



# Coalbed Methane [CBM] in the Yukon?

by CPAWS-Yukon. Visit [www.cpawsyukon.org](http://www.cpawsyukon.org).  
Email: [info@cpawsyukon.org](mailto:info@cpawsyukon.org). Phone: 867.393.8080 x. 3.  
Excerpts from High Country News reprinted with permission.

Methane gas wells at a 20-acre-spacing test area along I-70 near Rifle, Colorado (Rebecca Clarren photo)

**What is Coalbed Methane [CBM] and how is it extracted? — Read on.**

**What does Coalbed Methane development look like on the land? — Look on.**

**Have we ever had this kind of development activity in the Yukon before? In the North? — No.**

**Do we know its impacts? ... in the North? ... with permafrost? ... in hard-to-reach, pristine places? — No.**

**Do we have any laws or regulations for Coalbed Methane [CBM]? — No.**

**What are the risks and dangers to the health of humans, wildlife, land and water? — Read on.**

**Do we want Coalbed Methane [CBM] extraction in the Yukon? — That's for you to decide.**

## Out of Control

by Rebecca Clarren

GARFIELD COUNTY, Colorado — Arnold Mackley is a patient man. For nearly 40 years, he cooperated with oil and gas companies that drilled 11 methane gas wells on his 263-acre ranch near Rifle. He cooperated, he explains, because he's a mining consultant and believes in the development of natural resources.

So when the oil and gas companies cleared dirt roads on his property and created traffic, noise and dust, he didn't complain. When a gas company left a deep pit on his land, he cleaned it up. When a gas well exploded, when 300-year-old trees were logged, and when his water well was contaminated with methane, he worked it out quietly with the gas companies. But things are different now, he says, and the underlying economics of his town and western Colorado have changed; natural resources no longer rule. Mackley, changing with the times, wants to turn his ranch into an attractive bed and breakfast, but stepped-up gas drilling is in his way.

Across the country, rights to any surface property and to the minerals underneath it can be split. When Mackley leased his mineral rights in the late 1960s, he gave up

the power to determine where gas wells could be drilled on his ranch and how many of them there could be. Almost 40 years ago, gas companies were allowed to drill one well every 640 acres. On Mackley's property, that meant just one well.

In the last four decades, Colorado repeatedly liberalized that rule to allow one well every 320 acres, 160 acres, and then 40 acres. Now, one gas company, Barrett Resources, says 20-acre spacing should be permitted. Since each well requires up to 5 acres for a road, gravel pad and pipeline, more than a quarter of Mackley's land could be eaten up with gas development. While some ranchers say they want methane wells on their property because oil and gas companies pay rent, Mackley says the \$30 he gets "on a good month" isn't fair compensation.

"If we have gas wells every 20 acres, we're not going to have any quality growth," says Mackley. "Who's going to want to live among gas wells? Our property values are going to decline."

Across the state, land developers and homeowners echo his concern.

Mackley says, with softspoken rage, that he is a prime example of how little power surface owners have in the face of oil and gas development.



RELUCTANT REFORMER: Arnold Mackley stands near a methane gas rig on his ranch in Rifle. (Christopher Tomlinson photo)



Newly bulldozed coalbed methane well site. They average 4-5 acres each. (Gail Blinky photo)

# Oil wells in my backyard?

Residents say industry is driving people and wildlife away

## Troubled Waters

by Rebecca Clarren

DURANGO, CO. — “Well, in the late 1980s the kids started lighting the lemonade on fire, so I knew something was going on,” says Carl Weston, a resident of southwestern Colorado’s La Plata County.

Something was going on miles away at Randy Ferris’ house too, where his tap water emerged looking like milk and fizzing like Alka-Seltzer.

Both men were outraged when they learned the cause of their troubles: gas companies were drilling a coal bed rich in methane, causing the gas to seep out of the ground and into water and homes. Ferris says this is because the industry was careless.

Although the lemonade no longer burns and most methane seeps are under control, Durango locals say the industry can still make life miserable. On a recent tour of the area, Gwen Lachelt, director of the San Juan Citizens’ Alliance, points out boarded-up houses and valleys where elk no longer roam. A booming oil and gas industry led to the exodus of people and wildlife.

“This is considered a national sacrifice area by industry because it’s rural, unpopulated and rich in resources,” she says.

The problem has its roots in seniority being given to mineral-rights over surface rights, enabling companies like Amoco to set up noisy drilling rigs in people’s backyards and even site an oil well by an elementary school.

Now, Lachelt’s alliance wants a moratorium placed on gas development in Colorado, until the state studies the overall impacts of methane drilling. Her organization has been joined by other citizens’ groups and county commissioners around the state that feel outgunned by a powerful industry. Together, these groups have targeted the Oil and Gas Conservation Commission for reform.

La Plata isn’t the only county of Colorado beset by oil and gas development. Janey Hines of Parachute says the sheer number of drilling rigs are causing plants and crops in Garfield County to fail, and in southeast Colorado’s Las Animas County, local Marianne Reid says benzene, a proven carcinogen, has been found in unsealed evaporation ponds left by drillers in a “blatant breaking of clean-water act rules.”



NOISY NEIGHBOR: Development abuts homes (Oil & Gas Accountability Project)

## Water Rights

By Robyn Morrison

HOTCHKISS, CO. — “Not a drop of water runs off of this place,” says Steve Ela, looking over his 112-acre orchard where tiny sprinklers mist beneath a canopy of apple trees. The irrigation system is as efficient as it gets but even so, western Colorado’s ditches are running nearly dry.

But a plan by Denver-based Gunnison Energy Corp. to drill five coalbed methane wells on the highlands above the orchard has Ela worried about more than drought. If successful, the project could punch more than 600 methane wells on 96,000 acres of private and U.S. Forest Service lands along the south flank of 11,000-foot Grand Mesa, where snowmelt gathers and flows down through lower mesas to the Gunnison River.

Ela worries that fracturing the coal seams and pumping out groundwater — the method used to extract methane — could dry up aquifers and drain away water that residents depend on for drinking and irrigation. And like many others in this rural valley, Ela has turned to local government leaders for help.

More comfortable with approving salvage yards and gravel pits than with passing regulations, the Delta County Board of Commissioners imposed a nine month moratorium on oil and gas projects beyond the five test wells, then voted 2-1 to deny four of the test wells, and tagged 33 conditions to the approval of the fifth.

Delta County remains one of the poorest in the state. Politically conservative, with no zoning and only bare-bones land-use regulations, it also has a hundred-year

history of coal mining. Today, three mines ship 15 million tons of coal annually.

But the mining here is underground, while methane development would be painfully visible. Fears of polluted water, noisy pumps and a maze of roads and pipelines galvanized hundreds of residents — from dreadlocked communal farmers to former energy industry executives.

“We’re aligned with strange bedfellows,” said Larry Jensen, a former mine engineer turned rancher who owns grazing land near one of the proposed well sites. “But we all have a common goal.” Even the county Board of Realtors joined the opposition. More than anything, red flags raised by a former oil and gas industry geologist, Greg Lazear, became the rallying point. There are too many unknowns about how the methane wells might impact water, says Lazear, who submitted his own reports to the commissioners to counter company reports. “We have to understand what we’re getting into before we mess with the system.”

As the county commissioners said the day they voted to deny four of the five wells,

**“Water is the most crucial issue.”**



Coalbed methane in the backyard.

“ We have to understand what we’re getting into before we mess with the system. ”

## Yukon Concerns

Coalbed methane (CBM) exploration and development are being proposed for the Yukon. The Yukon has no experience of, or regulations for, CBM.

Methane is a primary constituent of natural gas. It is also present in most coal deposits.

Coalbed methane is trapped underground in beds of coal by the pressure of water also trapped in the beds of coal.

The water must be pumped off to allow the methane to escape from the coals. This often contaminates the water with salts, benzene and toluene.

Even if water is not contaminated, such large volumes can lead to heavy erosion of

streams, lakes and rivers, particularly in permafrost areas. In the Yukon, there is extensive and continuous permafrost. This presents ecologic and economic problems.

Release of relatively warm water from CBM wells can have severe impacts on aquatic ecology and permafrost integrity.

The CBM extraction process involves many of the stages of any oil and gas extraction but also differs in some important ways.

With oil and gas, single gas wells can be profitably developed. Stand-alone CBM wells are almost never profitable. It often takes hundreds of wells to effectively dewater the coals and produce enough gas to be economical.

This means more wells per area with each well connected by pipelines and/or roads to water disposals sites like injection wells or evaporation ponds.

## Larger than Life

How much water are we talking about? More than Whitehorse uses in a year.

In Wyoming’s Powder River Basin, where CBM development is happening on a scale like that proposed for the Yukon, gas wells pump out 1.6 million barrels of water a day, 365 days a year, for years.

Some is atomized or sprayed in a fine mist over the land. Some is injected back underground or collected in evaporation pits which can burst or overflow.

There has been no CBM development in northern Canada, so little is known about short- and long-term impacts or how to deal with them. Information gaps are gaping and baseline studies are lacking.

## Alberta Beefs

Since an oil and gas company began drilling for coalbed methane gas near her home in southern Alberta three years ago, Jessica Ernst has seen her tapwater go from drinkable to flammable.

Ernst first became worried about her well water when her taps started to whistle.

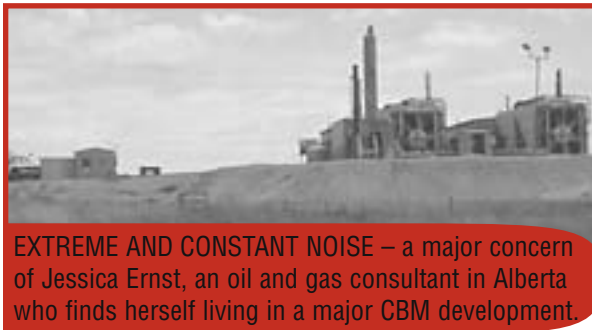
The water turned cloudy. And then it began to fizz and smoke whenever she poured a glass.

Now she can set her tapwater on fire because it contains so much methane, a highly combustible and deadly gas.

She’s developed rashes from showering and using the water to do her laundry.

“It’s hard to believe you are being poisoned by your own water,” says Ernst, who lives in the middle of a major coalbed methane development.

She now can’t drink her well water and requires water delivery by the Alberta Government.



EXTREME AND CONSTANT NOISE – a major concern of Jessica Ernst, an oil and gas consultant in Alberta who finds herself living in a major CBM development.

It only takes 1 mg/L of methane, or 1 part per million, for water to be a risk for explosion. Ernst’s well contains over 55,800 ppm.

CBM is not like conventional natural gas extraction, adds Ernst.

“The big difference is the intensity of drilling, the magnitude of the developments involved and the repeat entry onto the land.”

And though CBM exploration and development is supposed to be regulated by the province, the regulations are largely ignored, she says.

“When reports of regulations being ignored are presented to the regulator, they look the other way. So not only are the regulations being ignored by the companies, they are not being enforced by the regulators.”

## B.C. Mess-Around

### Shell Canada Quits Messy and Fruitless Coalbed Methane Exploration in Crowsnest Coalfield

“The recent history of coalbed methane in the B.C. Rockies is one of government laxity and corporate disregard for impacts on wildlife and wildlands,” said Casey Brennan, energy and mining program manger for Wildsight.

“We are relieved by Shell’s departure, but regret the damage that was done by the company’s fruitless efforts,” said Brennan.

“While we accept that Shell used best management practices for the industry and complied with provincial regulations, we documented numerous significant impacts from drilling,” Brennan continued.

“An open and unlined pit for the disposal of drill cuttings, failed attempts to mitigate erosion, a substantial landslide, and Shell’s decision to drill in the narrow valley bottom of Michel Creek were all evidence of the unacceptable sacrifices this industry imposes on our sensitive ecosystem.”

SCARS: Energy workers dig a trench for gas and water pipelines on the Sorenson family homestead in the Powder River Basin (Kevin Moloney photo)



Tumbledown fencing fails to separate people and wildlife from Shell Canada’s open, unlined waste pit for coalbed methane drill waste (Casey Brennan photo)



# Unnatural Disaster

Coalbed Methane pollutes water, scars the earth and steals away control of the land

by Hal Clifford

Bigger than Vermont and New Hampshire combined, the 20,000-square-mile Powder River Basin spreads east from the Bighorn Mountains to Thunder Basin National Grassland and laps north across the border into Montana.

The entire basin is underlaid by multiple coal seams in the rough shape of a bowl. In the center, around the broken hills of the Powder River Breaks, the seams are 1,200 feet deep and join to form a massive coal deposit known as Big George.

As of mid-August 2001, private companies had drilled 10,538 coalbed methane wells in the Powder River Basin, with projections of 139,000 wells, one every 80 acres, to essentially cover the entire basin.

Coalbed methane critics recite a litany of problems with the technology. Drilling a coalbed methane well typically disturbs four acres on each 80-acre parcel. Noisy well pumps and compressor stations spew nitrous oxide and other pollutants into the air. Wyoming officials acknowledge many of these emissions are unregulated and may violate air quality standards. Heavy vehicle traffic damages roads and throws up dust.

But water disposal is the big problem. Water is removed from underground to free the gas to flow to the surface. As of March 2002, well operators in the basin were pumping 1.85 billion gallons of water to the surface every day, causing an ironic problem: how to dispose of water in an arid landscape. In many places, the wastewater contains sodium, calcium, magnesium and benzene, and cannot be used for irrigation or dumped in waterways.

Once coal deposits are dewatered, says Walter Merschat, president of Scientific Geochemical Services in Casper, gas migrates to the surface in any direction it can, not just up well bores. It is odorless, colorless, tasteless. It can accumulate in buildings. The potential result? "Boom!" says Merschat, throwing up his hands.

A more mundane but widespread problem is salt. The state of Montana is worried about elevated salt levels from coalbed methane water in the Powder, Little Powder and Belle Fourche rivers, which flow from Wyoming.

Then there's how coalbed methane fields look. Each well pad contains up to five wells, one for each distinct coal seam. Structures the size of garden sheds shelter the wellheads. A road leads to each pad, along with a gas-collection pipeline, a water-disposal pipeline and a power line. Every few hundred acres, larger buildings house truck-size compressors to pressurize the gas for transport.



Rancher checks a water-belching well for contamination by methane gas (Kevin Moloney photo)

The prospect of energy ranchettes blanketing the Powder River Basin horrifies many who live here.

"This will turn into an industrial site," says Dale Ackels, a 60-year-old retired Army officer who raises hay on 100 acres along Lower Prairie Dog and is surrounded by wells. "And with the way the state has allowed it, there's no way to stop it."

## Terms of Endearment

**Aquifer depletion:** because of the large number of wells involved, CBM extraction can deplete entire aquifers which can: cause loss of ponds, seeps and springs; alter stream and lake characteristics; cause land and rockslides; alter what trees, shrubs and other plants can grow; and, increase the likelihood of dewatered coal beds catching fire underground.

**Flaring and venting:** flaring is the burning of gases released during drilling, well stimulation, pipeline maintenance and gas processing. Venting is the release of gas into the atmosphere when there is not enough to economically warrant capturing it.

Both release huge quantities of greenhouse gases associated with global climate change. Flaring can be loud and a potential fire hazard. Both venting and flaring can release hazardous gases.

**Infrastructure:** in addition to well sites, CBM development involves compressor stations, gas treatment plants, work camps and maintenance yards. All can lead to

contamination of water and soil from leaks and spills of harmful lubricants and fluids.

**Methane migration and seepage:** when shallow coal seam aquifers are pumped, methane will travel underground to areas of low pressure, primarily the gas wells. But if there are other areas of low pressure, methane will move towards them. This can lead to contaminated water wells and soils, causing trees, plants and wildlife to die.

**Noise and dust:** drilling and associated processes produce periods of jet-engine-level concentrated large-engine noise for drilling and stimulation. Once wells are operational, they may require water-pumping and compressor equipment to operate continuously for the life of the field. Compressors can produce high levels of low-frequency noise, which is often felt rather than heard – with physical, emotional and psychological impacts on people and wildlife. Noise and dust are created through construction of well pads and roads. CBM is an industrial activity that covers a large area, so it requires the steady movement of equipment and trucks. This affects air quality.

**Permafrost:** of primary concern in the Peel Watershed where the permafrost reaches great depth and is continuous. Disruption can have lasting impacts on land and water.

**Roads, seismic and pipelines:** all three can physically disrupt the movement of animals like caribou, moose, sheep and bears. Roads create barrier effects on wildlife movement. Roads open new areas to hunting and recreation. Pipelines can interfere with seasonal migrations and the free movement of wildlife. This is especially documented with caribou and moose.