

Rössing, Namibia

Uranium mining site

The Rössing uranium mine has been a cause for concern for more than 30 years. Unsafe and inhumane working conditions, occupational exposure to radioactivity and the contamination of the environment with uranium tailings and radioactive waste rock all pose serious public health problems.



The Rössing uranium mine, opened in 1976 by Rio Tinto, is the largest open-pit uranium mine in the world. About 2 to 5 tons of raw ore need to be processed in order to produce a single kilogram of refined uranium oxide. The rest is deposited as radioactive waste rock or tailings in the countryside. Photo credit: Ikiwaner / GNU Free Documentation License



Esther Ndeyanayi and Tekla Kavari drive uranium ore from the mine to the mill. For workers like them, the mining company built the town of Arandis, while the white executives live in the coastal town of Swakopmund, about 70 km away from the harmful effects and radioactive fallout of mining operations. Photo: From the movie “Yellow Cake – The Dirt Behind Uranium,” © 2010 Um Welt Film



Soil samples near a new uranium find in Namibia. The dust is radioactively contaminated, the crew inadequately protected. Workers at Rössing have daily contact with uranium dust and radon gas. Photo: From the movie “Yellow Cake – The Dirt Behind Uranium,” © 2010 Um Welt Film

History

The Rössing uranium mine was commissioned in 1976 by the international mining company Rio Tinto. Other major stakeholders include the governments of Iran and South Africa. Rössing is the world's largest open-pit uranium mine and its production accounts for 10 % of Namibia's total exports. Namibia is currently the world's fifth largest producer of uranium.¹

Depending on the ore grade, about two to five tons of raw ore need to be processed in order to produce a single kilogram of refined uranium oxide. The rest is deposited near the mines as waste rock or tailings and still contains about 80 % of the ore's original radioactivity. In 2005, 19.5 million tons of ore had to be mined in order to produce 3,711 tons of uranium oxide. According to Rio Tinto, this production required more than three million m³ of water and 226,000 tons of sulphuric acid for chemical leaching.² For the miners, who are mainly recruited from the poor black Nama community, the town of Arandis was built near the mine, while the white executives live in the coastal town of Swakopmund, about 70 km away from the harmful effects and radioactive fallout of mining operations.¹

There have been several cases of inadequate security measures at Rössing; an issue that has raised international concern, as fissile materials could fall into unauthorized hands. The most recent incident occurred in 2009, when workers stole 170 kg of uranium oxide from the mine and tried to sell it on the international market. They were caught, but the Global Threat Reduction Initiative still believes that security measures need to be increased at Rössing.³

Health and environmental effects

As long as uranium remains deep in the soil, its alpha- and beta-emitting decay products, such as radon or thorium, pose virtually no harm to human health. As soon as it is brought to the surface, however, where it can spread as airborne dust particles or be dissolved in effluent water, humans can ingest the radioactive isotopes and can suffer from internal irradiation. Miners at Rössing are exposed to uranium dust and inhale radon gas on a daily basis.¹ Although vast quantities of water are used to keep uranium dust on the ground, the use of explosives in open-pit mining causes large radioactive clouds, which are carried to the fields and settlements of nearby Arandis and the region's waterways.

Elevated levels of uranium were detected in nearly 80 % of groundwater samples, with the highest concentration of 528 µg/l 15 times above the WHO limit of 15 µg/l.⁴ Studies have also shown quantitative health

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effects in the miners, which cannot be explained by confounding factors. An independent case-controlled study performed by the Charité University Clinic of Berlin showed a sixfold increase in uranium excretion among uranium miners compared with the control group. The researches also found three times as many chromosomal aberrations, a significantly reduced lymphocyte count as a sign of hematopoietic damage, and lower testosterone levels, suggestive of gonadal damage. The blood cells of Rössing miners showed similar defects as those found in the casualties of the nuclear bombing of Hiroshima or the nuclear meltdown of Chernobyl.⁵ These findings echo newer scientific evidence that chronic exposure to low-level radioactivity can have effects similar to acute high-level exposure.

Outlook

Large-scale epidemiological studies would be needed in order to determine cancer incidence among the miners and inhabitants of the region, but none have been undertaken so far. Instead, Rössing Uranium Ltd commissioned a study in order to refute the findings of the Berlin research group. In 2007, instead of examining the damage already caused, Rio Tinto decided to expand the Rössing mine, extend its runtime to 2016 and increase the output to 3,800 tons of uranium oxide per year. The people living near Rössing are suffering from the industry's appetite for cheap uranium – they, too, have become Hibakusha.

Further information

A well-researched film about uranium mining at Rössing is “Yellow Cake – The Dirt Behind Uranium” by Joachim Tschirner:

www.yellowcake-derfilm.de/index.php?id=209

Hibakusha worldwide



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