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Laboratory of Radiation Biology
Fisheries Center

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BIO-MED, DR. CONARD
FOLDER 01 THRU 12/1967

Dear Frank:

Dr. Dunham called yesterday to ask that information relative to radioactivity at Bikini Atoll be sent to you for use at a meeting in Honolulu with members of the Trust Territory Government. From our telephone conversation yesterday, I understand that Mr. Bonnet, Manager of the AEC Honolulu Operations Office, will meet with Mr. W. R. Norwood of the Trust Territory on November 13.

The most recent data for Bikini Atoll were obtained by the Laboratory in August, 1964. A detailed report of this survey, much of which is pertinent to discussions regarding the repopulation of Bikini Atoll, was begun by Dr. R. F. Palumbo (deceased) and is now being completed by Dr. A. D. Welander. The complete report will be about 350 pages, three-fourths of which is now ready for reproduction.

Six pieces of information are included in this letter:
(1) survey meter readings; (2) gamma-emitting radionuclides in the edible portion of land plants; (3) ^{90}Sr and calcium values for land plants, soils, rats, birds, algae, bottom sediments, invertebrates and fish; (4) a summary of average values for gamma-emitting radionuclides by sample type; (5) gamma-emitting radionuclides in the top inch of soil fines; (6) a copy of a letter of September 21, 1964 from Dr. Held of our Laboratory to Mr. Coleman of the Trust Territory. Items 1-5 were provided by Dr. Welander. The letter by Dr. Held expresses the general attitude of the Laboratory at that time and at present in regard to the resettlement of Bikini Atoll.

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In reviewing the data it should be noted that where average values are given, these are arithmetic means and conservative values. The true mean is less than the arithmetic mean, since the distribution of radiological values is either Poisson or logarithmic. Also it should be noted that some values are in terms of wet weights and others, dry weights. (For some samples wet weights are difficult to determine reliably). Wet to dry ratios for various types of samples are of the order of 4 to 10. Also, the average value such as given in (4) and the inherent errors associated with lumping things together without consideration for the errors within or between species and within or between areas.

The table of survey meter readings (1) lists maximum and average values at ground levels and at three feet above the ground, and for gamma and beta-gamma combined. The maximum value was 21 mr/hr for beta-gamma at ground level for an area about ten feet in diameter (not a crater) on Rumurikku Island. In my conversation with Dr. Dunham I commented that perhaps levels of radiation in a few small areas might require the establishment of exclusion areas, but upon looking at the other information from this area, this conclusion may not have been justified.

The table of ^{90}Sr values (3) does not list coconut crabs. Only one coconut crab was captured at Bikini in 1964 and the analyses of samples from this specimen were not completed before preparation of the table. The ^{90}Sr and ^{137}Cs values are as follows:

	<u>^{90}Sr</u>	<u>^{137}Cs</u> in pCi/g (dry)
Shell	2200	192
Muscle	(600 est.)	940
Liver		135

The analyses of the muscle sample for ^{90}Sr is in process, but based upon the ratio of ^{90}Sr in shell and muscle of Coenobita, a closely related crab, and in coconut crabs from Rongelap, a value of 600 pCi/g(dry) has been estimated. As you recall, coconut crab was the only food item forbidden to the Rongelapese when they return to their home island.

The values for radionuclides in soils that you asked for are given in Table (5). These are values for the gamma-emitting radionuclides. These samples have not been analyzed for plutonium. Today, our plutonium analyses have been limited to Johnston Atoll samples.

The result of radiological analyses of Bikini samples and Rongelap samples were compared by inspection. The impression from this subjective comparison is that the levels of radioactivity are closely similar for the two atolls. Certainly the range of values for comparable samples overlap and on the basis of single samples, sometimes Bikini has the highest values, sometimes Rongelap. To refine the comparison much further would require extensive information on specimen, species and area variability.

We trust that this information, which is typical of the data that we have, will be helpful to you. We expect that the Bikini-Eniwetok report mentioned in the second paragraph will be completed next month.

Sincerely yours,



Allyn H. Seymour
Associate Director

AHS:ah
Enc.

cc: Dr. Dunham
Dr. Dunning