

**"No one is neutral" in water fight  
coal-bed methane water | first in a three-day series  
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Chuck Larson drives cattle to a higher field at the CX Ranch north of Sheridan, Wyoming. Larsen uses CBM water to water his cattle on the ranch. The development CBM in the area is causing mixed reviews.  
(RJ Sangosti | The Denver Post)

Out on the CX Ranch - a patch of ponderosa-pine prairie straddling the Wyoming-Montana border - water is hard to come by.

So a few years ago, when an energy company approached ranch manager Chuck Larsen with the idea of using water from its coal-bed methane gas wells, the burly cowboy didn't hesitate.

Today, on 37 lush, green acres, Larsen is growing 3 to 4 tons a year of alfalfa irrigated with water pumped out of an underground coal seam.

"Without the water, that field wouldn't be here," Larsen said.

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About 120 miles southeast of Larsen's spread, Ed Swartz is convinced coal-bed methane water isn't saving his ranch, but ruining it.

In October 1999, Wildcat Creek, usually just a trickle, was swamped, flooding the Swartz Ranch with coal-bed methane water.

"The water just kept running for over a year, and I noticed my trees started dying," Swartz said. "It was garbage water."

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As far as Wyoming sheep rancher Pat O'Toole is concerned, the worst thing anyone could do with coal-bed methane water is waste it.

Over the next eight years, up to 450,000 barrels of water a day are projected to be produced in southern Wyoming's Atlantic Rim Basin, where a major coal-bed methane reserve has been discovered.

The federal government wants companies to reinject the water into the ground.

O'Toole wants to gain control of the water and ship it down the nearby Colorado River to thirsty desert towns - a venture that could net a savvy water-rights holder millions of dollars.

"I believe it's too valuable a resource to waste," said O'Toole, who added that he has already floated the idea by Las Vegas' water provider, the Southern Nevada Water Authority.

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In the arid West, where some parts of the land get no more rain than the Sahara Desert, water from coal seams is being transformed from an energy-company waste to a valuable commodity - and it is worth fighting over.



Butch Jellis (Post / RJ Sangosti)

The water and gas have been trapped in coal seams for millions of years, mixing with fresh rainwater seeping in.

In the past decade, as natural-gas prices have soared and new extraction techniques developed, there has been a surge of drilling for that methane gas.

To get the gas, however, energy companies must first get rid of the water - lots of water.

A single gas well in Wyoming's Powder River Basin produced about 4,326 gallons of water a day in 2005, according to U.S. Geological Survey research.

USGS scientists estimated that in 2005, more than 1 billion barrels of water were pumped out of coal-bed methane basins in Utah, New Mexico, Colorado, Montana and Wyoming. A barrel is 42 gallons.

That's enough water to serve Denver Water's 1.1 million customers for about five months.

The water is gushing from gas wells at the same time that years of crippling drought have drained the region's water supply.

And the water woes look to get worse.

The Western Governors Association projects another 41 million people will be living in the West by 2030 and will need 60 billion extra gallons of water.

Yet while coal-bed methane water may be seen as an appealing new source, it comes with risks.

The water often contains trace metals, such as lead and arsenic, which can taint drinking water even in low concentrations.

But the primary pollutant in coal-bed methane water is sodium, which under certain soil conditions can kill crops, trees and grass.

Some coal-bed methane water is five times as salty as seawater.

Scientists say farmers who irrigate from rivers where coal-bed methane water is discharged are most at risk from damaging salt buildups.

"Salinity is a little like climate change," said Reagan Waskom, director of Colorado State University's Water Research Institute. "It happens very slowly, and it takes awhile to see the impact."

### **States left in charge**

Like Swartz, dozens of farmers and ranchers in Wyoming, Montana and Colorado tell tales of damage - at least 20 have sued energy companies and state regulatory agencies over the discharges of salty water.

Colorado currently has no water- quality rules to protect landowners from damage caused by coal-bed methane water.

Other states are retooling their regulations in the wake of mounting lawsuits.

The federal government has complicated the problem by failing to issue any guidelines or discharge limits for companies, leaving states responsible for managing the water.

And so two factions deeply rooted in the property-rights movement in the West are left warring - those who want coal-bed methane water and those who say their land and the environment are threatened by energy companies dumping the waste water.

The fight has spilled across state lines, pitting Wyoming against Montana in a bitter lawsuit over Montana's rules limiting discharges into waterways.

Some energy companies say a ruling upholding Montana's regulations could drive them out of business.

"There's just so much emotion around this issue," said Wyoming Gov. Dave Freudenthal. "People either view this water as their life blood or the end of the world. No one is neutral."

On the CX Ranch, the Larsens drink coal-bed methane water and bathe in it too.

Chuck Larsen doesn't understand why Montana environmental regulators think the water is a "gas byproduct" and not good, old-fashioned H<sub>2</sub>O.

"If that's the case, we're drinking gas byproduct" Larsen said.

At the Wrench Ranch, north of Sheridan, Wyo., and not far from Larsen's spread, Butch Jellis is funneling coal-bed methane water through the tentacle-like arms of an irrigation system onto 100 acres of alfalfa.

Jellis, a cowboy with Buffalo Bill Cody long hair and a bushy goatee, becomes animated talking about the water, which he says has helped increase his crop yield.

"This ranch is my business, and I wouldn't do anything that would hurt my business," he said.

Though no state keeps statistics, the single-largest users of coal-bed methane water appear to be ranchers who use it for livestock or to improve their property for hunting and wildlife, according to Western environmental regulators.

The water is often piped into impoundments, or a landowner might divert it onto their property through a nearby stream.

Both Jellis and Larsen get their water from Denver-based Fidelity Exploration & Production Co., the largest natural-gas producer in Montana.

The difference between coal-bed methane water killing trees and being suitable to drink is the amount of sodium.

In some places, the water is near- drinking quality; in others it is saltier than the sea. The water quality is dictated by the depth of the coal bed, the composition of rocks surrounding the bed, and the amount of time the rock and water interact.

In parts of the Powder River Basin, Fidelity's well water contains relatively few salts and metals, so the company can give it to landowners to irrigate small plots.

At Larsen's ranch, the water is not treated, but gypsum is added to the soil to make sure there's enough calcium to balance out the sodium in coal-bed methane water.

"It's not a silver bullet for every situation," said Joe Icenogle, Fidelity's vice president for regulatory affairs. "But in some places it works."

### **"Garbage grass" takes hold**

The first casualty of the coal-bed methane water spill on Ed Swartz's ranch were the box elders growing along Wildcat Creek.

Then, the Brohm grass that Swartz's father had planted disappeared, and then the alfalfa - the crops Ed's father used to pay off the ranch.

While that vegetation was wilting, alien plant species were taking over the creek bank, which is now dotted with salt-tolerant cattails.

"Mostly it's that 'garbage grass,' I call it," Swartz said. "You reach down and grab it, and it will practically tear your hide off. Think that's palatable to cows?"

The water that flooded the ranch, home to the Swartz family for four generations, came from one of the 150 nearby reservoirs that had been built to hold thousands of gallons of water from Powder River Basin gas wells.

The 22,000-square-mile basin was the scene of the nation's first large- scale coal-bed methane development, which exploded in the mid-1990s.

That was when Casper independent drillers Chuck Peck and Bruce Martens devised a new way to drill wells in shallower coal deposits where there isn't as much pressure locking the gas in place.

Operators were lured to the basin by the fact the gas was relatively inexpensive to produce, with most wells drilled at a fraction of the depth of conventional oil and gas wells - about 300 feet, compared with a standard well of 10,000 feet.

John Wagner, the head of Wyoming's Department of Environmental Quality's water division, said a "gold-rush mentality" prevailed during the times.

"They had figured out how to get the gas out, and everybody and their brother was headed up to the Powder River Basin," Wagner said.

Frustrated by the lack of response from state and federal environmental regulators, in 2002, almost three years after Wildcat Creek flooded, Swartz sued Wyoming regulators and the company that discharged coal-bed methane water into the reservoirs.

The company, Redstone Resource Inc., eventually agreed to pay Swartz for his damage and provide irrigation water under a court settlement.

Today, Wyoming leaders are still arguing about which state agency should handle the bulk of the coal-bed methane water complaints - the state engineer or the Department of Environmental Quality.

Wagner said the department frequently receives calls about flooding, a water-quantity issue that should be addressed by the state engineer.

"We can only tell the guy, 'Look, if you're getting damage, you can sue the coal-bed methane companies for damages,'" Wagner said. "And they don't want to go there."

In April, Gov. Freudenthal rejected new coal-bed methane water rules pushed by the Powder River Basin Resource Council, a property owner group, saying they were a "back door" approach to force the Department of Environmental Quality to regulate how much coal-bed methane water can be discharged.

Freudenthal says the state engineer is responsible for matters that relate to water quantity.

There are more than 3,900 coal-bed methane reservoirs in Wyoming permitted by the state engineer's office, state records show.

Wyoming has only one inspector to check that the structures aren't leaking, and a few other employees who can assist, said Harry LaBonde, deputy state engineer.

"We think it's sufficient," LaBonde said.

### **Dangers still under debate**

Even though Swartz is convinced coal-bed methane water damaged his vegetation, not all scientists are sure the effects are catastrophic.

They agree that water with high levels of sodium can hurt calcium- deficient soils, but they differ on at what level the changes start to occur.

A study conducted last year by the U.S. Department of Agriculture Salinity Lab in Riverside, Calif., indicated crops can be harmed by sodium levels about half as high as those originally thought safe.

That study analyzed soils on a farm in southeastern Montana owned by Roger Muggli.

Muggli is president of Y&T Irrigation Co., which serves about 200 farmers on 9,400 acres in southeastern Montana who grow alfalfa, barley, sugar beets, wheat and corn.

Muggli runs a plant that grinds hay and mixes it with barley, peas and wheat to make cattle feed pellets.

In October, Muggli noticed some of the crops he had irrigated with Tongue River water began to die.

The odd thing, Muggli said, is that alfalfa planted on top of the earthen dikes that had received no irrigation water remained healthy.

"We haven't done anything different in the past 126 years," Muggli said. "What do you mean nothing is going on?"

The state of Wyoming has granted more than 500 permits to energy companies to dump coal-bed methane water - from as many as 5,000 discharge points - into the Powder, Tongue and Yellowstone rivers, which flow through the two states.

Concerned about the impact on those rivers, Montana last year adopted a set of "anti-degradation" rules aimed at preventing water-quality declines.

The tribal government of the Northern Cheyenne, whose reservation is near the Tongue River, has adopted water-quality rules that are equally as stringent.

"Water is precious to us," said Herbert Bearchum, a former tribal council member nicknamed "Happy Herb."

"We heard from the prophecies, though, that people with hair on their faces would try to come and take it from us and disturb our land. Some of us still believe that," Bearchum said.

Wyoming officials insist that operators dumping coal-bed methane water have not harmed rivers that flow into Montana. They also believe that Montana's rules are so strict, they prevent companies from discharging without penalty.

Some scientists, however, believe that coal-bed methane water can harm irrigated crops.

"Montana is sitting at a corner. As is Colorado. As are downstream irrigators," said Jim Bauder, Montana State University soil scientist. "And there's a semi coming that's going to hit them."

Wyoming has sued the Environmental Protection Agency for signing off on Montana's rules. The two states and the tribe are currently in mediation talks with the EPA.

Dave Hogle, the EPA's regional energy adviser, wouldn't discuss the talks.

"I think everybody is gaining an understanding of each other's perspective," he said.

### **Looking to invest**

Twice a year, Pat O'Toole, his family and a small posse of Peruvian shepherders drive his Wyoming flock more than 150 miles between the summer and winter grounds.

In recent years, the view from the trail has come to include dozens of new coal-bed methane wells and the pits that hold the water pumped from the ground.

O'Toole has been angling for control over that water and more expected to be produced from 1,700 new wells planned in the Atlantic Rim Basin over the next eight years.

Under a plan recently approved by the federal Bureau of Land Management, the agency is requiring Anadarko Petroleum Corp. and Double Eagle Petroleum Co., the basin's operators, to reinject water into the ground.

But O'Toole believes reinjecting the water underground is a waste and is proposing a deal that involves shipping the water down the nearby Colorado River to water-desperate Western towns such as Las Vegas.

"It's such a no-brainer," O'Toole said.

Water leases in the West - which range from spot-market purchases to multiyear deals - can fetch as much as \$500 an acre-foot - the amount Santa Fe agreed to pay the Jicarilla Apache for 3,000 acre-feet a year.

Aurora Water buys spot leases from Denver Water for \$347 an acre-foot.

At those prices, Atlantic Rim wells could be pumping as much as \$10 million a year in water by 2021.

Officials with the Southern Nevada Water Authority said the utility has frequent conversations with water speculators, though it is not aggressively pursuing Wyoming water.

"You'd be surprised what we hear - there are icebergs from Alaska someone wants to bring down," said Scott Huntley, an authority spokesman.

Huntley said the Las Vegas water provider is looking at ways to augment its Colorado River supplies and may be open to using coal-bed methane water if the plan can survive an environmental review.

Produced water from energy development, Huntley said, is one of the many sources being analyzed in a major Colorado River study expected to be released this summer.

"We will have a tremendous interest in what that study identifies," Huntley said.

### **Pipelines are possibility**

The coal-bed methane water project that has the most momentum is a plan to build a pipeline to take water in Wyoming to the North Platte River, where it would flow into Nebraska.

The two states have been fighting over shortages in the river since the 1930s.

Last year, the state awarded \$500,000 to the water development commission to conduct a feasibility study.

The Wyoming Pipeline Authority also is querying energy companies to see whether they would be interested in paying for a pipeline for water disposal. Where it would be built or where it would discharge water has yet to be determined, said Brian Jeffries, the authority's director.

"We don't know if a water pipeline will work out," Jeffries said. "But we do think it might be a good idea to explore and see whether it makes economic sense to the producers."

In 2006, a \$50 million pipeline built by Houston-based Anadarko Petroleum Corp. went online and is ferrying more than 60,000 barrels of water a day 48 miles from the basin's northeastern edge to an underground reservoir near Midwest, Wyo.

Members of environmental groups who have complained about coal-bed methane water surface discharges say they support the water being treated and put to municipal use.

"We don't want to see the water go out of the state because we need it here," said Jill Morrison of the Powder River Basin Resource Council. "Every single town in the Powder River Basin - Buffalo, Gillette and Sheridan - is looking for more water."

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## **Regulatory issues**

The widespread coal-bed methane production that began in the 1990s in the Powder River Basin has been followed by a series of regulatory lapses.

A 2002 federal Environmental Protection Agency assessment of a plan for coal-bed methane development on federal land in the Powder River Basin voiced concerns about the impact of produced water on irrigation. It was never officially released because of pressure from Steven Griles, a former Interior Department official, according to EPA memos.

A U.S. Department of Interior inspector general's report found that Griles, a deputy secretary and former energy industry lobbyist, should have recused himself from discussions with the EPA. Griles resigned after the investigation and this year pleaded guilty to obstruction of justice in the investigation of lobbyist Jack Abramoff.

The EPA - which is in charge of protecting the nation's water quality - said in 2000 that it would issue guidelines for companies handling coal-bed methane water. The agency finished its report in 2003, but industry guidelines have never been released.

The EPA is currently analyzing whether effluent guidelines are needed for produced water, but officials say they don't expect a decision until at least 2009.

The Government Accountability Office, in a 2005 report to Congress, found that the Bureau of Land Management neglected inspections because employees were busy writing new drilling permits.