogenety in the samples.

DUPLICATE ANALYSIS

			pci/g dry 1st run	2nd run
OS-00001(00-01)	9/10/77	Chem. 239Pu	4.5 ± 17%	4.7 ± 10%
OS-00002(00-01)	"	"	3.1 ± 15%	3.4 ± 13%
OS-00003(00-01)	"	"	12 ± 14%	14 ± 10%
OS-00004(00-01)	"	"	21.6 ± 7.6%	28.8 ± 12%
OS-00001	"	gamma 241Am	1.6 ± 27%	1.2 ± 21%
OS-00002	"	"	1.1 ± 41%	1.1 ± 24%
OS-00003	"	"	9.2 ± 8%	8.1 ± 5.7%
OS-00004	"	"	13 ± 8%	13 ± 4%
OS-00005	"	"	44 ± 3%	40 ± 3%
OS-00006	"	"	35. ± 4%	30 ± 3%
OS-00007	"	"	33 ± 4%	30 ± 3%

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QUALITY CONTROL REPORT
Month Oct. Nov. 1977

ID#	IDENTIFICATION	DATE	TYPE	TRUE	pci/g dry OBSERVED
OS-1756 QC		10/29/77	gamma 241Am	4.93	3.70 ± 11%
"		"	Chem. 239Pu	4.32	3.84 ± 7.2%
OS-1757 QC		"	gamma 241Am	0.00	<0.10
"		"	Chem. 239Pu	0.00	0.08 ± 36%
OS-1861 QC		"	gamma 241Am	10.4	9.3 ± 6.4%
"		"	Chem. 241Am	10.9	8.9 ± 11%
"		"	" 239Pu	6.5	6.3 ± 6.9%
OS-1827 QC		11/9/77	gamma 241Am	5.21	4.98 ± 9.6%
"		"	Chem. 239Pu	4.32	4.48 ± 9.9%
OS-1828 QC		"	gamma 241Am	0.00	<0.10
"		"	Chem. 239Pu	0.00	0.04
13 REAGENT BLANK FOR AM-PU CHEM		"	Chem. 241Am	0.00	$\bar{X}$ = 0.08
			" 239Pu	0.00	$\bar{X}$ = 0.06

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QUALITY CONTROL REPORT
Month Oct., Nov. 1977

ID# IDENTIFICATION	DATE	TYPE	pci/g 1st RUN	2nd RUN
OS104000 (01)	10/6/77	Chem 239Pu	5.1 ± 6.9%	6.1 ± 6.7%
OS01045 duplicate count	"	"	17.9 ± 6.0%	18.2 ± 6.0%
OS01046 " "	"	"	21.1 ± 6.4%	21.8 ± 5.7%
OS01080(00 & 01)	10/7/77	alpha	16 ± 71%	28 ± 50%
"	"	beta	137 ± 12%	132 ± 12%
"	"	gamma241Am	3.3 ± 8.7%	3.5 ± 8.2%
OS01070(00&01)	"	Chem.241Am	6.5 ± 20%	7.7 ± 11%
OS01140(00&01)	10/10/77	alpha	34 ± 40%	16 ± 83%
"	"	beta	345 ± 6%	363 ± 6%
"	"	gamma241Am	8.6 ± 5.%	8.7 ± 5.1%
"	"	Chem.239Pu	12.7 ± 8.2%	13.0 ± 8.9%
OS01212900&01)	10/11/77	Chem.239Pu	19.4 ± 8.5%	21.6 ± 11%
"	"	241Am	15.2 ± 9.0%	15.6 ± 11%
OS01704(00&01)	"	alpha	10 ± 117%	21 ± 63%
"	"	beta	24 ± 47%	32 ± 36%
"	"	gamma241Am	3.1 ± 6.8%	2.8 ± 7.1%
"	"	Chem.239Pu	11.7 ± 6.7%	8.9 ± 6.5%
"	"	" 241Am	3.3 ± 17%	2.4 ± 17%
OS01836900&01)	"	alpha	5 ±235%	25 ± 49%
"	"	beta	72 ± 19%	62 ± 21%
"	"	gamma241Am	3 ± 15%	3 ± 15%
"	"	Chem.239Pu	6 ± 7%	6 ± 8%
			TRUE	OBSERVED
OS-1060 QC	10/6/77	gamma241Am	5.21	5.34 ± 6.10%
"	"	Chem.239Pu	6.49	4.70 ± 6.30%
"	"	" 241Am	5.48	4.37 ±13 %
OS-1061 QC	"	gamma241Am	0.00	0.08 ± 131%
"	"	Chem.239Pu	0.00	0.04 ± 42%
"	"	" 241Am	0;00	0.04 ± 100%
OS-1385 QC	10/10/77	gamma241Am	2.6	1.6 ± 20%
"	"	Chem.239Pu	6.49	6.46 ± 7.7%
OS-1386 QC	"	gamma241Am	0.00	0.15 ± 213%
"	"	Chem.239Pu	0.00	0.15 ± 85%

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QUALITY CONTROL REPORT
Month Dec. 1977

ID#	IDENTIFICATION	DATE	TYPE	TRUE	pci/g OBSERVED
OS-2578	QC	12/77	Chem. 239Pu	1.08	1.11 ± 10.3%
	"	"	" 241Am	7.83	8.60 ± 9.5%
OS-2579	QC	"	alpha	7.4	3 ± 240%
	"	"	Chem. 239Pu	1.62	1.59 ± 9.6%
	"	"	" 241Am	5.87	5.79 ± 10.5%
OS-2580	QC	"	Chem239Pu	1.08	1.16 ± 10.7%
	"	"	" 241AM	4.32	3.92 ± 10.7%

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QUALITY CONTROL REPORT
Month Jan. 1978

ID#	IDENTIFICATION	DATE	TYPE	TRUE pci/g	OBSERVED
OS-2578	QC	1/7/78	Chem. 239Pu	0.540	0.685 ± 9.3%
	"	"	" 241Am	7.83	7.88 ± 10.3%
OS-3427	QC	"	Chem. 239Pu	0.757	0.822 ± 16.3%
	"	"	" 241Am	5.87	5.86 ± 10.5%
OS-3428	QC	"	Chem. 239Pu	0.540	0.647 ± 10.4%
	"	"	" 241Am	4.32	3.92 ± 12%

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