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DAI

BROOKHAVEN NATIONAL LABORATORY  
ASSOCIATED UNIVERSITIES, INC.

Upton, Long Island, New York 11973

(516) 282-4209  
FTS 666

Department of Nuclear Energy  
Radiological Sciences Division  
FAX (516) 282-5810

January 3, 1990

Mr. Harry U. Brown  
Department of Energy  
Office of Emergency Response and Program Analysis  
Nevada Operations Office  
P.O. Box 98518  
Las Vegas, NV 89193-8518

Dear Harry:

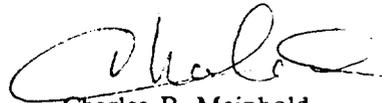
Happy New Year!

Enclosed you will find the first 40 plutonium results from samples collected this summer (Attachment 1). These data include urinalysis of all individuals who had a plutonium assay greater than 1,000 aCi ( $1.0e^{-18}Ci$ ) in the past. The data also includes the results of 3 samples collected from personnel in the Bikini Field Station and from 5 volunteers from the College of Micronesia (non-Marshallese) for evaluation of plutonium background in the RMI areas.

From the plutonium distribution of the enclosed data we now feel certain that the urine samples collected from 1981 to 1984 were contaminated during field collections. This new data support the statement that the individuals we measured have no greater than 100 aCi of plutonium in their urine nor will receive greater than 1 mrem/year from plutonium. More samples remain to be analyzed, and our final analysis of the entire 1989 urine collection mission should be available in June 1990. Nevertheless, it is clear that our new protocol seems to have cleared up the sample contamination controversy.

As you know, we only measured selected individuals (i.e., those who had high plutonium results). These 32 data do not represent a random outcome and, therefore, can not be used to compare the earlier population distributions. We have plotted the old vs. new data for comparison (Attachment 2). Please note that the vertical axis is logarithmic to accommodate the large range in the paired measurements. The unit is the attocurie. The minimum detection amount (MDA) of about 54 aCi is marked as a horizontal line. Also, note that for the purpose of presentation a value of 2 aCi was assigned for those samples with 2 aCi or less.

Sincerely,



Charles B. Meinhold  
Division Head

CBM/cs

cc: John Rudolph

DOE  
John Rudolph's Files  
D File  
Marshall Islands 1990

Attachment 1: Plutonium-239 urine data from the first 40 samples.

Sample #	ID	Fission track	1989 data Pu-239 (aCi)	81-84 data Pu-239 (aCi)
1†		53	17‡	n.a.
2†		53	17	n.a.
3†		68	35	n.a.
4†		58	23	n.a.
5†		19	2§	n.a.
6†		78	46	n.a.
7†		49	13	n.a.
8†		34	2	n.a.
9	851	102	74	8025
10	92	25	2	4722
11	1107	102	74	3442
12	279	34	2	3390
13	279	34	2	3390
14	279	53	17	3390
15	1167	40	2	3220
16	1167	76	44	3220
17	3870	23	2	2690
18	3870	15	2	2690
19	1690	53	17	2425
20	5059	78	46	2335
21	1156	68	35	2296
22	3870	9	2	2089
23	276	29	2	1938
24	2800	34	2	1853
25	1111	34	2	1662
26	1106	34	2	1630
27	2800	55	20	1452
28	1134	29	2	1386
29	900	65	31	1308
30	851	82	51	1295
31	5132	34	2	1151
32	1134	38	2	1145
37	1403	24	2	1055
39	5033	43	6	638
38	1403	44	7	549
35	5050	47	10	448
36	5050	33	2	448
34	2409	79	48	333
33	360	62	28	316
40	2409	34	2	282

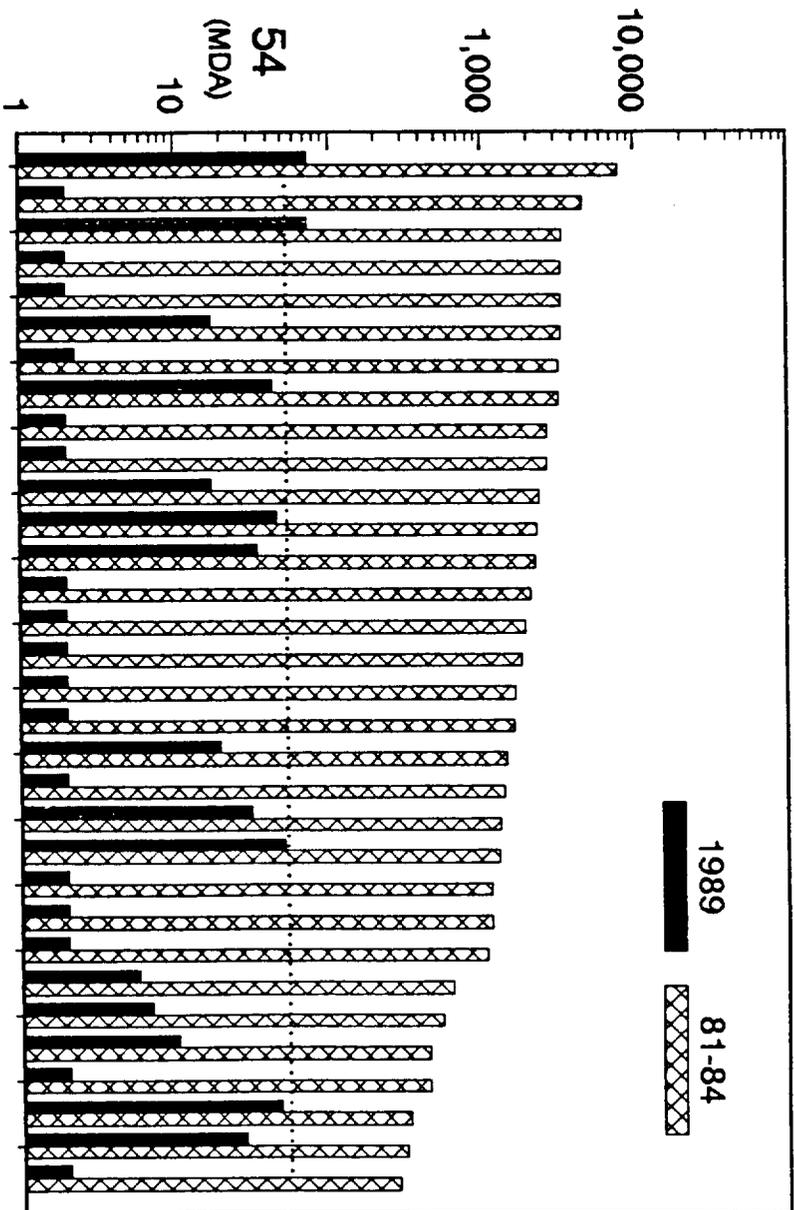
†: Bikini workers (1-3), Non-Marshallese (4-8): the earlier data are not available (n.a.).

‡: Values less than 54 aCi is below current MDA.

§: 2 aCi is assigned as lowest value for those 2 aCi or less.

# Comparison of 1989 outlier data with earlier samples.

Plutonium-239 activity,  $1e-18$  Ci,  
in 24-hour urine samples



32 Outliers sorted by earlier plutonium data

Note: for presentational purpose, 2 aCi is assigned as lowest value.