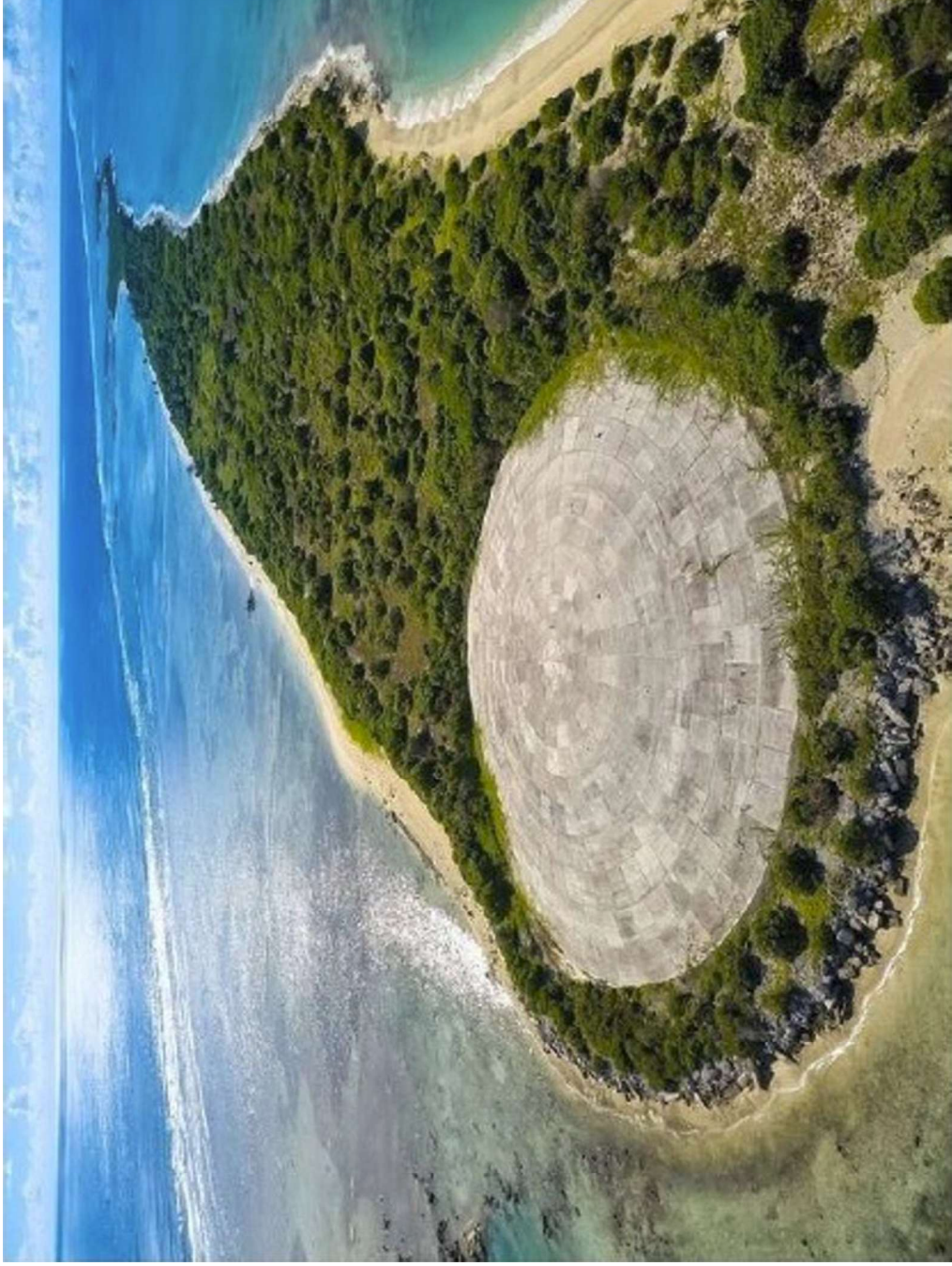


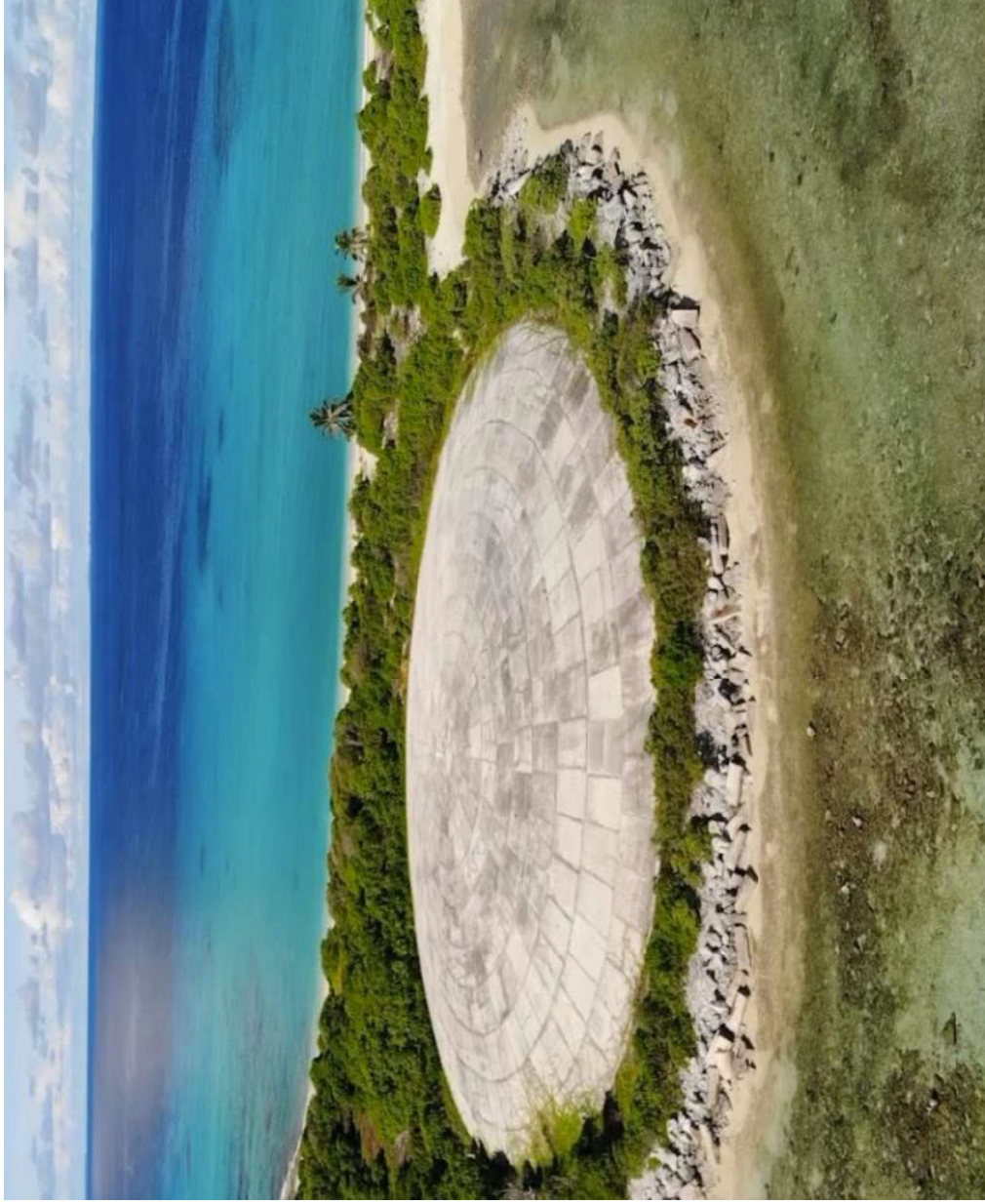
Radiation awareness training puts the radiation risk into perspective

- This is the Runit Dome, at the northern end of Enewetak Atoll



Radiation awareness training puts the radiation risk into perspective

- This is the Runit Dome at the northern end of Enewetak Atoll (completed May 1980)

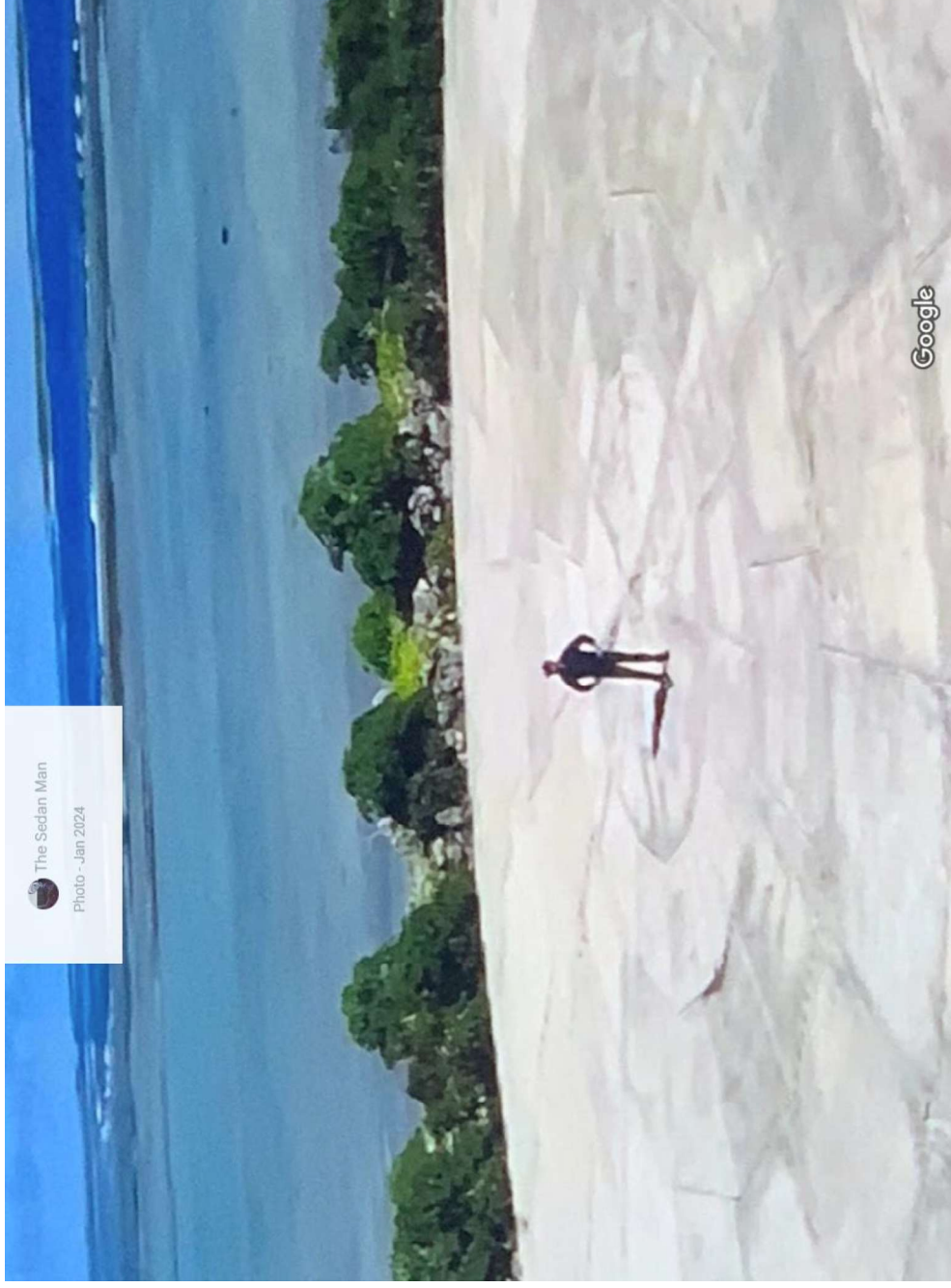


In the mid 1970s, the US decided to 'clean up' this site of repeated bomb tests (1946 to 1958). The clean-up would involve digging up soil and rock, putting it into the bomb crater and covering the crater with concrete.

The 1977 ambient dose rate above background in the area, 20 years after the last test, was about 1 mSv/y (0.00274 mSv/d).

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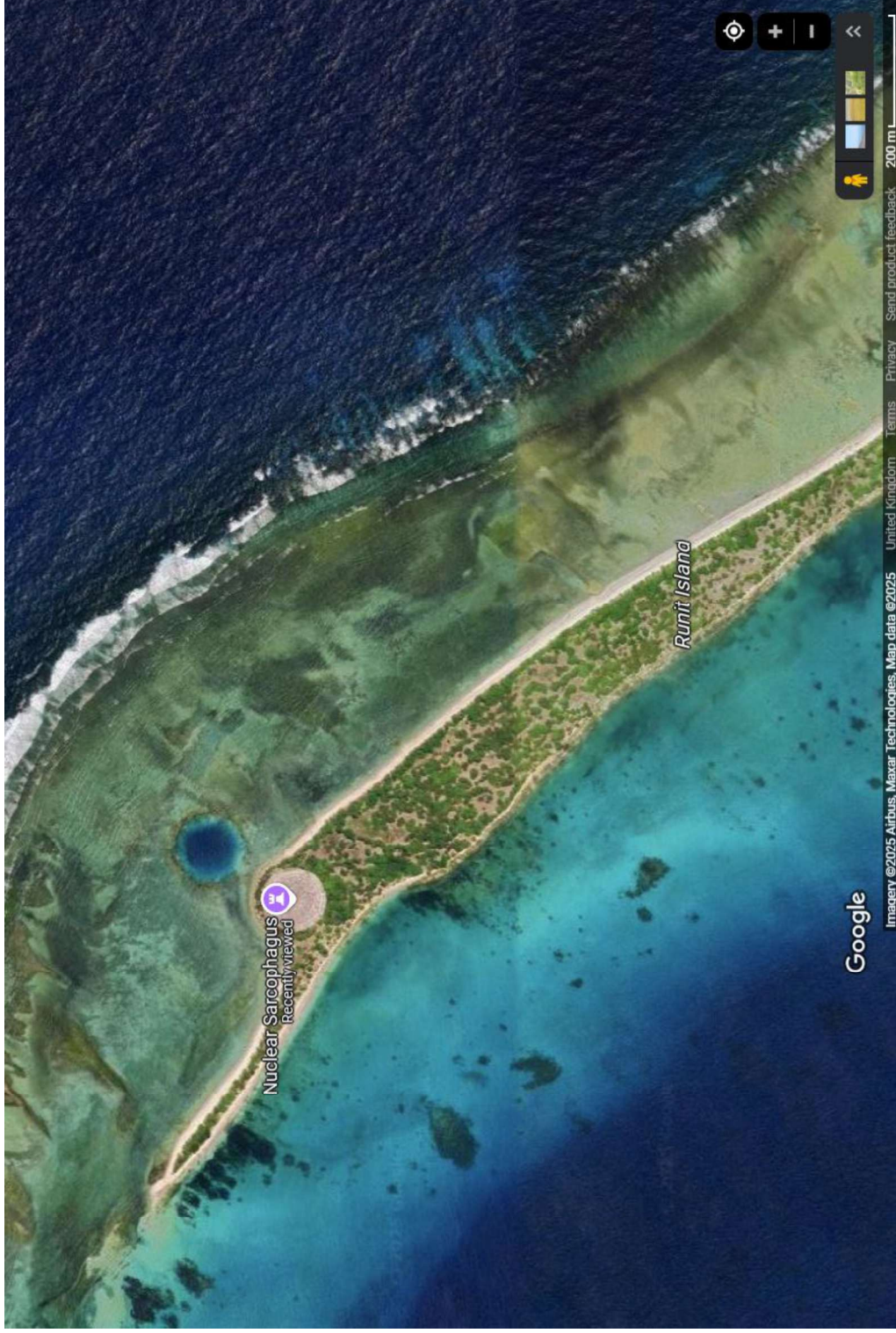
The Runit Dome, also called Cactus Dome or locally "the Tomb", is a 115 m (377 ft) diameter, 46 cm (18 in) thick dome of concrete at sea level, encapsulating an estimated 73,000 m³ (95,000 cu yd) of radioactive debris, including some plutonium-239. The debris stems from nuclear tests conducted in the Enewetak Atoll by the United States between 1946 and 1958.

Retrospective: Training

Training needs

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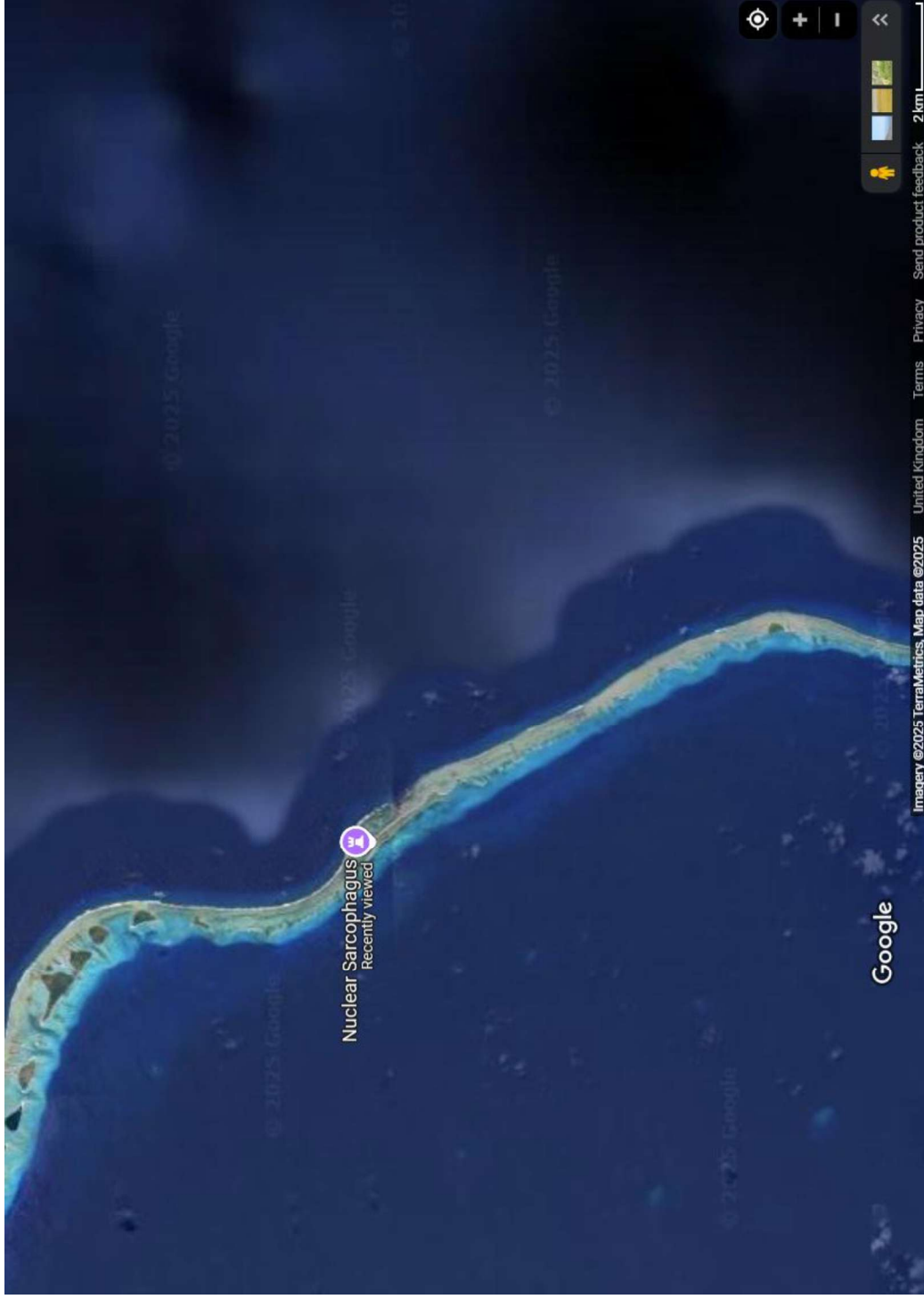
From May 1977 to May 1980, loose waste and topsoil from six different islands in the Enewetak Atoll was transported to the site and mixed with concrete to seal the nuclear blast crater created by the Cactus test. 8,033 workers (including about 6,000 US servicemen) were involved in the cleanup from this test, and it took three years to complete. The waste-filled crater was finally entombed in concrete. There were 6 fatalities and about 60 lost time injuries during this.

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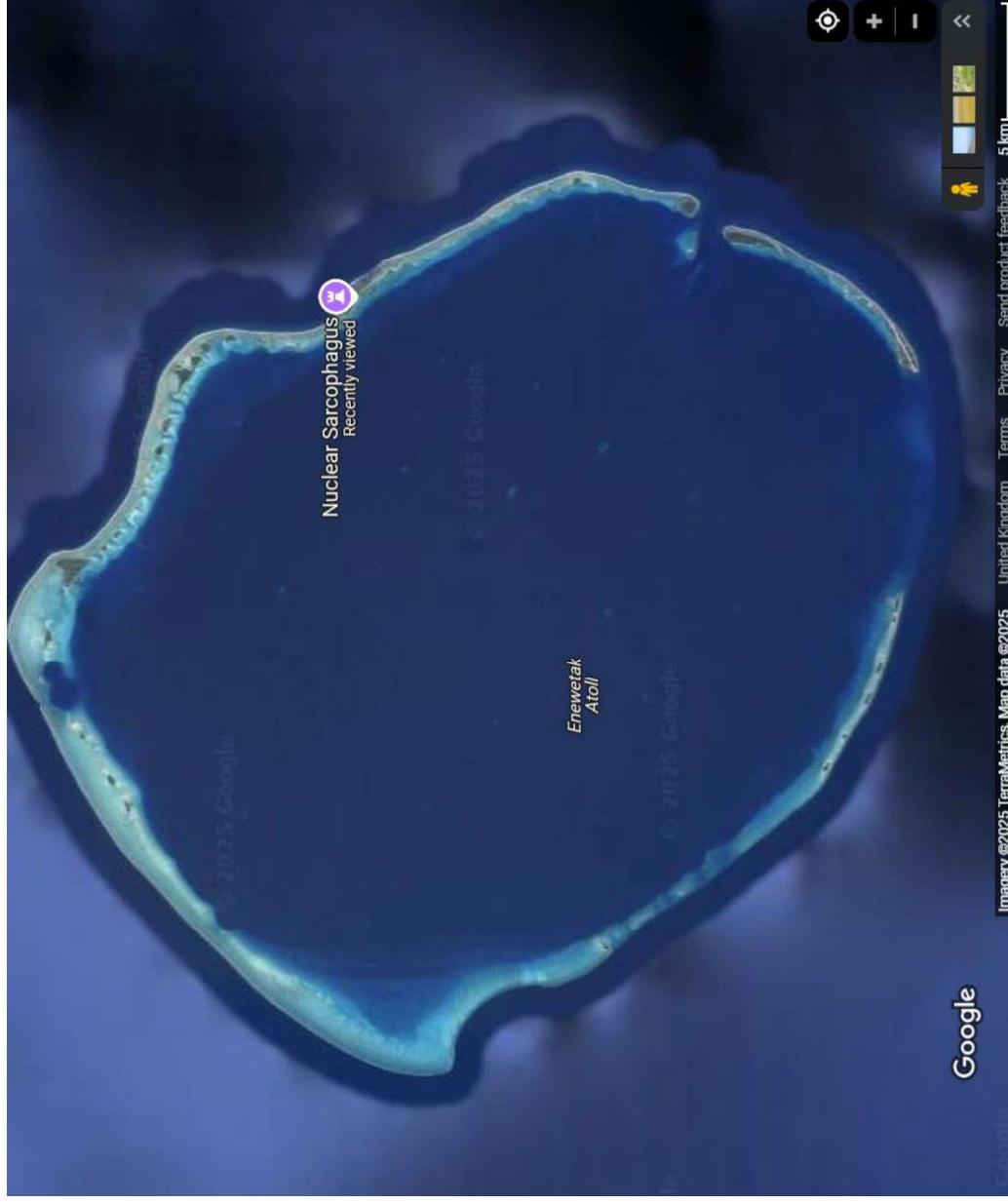


Construction worker deaths happen to real people, while the benefit of site cleanup is typically calculated by considering hypothetical populations assumed to live under site conditions that do not currently exist.

If highly conservative cleanup standards are invoked across the board without evaluating the risk/cost benefit, what can develop is the unnecessary expansion of volumes of material and soil to be remediated with an accompanying increase in worker injuries and fatalities.

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In 2015, Columbia University visited the Dome and took some measurements.

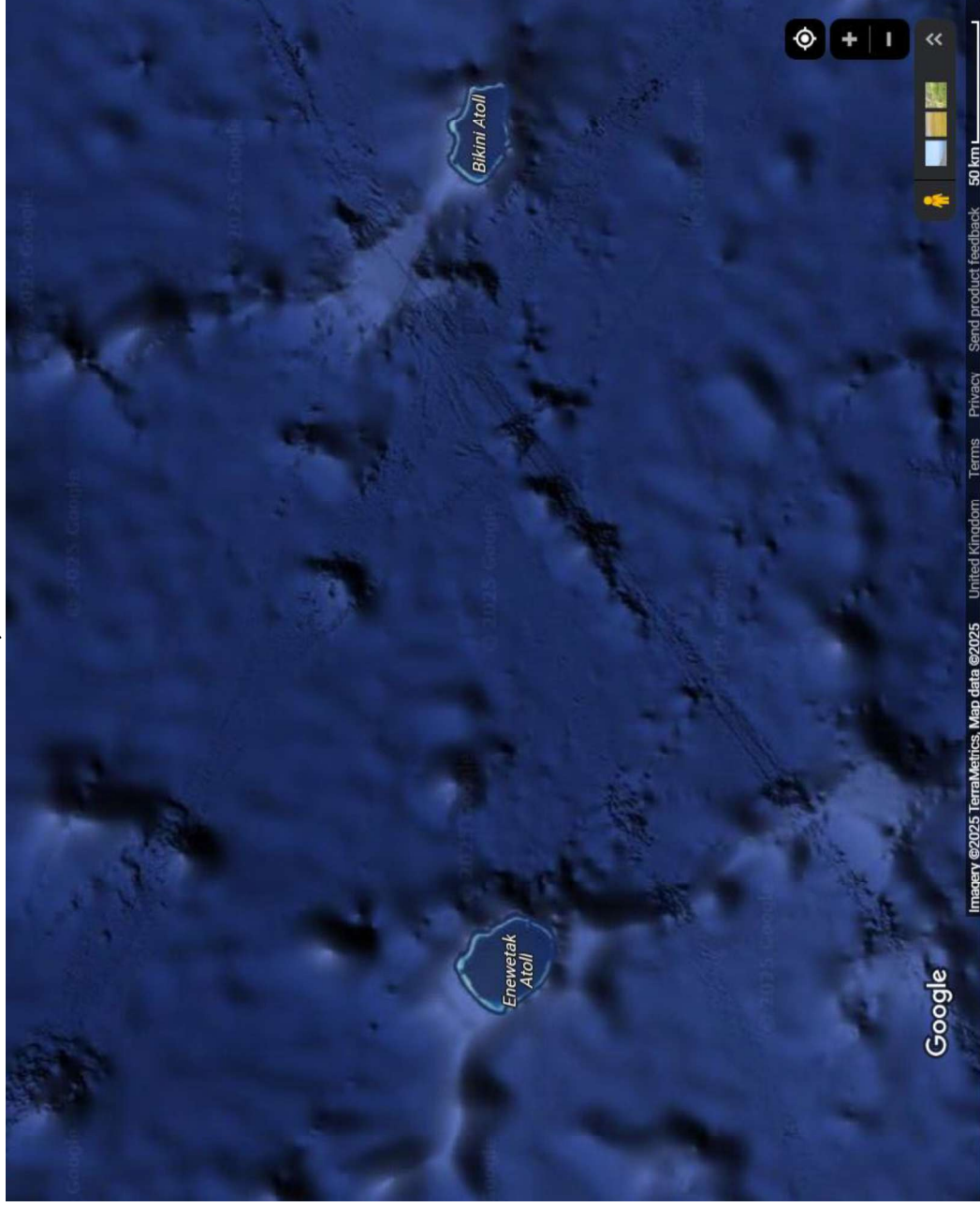
Enewetak is a very low background dose area. The gamma dose rate on the top of the dome is 0.18 mSv/y. At the base, it is 0.43 mSv/y. The mean for Runit was 0.13 mSv/y with large relative dispersion. Columbia uses New York's Central Park as their reference. Columbia's measurements for Central Park range from 0.13 to 2.13 mSv/y with a mean of 1.00 mSv/y.

The clean up required an Environmental Impact Statement. **EIS rules require you analyze the Do-Nothing option...**

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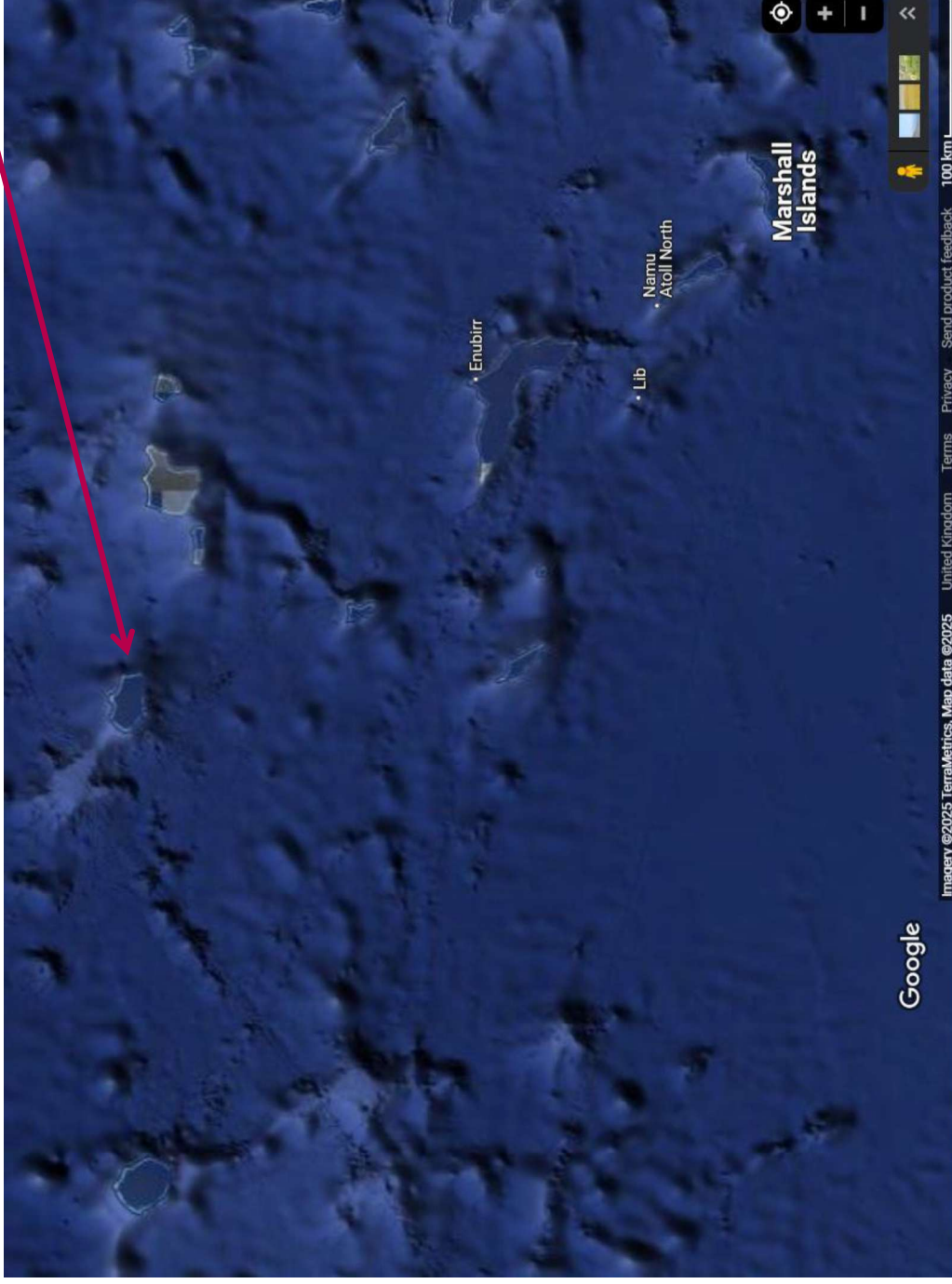


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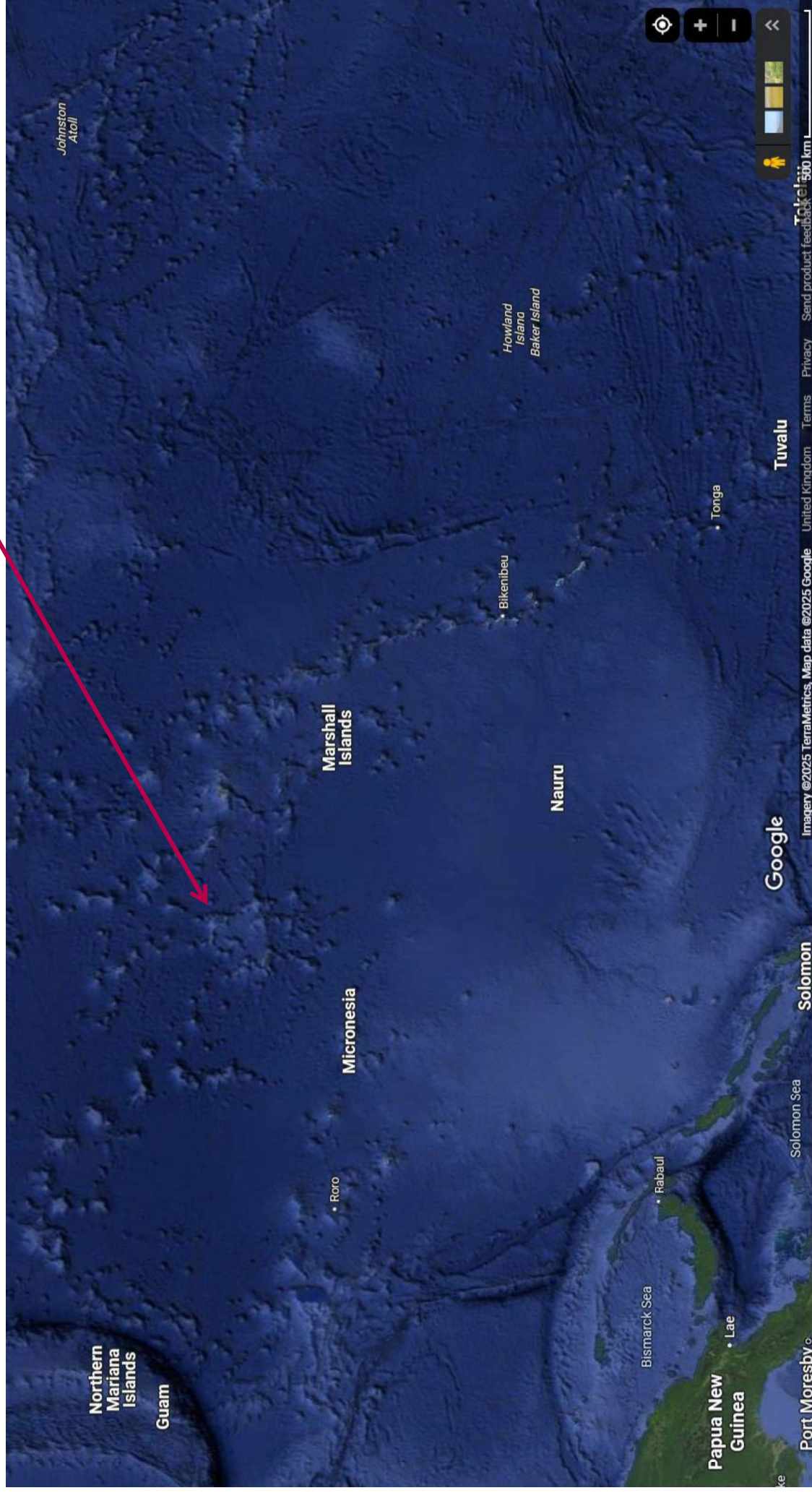


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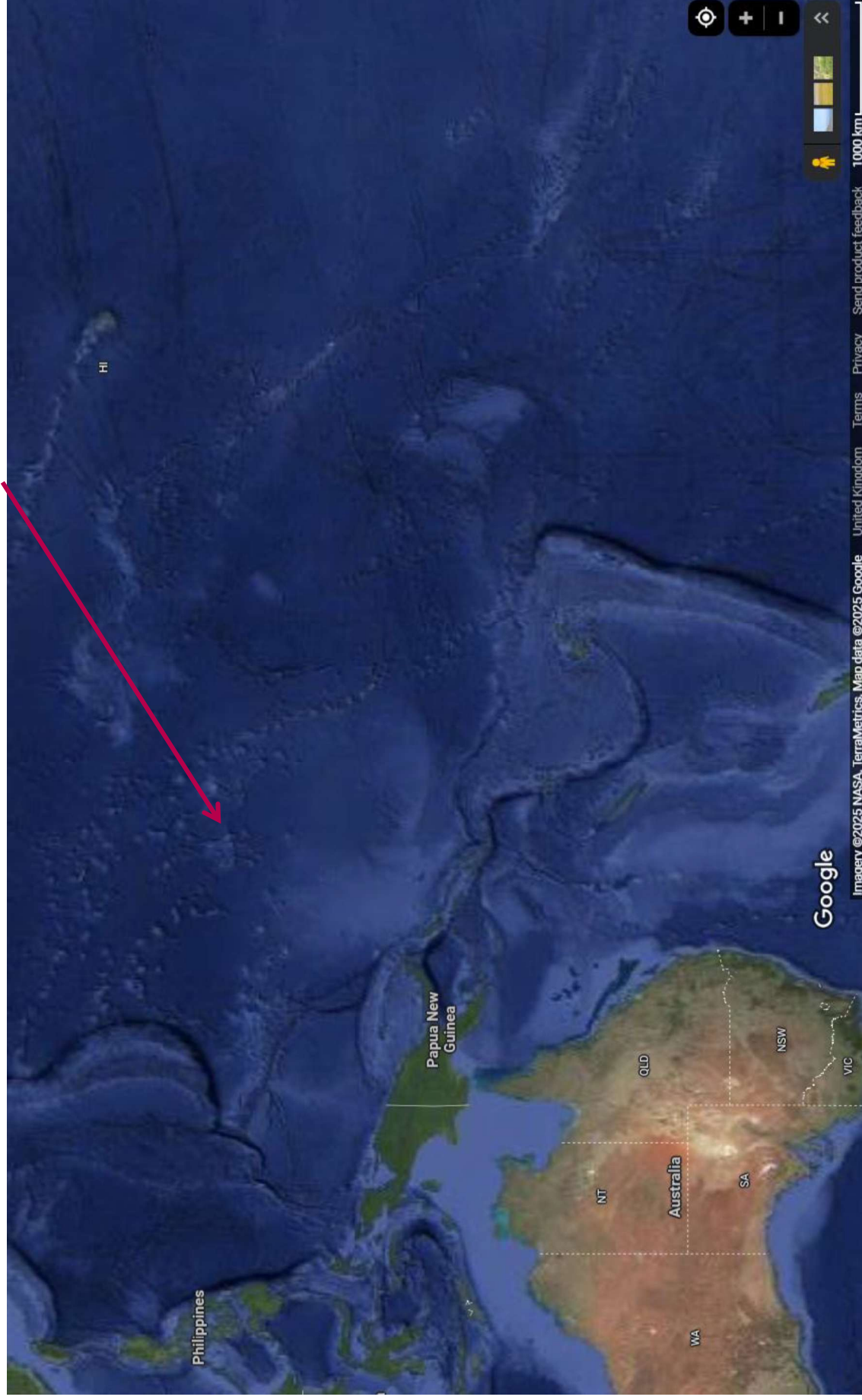
Retrospective: Training

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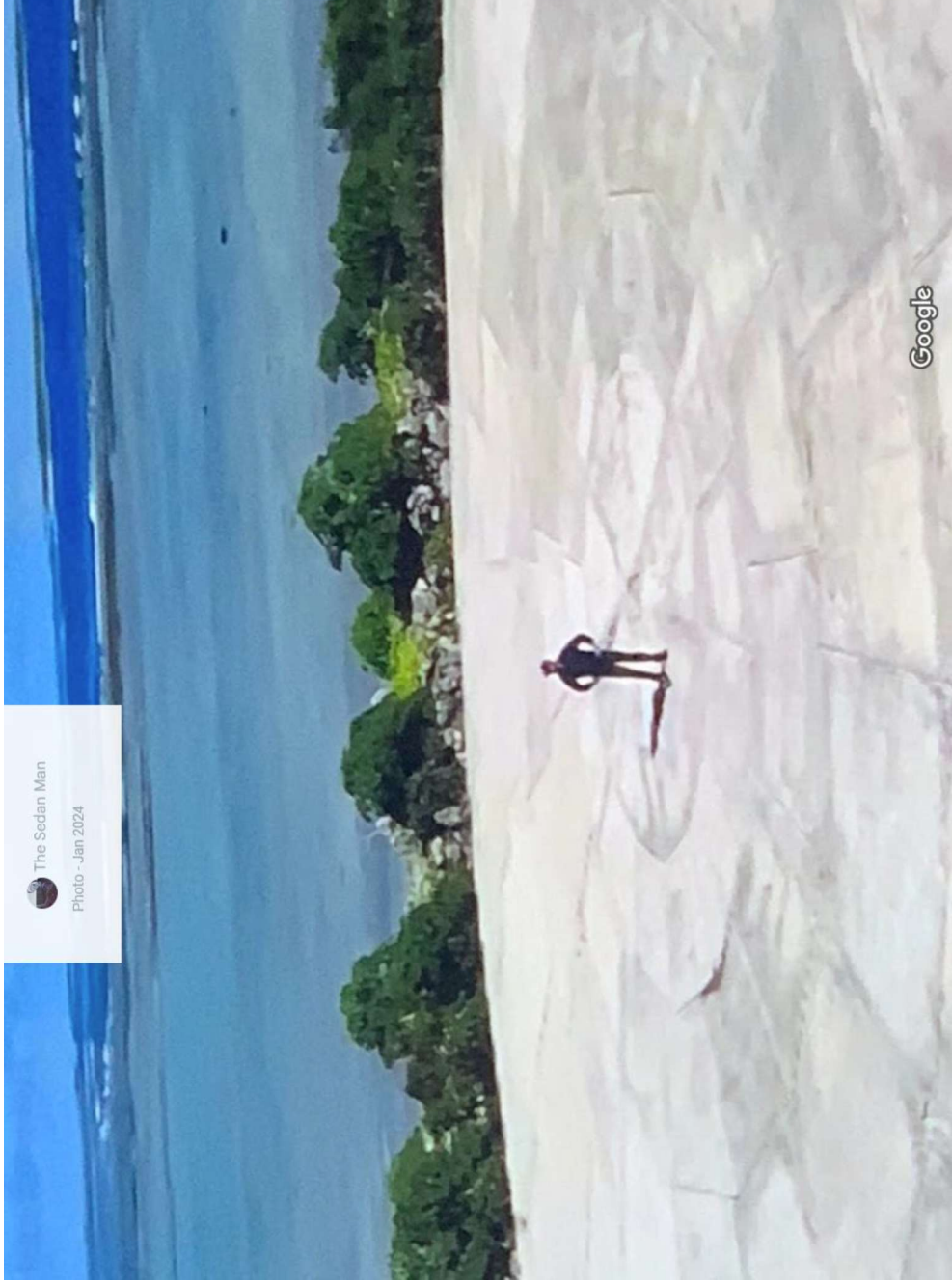
- Enewetak Atoll



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What is more significant, theoretical risks to life (the possibility of radiation-induced cancers, about twenty years after an exposure) or immediate death in a construction accident?

The other islands (probably only the larger ones) in the atoll are now inhabited (about 300 people in total), and exposures due to the remaining contamination are a tiny fraction of world average background radiation.