Cold War cleanup in Texas

A&M researchers investigate coastal uranium pollution

BY LINDA WANG
Special to the Battalion

The population of Karnes County, located on the southern gulf coast of Texas, north of Corpus Christi, is projected to increase by more than 87 percent over the next 30 years, according to data from the Texas State Data Center.

With such rapid growth, the uncertainty of whether uranium and other toxic elements are polluting citizens' soil and ground water leaves the door open for serious health risks.

"This is an issue that has not been studied," said Bruce Herbert, associate professor of environmental geochemistry at Texas A&M. "If their major drinking wells are in peril, we need to know about it." Herbert is leading a team of researchers from Texas A&M and Texas A&M University-Corpus Christi on a two-year, $130,000 project to survey the extent of uranium contamination along the southern gulf coast of Texas, where uranium was heavily mined during the '60s and '70s.

A "hot" metal

Natural uranium is a silver-colored metal found in rocks and soil in the earth. During World War II, when scientists discovered uranium's potential as an explosive in nuclear bombs, the U.S. Department of Energy hired companies, like Chevron and Exxon, to set up and operate mines wherever uranium was found. Most uranium deposits were discovered in the Rocky Mountain states, such as Colorado, Wyoming and Utah.

But in 1952, uranium was found in Karnes County, Texas. Tony Mank, a landowner in Karnes County, remembers when he learned his property was uranium-rich.

"We didn't know what uranium was," Mank said. "We thought it was a good thing."

Chevron bought 26 of Mank's 64 acres of land for $1000 an acre and stripped it of its uranium.

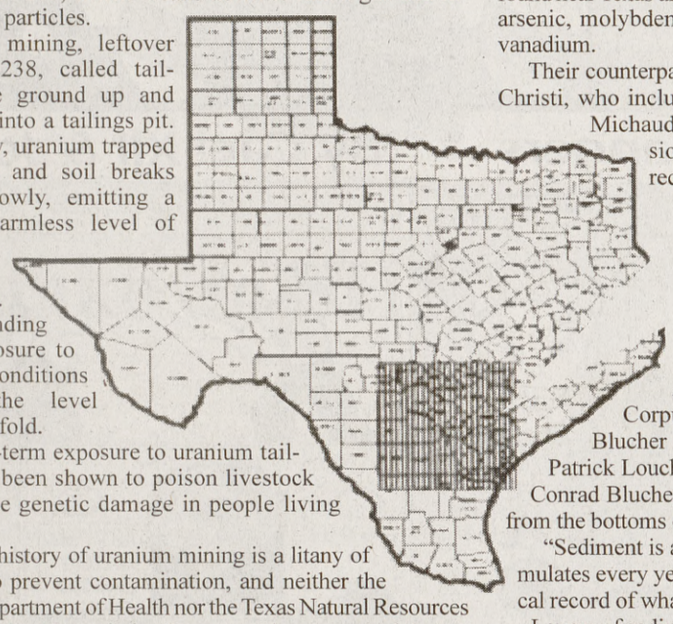
Following the Three Mile Island nuclear meltdown in 1979, the demise of the nuclear weapons industry was imminent. Uranium prices plummeted, and mines were abandoned.

By 1984, the uranium mining industry was dead, but its aftermath continues to affect us all.

Not a clean process

Less than 1 percent of natural uranium, in the stable but radioactive form of uranium-235, can be used to fuel nuclear bombs. The rest is in the unstable, but non-radioactive, form of uranium-238, which breaks down to radon gas and radioactive particles.

After mining, leftover uranium-238, called tailings, are ground up and dumped into a tailings pit. Normally, uranium trapped in rocks and soil breaks down slowly, emitting a small, harmless level of "background" radiation. But grinding and exposure to natural conditions raises the level 100,000-fold.



Long-term exposure to uranium tailings has been shown to poison livestock and cause genetic damage in people living nearby.

"The history of uranium mining is a litany of failure to prevent contamination, and neither the Texas Department of Health nor the Texas Natural Resources Conservation Commission has as much as surveyed the extent of contamination," said state Sen. Carlos F. Truan, who represents Karnes County.

Extent of contamination

The A&M research project will be the first to survey the downstream extent of contamination along the southern gulf coast of Texas.

Department of Energy researchers have surveyed and cleaned up areas in the immediate vicinity of the mines.

Herbert and his group from College Station will collect, by hand, soil samples in areas they believe have high levels of uranium and other toxic elements found near Texas uranium mines, such as arsenic, molybdenum, selenium and vanadium.

Their counterparts in Corpus Christi, who include Patrick Michaud, division director of the Near Shore Research division of Texas A&M University-Corpus Christi's Conrad Blucher Institute for Surveying and Science, and Patrick Louchouarn, associate research scientist at the Conrad Blucher Institute, will collect sediment samples from the bottoms of lakes and rivers.

"Sediment is a very interesting system because it accumulates every year," Louchouarn said. "It is like a historical record of what happened in the past."

Layers of sediment will be analyzed to see if there is increased uranium concentration in the layers from the '60s and '70s.

Because uranium is highly mobile in sediment, Louchouarn is looking for a more stable element commonly found with uranium that can be used as a marker. He hopes to find increased levels of the marker in the layers from the '60s and '70s.

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The Gulf Coast area north of Corpus Christi is the only area in Texas where uranium mining occurred during the '60s and '70s. Texas A&M researchers are now investigating groundwater pollution. Hexagons represent the sites of former open-pit uranium mines.

Michaud said the soil and sediment data they collect will be analyzed and put into a Geographic Information System (GIS), which allows them to map the contaminants and predict where they are going.

These results will help watershed management strategies prevent the release of toxic elements into ground water.

The project is being funded by the Texas Advanced Research Program.

Even though the project just started, Herbert already has some ideas about what they might find.

"I think we'll find that the concentration of these elements are pretty low," Herbert said. "But in some watersheds, they will be extremely high, higher than allowed by law."