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September 1, 1976

Mr. T. F. McCraw  
Division of Operational Safety  
U. S. Energy Research & Development  
Administration  
Washington, D. C. 20545

Dear Tommy:

Dr. Conard and I have discussed the urine plutonium problem at length, and have arrived at several courses of action which will hopefully shed more light on it. The fall medical survey (~ September 19 to October 3) will afford us several opportunities to test the "regional theory", i.e. that urine Pu levels are generally higher in the tropical Pacific than at temperate latitudes. The survey has scheduled stops at Wotje, Ailuk, Utirik, Rongelap and Bikini. We expect to collect as many bioassay and relevant environmental samples as possible at these atolls; and additional urine samples will be collected at Ebeye and Majuro. We are also investigating the possibility of collecting bioassay specimens from "long-term" residents at Kioajalein and Enewetak (?) I am hoping that we can obtain separate specimens from 17 year old and younger Marshallese, and from Peace Corps volunteers with notation of the duration of their residence. Additional "local" controls from Brookhaven National Laboratory employees will be analyzed and samples will be collected from several BNL employees who spent substantial amounts of time in the northern Marshalls during the testing days. Special efforts will be taken to minimize cross contamination of urine samples with Pu contaminated soil, and the samples will be Millipore filtered before radiochemical analysis.

Vic Nelson will be making this trip to gather additional data on the geographical distribution of radionuclides from the testing programs. We expect to place special emphasis on analyses for transuranic isotopes. I plan to gather additional samples from "reservoirs" for resuspended and redeposited soil at Bikini to support our preliminary finding that plutonium bearing particulates are fractionated from inert materials and are selectively left behind when soil is resuspended.

As a result of some recent discussions with Ed Wrenn (NYU), I am convinced that we should look for americium in Marshallese whole body counts. Making inferences about Pu from Am data can be pretty tenuous, but  $^{241}\text{Am}$  uptake data would be useful in establishing conservative upper limits on Pu body burdens. Besides that, the present state of the art allows us to see a small fraction of a maximum permissible body burden for  $^{241}\text{Am}$ , and the incremental cost of adding this specific analysis to the present whole body counting program should be small; I am strongly encouraging the addition of Ed Wrenn's resources to the whole body counting program tentatively scheduled for next spring. I hope to arrange a meeting soon between Ed Wrenn, Stan Cohn, Bob Conard, and myself to discuss the details. If additional costs are identified beyond our budgets, I may have to talk to you about the possibility of additional funding from BER or OS.

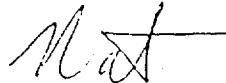
As a follow up to our discussion about the Utirik thyroid cancer cases, I spoke with Bob Conard about the dose estimates. He substantiated our surmise that the estimates were based on rather tenuous and late (post-exposure) urine analyses, and external exposure rate measurements. Evaluations of environmental levels of  $^{129}\text{I}$  may prove helpful in shedding more light on thyroid dose estimates (at least in establishing a dose ratio between Rongelap and Utirik). However, preliminary attempts at activation analysis by the BNL Chemistry department have indicated a total soil iodine level of  $\sim 10$  ppm in samples from Rongelap. This is near the limit of detection, and the  $^{129}\text{I}$  level is yet to be established. We will continue to look into this approach, however, because larger samples and preliminary chemical separation of iodine may increase the sensitivity of the technique.

The following approximate schedule may slip a week depending on interface requirements with Batelle's marine sediments program at Bikini.

Fri.	September 17	Hono	-	Kwaj
Sun.	September 19	Kwaj	-	Wotje
Wed.	September 22	Wotje	-	Ailuk
Thurs.	September 23	Ailuk	-	Utirik
Mon.	September 27	Utirik	-	Rongelap
Fri.	October 1	Rongelap	-	Bikini
Sun.	October 3	Bikini	-	Kwaj
Mon.	October 4	Kwaj	-	Hono

I will keep you apprised of any new developments.

Best regards,



N. A. Greenhouse

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cc: C. Meinhold  
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