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ENVIRONMENTAL SCIENCE DIVISION
Marshall Islands Program

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Mayor Joe Saul
Utrik Atoll Local Government
Majuro, Republic of the Marshall Islands

Subject: Initial comments related to the Utrik Radiological Remediation Proposal prepared by T.T. Manese Mansur, Utrik Atoll Local Government, in cooperation with S. Cohen & Associates

Dear Mr. Mayor,

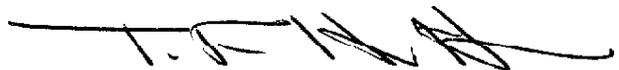
I am pleased to provide some initial feedback on the Summary of Recommended Radiological Remediation of Utrik Island and Associated Costs. I have limited my discussion to guidelines justifying intervention and the potential effectiveness of potassium in reducing the uptake of radioactive (Cesium-137) into plants from coral soils. The Department of Energy (DOE) has not been directly involved in the remediation work other than providing recommendations for remediation and collecting environmental data to verify the effects of intervention strategies. Consequently, I have not addressed the issue of cost in this proposal as the work is outside DOE's mandate.

Utrik Atoll is located about 300 miles east of Bikini Atoll. The atoll experienced significant radioactive fallout deposition from atmospheric nuclear weapons tests conducted in the Northern Marshall Islands during the 1950s. The most significant contaminating event on Utrik Atoll was the Bravo shot conducted at Bikini Atoll on March 1, 1954. Utrik residents were evacuated 3 days after the Bravo detonation and returned to their atoll 3 months later. Until this day the community has struggled to overcome their societal fear of radiation. Yet the existing exposure conditions on Utrik Atoll represent only a small fraction of the dose than people unavoidable receive from natural sources of background radiation in the Marshall Islands. According to Robison *et al.*, (1999)¹, the estimated population average maximum annual dose using a diet including imported foods is less than 4 mrem per year and has no consequence to the health of the population. The authors of the Utrik Radiological Remediation plan argue that Utrik residents who live largely on a local only diet may experience doses of 30 mrem per year or more. These latter estimates exceeds the cleanup standard adopted by the Marshall Islands Nuclear Claims Tribunal of 15 mrem per year based on U.S. EPA criteria for cleanup of Superfund Sites. Such high-end individual doses in the Utrik population have not been clearly demonstrated. Justification for intervention would therefore need to be based on the presumption that such high doses are reasonably achievable and that exposures can be reduced or prevented by means of some remedial

action or intervention. If justified on radiological grounds, then intervention for the purposes of radiation protection should always be undertaken. However, it must be emphasized that the EPA guidance does not provide a robust or pragmatic action level. There are many situations around the world where a much higher dose (e.g., 1000 mrem per year) is used as a generic guideline for intervention, especially for existing chronic exposure situations like Utrik Atoll.

For the purposes of discussion lets assume that the Utrik Atoll Local Government is successful in obtaining funding for development of infrastructure and remediation of Utrik Island. This could be justified on the basis of either radiological, social, ethical and political judgments or simply to allow the United States to bring the tragic events related to deposition of fallout contamination over Utrik and exposure of the local population during the 1950s to a close. It has been assumed that the most cost-effective method for reducing the dose on Utrik is the application of potassium to the soil in order to block the uptake of Cesium-137 into the plants. Studies on Bikini Island show that addition of potassium can reduce Cesium-137 uptake to less than 5% of the pretreatment level. However, preliminary studies on Bikini and Rongelap Islands indicate that the effectiveness of potassium treatment is also correlated to the concentration of Cesium-137 in the soil (Hamilton, unpublished data). My concern is that the Utrik Atoll Local Government may spend considerable resources on employing the potassium treatment option for only a modest benefit in reducing the dose to the resident population. I would recommend that a pilot study be developed to assess the affect of potassium on Cesium-137 uptake into plants on Utrik Island. This could take the form of a short-term experiment using local field station workers to plant, water and harvest a seasonal grain crop to compare with similar studies conducted on Bikini and Rongelap. The results of this study could then be extrapolated to coconuts and other locally grown food crop products in order to obtain information on the quantitative effects of potassium fertilization. The project would take about 6 months to complete and would require Bechtel Nevada (BN) and LLNL support to manage the logistical, analytical and consulting services. Please let me know if I can provide any further information.

My personal best regards,



Dr. Terry F. Hamilton
Marshall Islands Program Leader
Lawrence Livermore National Laboratory

¹ Robison et al., (1999). Utrik Atol Dose Assessment, Lawrence Livermore National Laboratory (LLNL), UCRL-LR-135953, 80-pp.

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