HOMEWARD BOUND:
Radiological Surveillance Measures in Support of Rongelap Atoll Resettlement

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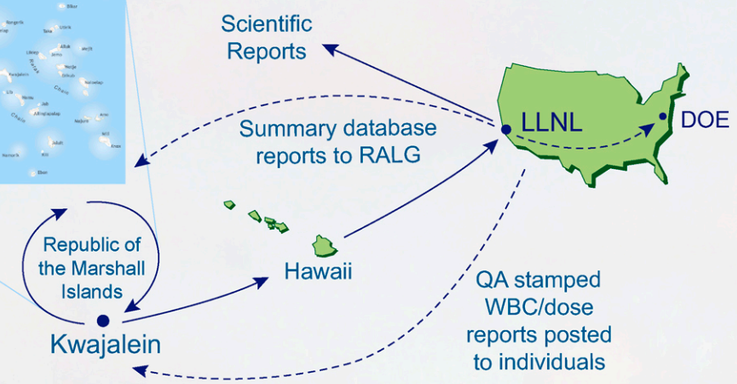
Introduction

The Marshall Islands Program provides individual and environmental measurement data and dose assessments to characterize current radiological conditions and minimize exposure of resettled and resettling populations. The program is conducted under the auspices of Office of Health Studies within the U.S. Department of Energy and is implemented through a series of strategic initiatives to address long-term radiological surveillance needs at former U.S. nuclear test sites in the Marshall Islands.

Environmental Monitoring

LLNL has been monitoring radiation levels in the environment since the mid-1970's. This information has provided a basis to develop clean-up methods to reduce radiation doses to future island residents. The most effective technique for reducing radioactive levels in locally-grown food is to add potassium fertilizer.

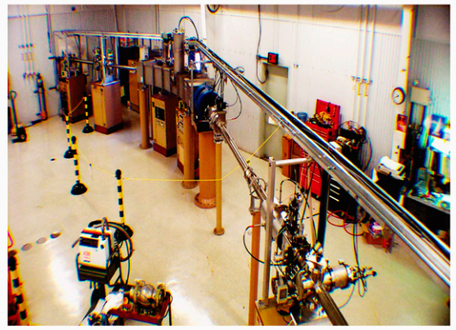


Strategic Initiatives in Support of Rongelap Resettlement

There are two main strategic initiatives developed under the Marshall Islands Rongelap Resettlement Support Plan:

1. To establish a high-quality radiation protection monitoring program on Rongelap Island to assess exposure to resettlement workers from internally deposited fallout radionuclides.
2. To provide environmental characterization and verify effects of the environmental cleanup program.

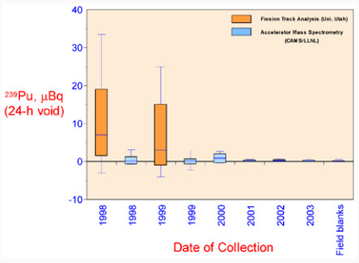
Plutonium Bioassay



AMS Heavy Element Line. Improving the quality and reliability of plutonium bioassay exposure assessments by using innovative measurement technologies.

In collaboration with the Center for Accelerator Mass Spectrometry (CAMS) at LLNL, the Marshall Islands Program has greatly improved the quality and reliability of plutonium exposure assessments at former U.S. nuclear test sites in the Marshall Islands. The measurement capability employed at Livermore based on accelerator mass-spectrometry (AMS) is 200 to 1000 times more sensitive than classical methods used for monitoring of exposures to plutonium. AMS far exceeds the requirements of the latest Department regulation 10CFR 835 for in vitro bioassay monitoring of plutonium-239 where classical techniques fail.

Historical bioassy measurements in the Marshall Islands have used fission-track analysis. Results using AMS show that plutonium excretion rates from resettlement workers are not clearly discernible from background levels expected from previous exposures to worldwide fallout contamination. Moreover, as the measurement technique has evolved at CAMS over the past few years all the bioassay results fall below the critical value of the measurements and are equivalent to that observed in collection bottles containing acid preservative (field blanks). (Refer to the adjoining figure).

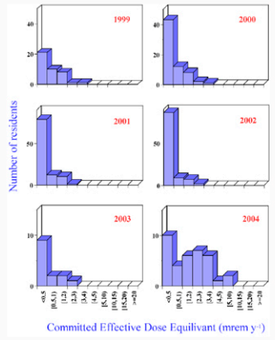


Phase I Resettlement Activities

Soil remediation work around the community center shows a 20 to 25-fold reduction in external gamma exposure rates within this region. The addition of clean crushed coral fill has the added benefit of reducing inhalation and/or ingestion exposure to contaminated soil containing elevated levels of plutonium and americuium-241.

Whole-Body Counting

The availability of a whole-body counting system on Rongelap Island offers resettlement workers (and future residents) an unprecedented level of radiation protection monitoring. Information about individual uptakes and potential "high-end" health risks can be assessed from measurement data rather than relying on assumptions based on a range of possible intake scenarios.



Preliminary results of the whole-body counting program show that current levels of radioactivity are below the safety standards set by the Republic of the Marshall Islands, where the annual dose is below 15 mrem per year.

Conclusions

Recent initiatives developed under the DOE Marshall Islands Program demonstrate a continuing commitment by the United States to help ensure the safety of resettled and resettling atoll populations in the Marshall Islands. The Rongelap Atoll Local Government has made significant advances towards unrestricted resettlement of Rongelap Island. By developing shared responsibilities, building infrastructure and training local health physics technicians in radiation protection under the LLNL Marshall Islands Program, the DOE is assisting Marshall Islanders to invest in their own futures and leveraging program assets to support similar actions on other islands or atolls.

This work was performed under the auspices of the U.S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.