

eberline

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Reviewed by R. K. Skrutto Date 4/29/77

April 21, 1978

EI-916124

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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
MICHAEL A. ORTIZ
Laboratory Manager

MAO/jm

Encls.

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REPOSITORY PNNL
COLLECTION Marshall Islands
BOX No. 5685
FOLDER Enewetak April 1978

TABLE 1. Duplicate analyses (two 5-gram aliquots) from Enewetak Atoll soil field samples.⁺⁺

	Month	Analysis 1	Analysis 2	Percent Relative Variability ⁺ (%)		
²³⁹ Pu	Sept.	pCi/g	pCi/g			
		3.1	3.4	6.5		
		4.5	4.7	3.1		
		12	14	10.9		
	Oct.	21.6	28.8	20.2		
		5.1	6.1	12.6		
		6.0	6.0	0.0		
		11.7	8.9	27.2		
		12.7	13.0	1.6		
		17.9	18.2	1.2		
		19.4	21.6	7.6		
		21.1	21.8	2.3		
	March and April	0.58	0.62	4.7		
		0.62	0.73	11.5		
		2.35	1.97	12.4		
		16.86	13.39	16.2		
		22.95	31.42	22.0		
		29.56	27.15	6.0		
		38.23	36.82	2.7		
		119.2	116.2	1.8		
				Median = 6.0%		
				Range: 0.0 to 27.2%		
²³⁸ Pu	March and April	0.01	0.02	47.1		
		0.03	0.05	35.4		
		0.20	0.18	7.4		
		1.89	1.57	13.1		
		2.66	1.96	21.4		
		4.00	3.53	8.8		
		4.09	4.07	0.3		
		6.66	8.82	19.7		
						Median = 16.4%
						Range: 0.3 to 47.1%

⁺100(s/ \bar{x})

⁺⁺From Eberline Quality Assurance Reports for September 1977 through April 1978 transmitted to R. O. Gilbert in letters from Mike Ortiz (Eberline) dated April 21 and May 15, 1978.

TABLE 2. Duplicate analyses (two 5-gram aliquots) from Enewetak Atoll soil field samples. ++

	Month	Analysis 1	Analysis 2	Percent Relative Variability ⁺ (%)	
Gamma 241Am		pCi/g	pCi/g		
	Sept.	1.1	1.1	0.0	
		1.6	1.2	15.7	
		9.2	8.1	9.0	
		13	13	0.0	
		33	30	6.7	
		35	30	10.9	
		44	40	6.7	
	Oct.	3.0	3.0	0.0	
		3.1	2.8	7.2	
		3.3	3.5	4.2	
		8.6	8.7	0.8	
	March and April	<MDA	0.25	-	
		<MDA	<MDA	-	
		1.72	1.77	2.0	
		5.46	5.35	1.4	
		14.25	15.45	<u>5.7</u>	
					Median = 4.9%
					Range: 0.0 to 15.7%
	Chemistry 241Am	Oct.	3.3	2.4	22.3
6.5			7.7	12.0	
15.2			15.6	<u>1.8</u>	
				Median = 12.0%	
Gross Alpha	Oct.	5	25	94.3	
		10	21	50.2	
		16	28	38.6	
		34	16	<u>50.9</u>	
				Median = 50.5%	
Beta	Oct.	24	32	20.2	
		72	62	10.6	
		137	132	2.6	
		345	363	<u>3.6</u>	
				Median = 7.1%	

⁺100(s/ \bar{x})

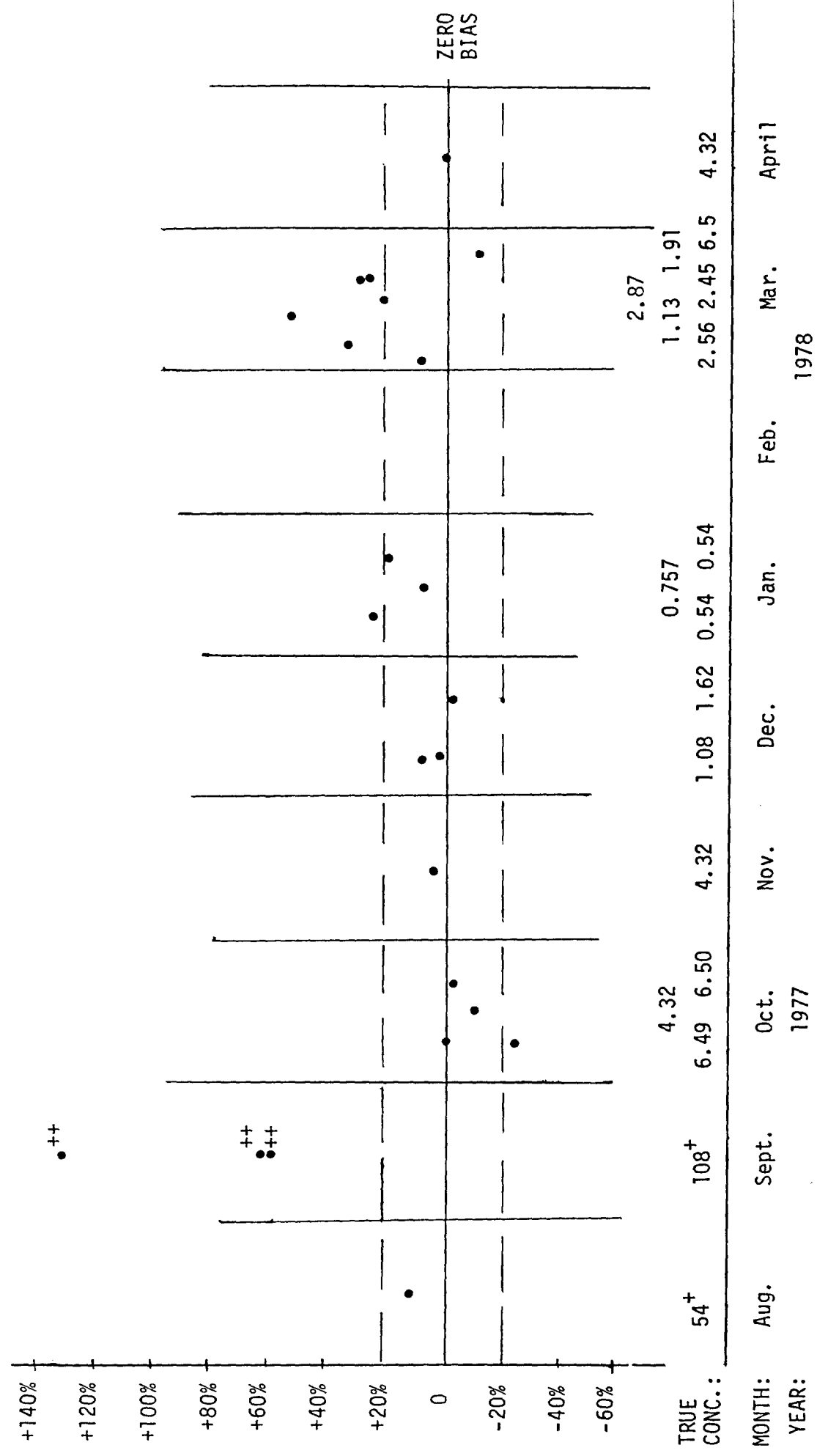
++ From Eberline Quality Assurance Reports for September 1977 through April 1978 transmitted to R. O. Gilbert in letters from Mike Ortiz (Eberline) dated April 21 and May 15, 1978.

TABLE 3. Analyses on blank soil samples taken from Enewetak Island.⁺

	Month	Amount of Spike Added	Observed (pCi/g) \pm Counting Error (2 σ)
²³⁹ Pu	Oct.	0.0	0.08 \pm 36%
		0.0	0.04 \pm 42%
		0.0	0.15 \pm 25%
	Nov.	0.0	0.04
	March	0.0	0.28 \pm 25%
		0.0	0.25 \pm 25%
		0.0	0.11 \pm 32%
		0.0	0.24 \pm 26%
	April	0.0	0.65 \pm 46%
		0.0	0.05 \pm 45%
			Median = 0.13 Range: 0.04 to 0.65 pCi/g
²³⁸ Pu	March	0.0	0.02 \pm 52%
		0.0	0.04 \pm 58%
		0.0	0.02 \pm 71%
		0.0	0.03 \pm 67%
	April	0.0	0.03 \pm 61%
Gamma ²⁴¹ Am	Oct.	0.0	<0.10
		0.0	0.08 \pm 131%
		0.0	0.15 \pm 213%
	Nov.	0.0	<0.10
	March	0.0	<MDA
		0.0	<MDA
Chemistry ²⁴¹ Am	Oct.	0.0	0.04 \pm 100%
	March	0.0	0.02 \pm 200%
		0.0	0.53 \pm 82%
		0.0	0.03 \pm 100%
		0.0	0.04 \pm 115%
	April	0.0	0.07 \pm 67%

⁺ From Eberline Quality Assurance Reports for September 1977 through April 1978 as transmitted to R. O. Gilbert in letters from Mike Ortiz (Eberline) dated April 21 and May 15, 1978.

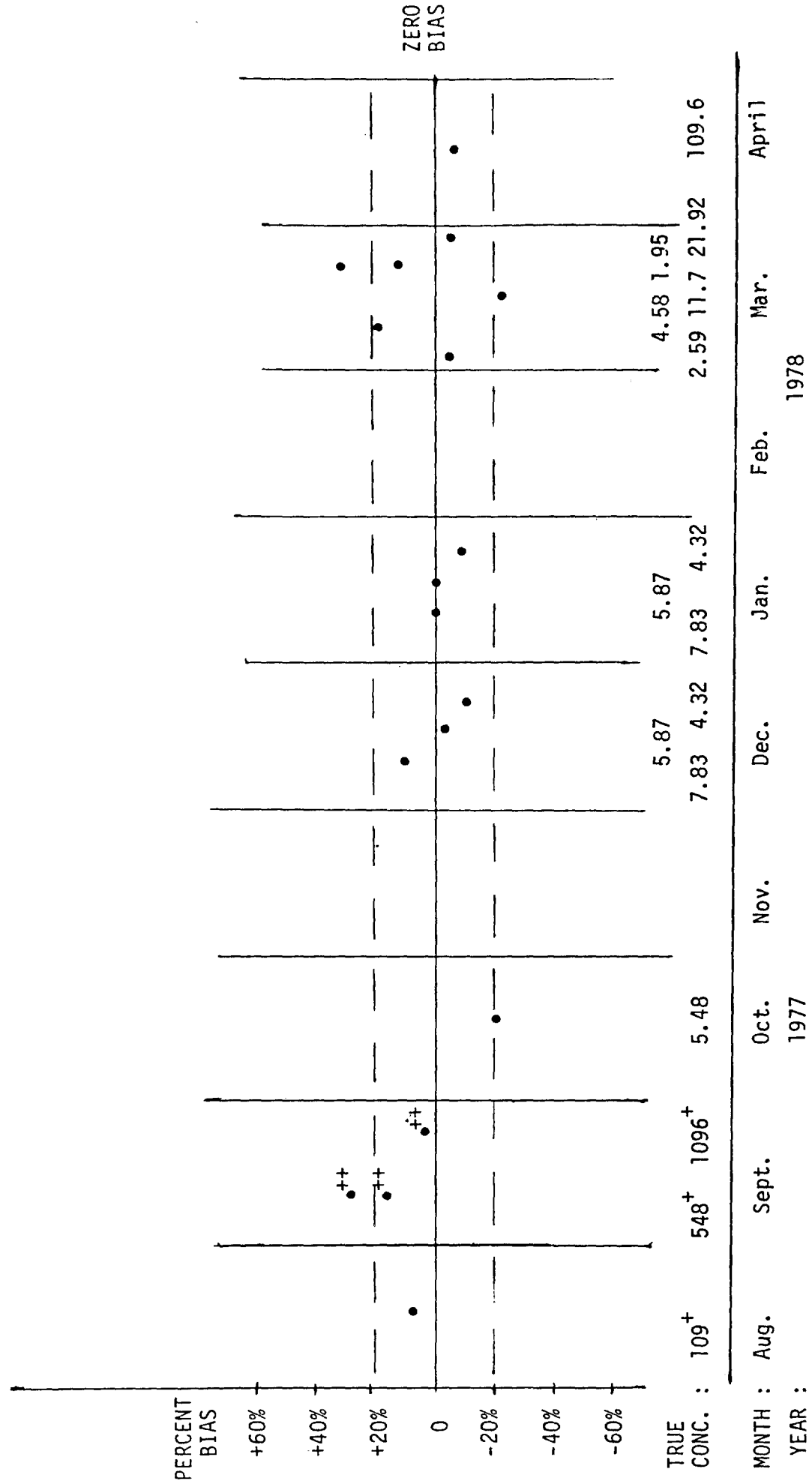
PERCENT DEVIATION FROM ²³⁹Pu SPIKED SOIL SAMPLES. WET
 CHEMISTRY ANALYSIS BY EBERLINE ENEWETAK LABORATORY



⁺pCi Total. All other values are pCi/g dry (Enewetak Island) soil.

⁺⁺Samples not ball-milled.

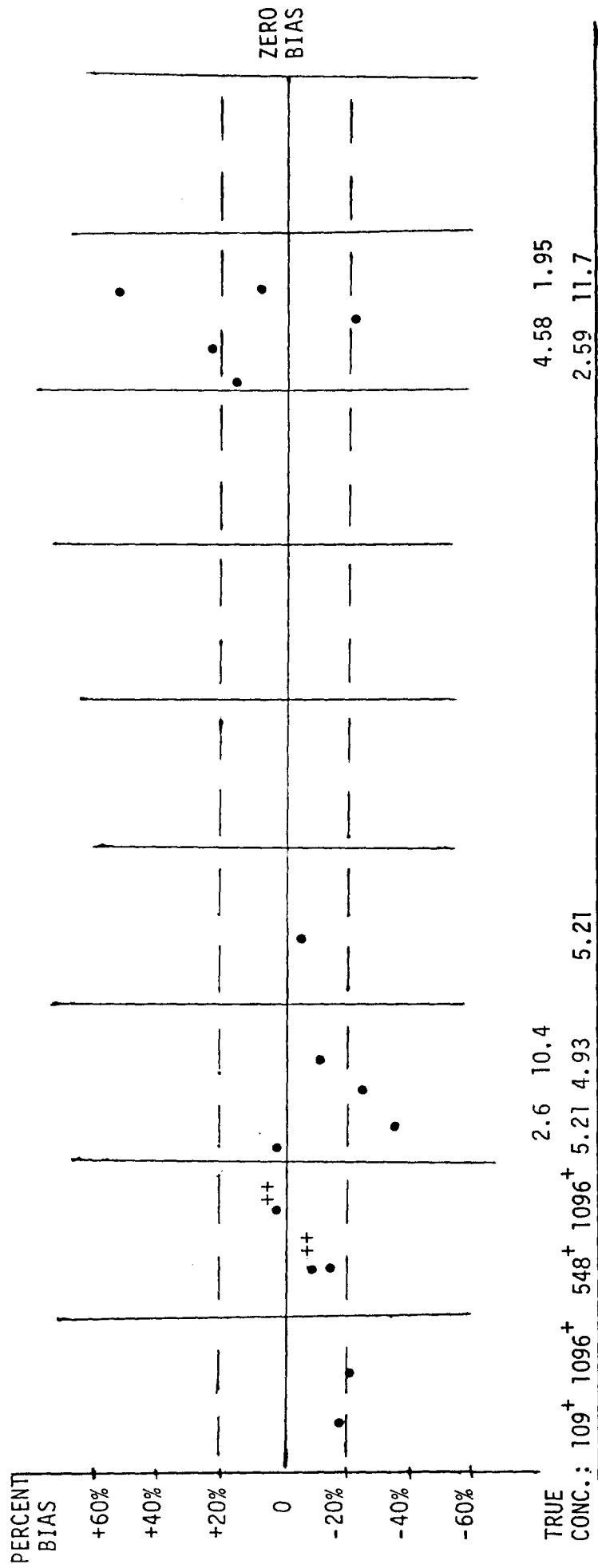
PERCENT DEVIATION FROM ^{241}Am SPIKED SOIL SAMPLES. WET
 CHEMISTRY ANALYSIS BY EBERLINE ENEWETAK LABORATORY.



⁺ pCi Total. All other values are pCi/g dry (Enewetak Island) soil.

⁺⁺ Sample not ball-milled.

PERCENT DEVIATION FROM ^{241}Am SPIKED SOIL SAMPLES. GAMMA SPECTROMETRY ANALYSIS BY EBERLINE ENEWETAK LABORATORY.



MONTH: Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. April
 YEAR: 1977 1978

⁺ pCi Total sample. All other values are pCi/g dry (Enewetak Island) soil.

⁺⁺ Sample not ball-milled.