**Additional Review By M. D. Campbell and Associates, L.P.**
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**Red = C&A Mining Group Comments**

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**Article in Question:**

## Power Struggle: Opponents of a Proposed Uranium Mine near Nunn Find Kindred Spirits in South Texas

By Rebecca Boyle, *Fort Collins Now*
February 6, 2008

GOLIAD, Texas — The first sign that there might be something wrong with the water on Craig Duderstadt's south Texas ranch was when the cows wouldn't drink. Last summer, they began to bypass their special groundwater well-fed trough, preferring to drink from a muddy puddle of rainwater.

[Like cats, cows prefer oxygenated water (fresh water) as opposed to water that may have an odor caused by the presence of iron bacteria and associated sulfate-reducing bacteria, which often occurs in anaerobic sites below the encrusted iron bacteria and which releases small volumes of hydrogen sulfide. The latter gas imparts the odor cows avoid (see below for further discussion)]

"This is a full water trough, and they'd walk a couple hundred yards and drink from a water hole. They'd walk right past that water trough," Duderstadt said. "You can't make 'em drink."

About that same time, the well water used inside the house for everything from showering to drinking started running red and slimy. A well filter that would normally last six months plugged up in a matter of hours—one time, Craig couldn't even get it out of the filter casing because of all the sediment. The Duderstadts stopped drinking the water, too.

[Red, slimy water produced from water wells is commonly the result of iron bacteria in the well. No mention is made above of any analysis or treatment of the water for iron bacteria or anything else. It is not unusual for a water well that has not been regularly maintained over the years to suddenly begin to have such problems, especially wells installed in rural areas. Wells require regular maintenance programs performed by licensed water well contractors. Cars require similar maintenance programs. In addition, the problem water often indicates that there may be other problems with the well. Was the surface seal (called the sanitary seal) of the well tested, as would have been tested during regular maintenance programs? Also, about the same time as this problem was first reported, a major drought was broken with heavy rains and flooding. Rain water collecting around the water well's surface casing can often introduce iron bacteria and other contaminants into the well, especially if the near-surface fittings of the sanitary seal or cement apron surrounding the water well's casing have been damaged.]

A Culligan driver now brings four blue jugs of clean water a month from Victoria, the nearest big town, about a 30-minute drive northeast.

The culprit, they say, is a uranium mining operation 1,250 feet from their front door. They say the water turns bad when the mining company drills exploration wells nearby.

["They say" is not proof, and without it, the claim is pure speculation by some unidentified person. Also, if "they" refers to the Culligan driver, he is not qualified to offer hydrogeological opinions as to the cause of the water turning "bad". In fact, he has a conflict of interest in that he is selling bottled water.]

The resurgent field of in-situ uranium mining throughout the American West has forged a new kind of pioneer, one who still fights for land and water on the plains but must oppose a well-heeled, highly technical modern foe. It's different than oil and gas production, which is as familiar to the West as open fields and thunder, and it's prompted a new wave of education and employment on both sides.

[The above is clearly a highly biased, anti-mining statement. The author is casting the mining companies as the "bad guys" and the land owners and others as the "good guys", and is pandering to the people of the American West:

> *"American West has forged a new kind of pioneer, one who still fights for land and water on the plains but must oppose a well-heeled, highly technical modern foe."* ]

[The author states that in-situ mining is different from oil and gas production, which is a falsehood. Both utilize water-flooding techniques to increase the recovery of the uranium or petroleum. No mention is ever made of the numerous problems that the oil and gas industry has had over the years with leaking casings and surface evaporation pits that have polluted nearby drinking water supplies with brine or natural gas. So, have we banned oil and gas production/exploration? Of course not! That's just part of the local risk. Oil companies usually take care of such occurrences in one way or another and so would uranium recovery companies if they ever were held responsible for such pollution.]

Fort Collins Now traveled to Goliad, Texas, to find out how ranchers and grandmothers are trying to stop a newly formed company from extracting uranium from the ground using their groundwater.

The fight against in-situ uranium mining in south Texas is similar to a battle brewing in Northern Colorado. There are differences, to be sure, but in both places, the fight comes down to water and the fundamental fact that it is essential to life.

It's an especially tough issue for people who long thought they could count on that water to work on the land and earn a peaceful living.

[Yes, water is essential to life, however, the author is using the above statements to spread fear among his readers. No mention is made that the areas immediately in and around the mine are not of drinking-water quality because the ground water in and around an aquifer containing uranium mineralization has been naturally contaminated for millions of years. Furthermore, a vertical sequence of aquifers is often partly mineralized with uranium and associated elements extending over an area of a few miles. Only certain favorable zones along the oxidation front are mineralized with uranium, and only small segments of these are of sufficient concentration to be considered to be of economic significance. Zones in other aquifers located some distance away

from the primary uranium production areas may also contain naturally occurring uranium and associated elements that become apparent in the aquifer water during background surveys.]

But as the Duderstadts and their neighbors have learned, nothing is ever certain.

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The third-generation farm Craig and Luann Duderstadt share with two dogs and three horses is a comfortable, quiet place where butterfly weeds grow along the patio and where ball moss, blown in one day on a hurricane, makes its home on the inner branches of giant live oak trees.

A bull watches visitors with suspicion from a small barn across the yard, and a spare water trough behind the house betrays the Duderstadts' fondness for creatures of all sizes—it's dedicated especially for wildlife and the many migratory birds who pass through Texas' Coastal Bend region. Atop the wooden kitchen table at the center of the old farmhouse is the first sign that this is not an average Texas ranch, however. Next to a ceramic vase and a candy bowl is a framed photograph of a billboard in Victoria: "Help Stop Uranium Mining."

[This is a very artful description of a typical Texas ranch. It is also a very nice description of the Duderstadts' political stance.]

On the carpet a few feet away, Luann pushed back her two blond braids to sift through a plastic tub of papers and files she has amassed about uranium mining, Texas land law and her cohorts in the fight against Uranium Energy Corporation. Like Powertech Uranium Corp., which wants to mine in Northern Colorado, UEC is based in Vancouver, British Columbia, has a corporate office in the capital city of the state they're exploring for uranium, and set up a field office in the town where their opponents live.

Luann is Texas-style blunt and does not seem given to hyperbole; it's clear that raw emotions feed her activism against an operation she believes will poison her water beyond repair.

Until two summers ago, the Duderstadts' lives consisted of farming and ranching and generally appreciating south Texas life at the end of a fulvous gravel road. Since Uranium Energy Corp., a newly formed company, starting drilling exploration and test wells for uranium, her water and her life have both changed for the worse.

She said she is committed to helping stop the "environmental disaster" she believes is inevitably wrought by this type of mining. "The Navajo people say it all when they refer to yellowcake as yellow death," she said, referring to the material uranium is processed into.

[The "environmental disaster" that Mrs. Duderstadts appears to be worried about is that associated with the problems experienced in New Mexico during the 1960s and 1970s Unfortunately, those were the result of open-pit and underground mining. Miners were exposed to high levels of radiation associated with uranium found in the subsurface and the radioactive tailings from those mining techniques. In situ mining has no tailings and the uranium produced has a very low level of radiation. The difference in radiation levels is the result of removing only uranium from the ground and groundwater, not the daughter products. Uranium in and of itself is not highly radioactive, but the daughter products, such as $^{226}$Radium and $^{222}$Radon, are. Also, although the workers who once worked underground were surrounded by such radiation, they also weren't breathing it in to any depth in their lungs, unless they were smokers. Interestingly,

health studies have shown that being exposed to radiation wasn't the principal problem but being exposed combined with smoking tobacco greatly exacerbated the health problems experienced by underground uranium miners, suggesting that by smoking, radioactive particles were carried deeper into the lungs causing serious health issues.]

The people of the South Texas Crossroads region are largely ranchers and farmers, salt-of-the-earth people with hubcap-sized Lone Stars on their homes. They're the sort who balk when a new restaurant dares to charge $11.99 for chicken parmesan. They are the kind of people who wear cowboy boots because of the mud, not the style. They keep horses for work, not as pets.

They keep herds of whitetail deer in fenced-in private ranches, for the hunting pleasure of the region's tourist visitors. Buzzards are praised for keeping the roads clean.

Their cattle, including Hereford and Texas Longhorns, drink from troughs fed by the ground water—until last summer when uranium exploration operations began in earnest.

Since the water turned bad in 2007, the Duderstadts have tested it for radionuclides and other material and will probably do it again, but each time a baggie of the red stuff is sent to the water district, the Duderstadts fork over $400. Some tests have shown elevated levels of iron. The Duderstadts can't afford to test it as regularly as they'd like.

[First of all, it appears that improper sampling of the well took place. "A baggie" is not an approved container for water samples. The samples should be taken using the EPA-approved methods (which are not mentioned as having been accomplished) and placed in approved laboratory containers. Different analyses require different containers.

No mention is made as to whether or not any radionuclides were found in the sample. No mention is made as to what constituents were found in the sample, other than iron. Assuming that only elevated iron content was found, this would confirm an iron bacteria problem, which has nothing to do with exploration drilling that's being done 0.25 miles away.]

Their friend Mark Krueger, who lives in neighboring Victoria County, offered a cheaper trick that will betray any particles in the water invisible to the unaided eye. He shone a laser pointer, the kind used to assist in PowerPoint presentations, through a glass of water. In a glass of well water, the laser beam is visible all the way through the water; in a glass of distilled water, the laser light is only visible where it enters and exits the glass. There is no line through the distilled water, because there's nothing in it to reflect the light.

But the trick is only comforting to a certain level—what about hazardous content that can't be seen?

[Cheap trick is correct and meaningless. Water from a well is unfiltered and the concentration of suspended material varies no matter where the well is located, while distilled water is filtered, One will get the same result as above from testing tap water from a city water supply. It has nothing to do with contamination. Any "unseen" hazards are determined only from a chemical analysis of a water sample conducted by an accredited laboratory].

The mining company and the Texas Railroad Commission, which has jurisdiction over mining exploration, have told the Duderstadts the uranium exploration has nothing to do with the

changes in their well water, and that in the areas near where the uranium ore is found, it is undrinkable anyway.

But Duderstadts and generations of many other families have lived in the area and have been drinking the water for a hundred years, and their relatives say it has never been red.

The families said any changes that are directly related to the mining or exploration are just tough luck. There is no recompense.

[Again, money has to be spent on maintaining water wells. They will not operate properly without maintenance. In addition, as discussed previously, there was an extreme drought in the subject area that broke at the same time as this problem apparently developed. Uranium exploration drilling does not inject the large volume of fluids into the formation over the extended period of time that would be required to affect wells 0.25 miles away. The ground water typically doesn't flow at a rate greater than about 0.33 feet per year in such sediments, which would require almost 11 years to reach a well 0.25 miles away. Therefore, water could not likely have traveled the distance indicated. Have any studies been conducted to determine if there's a pattern to the problem? Are there unaffected wells between the exploration area and the problem wells? If so, the problem isn't coming from the exploration area. How deep are the wells? If they are all shallow wells, the problem may very well be an influx of surface water from the heavy rains and flooding associated with the breaking of the drought. Based on the evidence provided, however, the red water is likely due to an infestation of iron bacteria in the subject well having nothing to do with flooding in the area].

"You don't see them paying the Culligan man for bringing all this water, and you don't see them coming to my door to ask me, either, because they don't give a damn," Luann said.

The Duderstadts have about 15 cattle on the 150-acre property and several more nearby. Craig has been slowly moving them to other ranchland. But Mary and Tom Anklam can't do that. The couple moved from Michigan to Victoria in 1997 to retire, and bought a ranch in Goliad down the road from the Duderstadts four years later.

The Southern Comfort Ranch is now home to Boer goats the Anklams raise for meat and for show. The animals fetch between $150 and $400 a head, but since uranium exploration began, nobody wants to buy them. Mary Anklam said she takes the animals to auction, where she can only get $30 to $60 a head.

"People are afraid to buy them," she said. They see the drill rigs near her property and start asking questions.

"I have to tell them; I can't lie to them."

[Unfortunately, Ms. Anklam appears to be compounding her problems. When asked about the drill rigs does she simply say that they're exploring for uranium, or does she give a diatribe on her fears of perceived environmental problems? Her fear may be causing buyers to become afraid, when there really isn't any real reason for this.]

Loss of livestock income is not an option in historic Goliad, which extols itself as the birthplace of Texas ranching. The town, whose population was 1,975 in 2000, is one of the oldest

municipalities in Texas. In 1749, Spanish settlers established a mission and a fort, in an area that was then called Santa Dorotea. Presidio la Bahía, the "fort by the bay," is still nestled on the southern bank of the San Antonio River.

In February 1829, the town's name was changed to Goliad, an anagram derived from the last name of a missionary priest, Miguel Hidalgo, a father of Mexican independence from Spain.

About a 90-mile drive upriver is the famous Alamo—remember it for the standoff where Davy Crockett died—but Goliad is the site where Texans stormed the garrison, defeated the Mexican troops and first declared their independence from Mexico as the Republic of Texas, in 1835. Now, as they fight to keep their land from a more modern foe, the residents of Goliad are prepared to make another historic stand.

It's one that is bound to be repeated throughout the United States, including in Nunn just northeast of Fort Collins, as uranium mining—an industry that was recently as fallow as some of the fields that will be drilled—enjoys a resurgence on the tail of rising uranium prices, and a renewed interest in nuclear power.

[Again, this is highly biased writing on the part of the author who is apparently attempting to create controversy promoting a minority view against nuclear power. Is this reporting on the news, a travel dialogue, or a political campaign? She attempts to make the point that mining is bad no matter where it occurs.]

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Goliad's fight started almost two years ago, when UEC began knocking on doors. Not all residents had an intrinsic bad feeling about uranium mining—this is oil and gas country, after all, and residents are more than accustomed to trucks and pipes and drill rigs dotting the landscape. Mineral extraction is nothing new to Goliad County. What's more, the company arrived with promises to be good neighbors, offering handshakes, scholarships for local high school students and, some residents recall, hams and cookies delivered to landowners.

But then they poisoned the land, some believe—UEC improperly filled some of its initial drill holes, resulting in radioactive soil around the boreholes. Residents started to worry, and the history of south Texas uranium operations did little to ease their fears. People knew of uranium mining operations in next-door Karnes County through the 1980s, and a history of spills and contamination fears from in-situ uranium operations in Kleberg County's Kingsville, about two hours' drive south.

[No mention is made that only the mining in Kingsville is via in situ mining, the other areas were open-pit mining. The author has conveniently left out discussing the successful ISR mines in Live Oak and other south Texas counties. As discussed earlier, the two methods are not similar in their risks or potential problems. In addition, it's not until later that you learn that the "improper" plugging of the drill holes was because cement was used, rather than drilling mud. Both are acceptable practices, but the cement method was considered "improper" only because UEC didn't modify its exploration permit to allow it until after some of its exploration holes were plugged using this method.]

UEC started drilling exploration boreholes in Goliad in May 2006, in an area about 15 miles north of the town. Opposition and concern grew that summer, and the county commissioners passed a resolution opposing the proposed mining operation. In November 2006, the

commissioners decided to form a uranium research and advisory board. The presidents of the area groundwater district and farm bureau are among the members.

The commissioners also voted to spend $150,000 to hire experts, including an attorney, Jim Blackburn, anticipating a contested case hearing in the matter of UEC's mining permit. That hearing would be similar to a civil trial in terms of evidence and argument, and it would be intended to fight the state's decision, if it is so made, allowing the mining company to move forward.

Commissioner Jim Kreneck said he's lost some support and even some friends because of his outspoken opposition to the project. But as a rancher and public official, his concern for the water supersedes any political ideology that might otherwise bend him the opposite direction. The taxpayers are the ones who must ultimately pay, he said.

[The county commissioners can pass all the resolutions they want and even oppose mining in court, but the permitting and regulation of exploration and mining operations in the State of Texas are controlled by the Texas Railroad Commission and the Texas Commission on Environmental Quality. Both of these Commissions base their decisions on well-established rules and regulations that are also based on state laws and sound scientific investigations and principles designed to protect human health and the environment. The question arises as to whether public officials can hire plaintiff attorneys to oppose mining. Also, are there other agenda at work here? This needs to be investigated as well by the news media.]

After the uranium committee formed, local opposition started growing, said Art Dohmann, president of the Goliad County Groundwater Conservation District. The bad blood began flowing in earnest in spring 2007. That April, several residents, including the Duderstadts, complained to the water district that their wells were being plugged up with slimy red sediment. The water district tested the residential wells and found "significant changes" in iron and other mineral content in four of the wells; a fifth had only turned red, according to Dohmann.

[Any member of the GCGWD should know that red water suggests an iron bacteria infestation of water wells that have been improperly maintained. Also, as discussed earlier, the spring and early summer of 2007 was the 6th wettest spring and summer in Texas history. There were massive rains and flooding in the area. Could this have contributed to the problems? There were no reports of problems when UEC was exploring in the area the previous year, nor 20 years earlier when the original exploration was taking place.]

On top of that, the Texas Railroad Commission found that the company had not plugged the majority of its boreholes as it said it would. GPS coordinates also didn't lead to any holes, and the wells they were able to find were surrounded by piles of radioactive dirt because the holes had been improperly refilled. Residents seized upon those violations as proof that UEC had already shirked its environmental responsibility and would continue to do so.

Harry Anthony, chief operating officer of the uranium company, told residents at a formal meeting Jan. 24 that those violations happened because UEC used a different method than previously chosen to plug the holes. The new method, using cement, is better, but state regulators had expected something different and that's why the company was cited; he said the company's permit has been modified to reflect the change, and the company bought better GPS devices.

But residents' concerns took off from the first violation, so they were already primed for a fight when, last August, the Texas Commission on Environmental Quality notified residents that UEC had applied for an underground injection control permit. It is the first step needed to begin in-situ leaching of uranium from the rock.

[There is no substitute for good data. Inexpensive GPS equipment does not have the kind of accuracy of expensive models. An exploration drill hole is typically six inches in diameter but inexpensive GPS equipment only has an accuracy of 9 feet at best. Expensive GPS's have accuracies of inches.

There is also no reason why the exploration permit wasn't modified for the new plugging technique prior to its use.]

Powertech Uranium Corp. is about a year away from filing a permit to do the same in Northern Colorado.

Dohmann, the county's groundwater conservation district president, said the monitoring and exploration wells are being drilled in a concentrated area at the moment, but it's expanding. The ore body is 157 acres, and Dohmann said test wells were being drilled over a 600-700-acre area; in recent weeks, new testing began in other areas of the company's 10,000-acre exploration permit.

"It's like a fire. It's just going to keep spreading," he said.

That kind of language is common among the opponents. Paranoid might not be the right word, but to say they're scared is an understatement.

Resident Margaret Rutherford, who started a group called Uranium Information At Goliad, said she has felt intimidated. Health problems led her to step down recently as the group's president, but she's still involved and said her newspaper, for which she writes a column about uranium, has been repeatedly stolen. She even thinks someone may have tapped her phone.

[Paranoid sounds about right. The idea that a company would tap opponent's phones and steal their newspaper is ludicrous, especially in the age of the Internet.]

Also, since it's mentioned that she's stepped down due to health problems, the reader is lead to believe that it's the fault of UEC. This statement should have been clarified as to whether or not she thinks it's related and why.]

Rutherford said she worries about her water and health but also her land and her home, where her late husband's carvings are still embedded in the wood. Her memories live there and she doesn't want to abandon them. She has nowhere else to go.

That comment surprised Luann Duderstadt.

"You're gonna live here if they get a permit?" she said.

"What am I gonna do?" Rutherford shot back, throwing up her hands.

"I'm not living here," Duderstadt replied.

Anklam said she'd considered packing up and going somewhere else.

“Can I live with you?” Duderstadt asked her.

“Sure, we’ll have a little house on the prairie,” Anklam replied with a laugh. “Let’s go.”

The women all chuckled at the fantasy.

“At least we can still laugh,” Rutherford said.

Although the company’s opponents find comfort in each other, the issue has divided the community. Members of Rutherford’s own family have willingly leased their land and support UEC, to her great chagrin. Her aunt and uncle, Joe and Betty Jacob, even had their pictures included in a 3/4-page newspaper ad UEC took out in the Victoria Advocate, the larger local paper.

“I think the project is a great blessing for the county. I think it’s safe; we've researched it and feel real good about it,” Betty Jacob is quoted as saying.

Luann Duderstadt and Rutherford scoff that they’re just in it for the money, and that opponents outnumber the willing participants.

[Is all this possibly the result of neighbor envy? A neighbor will become wealthy because they were fortunate to have uranium deposits below their land while neighbors do not.have uranium. That would be a sad commentary.]

They say even some who have leased their land now regret the decision.

Across the road from the Duderstadts, Elder Abrameit leased his mineral rights for $5 an acre in the early 1980s. Soon after, a precipitous drop in uranium prices meant the deal fizzled—until three years ago. Now Abrameit is saddled with a decades-old lease which comes with a promise of 8.25 percent royalty on the ore extracted from beneath his land.

[It’s surprising that these leases weren’t dropped after the uranium depression in the 1980’s hit. Most companies allowed their exploration leases to lapse because uranium became un-economic to explore for or to produce. Also, $5-10 per acre and 8.25 % royalties were standard back then. With today’s price, double the peak in the 1970’s boom, higher royalties can be paid. This regret by owners like Mr. Abrameit sounds more like greed than true regret.]

County Commissioner Kreneck wondered how the company will measure the extraction to properly pay royalties—it’s not like oil and gas, which can be easily metered. And even then, payment of royalties isn’t payback for the loss of their water.

So the opponents hope the state can help.

The Duderstadts, the Anklams, Rutherford and about 450 of their neighbors turned out for a meeting with state officials Jan. 24, the one in which Anthony explained the company’s violations.

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The meeting was sponsored by the Texas Commission on Environmental Quality, TCEQ, along with the mining company. During exploration, which is ongoing, the Texas Railroad Commission has jurisdiction. Mining requires a separate permit from the TCEQ, which is still pending; the meeting was to address questions and accept formal comments from residents regarding the permit application.

The complexity of the permitting process is similar to that faced by Powertech in Northern Colorado. Texas and Colorado laws are different, but the same federal environmental and nuclear regulations apply, and it takes several months to complete information-gathering, public review and final approval.

UEC's application in Goliad is about a year ahead of the proposed project northeast of Fort Collins. TCEQ geologist David Murry told the crowd he was still examining the application and that no mining could take place until a permit was granted. Several residents wondered how well TCEQ could protect their interests, noting that the agency is funded mostly by permit fees from the industries it regulates.

[This is a complete misperception. Permit fees are very low and do not contribute a significant percentage of the TCEQ's budget, which it gets from the State Budget.]

At one point, Murry answered a question about water quality monitoring and told residents the company would provide the samples to be tested. Some people guffawed at that.

[The skepticism on the part of the community is understandable. The company shouldn't provide the samples to be taken as this could allow for a conflict-of-interest. The company should hire an independent third-party to do the sampling and testing. This is standard policy in the industry, and therefore, it is highly possible that this has been mis-reported by the author.]

"You obviously don't find that very comforting," Murry acknowledged.

There weren't enough chairs in the auxiliary hall at Immaculate Conception Catholic Church; so many people turned out that the Texas Rangers came to provide security. Town Constable Kirby Brumby, who is running for county sheriff, said earlier in the day that there was even a security meeting to discuss logistics.

In fact, so many people were there in opposition, Sherilyn Arnecke said, that the quiet base of support for the mining operation was nervous to speak.

[The author of this article is not reporting the news but being an advisary. Were they concerned about violence breaking out? By whom? The anti-mining group.]

She appeared in that newspaper ad with Rutherford's aunt, and has been one of only a couple to stick her neck out in favor of UEC.

"We don't have the money to hire lawyers to come in here, and we don't have all the facts and figures, but there are a bunch of us," she said.

[The author is clearly trying to make the case that the pro-mining people are un-educated stooges who have been paid off by the mining company (see below).]

She said her elderly parents have been harassed because they leased with UEC, and she found that unacceptable and was motivated to speak in favor of it.

"I don't feel like I've been lied to. There are a lot of people for this, but you don't see them in here, because they're afraid to come in here and face this bunch," she said.

Sidney Braquet, an attorney who owns land in Goliad and also supports UEC, said his family's roots in the county go back to the 1800s and he wouldn't jeopardize his family land.

[Mr. Braquet is an attorney from a long-time family in the community, who wouldn't jeopardize his family land. This leads the reader to believe that he's against the mining operation. Unfortunately, the reader doesn't find out until two paragraphs later that he's actually in favor of it. The author should have been up-front with Mr. Braquet's position instead of hiding it. This promotes more mis-information.]

He said Goliad residents should not fall victim to misinformation and fear. "There are risks involved in all aspects of life," he said of their concerns. He also talked about the potential growth of nuclear power.

"Why not use what south Texas has to offer to reduce our reliance on foreign sources for our energy future?" he said.

A few clapped for Arnecke and Braquet, but most of those who asked questions and read formal statements opposed the company's efforts.

[Again, the author is leading the reader to the conclusion that Ms. Arnecke and Mr. Braquet are uninformed and don't know how to ask questions.]

They argued in-situ mining was unsafe, unproven and unhealthy; that it would poison their water; and that the state was the only entity that could help them.

Pat Calhoun, a barrel-chested ex-Marine and president of the Goliad County Farm Bureau, boomed agricultural statistics into the microphone, estimating how many gallons of groundwater would be denied thirsty lactating cows if the mining operation went ahead. He said the TCEQ should deny the permit.

"There (is) historical evidence that no unconfined aquifer can be mined without irrevocable change and damage to it," he said.

[Why has nothing been mentioned of the extensive in situ mining in south Texas during the 1970s and 1980s in ranching communities like George West, only an hour and a half to the south of Goliad. Those mines were successful and remediated successfully. The ranchers in the area were unaffected, and no cattle went thirsty. Mr. Calhoun also shows his lack of knowledge of the hydrogeology of the area when he states that the aquifer is unconfined. It's actually a confined aquifer.]

Even before the residents spoke, Anthony said those claims were unfounded. His comments were echoes of the arguments used by Powertech to quell concern and opposition to its project in Nunn.

“This project will not adversely affect the groundwater, nor will it cause other concerns,” he said. “We’re well aware that many people have concerns about this project. I respect those concerns and so does the company. We wouldn’t have undertaken this project if those concerns were even partially true.”

Anthony is among a small group of people who blazed trails decades ago for this form of mining, saying it is better for human and environmental health and safety. No pits or caverns involved; it is not even really mining in the traditional sense, but a chemical process that, for a moment, reverses the work of millions of years.

[Actually, it wasn’t a small group of people back then. It’s a small group of people who have either stuck with uranium mining all these years or have come back to it. Most of the people familiar with uranium left the industry during the depression of the 1980-1990’s. Those who survived or came back did so because they saw an opportunity to get back into something they enjoyed doing and wanted to make sure the mistakes of the past weren’t repeated by those who are new to the field.]

Those in the field trust the method and say it is the best way to extract a relatively abundant resource that can help power the world.

Anthony said UEC just wants to recover some of Goliad County’s “ample resources” in order to power potential nuclear power plants in the U.S.—including one that just filed a permit application in Victoria, the first newly licensed nuclear plant in 30 years.

“The U.S. is trying to achieve energy independence—both the United States and Texas. And they can do this by finding clean sources of energy,” he said.

Whether residents agree with nuclear power or not, the needs for new energy are clear. Anthony is far from the only one promoting nuclear as a homegrown solution.

[This is true. The United States once was self-sufficient in uranium, even a net exporter of it. During the depression of the 1980-1990’s the price for uranium fell so low that 95% of the mines in the US were closed and the number of people involved in uranium exploration and mining fell from 4,000 to 400. The amount of known uranium deposits in the U.S. is currently enough to supply our needs for many decades to come. Many in the industry believe that there are many more areas of the U.S. that could produce uranium, but haven’t been evaluated as yet.]

What is In-Situ Mining?

The agency estimated reserves based on cost in 2003, and the 18 million figure is based on a price of $50 per pound. But last summer, uranium prices more than doubled that amount, and were hovering around $80 a pound the week of Jan. 28, 2008.

It’s evidence that investors and private and public utilities know uranium is an increasingly feasible alternative to coal and gas-fired power plants, especially since nuclear power plants don’t generate greenhouse gases in the process of creating electricity.

That is what led Paul Moore, a co-founder of the global environmental group Greenpeace, to advocate for nuclear. He is now a paid spokesman for the industry-funded Clean and Safe Energy Coalition, whose logo includes a 70's-style nuclear power plant protest pin with the phrase "No Nukes," but the "no" is crossed out and "yes" is scratched in.

On the group's Web site, several national lawmakers are quoted saying good things about nuclear power, including Senate Majority Leader Harry Reid, from Nevada, who reportedly said, "I'm cool with nukes," and GOP presidential front-runner John McCain, who is quoted saying, "We need to go back to nuclear power."

[With today's concern about global warming, nuclear power is clearly the best way to reduce $CO_2$ emissions. Unlike coal, oil, or gas-fired electric plants, nuclear power plants produce no $CO_2$. Unlike wind and solar power, nuclear power is not subject to the whims of the weather or daily oscillations of sunlight, unlike hydro or geothermal power, a nuclear power plant can be installed anywhere, not just where massive rivers flow through large canyons.]

Talk of a nuclear resurgence is being phrased in the language of national security, even patriotism—the United States needs home-harvested material like uranium to survive, advocates say. It's not a renewable resource, but advocates say it could prolong stockpiles of fossil fuels that some say are right now reaching their peak.

In large measure, fears about nuclear meltdowns have abated since the Three Mile Island nuclear power plant incident in 1979, when a malfunction caused the reactor core to overheat. Although no one died, or was even hurt, the incident prompted sweeping changes to the nuclear power industry. It also generated enough public mistrust and trepidation to help quash it. At the same time, uranium prices plummeted, and industry interest in the resources dissipated.

[This is partly true, but the author didn't point out that the news media in those days promoted anti-nuclear sentiment by repeatedly bringing this up. The author doesn't mention that today new designs are available for nuclear power plants that work at much lower temperatures, temperatures so low that accidents like Three-Mile Island or Chernobyl can't happen because the temperatures would never be able to get high enough to cause meltdowns or steam explosions.]

Dain McCoig is evidence of the three-decade gulf in uranium interest. A 2002 Colorado School of Mines graduate, he now works as senior engineer at Uranium Resources Inc.'s Kingsville, Texas, in-situ mine and processing facility. There's a wide generation gap in his profession—some of his colleagues are old enough to be his parents—but the field is again ascendant as prices in uranium and even precious metals like gold have sparked a resurgence in mining education and employment.

[Unfortunately, when an industry is down for 20-30 years, the industry loses the knowledgeable people. After making a new career for themselves, many of the old experts aren't willing to come back or have retired. This is the cause of the "brain drain" in the field. For 20-30 years none of the younger professional geologists have learned about uranium exploration or mining, so the industry has to practically start over in training young professional geologists and engineers. The knowledge base that was lost will take many years to replace. Those who remain active in the uranium industry are valuable resources]

It's tied to the potential "nuclear renaissance" many believed would begin after the 2005 energy bill, which promised huge tax credits for new nuclear power plants. South Texas seems to be the modern-day Florence in this new renaissance.

In the past three years, NRG Energy, Energy Future Holdings Corp. and Exelon Corp. are among companies in Texas to have proposed eight new reactors, one-fourth of the total planned in the U.S., according to the Nuclear Regulatory Commission. Exelon proposed the new plant in Victoria.

Julian Reed, a public relations expert hired by UEC, said the plant could conceivably use Goliad-mined yellowcake for power. "It so happens that this area has very extensive uranium deposits," he said. Many Goliad opponents don't believe that's where the processed uranium will be used, however, saying they know the biggest markets for uranium are still overseas.

[Yes, the biggest market for uranium is oversees and will remain so. However, since the U.S. produces very little of its own uranium, and since new nuclear power plants are on the drawing boards both in the U.S. and overseas, any amount of uranium produced in the U.S. will be used in the U.S. to offset the volume of uranium we are currently importing.]

Reed said much of the opposition is fueled by misinformation or misunderstanding. "The scientific facts are that this can be done without doing harm to the environment," he said. Residents in Kingsville, Texas, would beg to differ, however.

The rapid rise in uranium prices led URI, where Dain McCoig works, to reopen its in-situ uranium operation in Kingsville in 2005 and drill new wells.

The Kingsville Dome—actually a visible dome-like swell in the land, covering a major oil and mineral deposit—was mined for uranium from 1988 through 1999, but closed for a while after low prices made it uneconomical. Some also say pollution from spills and abandoned wells was partly to blame.

[Spills occur no matter what type of industry. Even the oil and gas industry, which earlier in this article, was indicated as being "safe and familiar", has spills and abandoned wells that have caused problems. Most spills in the uranium industry are small and easily cleaned up.]

The operation restarted after a controversial decision by the TCEQ to overrule the state Office of Administrative Hearings, which had tried to stop new operations until the company had cleaned up its previous wells.

[It is unreasonable to expect a mining company to stop all mining for however long to clean up one area before a second portion of the mine can be produced. It is standard mining practice that a company can use the funds from the active mining activities to help fund its restoration activities. This is the most efficient manner to produce anything. Even open-pit coal (lignite) mines continue to expand one end of the mine while closing and remediating the opposite end.]

Teo Saenz started a group called STOP, South Texans Against Pollution, to fight URI and raise awareness of its previous actions. Saenz, a pharmacist in Kingsville who also owns a ranch, lives about three-fourths of a mile from the mine production area, and worries about arsenic, selenium and other metals in his well water. The fields look fine, with white PVC pipes sticking up from the ground. But what lies beneath is far uglier, according to Saenz.

"The reality is they can't clean up, they can't restore the water," he said.

[The author's representations concerning Mr. Saenz are misleading. What basis is he using to make this statement? It is important to remember that uranium and arsenic, selenium, molybdenum, and other elements are associated with the biogeochemical processes that precipitated uranium and associated elements within the sediments of the aquifer millions of years ago. With time, radioactive daughter products evolve from the uranium such as $^{226}$Radium and $^{222}$Radon. Just because someone's been using well water for decades or even centuries doesn't make it "drinking water quality". The quality of the water can only be determined from laboratory analysis. There are many cases where generations of families have been drinking water that was above the drinking water standard but didn't know it until the ground water was tested by a laboratory. The presence of naturally occurring radioactive mineralization can go unrecognized for decades, until uranium exploration discovers it. Because ground water flows very slowly, it requires decades for the ground water to migrate a distance of one mile. Also, drinking water wells should be tested at least annually to assure that the quality hasn't changed either resulting from a lack of maintenance where iron bacteria have infected the well. Also, concentrations of chemicals of concern present in the ground water naturally fluctuate with time.]

The mining companies say they can, and that Mother Earth will help.

The uranium came to rest under Kingsville, Goliad and Nunn for a number of reasons, including other elements in the rock that "reduced" it from a mobilized state and essentially made it part of ancient river sands (in Colorado's case, sands from a Cretaceous era marine barrier island). The reducing agents are still there, and when the uranium and other metals are mobilized, they can only move so far before the Earth will bring them back in, the companies say.

But Saenz has done his own research, rattling off members of the periodic table of the elements and saying scientists have told him the cleanup can't be done. There are key differences in the geology of South Texas versus Northern Colorado, which Powertech says will safeguard this region's water more so than in Texas.

[Which scientists is Mr. Saenez talking about? Where is his proof? When a mine is installed background samples of the area are collected quarterly for a year prior to any mining. This baseline establishes the parameters to be used. However, the baselines are sometimes far lower than what health-based risk analyses would normally allow, so these are often used instead of the baseline. Is that what the complaint is about, that companies aren't cleaning up the aquifers to an ultra-pure state?]

*(For more on the scientific aspects of in-situ mining, including why Powertech, UEC and URI say their operations will be safe and how the two regions' geology differs, see Friday's edition of Fort Collins Now.)*

Saenz said TCEQ has abdicated its duty by not forcing URI to clean up wells from 1988, and he believes regulators have made things easy for the industry. He thought the meeting in Goliad would be a "sham."

"You're not only going against the business, you're going against the state, too," he said.

In what appears to be a common industry refrain, Powertech officials have said in interviews

that they have not yet devised the exact method for cleaning up Northern Colorado's water—many company officials have worked for other in-situ operations before, but as a company, Powertech hasn't done it yet. They have promised to figure it out, as they must in order to get a permit.

Saenz said URI told Kingsville the same thing.

"They keep saying, 'We'll figure it out, we'll clean it up.' That's not good enough," he said. "It's not a little poker game. You're dealing with people's lives."

He said potential problems from materials in the aquifer won't manifest themselves in the years URI, or any other company, is mining; it could be years, even decades, down the road. He is so against in-situ mining that he even traveled to New Mexico to drum up opposition in that region.

[Mr. Saenez doesn't appear to understand how stringent the TCEQ rules actually are. He has no educational background on the subject and insists that "feel-good"-based guidelines be used. These are not based on scientific principles but on a guess that someone felt would be appropriate.]

In Cibola County, N.M., county and municipal officials have announced support for URI's plans to mine in that region, despite a history of pollution problems in the Navajo Nation. The Navajo came up with the phrase Luann Duderstadt remembered—yellow death—but other New Mexico residents in sparsely populated areas seem supportive so far.

Saenz said he's heard about the brewing battle in Northern Colorado and wished his counterparts luck.

"I hope that maybe you can learn something from our mistakes," he said.

[As stated previously, comparing the former mining activities in New Mexico with today's in situ mining is like comparing apples and oranges. Both deal with different problems and solutions. It is unfair and purposely deceptive to claim that they are similar.]

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That solidarity is common among opponents of uranium mining. Weird, unlikely alliances are formed in this field. There's Moore, from Greenpeace, going nuclear. And in Goliad, conservative-minded ranchers like Kreneck are active members of the Sierra Club, where they share environmental beliefs with liberal types who choose not to eat the beef those ranchers spend their lives raising.

[Does this mean that after the Sierra Club gets uranium mining and nuclear power banned from the US they'll be going after the beef industry? Perhaps we should also ban the raising of all animals for food. Extremist groups like these typically mean well but don't realize that if they had their way, there would be electricity for only the very rich and the rest of us would lead the simple life of peasants.]

Dr. Richard Abitz, a geochemist from Cincinnati hired by the Groundwater District, said it's common for such matters to transcend politics or personal persuasion. "What's that quote from 'Oklahoma!'—'The farmer and the cowboy should be friends,'" he said. "Everybody should be friends when it's the right issue."

Fear seems to be a unifying one. McCoig, the URI engineer, said fear drives a lot of the opposition. “A lot of people just don’t want us here in the first place. They hear that uranium word and it’s scary,” he said.

He lives a 50-minute drive away in Corpus Christi with his wife and future daughter, who is due in a matter of weeks, and he cares about the land and his family’s health. Most URI employees live in Kingsville or nearby towns, and wouldn’t harm the land and water they use themselves, he said. He said many opponents make up their minds before they have all the facts. If they learned about the careful regulations the industry must follow to protect water, and if they learned the science, which explains how the earth itself will protect the aquifer, they wouldn’t be as afraid, he said. In fact, they might embrace the method because it is so much less intrusive.

“If everything could be mined this way, you wouldn’t have any pits, you wouldn’t have any shafts, you wouldn’t have any mountaintops removed for coal, the environment wouldn’t be pillaged,” McCoig said. “When we’re done here, it will be restored back to farmland. … The same water is going to be there and the same land is going to be there.”

[Why doesn’t the author or someone else do an investigative story on places like George West, Texas, where in situ mining was performed extensively in the 1970s and 1980s? Those mines are now remediated and nothing remains. What story do the people in George West have? Has their ranching disappeared? Has their drinking water been affected?]

Some Goliad residents who oppose UEC agree that the land will be the same, and some even say they support mining; the difference, they say, is that they don’t want it in their water source.

On his Web site, Goliadproject.org, Mark Krueger, the Victoria County resident who brought the laser pointer to the Duderstadts’, said he is not against mining on the whole.

“Please keep in mind that I do not oppose mining as it is necessary for the continuing development of our technology-based society. I DO oppose uranium mining in a people’s drinking water supply! In-situ leach mining needs to be done in remote areas, not in my (your) water supply until it can be proven to be 100 percent safe!” he wrote.

[Mother Nature doesn’t ask where to put uranium in the subsurface; neither do the bacteria that deposit uranium in the aquifer. It would be wonderful if it were simply sitting on the surface and could be scraped up and put directly into a power plant, but that doesn’t happen. Uranium is where the bacteria deposited it millions of years ago. A company can recover it or leave it alone to continue to naturally contaminate the aquifer. In either case, that portion of the aquifer that’s in proximity to the deposit does not, and will not for millions of years, contain ground water that is fit to drink.]

At the meeting last month, he asked if that was possible. Krueger waited until the end of the question period to take the microphone.

In his soft-spoken way, he asked TCEQ and Anthony a few pointed questions about how many wells were situated within a quarter-mile of the mine site, what kinds of material would be used to clean the water and how long it would take.

His last question:

“Is it possible that one well, one well for human water consumption, could be contaminated in Goliad County? Yes or no question. Does the possibility exist?”

The audience watched expectantly.

Tara Drissell, with the office of public assistance for the TCEQ, turned to her colleagues on the left and to the UEC table on her right. She paused for a moment and looked at him with an uneven, almost exasperated expression, as if knowing her answer wouldn’t be the one he wanted.

“Nothing is 100 percent,” she said.

[Nothing is ever 100 %. No one can operate at 100% efficiency or be 100% accurate. Using 100% is an unrealistic goal to achieve in anything. It’s a good goal to strive for, but impossible to attain.]

Goliad, Texas and Nunn, Colorado are home to ancient deposits of uranium, a naturally occurring heavy metal as old as Earth itself. Ancient volcanic ash spewed the metal into the air, where it was picked up in highly oxygenated rainwater and brought back down to Earth. When it hit the ground, other metals in the rock helped to de-oxidize the uranium, and the element was embedded in ancient river or marine sandstone formations.

In the 1950s and 60s, uranium mines were much like other metal mines, including shafts and open pits. But in the 1970s, scientists figured out a way to get the uranium out without having to dig anything bigger than a well hole.

In-situ, or “in-place” mining, duplicates the same chemical process that led the uranium to be deposited into the rock in the first place. Groundwater is oxidized and turned into a solution called a “lixiviant,” which is forced down into the sandstone layers, where the uranium is essentially drawn to combine with the water. The solution is pumped back to the surface and combined with resin beads in a process that works basically the same way as a home water softener. Molecules of uranium hop on to the resin beads, which are taken to a processing facility to strip the uranium off, refine it and make yellowcake. That material can be turned into weapons-grade uranium or enhanced for use in nuclear power plants.

[Yes, uranium can be used in atomic weapons, but the U.S. currently uses plutonium, not uranium for its atomic weapons. Stating that uranium can be used in weapons, especially as the first portion of this sentence, is simply fear-mongering of the worst type.]

With the possibility of an in-situ uranium mine opening near Nunn in the not-too-distant future, Fort Collins Now traveled to Goliad, Texas, to see how another community is dealing with the same issue. The uranium mine there is about a year ahead of Powertech’s proposal for Nunn, and even though it isn’t yet fully permitted, it is being blamed for ruining the ground water locals rely on to for both themselves and their cattle. Efforts to oppose the mine have divided the community, and provide a cautionary tale for those in Northern Colorado as Powertech’s proposal comes under scrutiny from neighbors, regulatory agencies and even the state Legislature.

[Why is the news media supporting such allegations when they should know that they are patently wrong? It is impossible for mining operations to “ruin” an aquifer before they even start

to recover uranium! Certainly not from exploration drilling. Perhaps what's happened is simply a case of a uranium company doing its due diligence analysis of the surrounding area and finding that people have been drinking unfit ground water for generations because no one ever tested their water supply previously.]

To be fair, there are numerous differences between Powertech's proposal and the in-situ operation in Goliad. Those will be detailed in Friday's *Fort Collins Now.*

But what we found are numerous similarities as well: The fears of opponents, the reassurances of the mining companies, and the divisive nature of the issue are not unique to either area.

[Articles such as this one tend to contribute to the divisive nature of the issue by stressing the emotional aspects and not fully addressing the factual aspects. This should be apparent to the intelligent reader.]

Perhaps most importantly, neither company can ensure that their mines will not harm the ground water needed to extract uranium. They say they will be able to make it better, but residents are not so sure.

[Notice how the author ends this article on a down note. The entire article has an obvious anti-mining bias to it. A minor amount of factual information is given, but most is down-played while emphasis is given to people's fears and non-factual, emotional perspectives. This should alert the readers that someone is trying to sway them using long-standing methods of emotional persuasion bad information.]

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