

## **Radiation Doses That People May Receive If They Return To Rongelap Island In 2006**

Prepared by

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## Summary

I have been asked to review Dr. Hans Behling's January 19, 2004 letter report to the Rongelap community in which he indicated that under the conditions that existed in 2000 on Rongelap Island, a radiation dose of 23 millirem per year was estimated for the average person whose diet is not limited to locally grown foods but includes imported foods, and therefore that he felt that it would be safe for the people to return to Rongelap Island.

The radiation dose that is referred to here is the residual radiation from the atomic bomb tests. One should note that there is also radiation from natural sources which on Rongelap is very low, lower than in most parts of the world.

I contributed as a scientist to the Rongelap Resettlement Project that was completed in 1995. The standard for residual radiation at the time was 100 mrem per year. Our project team concluded at the time that if people would live on Rongelap Island and eat only local foods (no imported food), the radiation dose to some people would be above that limit. Since then, the level of radioactivity on Rongelap Island has decreased, due both to natural effects and to the recent cleanup efforts.

After a careful review of Dr. Behling's letter, the in-depth SC&A report by Dr. Hans Behling and Dr. John Mauro conducted in 2000 upon which Dr. Behling's letter is based, other studies, and documentation that I have been provided regarding the cleanup work conducted thus far on Rongelap Island, I would agree with Dr. Behling's finding as to the average level of exposure to people returning. Actually, my estimate for the average dose today, in 2006, is 17 mrem per year (a little bit smaller than Dr. Behling's conclusion), mostly because I took recent cleanup into account .

Therefore, to the question, "Is Rongelap Island a safe place to live now?", my answer is twofold:

- Under certain circumstances, identified by Dr. Behling and discussed in more detail in this report, Rongelap Island can be a safe place now.
- Further cleanup (spreading additional potassium) on Rongelap Island should be completed to provide additional assurance of safety.

In reaching my conclusions, I have looked at all the potential options that people may have if they return to Rongelap and reside in the village:

- Eating only imported food (no local food at all)
- Eating a food mix like on Mejjatto (some local foods)
- Eating only local food (worst-case for radiation exposure)

I took into consideration the mixed food diet that, as part of the 1993 Rongelap Resettlement Project, we determined was the diet for people living on Mejjatto. It showed that only 18% of the calories come from local foodstuffs such as coconut, pandanus and reef fish. I used the Rongelap Resettlement Project method to calculate the radiation doses.

I also took into account that the village area on Rongelap Island has been cleaned up. Considerable effort has been undertaken to this effect. About 10 inches of surface soil was removed and coral fill was added around the service and village area. Because of this, external radiation exposures are now greatly reduced in areas where people spend most of their time. All analysis show that the dose from plutonium is extremely small, and that the most important radionuclide is cesium-137.

Based on the information I have, one cleanup step remains to be done: the treatment of the entire island with potassium fertilizer. Potassium fertilizer reduces the amount of cesium-137 in food plants to about one tenth (1/10) of what it would otherwise be if there was no potassium added to the soil.

I calculated the doses for the average person and the reasonable worst-case which is called "high-end". I also compared the results before and after completion of potassium fertilizer treatment. As a measuring stick, I used the cleanup standard of 15 mrem per year that the Nuclear Claims Tribunal (NCT) has established. The results are shown in the enclosed two figures for the average and high-end doses.

Under the existing circumstances as I understand them to be on Rongelap Island today, the following conclusions can be made:

- If a person returns to Rongelap Island in 2006, stays primarily in the village area and eats no local food, the average radiation dose will be 3 mrem per year, and the high-end dose will be 6 mrem per year.
- If a person returns to Rongelap Island in 2006, and eats a mixed food diet that is similar to the Mejjatto diet, the average radiation dose will be 17 mrem per year, and the high-end dose will be 30 mrem per year.
- If a person returns to Rongelap Island in 2006, and eats local food only (no imported food), then the dose would be much larger: 76 mrem per year for the average, and 147 mrem per year for the high-end dose.

After potassium fertilizer has been applied to all of Rongelap Island, and has reduced the concentration of cesium-137 in plants (which would take about one year from the time the potassium is spread), the radiation doses will be much smaller:

- Approximately one year after potassium fertilization has been completed, the average radiation dose to a person eating a mixed food diet like on Mejjatto would be 4 mrem per year, and the high-end dose will be approximately 9 mrem per year.
- Approximately one year after potassium fertilization has been completely spread on the island, the average radiation dose to a person eating local food only, will be 11 mrem per year, and the high-end dose will be 22 mrem per year.

What does this mean for anyone wishing to return to Rongelap now? It is very unlikely that somebody returning to Rongelap Island will suddenly change his or her diet to eat only local food. In reality, most people will live on a mixed food diet. Therefore, it is likely that most

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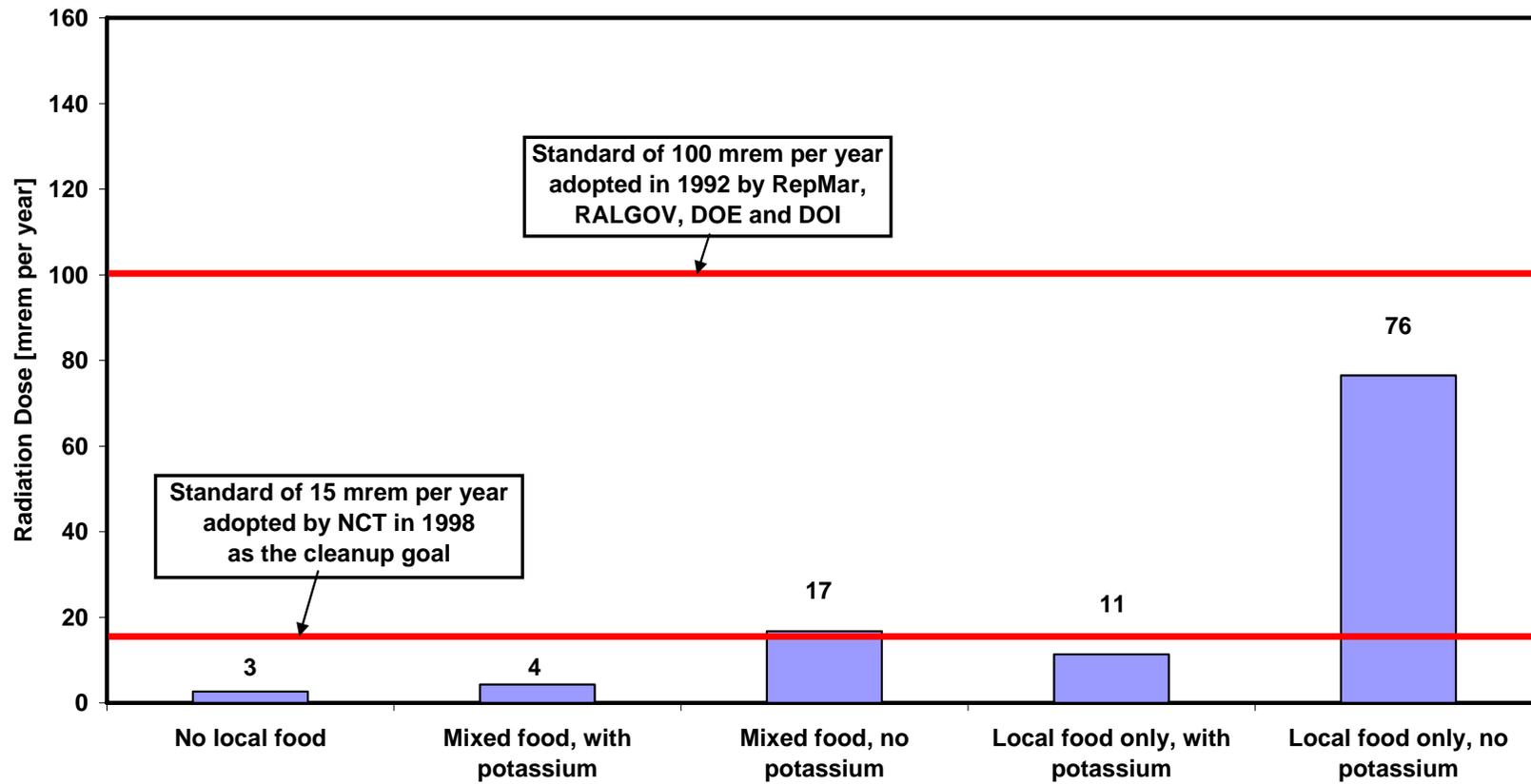
everybody who wishes to return now will have a radiation dose around or below the 15 mrem per year standard, with a few people slightly above the 15 mrem limit depending on their diet.

In summary, the best way to ensure that the radiation dose will be below the standard is to complete potassium fertilization on the entire island of Rongelap. In that case, even if somebody would eat local food only (no rice, no bread etc), the average radiation dose for this person would be only 17 mrem per year. Even the high-end dose for this unlikely scenario will be small as well – just 22 mrem per year.

Lastly, I should acknowledge the fact that the above-cited dose estimates are based on a model that employs environmental data and several assumptions. As with any model, there is some uncertainty regarding the degree of accuracy with which the model accounts for differences among individuals. As a final safeguard, it is assumed that all persons who elect to resettle Rongelap Island will be monitored routinely by means of whole-body counting. Whole-body counting will provide a high degree of assurance that the true radiation exposure is known for each individual and that steps can be taken to ensure full compliance with the 15 mrem per year standard.

Dr. Behling has described that a dose of 15 mrem per year is a very small dose of radiation. I agree with what he said. A dose of 15 mrem per year is indeed only a small fraction of the amount of radiation that any person in the world receives from natural sources, regardless of where the person lives. The potential health risks from such a small dose are so small that they are insignificant when compared to other risks in our everyday lives.

### Rongelap Island Average Radiation Doses In 2006 (From Residual Contamination)



### Rongelap Island High-End Radiation Doses In 2006 (From Residual Contamination)

