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Water in the Well

The fresh-water-injection debate

by Mike Leschart

Real or imagined, the link exists—firmly entrenched in the minds of many Alberta farmers, ranchers and town councillors. Few will claim that the oil and gas industry is directly responsible for the recent years of drought. But many believe that industry's use of water is linked to low lake levels, decreasing river and stream flows, poorly performing water wells, and water supply shortages in rural communities.

"We used to be in a fairly good moisture belt area, but things have dramatically changed," says Don Bester, who owns a 150-head cattle ranch near Caroline, roughly 180 kilometres west of Red Deer. "We started experiencing drier conditions, less moisture, less snowpack—river levels, dugout levels, everything, just going down." In response, Bester helped to form a local activist group, the Butte Action Committee. Since its inception in 1999, the BAC has been a visible, unofficial leader of a movement to convince the province to stop the oil industry's use of fresh water in injection processes.

Bester acknowledges it is impossible to prove that oilfield water injection is exacerbating Alberta's drought conditions. But, he argues, during a time when all Albertans are being asked to conserve water, the oil and gas industry is injecting fresh water into the ground with impunity—water that is forever removed from the evaporation and rain cycle. "You don't have to be a rocket scientist to see that if you keep removing water from the natural cycle, then there's going to be nothing left," he says. "There's only so much moisture that we're getting during these dry years—why contribute to it any further?"

To illustrate its point, the BAC makes the standard claim that the oil and gas industry injects more than 45 billion gallons of fresh water into the ground every year—an amount roughly equal to the volume of Pine Lake, southeast of Red Deer. And unlike the water used for irrigation, livestock or other agricultural purposes, injected fresh water is gone from the cycle—it will not evaporate and hence will not return as rainfall.

MORE THAN HALF of all oil produced in Alberta is extracted using water, either in injection or through the steaming processes of oil sands projects. Water injection occurs throughout the province at enhanced oil recovery projects that pump water or steam deep into reservoirs to coax out more oil. These projects recycle much of the water, but much is also left deep in the ground and thus removed from the water cycle.

According to Alberta Environment, the government allocates about 176 million cubic metres, or 47 billion gallons, of water for oilfield injection and other oil recovery methods each year. (Other industrial uses, including oil sands processing, are allocated 236 million cubic metres.) About four-fifths of this allocation is surface water and the rest is groundwater. Also, some companies use saline water, which the government does not regulate.

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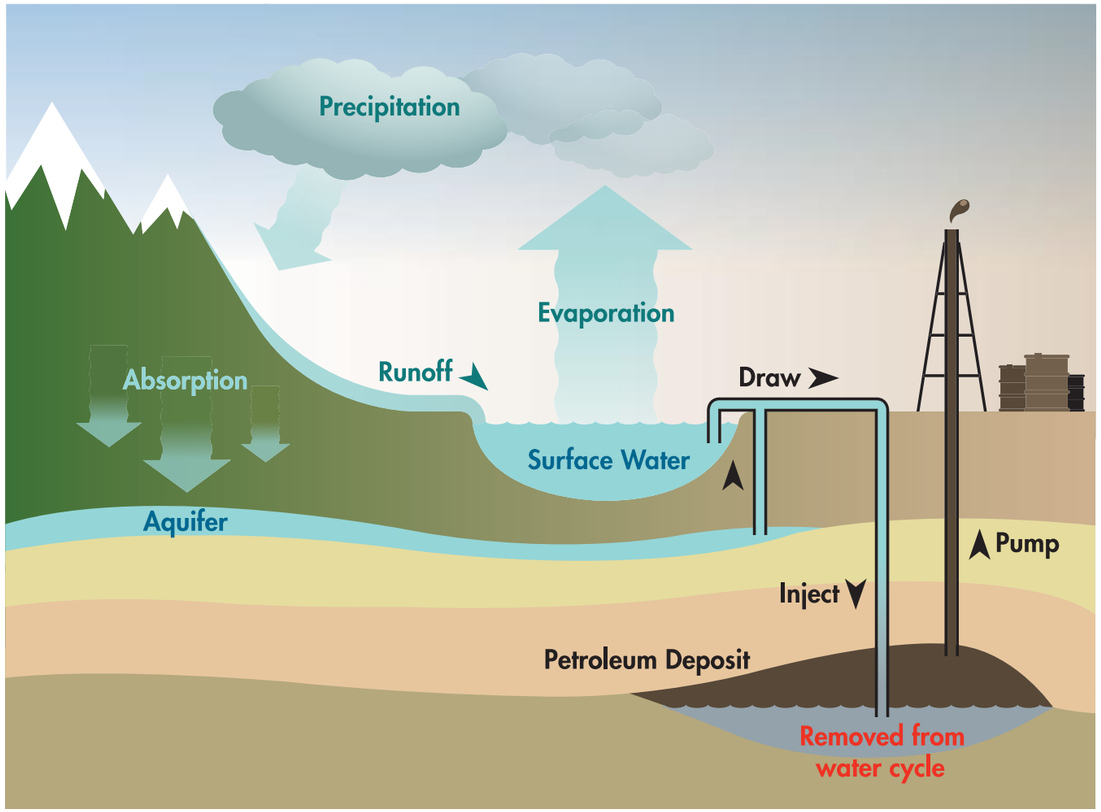
The government does not keep track of how much water is actually used. "At the moment we don't have proper reporting of the amount of water that's used," says Mary Griffiths, a scientist with the Pembina Institute in Calgary. "They've got the figures more or less, but not exactly." When Griffiths approached the government for figures on how much water, and what type, is used in injection, she was directed to the Alberta Energy and Utilities Board. The EUB responded that the total amount of water used for oilfield injection in 2001—as reported to the board by the oil industry—was about 47 million cubic metres, of which 32



The oil industry's deep injection technique disrupts the natural water cycle.

million cubic metres came from surface water or shallow wells and 15 million cubic metres from licensed source wells. Some of that water was saline—the EUB explained that their "records do not distinguish between useable and non-useable water for licensed wells."

The oil industry claims that their water use is comparatively light. "The amount of water consumed by the industry, as compared to municipal use or agricultural use or other industrial use is very small," says Pierre Alvarez, President of the Canadian Association of Petroleum Producers, "and we have to make sure the public understands that."

Although Alberta Environment allocates roughly one quarter of the fresh groundwater in the province to the oil industry, in total the industry receives only 3 per cent of all water licensed in Alberta. Alvarez suggests that, aside from the nominal portion of water the industry uses, its allocations are validated because, in the end, the entire province benefits. "We're not the only ones using that water base. There's a lot of other sectors doing it as well, and some of them don't generate anywhere near the economic returns to the province that we do."

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But despite the belief of many Albertans that the government is in the pocket of the oil industry and would never restrict their water supply, CAPP is clearly not dismissing the issue. As part of what Bester refers to as a "major campaign of propaganda," CAPP has published a brochure designed to correct what the association sees as a public misperception about their irresponsible use of water.

Individual companies, likewise, are working to change the perception that they are squandering massive amounts of fresh water from lakes and aquifers. Imperial Oil's Cold Lake oil sands project uses an injection process in which steam is sent down a well to loosen the buried bitumen. Imperial Oil spokesman Pius Rolheiser says the company uses roughly 400,000 barrels (63,500 cubic metres) of water per day to make steam, but about 90 per cent of that amount is recycled. "You inject 350,000 barrels per day—most of it comes back, along with the bitumen. So we purify and soften it and it goes back into the steam boilers," he says. "If we could use nothing but recycled water that's what we'd do, because it's more energy efficient." The remaining 10 per cent of the water comes from nearby salt water wells (which the industry commonly calls brackish water or brine). Fresh water drawn from Cold Lake and aquifers in the region is used for on-site showers, toilets and fire protection.

Imperial says its withdrawals from Cold Lake represent less than 1 per cent of the volumes that flow out of the water body. However, a number of similar steam-injection oil sands projects operate in the area and people are afraid that oil companies are draining the lake. When a lake level is declining, Rolheiser says, an oil company is an obvious, if wrongly accused, target. "People, unfortunately, tend to associate that with industrial activity," he says. "The lake levels are low, but that's a function of regional drought conditions."

Though Rolheiser sees this connection as a misperception, the Alberta Energy and Utilities Board agreed that the people had grounds for their concerns. In 1999, a group of citizens persuaded the EUB that Imperial's groundwater extraction was affecting local water wells. The EUB stated: "the Board notes that there have been impacts to domestic water wells from Imperial's groundwater extraction practices in the past. The Board agrees with intervener statements that impacts to domestic wells resulting from groundwater withdrawal by Imperial are not acceptable." The company was ordered to monitor the response of groundwater to steam injection.

To Fritz Crone, who owns a ranch near Provost and is serving his first term as Reeve of the Municipal District, the link between oilfield water injection and drought is as clear as the dry dugouts and sloughs on his property and the receding water level in nearby Muriel Lake. "We feel that it's contributing to the drought," he says bluntly. "It's depleting the aquifers, so we feel that it's having an effect on our environment."

Last fall, Crone presented his view to colleagues at the Alberta Association of Municipal Districts and Counties, which represents all 65 of Alberta's rural municipalities, and persuaded the association to pass a resolution urging the provincial government to halt the use of fresh water for oilfield injection. Crone says the group is beginning to "perk the government's ears," but little action on the issue has been taken. "[The Alberta government] derives a lot of revenue from the oilpatch, so they don't really want to rock the boat," he says.

WITHOUT A DOUBT, water use has boosted both oil production and the government's revenue stream. No regulatory changes discouraging the use of fresh water in injection are on the horizon, according to Sherri-Dawn Annet, a spokeswoman with Alberta Environment. She says changes designed to reduce the injection of fresh water and encourage alternatives—such as saline water, carbon dioxide or petrochemicals—are "not [happening] at this time."

Alberta Environment's water strategy draft, which it released at the end of March, may lead to a more active role for the government in this area. The draft says the government will discourage, and eventually eliminate, processes that remove fresh water from the water cycle. But for now, not only does the government not keep track of how much water is used in injection but it also doesn't consider the use to which water will be put when it grants water licences. "The government is not in a position to put value judgments on what use of water is most important—be it industry, be it irrigation, be it golf courses, be it townships etc.," Annet explains. "Currently, we do not evaluate what the water will be used for." Instead, the government looks at whether the water is available, in-stream flow needs are met, the ecosystem is protected when water is removed, and existing licence-holders are affected.

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The lack of data on water use has been a source of frustration for Griffiths. The Pembina Institute has yet to finalize a policy on the oilfield water injection issue, but Griffiths is working on a draft document that recommends the province limit the amount of fresh water used in oil injection projects and require the use of saline water wherever possible, because "much water that is injected is lost to the hydrologic cycle." She also recommends that the government keep a better record of the amount of fresh water injected each year into oil wells.

DON BESTER NOTES that his group has had some success. He says that the BAC convinced ConocoPhillips that it was using too much fresh water and convinced Murphy Oil to drill deeper water wells to tap into saline water.

But he says the group's work will not be truly done until no fresh water is injected into the ground to help recover oil. And like the oil and gas industry, he seeks a change in public perception to help his organization achieve its goal.

"Until every Albertan realizes that this use of fresh water has got to stop, and it's wrong, we're not going to get anywhere," he says. "We need water to live. I can live without oil."

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