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DRAFT:3/6/68

SUBJECT: A meeting was held at the AEC H Street office February 28, 1968, to discuss preliminary results of the Bikini Atoll survey of April-May 1967 and to consider actions by the Federal Government in returning the native population to Bikini Atoll in the near future. Attendees were:

Honorable W. R. Horwood, High Commissioner, Trust Territories
 H. M. Holland, OSD, IEA
 George Milner, Department of the Interior
 C. E. Johnson, NDC
 A. R. Pritch, AEC
 J. R. Totter, DEM, AEC
 P. F. Gustafson, DEM, AEC
 R. D. Maxwell, DOS, AEC

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 AUTHORITY: DOE/SA-20
 BY ~~H. R. SCHMIDT~~, DATE: 6-16-94
 D. R. GILSON

Commissioner Horwood stated that it would be highly desirable for the natives to return to Bikini Atoll. Some of the problems discussed in some detail that would need solution before approval could be given for rehabilitation included the health and safety for a returning population, requirements for Air Force usage of the area (no decision on the future use has been stated) and agricultural rehabilitation which appears to entail a great deal of careful planning and work prior to a return of any inhabitants who will depend on the resources of the island for their livelihood.

It was generally agreed that all agencies represented at the meeting would support authorizing a return of the Bikinians to the atoll if the studies indicate this is feasible and if the safety of the natives can be assured. Mr. Holland stated that the Air Force would be queried as to any future requirement for the atoll. Although there was no agricultural expert at the meeting, it was pointed out that a preliminary report submitted by Mr. James Miyane, Office of District Agriculturist, Marshall Islands, U. S. Trust Territory, last year discussed possible actions that could be taken and costs required to initiate proper rehabilitation. It was generally

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agreed that the cost estimate contained in the report was low, considering the work required, even though the rehabilitation efforts suggested were modest.

The question was raised as to what agency would fund for the rehabilitation or what agency would be responsible for specific portions of the work. Dr. Fritsch indicated that the ABC would probably be willing to support part of the necessary funding. Commissioner Horwood indicated that there could be some support from the Trust Territories. Dr. Johnson pointed out that possibly funding, which will be over and above normal departmental funding, could be best handled by the JCAE. This point was not pursued. It was pointed out that return of the Bikinians would meet with a high degree of approval at the UN, however any action would necessarily depend on the Air Force requirements and the radiological situation of the environment.

As background to a discussion of the radiological situation of Bikini Atoll it should be noted that when the 166 natives were moved from Bikini Atoll to Rongerik Atoll March 6, 1946, in preparation for Operation CROSSROADS, it was tentatively planned that when the U. S. no longer had a requirement for the atoll the area would be returned to the rightful owners. Due to insufficient natural resources on the Rongerik Atoll, the natives (then numbering 184) were moved to Kwajalein Atoll in March 1948 and housed in tents temporarily while a decision was made for a permanent location. The group moved to Kili Island in November 1948, where they now reside. It should be noted that Kili Island lacks a lagoon and that marine life as a source of food is not available in sufficient amount to supply the needs of the population.

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The forced change in diet has contributed markedly to their inability to adapt to Kili Island. Thus the strong desire on the part of many to return to their native Bikini Atoll remains alive. There are now approximately 500 people on Kili Island and when a poll was taken early in 1967, 146 of the group indicated a desire to return to Bikini Atoll.

In the ten years which elapsed from the last test series (1958) at Bikini to the present, the atoll has been essentially uninhabited. Dense vegetation has spread over the larger islands, and native marine and terrestrial animals have flourished in man's absence.

During the period from 1946 to 1958 the land mass and water in the lagoon at Bikini Atoll became contaminated from both atmospheric and underwater tests. Brief radiological surveys were made on several occasions to follow the decay of radioactivity on the atoll; however, an intensive, rather complete radiological survey was made during August 1964. The decision was made at that time that the health and safety of people returning permanently to the area might be endangered. A detailed resurvey was made during April-May 1967.

Dr. Gustafson reported that the radiological resurvey of Bikini Atoll consisted of taking numerous radiation exposure measurements, and collecting representative samples of the prominent plant and animal species (including fish and birds). Particular efforts were made to sample those items likely to be consumed as food by the returning Bikinians. Several kinds of devices were used to measure radiation dose rate. Confirmation of dose rate by more than one instrument increased reliability, and the field γ -ray spectrometry provided detailed information on the radionuclide composition of the contamination.

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The island of Bikini was surveyed most extensively. The former village was located here, and remains the most desirable location for permanent housing. The beach area, village site, and selected transects across the middle and both ends of the island were surveyed for radiation levels. The dose rate at or near the beaches was lowest due to leaching and wash off of radioactivity. Radiation levels were comparable to those found in the U. S. ($\sim 10 \mu R/\text{hour}$). Higher levels (roughly twice to three times beach values) were present in the interior (densely overgrown) regions. A sizable area was cleared of vegetation, and dose rates remained essentially constant. Other measurements indicated radioactivity to be present in the vegetation. Hence one may conclude that as the shielding effect of plant material is removed, the dose from ground deposition compensates for the removal of radioactivity in plant material. Under habitation, the islands would be cleared of underbrush; hence, the plant source will be removed. Flowing under, or otherwise burying the top layers (inch or so) of soil should substantially reduce the dose rate. As expected, the residual radioactivity is all relatively long-lived: Cs^{137} contributes 70-80 percent of the external dose. Thus only a slow decrease with time can be expected from radioactive decay:

Plant and animal tissue contained varying amounts of fission and activation products. Pre-1946 Bikinian diet consisted predominantly of fish, with pandanus fruit, coconut, arrow-root, and land crabs supplying a lesser intake. Imported foods such as dried milk, canned meats, flour, and rice were seldom used by the Bikini people prior to 1946. Contacts with the outside world doubtless have tended to alter former tastes. Fish fortunately

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showed low levels of radioactivity and could be eaten in normal amounts (1-2 pounds per day per adult) without reservation. Pandanus, coconut meat and milk, as well as coconut crabs (land crabs) all contain substantial amounts of Cs^{137} and Ba^{90} . Further work must be done with raw data before a realistic evaluation of radiation risk due to consuming these foodstuffs can be made. Exclusion of some locally-produced food items from the diet may be indicated, as was done in the case of land crabs in the resettlement of Rongelap.

In summary, it appears that re-occupation of Bikini Atoll within the near future would result in an external radiation exposure about double that incurred by the average U. S. population but similar to that now incurred by residents of the Colorado Plateau area. The matter of soil burial or plowing would presumably reduce such exposure to near average levels. (It should be noted that the soil cover is thin--a few inches--and disruption of this might impair the fertility of the islands.) Consumption of local produce in normal amounts would yield radioactive body burdens of Cs^{137} 20 to 50 times greater than those occurring in U. S. population during the high fallout period 1963-1964. None the less, these levels are below those currently experienced by some portions of the Eskimo population. By removing specific locally produced food items, and substituting important nutrient, the Bikini diet will contain about the levels of radioactivity deemed acceptable to world population in recent years.

Sources of exposure will have to be evaluated and decisions reached whether or not to take action to minimize exposure through the various pathways that may be present. In addition, one should weigh, with some

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compassion, the present socio-economic stress of displacement and the fact that life away from Bikini is quite depressing to say the least.

The following time-table was proposed for consideration of the radiological health aspects: 1. Completion by late March of a draft report synthesizing pertinent available data, and submission of this report to a working group. 2. Consideration of report by working group and presentation of a final report to panel of experts for review and recommendation after mid-April. It was agreed that the schedule recommended for completion of this evaluation was reasonable. It was pointed out that even when the health and safety considerations are met, and the USAF relinquishes title to the area, it will take some two or more years to complete the rehabilitation program (clearing land, planting coconut and other crops, building houses and the like). Thus an early finding regarding radiological safety would facilitate the entire program.

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