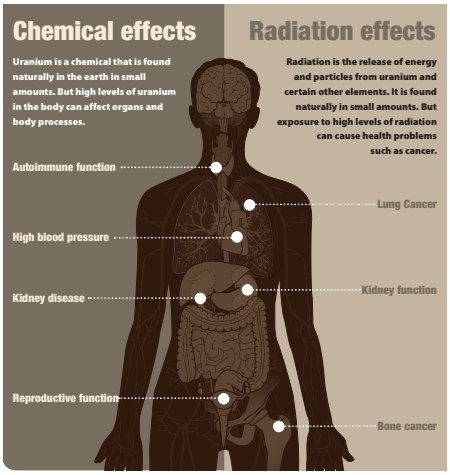

Your Health: Uranium and Radiation on the Navajo Nation, EPA

The Health Risks of Uranium Exploration and Mining in Nova Scotia

JUNE 10, 2025

URANIUM IS UNLIKE other minerals mined in Nova Scotia. It is a heavy metal that is both chemically toxic and radioactive, decaying over time to produce other materials that are even more toxic and radioactive. This includes the carcinogenic, but colourless, tasteless and odourless gas radon, emitted by uranium deposits. Radon gas can travel hundreds of kilometres in the air, emitting radioactive particles as it moves.

Radon can also collect in homes, and in Nova Scotia, it is responsible for more than 100 deaths a year.[1] According to Health Canada, radon is the number one cause of lung cancer in non-smokers.[2] For this reason, the Nova Scotia government has developed a radon-risk map,[3] and radon detectors can be borrowed from provincial libraries. Canada's standards for acceptable radon gas limits in homes is (200 Bq/m^3),[4] which is twice the limit recommended by the World Health Organization 100 Bq/m^3,[5] and even more lax than that of the United States (150 Bq/m^3).[6]

The radon decay chain continues to produce new radioactive products that can enter water, crops, trees, soil, animals, and humans.[7] People are exposed by drinking contaminated water, inhaling airborne uranium particles, and ingesting contaminated food, and increased levels of radiation in the environment.

Even exploration of uranium deposits can release harmful radon gas into the environment and mobilize uranium that is highly soluble, contaminating well water.

Suggesting, as industry proponents do,[8] that mining the uranium that underlies so much of Nova Scotia would reduce these risks, is inconsistent with the evidence. In fact, mining would unearth not only uranium but also many of its extremely toxic, radioactive by-products.[9]

The best way to protect Nova Scotians from uranium and radon exposure is for the provincial government to focus on, and even expand and strengthen, its existing programs of public awareness, testing, and mitigation measures.[10] [11]

The safest place for uranium is underground in undisturbed, stable deposits.[12]

The Health Risks

Physicians increasingly oppose uranium mining because of its potential to cause a wide range of adverse health effects from uranium exposure.[13] [14] These health effects include:[15]

- Kidney failure[16]
- DNA damage
- Infertility
- Damage to the brain, lungs, liver, kidneys and bones
- Damage to the immune system
- Cancers, most commonly lung cancer, but also leukaemia and tumours of the lung, breast, thyroid, bone, digestive organs, and skin, which are linked with radiation exposure [17]
- Premature aging and decreased life expectancy[18]

Higher risks for children and females

The health effects of radiation from radioactive materials—particularly cancer—need to be studied over long periods. Studies of nuclear bomb survivors show that gender and age matter greatly when it comes to survival rates.[19] Those exposed as small children were most likely to suffer cancer later in life, with girls twice as susceptible as boys. Adult women exposed to the radiation suffered 50% more cancer than adult males.

Uranium exploration and mining threaten to increase radiation exposure, which could disproportionately endanger the health of women and children.[20] Uranium and radiation exposure are particularly risky during pregnancy, linked to many health issues, including:

- Birth defects, including those of the brain and spine[21 22 23]
- Low birth weight and premature births, with complications for mothers and babies [24]
- Increased infant mortality[25]

Health risks in surrounding communities

Uranium mining can devastate surrounding communities through widespread contamination of water sources and wildlife, with Indigenous Peoples and rural populations bearing the heaviest burden. Radioactive and toxic pollutants from mines seep into groundwater and surface water, with studies showing fish in mining-affected waters containing heavy metal concentrations up to 43 times higher than normal levels.[26] The "caribou connection" represents one of the most serious threats to community health,[27] as airborne radionuclides concentrate in lichens eaten by caribou, which are then consumed by people—potentially increasing cancer risk to six cases per 1,000 individuals, far exceeding acceptable risk standards.[28]

Indigenous communities face dual threats as mining operations disrupt traditional hunting, fishing, and gathering activities while simultaneously contaminating the land and water they depend on for physical, cultural, and spiritual wellbeing.[29] Rural communities relying on local wells and water sources have little protection against the perpetual threat of contamination, as uranium tailings require monitoring "essentially forever" to prevent release of contaminants. These environmental injustices are compounded by the historical exclusion of affected communities from mining development decisions, leaving them with generations of health consequences while receiving minimal economic benefits.

In situ recovery mining, also known as in situ leaching, involves injecting a chemical solution into underground uranium deposits to dissolve the mineral, which is then pumped to the surface. While this method leaves less waste rock and tailings than open pit or underground mining, it poses serious environmental risks. Chief among them is the potential for groundwater contamination and its associated health risks, particularly for nearby populations.[30 31]

The long-term health costs

Before the government of Nova Scotia ended the legislated ban on uranium exploration and mining, it did not undertake any studies to examine the potential human health and environmental costs. The health costs—including increased healthcare burden and lost productivity—could far outweigh any economic gains.[32]

Uranium mining leaves toxic legacies of radioactive tailings and waste rock[33] and contaminated groundwater, which have to be dealt with and monitored in perpetuity, long after the mine closes. Future generations will be saddled with the inestimably high health and environmental costs of today's uranium exploration and mining. ◆

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CAPE Nova Scotia
Canadian Association of Physicians for the Environment

CAPE is a non-partisan, physician-led organization with over 36,000 supporters across the country. It brings an evidence-based approach to issues intersecting health, the environment, and justice. CAPE Nova Scotia represents more than 100 p hysicians and other healthcare providers across the province.

Endnotes

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