Are we digging a new toxic legacy before the last one’s filled in?

by Greg Harman

A string of lakes across Karnes County sparkle as blue as any found in the resort towns of Colorado, New Mexico, and Wyoming. Each is graced with the gentle slope of a nearby hill, where wildlife forages on its way to and from the waterline. These former mine sites were blasted open during the uranium boom that swept South Texas in the 1950s and '60s, when the U.S. military was racing to keep pace with the growing Soviet atomic-bomb program and the newborn Atomic Energy Commission was struggling to develop beneficial uses for the monstrously destructive power we had tapped. Today, 17 of Texas' earliest open-pit mines remain abandoned on private property. Land owners like to fish these man-made water features. More than a few have learned to water-ski here, despite the fact that the Texas Railroad Commission has found the sites to be emitting abnormally high levels of cancer-causing radiation.

In a recent letter to one area landowner, an official of the Railroad Commission’s Surface Mining & Reclamation Division wrote that uranium mill tailings at the edge of his lake emit “up to” 850 micro-Rem of radioactivity per hour. In the time it takes you to thread a worm on a hook and reel in a catch, your body would receive dozens of times the natural level of background radiation.* Like other abandoned mines nearby, this site on the western edge of Karnes County also contains elevated levels of arsenic, selenium, and molybdenum, according to the commission’s letter.

The lakes are only the most glaring reminder of South Texas’ uranium-mining history. Dozens of more modern, underground “in-situ” mining sites are scattered from Karnes County all the way to Laredo, along with uranium mills and processing plants, where mined uranium is treated with
acid to leach out a refined “yellow cake.” Karnes County is also home to a string of disposal pits outside Panna Maria and Hobson used by the energy companies that mined South Texas through the 1980s. Today, these pits are filled with more than 20-million tons of radioactive tailings and processing wastes that will remain toxic for hundreds of thousands of years. They have leaked into area groundwater, and one spoiled aquifer in western Karnes has been tagged by the U.S. Department of Energy with an estimated cleanup cost of $350 million.

The Texas Mining & Reclamation Association estimates more than 76-million pounds of uranium have been produced in Texas, but there’s plenty more where that came from. Should the so-called nuclear rennaissance pan out and new reactors be built, a demand for fuel will certainly follow.

“Assuming nuclear energy is the energy of the future, we’re going to have to have a feedstock to provide it with,” says Art Dohman, president of the Goliad County Groundwater District.

San Antonio’s utility has been pushing hard for an expansion of the South Texas Project nuclear complex, 200 miles to the southeast at Bay City. A partner with NRG Energy at the existing reactors, CPS Energy wants to maintain a controlling interest in the proposed two new reactors at 40-percent ownership. Public hearings have become a form of popular entertainment, as the merits and demerits of nuclear power are picked apart and challenged by an array of local leaders — with a few notable exceptions: The environmental and public-health costs associated with nuclear power have largely been brushed aside with an optimistic nod to the future. In a meeting with members of the political-accountability group COPS-Metro Alliance on Sunday, San Antonio Mayor Julián Castro repeated that he was “comfortable” with the environmental impact of nuclear power. While critics evaluate uranium mining and radioactive waste disposal in “moral terms — leaving something to future generations we really don’t have a handle on,” Castro said, “I believe in the decades to come there will be a safe way to deal with that waste.” Like the nonexistent dumps that proponents hope will one day safely store our nuclear waste for what amounts to eternity, the risks involved in uranium mining and processing should be a starting point for any debate about the promise and peril of nuclear power, yet it has received scant attention in San Antonio’s decision whether or not to partner in the expansion of the South Texas Project nuclear complex.

The plants, the dumps, the mines — perhaps they’re simply too far from San Antonio to register. But the aftermath of our last uranium boom still echoes loudly in South Texas.

Florence Bodine is waiting for a call back from the Railroad Commission about the water-filled pit on her western Karnes County property. First contacted by the agency in 1998, Bodine signed the paperwork granting the state permission to clean up the site — even with the disclaimer that
the work “cannot be warranted … and may not achieve the intended result.” She’s already waved off one offer to purchase water from the lake for irrigation (“I said no, I didn’t want to be liable for that.”).

Ramona Nye, spokesperson for the Texas Railroad Commission, insists that since these defunct mines were dug prior to the creation of federal laws governing them, it is not the state’s responsibility to repair the damage. As federal money trickles in — siphoned from the coal companies’ profits via a mine-reclamation tax — the Railroad Commission pumps the water from another abandoned pit, pushes the tailings back into the hole, and covers it over with a few inches of uncontaminated soil. To date, cleanup per site has run between $224,000 and $2 million.

A.C. McAda, city attorney for Falls City and Kenedy, grew up observing the impact mining had on area livestock. Back when uranium trucks on the road meant thriving downtowns and auto dealerships, his father, a local veterinarian, was documenting marked declines in local livestock reproduction. His father also recorded a rare type of heavy-metal poisoning that robbed black Angus cattle of their pigment, turning them white.

“They never really found a way to get that reversed,” McAda said.

But agricultural anomalies were soon dwarfed by public-health fears. Father Frank Kurzaj was the priest of the small Polish community of Panna Maria in the 1980s when the fight over waste disposal at an unlined pit a few miles west of town exploded. He counseled parishioners stricken with cancer and couples unable to conceive, labored over the faith-challenging questions that can follow birth defects, and worked with two families living near the dump whose children were born as hermaphrodites. He helped organize the Panna Maria Concerned Citizens to give the community standing at the public hearings held about the toxic hill, which was owned by energy giant Chevron and later sold to Rio Grande Resources.

“The dumping was done over there and people were not aware of the consequences of being in this area. They were lied to, simply by telling them everything is under control,” Kurzaj said.

It wasn’t under control. Mines, trucks, and processing mills all spread contamination, exposing residents. Lawsuits followed, as did confidential settlements that keep firsthand tales out of the headlines.

While Kurzaj doesn’t object to uranium mining or nuclear power on principle, he says the toxic nature of uranium combined with the destabilizing power of greed should motivate communities to fight for the strongest possible oversight. “Money’s important, we need money to live,” Kurzaj said. “But there are some more important things than money. If we have plenty of money but we don’t have health, why do you need the money? You cannot use it.”
When it comes to open-pit carnage, some of the worst damage has been done to indigenous lands, like the Navajo territory in New Mexico, where workers dug uranium ore in underground mines without the benefit of safety equipment. As in Karnes, the land around Church Rock, New Mexico, outside Gallup, is marked by abandoned mines and milling sites, but this area has the unwelcome distinction of also being the site of the second-largest non-weapons-related radiological release in history, the largest being the Chernobyl meltdown of 1986. It happened just a few months after the Three Mile Island accident of 1979. An estimated 90-million gallons of liquid radioactive waste burst through a dam wall at a uranium-processing mill owned by United Nuclear Corps, flooding farmland, arroyos, and fields, and permanently contaminating the Rio Puerco River.

Despite adamant resistance from the Navajo and other nearby tribes, a subsidiary of one prominent Texas mining outfit, Uranium Resources, Inc., is petitioning the state of New Mexico to gain access to Church Rock for another go. Recently, tensions between the Navajo’s objection to mining and those anxious for jobs in the area spilled over in an attack on five Navajo men in Grants, New Mexico.

“Just because they’re Navajo, these men got beat up, very severely. One man had to have his eye put back in,” said Anna Rondon, who since 1987 has served as a volunteer organizer for the Southwest Indigenous Uranium Forum, a series of gathering intended to shed light on the environmental and health impacts of uranium mining.

Native American communities throughout the Southwest have experienced high levels of kidney diseases and cancer thought to be related to uranium mining. While cancer was once something of an anomaly among the Navajo, after 30 years of heavy mining activity, cancer rates in Navajo Country began to shoot upward, doubling by the late ’90s, according to Indian Health Service data. Still, no study of the residents around Church Rock has ever been performed, according to Linda Gunter from the non-profit organization Beyond Nuclear.

By contrast, at least two studies have been performed in Karnes County. The Texas Department of Health carried out a single population-based study of cancer occurrences in Karnes County and reported no statistical abnormalities. That was followed by another study by researchers from the International Epidemiology Institute in Rockville, Maryland, who reached a similar conclusion in 2002. Both of these studies were well reported in the media.

However, research conducted through the early 1990s by a team from the University of Texas Medical Branch at Galveston took a different approach and found cause for concern. Instead of simply relying on the number of cancer cases reported, the group took physical samples from residents living within 1.5 miles of uranium-waste pits in Karnes County and looked for cellular damage. In 1995, the team reported in the highly regarded journal Environmental Health Perspectives that the DNA of the Karnes County residents had more “chromosome aberrations” than a similar number of people who did not reside near toxic-waste sites. The UTMB team then exposed the cell samples to a dose of radiation and observed that the cells had an “abnormal DNA repair response.”
With the benefit of improved evaluation methods, one of the UTMB study’s chief researchers, Dr. William Au, returned to the Karnes County issue in a report published this year in the International Journal of Hygiene and Environmental Health. This time, he showed that residents near those waste sites “could have been exposed to a level of radiation that is similar to those for nuclear workers [and] … have increased risk for cancer over the non-exposed residents.” The National Council on Radiation Protection estimates that the average American is exposed to about 300 micro-Rem of radioactivity each year, mainly from radon gas in the air. But, the U.S. Nuclear Regulatory Commission allows workers within the nuclear industry to receive as much as 5,000 micro-Rem a year. The National Academy of Science maintains that no level of radiation exposure can be considered safe.

Au, a 20-year veteran of UTMB who is moving to China to take over an environmental-health program at a medical school there, is critical of the state’s statistical approach.

“They were forced to do a study,” he said, “but the population is too small to do that kind of study … The result was predictable to be negative because [the population] is too small to do anything meaningful.”

Of course, when mining returns to Karnes and any number of former uranium-mining sites in South Texas, it won’t be done in open pits under a cloud of yellow dust. During the past 20 years, South Texas has served as a staging ground for the development of a new mining technology that leaves the Earth’s surface relatively unmarred. Ore trapped in underground aquifers can be “mined” through a complex system of injection and extraction wells. In the uranium-bearing water sands of South Texas, virtually all of the uranium particles are anchored in underground rock and sand formations, not floating freely in the water. By pumping heavily oxygenated solution through an ore deposit these particles can be released in a chemical exchange not unlike salt dissolving in water. With the uranium broken out into the water column, it can be pumped to the surface and stripped out at a processing plant.

In-situ is not as effective as strip mining. It tends to leave more uranium behind. It also releases more radon gas into the air and other radioactive elements into the water, including thorium, radium, and radon. Exposure to these radioactive elements is dangerous on two levels: As a heavy metal, uranium in drinking water can damage liver and kidney function; exposure to the radiation via the mineral dust or radon gas it produces is known to cause cancer and birth defects, as well as damage human DNA. This DNA damage can be passed along genetically, increasing the susceptibility of future generations to certain diseases.

Largely developed in Texas, in-situ uranium mining has been exported and used at a variety of sites around the world with varying degrees of success. In Eastern Europe, the use of harsh solvents to strip out the uranium deposits coupled with weak environmental oversight led to the contamination of drinking-water supplies in communities in Bulgaria and the Czech Republic. When in-situ mining proposals reached Australia a decade ago, the Australian Conservation
Foundation hired Gavin Mudd of the Victoria University of Technology to conduct an environmental assessment.

“The environmental impacts are generally underground and therefore, on the surface, it would appear that such negative impacts are minimal. However, the quality of groundwater and the mined aquifer are permanently altered as a result of ISL mining,” Mudd wrote in 1998. “The industry will continue to claim that the ISL technique is ‘environmentally benign,’ but the reality of the depressed world uranium supply simply dictates that future uranium production will come from ISL merely due to its lower overall production costs.”

If the in-situ method represents an improvement over the old dig-and-dump uranium mines, it’s worth noting that Texas regulators didn’t get any such upgrade. Take, for instance, this May 24, 1999, communication from the Texas Department of Health’s Incident Investigations Program in the Bureau of Radiation Control concerning a spill of 2,000 gallons of uranium-polluted water by Cogema Mining at a site outside Bruni, Texas — considered by some the birthplace of industrial in-situ mining:

“This is in reference to your facsimile (FAX) to the Agency dated May 11, 1998, concerning the spill of U3O6 at the West Cole Wellfield III by well 627. I am sorry to be responding after nearly a year but the facsimile was evidently lost in the paper shuffle for over a year. After review of your report, I have a couple of questions concerning the spill that should be clarified for future reference … ”

Such spills are not unheard of in the in-situ mining world. In fact, the same company had already reported three other spills that same year: 2,500 gallons in February 1998, 20,000 gallons in May 1998, and 8,000 gallons in July 1998.

Three years earlier, Manuel Longoria sued Uranium Resources, Inc. at another Bruni site for dumping “massive amounts of wastewater” into a spring-fed pool known as Arroyos de los Angeles and fouling his groundwater, according to a lawsuit filed in district court in Duval County.

Like the Australian researcher, public-health advocates aren’t as concerned about the visible spills topside as they are about what may be happening beneath the surface. So far, only a handful of the mine operators have managed to return the groundwater to the same quality it was before mining got underway, a survey of state data shows. The amount of water consumed by in-situ mining should also set off alarms in drought-prone, water-poor South Texas, says Mark Walsh, who has dogged the URI Kingsville mine for years as a member of South Texas Opposes Pollution.

“All of the billions of gallons of water used to mine this, and then we end up destroying the aquifer in so many places,” Walsh said. “We’re in the biggest drought since the 1950s. Whatever we have in the aquifer we have to protect, but we want to protect the uranium companies.”

According to data from the South Texas Water Authority, last summer URI was using about a million gallons per month mining at Ricardo, Texas. About one-fourth of that water was
ultimately shot down deep disposal wells as waste. URI officials say that while mining stopped in June due to the collapse of uranium prices, a skeleton staff continues running roughly 20-million gallons per month minimum through reverse-osmosis units in an attempt to clean up contamination at its three Kingsville mine fields.

The company also hasn’t ruled out applying for an amendment to its permit that would increase the amount of contaminants they would be able to legally leave behind, according to URI Executive Vice President Rick Van Horn.

“That’s certainly something we can look at doing if we feel we’ve done everything that we can as far as cleaning the groundwater up, but that’s something that is going to be the subject — if we do that — will be the subject of public hearings and the state would have to sign off on that,” Van Horn said. “It’s not just something we could do unilaterally.”

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URI has also started funding promising research at Texas A&M Kingsville into the ability of hydrogen to remove heavy-metal pollution from water. So far, injecting and circulating hydrogen at the Kingsville Dome site has succeeded in reducing uranium contamination in the groundwater from around 5,000 parts per billion to 70 ppb, according to lead researcher Lee Clapp, associate professor of environmental engineering. The EPA’s threshold for uranium in drinking water is 30 ppb.

But Clapp and his team have had trouble circulating the hydrogen widely enough through the well field to reach all of the existing contamination. And no one knows how long the treatment will successfully keep the uranium out of the water column. After a period of time, the leftover uranium could start to migrate again.

“Those are absolutely critical research questions we’re looking into,” Clapp said. So far, he adds, “I think the results are pretty encouraging.”

Clapp is in communication with researchers from the U.S. Geological Survey who are keen to apply the research at contaminated federal waste sites, but Kleberg County officials are interested as well. In recent years, heavy groundwater pumping by the city has reversed the flow of subsurface water so that it no longer flows toward the Gulf of Mexico south of Kingsville but instead flows back toward the city. Since URI’s mine is located several miles south of the city, some observers are concerned that the contamination could migrate upstream to city wells. Even if URI abandoned their operations and shut down all of their pumps, the Texas Water Board estimates it would take more than 1,000 years for the contamination to reach Kingsville. But slow-moving water is still poisoned water.

“The fact of the matter is, they have these applications, they say they’re going to return the water to such-and-such a level when they know they can’t, and the state knows they can’t,” says Ann Ewing, of South Texas Opposes Pollution. “So why do they even put that in there?”
It’s doubly instructive to consider that when Kleberg County tried to stop the expansion of mining operations by URI until the existing contamination was cleaned up, they gained the support of an administrative law judge with the State Office of Administrative Hearings, who ruled the expansion request should be approved “contingent upon URI’s restoration of [Production Area] 1 and substantial progress toward the completion of PA 2.” Turned out the company had bigger friends, and backed by three members of the Texas Commission on Environmental Quality it moved forward anyway.

Up the road in Goliad County, Uranium Energy Corp is working hard to open an in-situ operation. The groundwater district and the county government charge that the company has already fouled the local aquifer by punching nearly 100 exploratory holes in the subsurface water sands. Instead of closing these holes within 48 hours as state law demands, many of them were left open to the elements for several weeks. With air and rainwater shooting down the shafts, Groundwater District president Dohman says the uranium reacted to the oxygen and began to dissolve out of the water sands, polluting the Evangeline Aquifer.

The fight over uranium mining in Goliad is significant, because it may represent the first time a South Texas community has been organized enough to take a thorough assessment of its water quality before uranium-exploration drilling got underway. State law requires companies to sample the water to establish its quality prior to mining, but this is often done after exploration drilling takes place, a process that inevitably stirs up some contaminants in the water and skews subsequent baseline samples. A contested case hearing over the UEC permit applications will be held before the State Office of Administrative Hearings early next year.

Recently, a former Kingsville Dome employee surfaced in nearby Yorktown to help fight off UEC’s advance. Roland Burrows worked as a well-field operator for URI for five months in 1996, and says he witnessed the company routinely flushing the well field with far more water than allowed by the terms of its permit. He claims to have witnessed the falsification of monitoring-well data by company employees, which must be submitted regularly to TCEQ to show that contaminated water is contained at the mine site.

After more than one confrontation with his supervisors over these alleged practices, Burrows says he was out shutting down some of the offending injection wells about 45 minutes before sunrise on July 27, 1996, when a crop duster spraying an adjacent field crossed over the mine and dropped a load of malathion on him. He quickly showered, changed his clothes, and returned to work, where he promptly passed out. Within a week, doctors at South Texas Cost Containment cleared him to return to work despite a diagnosis of exposure to pesticide spray.

Harry Anthony, the URI engineering manager at the time, who is now an employee of UEC, did not return repeated phone calls from the Current, but Van Horn provided a document that showed an investigation by the TNRCC (now the TCEQ) was carried out the following year that cleared the company of any wrongdoing associated with Burrows’s charges.
From the vantage point of a refurbished uranium mill in Karnes County, Greg Kroll feeds mesquite wood into a small cooker. His company, South Texas Mining Venture, is watching uranium values, and a number of potential future mining sites.

Well over 6 feet tall and broad-chested, Kroll laughs off suggestions that elevated uranium levels at abandoned mining sites in the area could be hazardous to human health. “Look what it did to me! It probably stunted my growth!” he says goodnaturedly.

City Attorney McAda understands the pull uranium mining can have in a community of limited means. “It’s an interesting dynamic,” he says “You probably know there’s something wrong there, you just don’t want to know about it. You don’t want to ask. You don’t want to know too much.

“When I grew up in Kenedy and Karnes City, they were thriving little towns. We still had stores downtown, car dealerships. They were really going. They were driven by uranium mining and oil and gas services.” After he returned from college and law school eight years later, everything had changed. “Those towns had just died. The mines had shut down … When it shut down, it killed those towns.”

Like URI, Mining Ventures is waiting for the economy to recover, and for uranium prices, at $45 dollars a pound today, down from a high of nearly $140 a pound in 2007, to rebound. With the early signs of a uranium-mining revival now apparent, a counterbalancing vigilance is also on the rise.

Donald Dugosh lives across the street from Rio Grande Resource’s unlined dump at Panna Maria. Though the waste from the pit has already leaked into the underground aquifer, Rio Grande Resources wants to reopen its uranium mill to process the ore from the new generation of in-situ sites. If a permit pending with the state is approved, operators would be allowed to shoot the resulting toxic mill waste down deep injection wells nearby. The draft permit allows for 131 million gallons of radioactive and toxic waste to be shot down the holes each year, to a depth of 6,000 feet — just over a thousand feet beneath the Carrizo-Wilcox Aquifer, considered the deepest underground source of drinking water in the area.

“They’re supposed to take the waste back and re-inject it back into the formation,” Dugosh says. “But these folks here want to be cheap and just deep inject it here.”

And therein lies the crux of the dilemma: How much will Texans be willing to risk for another injection of mining income. With much of the nuclear debate in San Antonio focused on the water needs of the two proposed new reactors, what are we to do with the wasted waters already bequeathed to us from decades of uranium mining, processing, and dumping? Are we ready for another round?

In white shirt and clerical collar, Father Kurzaj still serves as a reminder of the impacted families and fouled aquifers of Karnes County. He speaks in hope that past actions won’t be repeated, that the hunger of distant power plants and the pursuit of profit won’t poison the waters again. After
all, Kurzaj asks: “If the water is contaminated and the cattle and people cannot drink it, what is this land for? For nothing.”