



All Drains Lead to Home —Municipalities

Ask Elke Blodgett for proof that Albertans are trashing and polluting their water, and she'll lead you right to it.

The 70-year-old grandmother steps down the steep side of a bike path that runs by the Sturgeon River in St. Albert, sun hat perched on her head. She points to a trickle of rust-coloured liquid almost hidden by the surrounding vegetation. Pushing through reeds taller than her head, she tracks the trickle's winding path to a spot about a metre short of the river. "See the sheen there? The oil?" she says. "See how close it is to the river?"

The liquid, she claims, is toxic leachate from one of several old landfills on the other side of the bike trail. She was one of the first people to discover the leak a few years ago, and reported it to Environment Canada. The federal government was investigating the City of St. Albert's handling of this leachate as of this writing.

Government records and visual accounts she's collected paint a terrifying picture of what's in those dumps: paint cans, old transformers, 50-gallon drums of mysterious origin. . . "One guy dumped five cars in there," she adds. "There's uranium, strontium, everything you can think of is in there, and it all runs right into the river."¹

Blodgett is one of the most well-known environmental activists in the Sturgeon, and has watched the river like a hawk for over 15 years. Every shelf of her bungalow is packed full of studies, reports, and letters she's obtained from the province and local scientists about the Sturgeon; what little space is left over is taken up by clay sculptures, samples of her work as a potter.

Municipalities like St. Albert are the third largest users of water in Alberta, accounting for 11 per cent of all allocations (about a trillion litres a year).² People use water for recreation, lawns, bathing, and, of course, drinking. This makes water quality a much bigger concern to municipalities than water quantity; it doesn't matter if there's water everywhere if you die when you drink it.

Bigger Cities, Bigger Messes

Landfills are a symptom of a major cause of water contamination: urban expansion. Cities aren't the biggest water polluters, but they are one of the most significant because their pollution is concentrated in a small space.³ As cities grow and build more roads and subdivisions, they plough under forests and wetlands, changing runoff patterns in the watershed. Some cities (such as St. Albert) will build structures in the floodplain of a river, destroying chunks of riparian vegetation and changing the river's flow in the process. The NSWA found that 94 per cent of all land development in the Sturgeon was the result of urban expansion.⁴ Bigger cities also produce more trash, and leachate (or runoff) from that trash can harm aquatic life.⁵ City reports obtained by Blodgett say that about 23,000 cubic meters of leachate discharge into the Sturgeon every year (enough to submerge an acre of land to a depth of 19 feet). "That's a lot of stuff into a river that barely moves," she says.⁶

Municipalities pollute lakes and rivers through their wastewater. Canadian cities produce about 14.4 million cubic meters of storm-water and sewage each day, making them one of the biggest point-source water polluters in the country. Storm-water is water that falls from the sky, absorbs pollutants spread on roads and lawns, and flows into a local lake or river. Sewage is water poured or flushed down the drain. Both typically contain heavy loads of sand and grit, which smothers plant life, fills in rivers, and generally makes water look ugly; bacteria and viruses, which threatens fish and animal life; organic waste, which sucks oxygen from water as it decays; nutrients, which encourage algae blooms; and some 200 other known chemicals, many of them toxic.⁷

Towns and cities in the Sturgeon used to dump sewage into the river, but stopped a few decades ago. Now, most sewage is pumped to treatment plants in Edmonton, which adds about 128 billion litres of treated sewage to the North Saskatchewan each year.⁸ Treated wastewater is the second largest source of nitrogen and phosphorous in Canadian waterways after agriculture.⁹

Sturgeon communities pipe loads of storm-water into the Sturgeon. St. Albert's storm-water has added 160,000 cubic meters of sediment to the river since 1986 (equivalent to 150 tandem dump truck-loads a year), creating visible sand bars near sewage outfalls, blocking the passage of canoes and fish and making the river look more shallow and dried up.¹⁰ Around Lac Ste. Anne, fertilizer and septic tank runoff from cottages (of which there are about 1,500) and farms have increased the lake's phosphorous and nitrogen loads to 10 times their natural levels, turning it into a pea soup of algae during the summer.¹¹ Rain and snow can also pick up salts and oils from roadways and deposit them in rivers. Canadians also dump about 300 million litres of

used motor oil down the drain each year — more than seven times the oil spilled during the *Exxon Valdez* disaster.¹²

So what can Albertans do about all this? It's remarkably simple, but often expensive, to reduce or eliminate the impacts cities have on water. Properly reclaimed landfills will not leak leachate, for example, and improved treatment will cut the amount of pollutants in sewage. Lac Ste. Anne County has started giving cottage owners tax breaks if they agree to preserve their land in its natural state, creating a healthier riparian zone around the lake and reducing the effects of urban runoff.¹³ The City of St. Albert plans to spend about \$10 million over the next decade to add 23 oil-and-grit separators to its storm-water system to take care of its sediment problems.¹⁴

Cities can also pass stricter pollution laws. Lac Ste. Anne County raised their standards for sewage quality in rural subdivisions in 2004, for example, and randomly inspected 500 lots to ensure compliance. "We've been told by [local septic tank vendors] that their business has substantially enlarged all of a sudden," laughs County Reeve Derril Butler, when asked about the change. As for St. Albert, it recently banned new developments in the Sturgeon River's floodplain, and plans to negotiate a basin-wide ban sometime in the future.¹⁵

For many towns, these new laws and expenditures help both their environment and their economy. "Our jewel in the crown has got to be the Sturgeon River," says Derek Richmond, former environmental consultant for the City of St. Albert. If it's full of algae and silt, he says, that costs the city a lot of tourism dollars, and those tourists bring about \$690,000 a year to the city and about \$900 million to Alberta.¹⁶

Our physical health also depends on our water, Blodgett adds. Pesticides and chemicals dumped down the drain can make their way back to people through their food and water.

"We are what we eat," she says.

Can I Trust My Tap?

Perhaps no one in Canada knows that lesson better than Bruce Davidson.

It's late May in an Ontario town called Walkerton. Davidson, a massage therapist, is standing in his backyard with his family. The staccato beat of the medical helicopter chops through his once peaceful neighbourhood.

For weeks Davidson has watched his friends and neighbours fall ill and die from what he would later learn was bacteria contaminating the town's water supply. Now he watches as the chopper take off with the fourth patient to be airlifted out of town in two weeks: a young boy, the best friend of his nine-year-old daughter.

As it whirrs overhead, his daughter turns to him. "Daddy?" she asks. "Is he gonna die?"

That's when he realized he needed to act, says Davidson, now vice-chair of the Concerned Walkerton Citizens environmental group. "You realize that you can't sit back and leave this to somebody else. Death has come to your door. It's knocking, and you better be prepared to do something."

In May 2000, seven people died and over 2,000 became ill from a lethal strain of *E. coli* in Walkerton's tap water.¹⁷ The incident put drinking water safety at the top of the health agenda across the country, and triggered a flurry of policy reviews.

The verdict in Alberta? Alberta water is pretty safe, say experts, but without training, technology, and a lot of money, it won't stay that way.

There were 288 outbreaks of waterborne disease in Canada from 1974–2001, according to Health Canada, five of which happened in Alberta in the '70s–early '80s. There have been no reported outbreaks in Alberta the last 20 years.¹⁸ The culprits behind most outbreaks are bacteria

like *giardia* and *campylobacter*, both of which can cause diarrhoea in people. *E. coli* water outbreaks are actually pretty rare, according to Health Canada.

Alberta has been a leader in water treatment for years, says Daniel Smith, water quality expert and professor of environmental engineering at the University of Alberta. EPCOR Water Services is particularly good at water treatment, he notes, with its officials serving as expert witnesses at the Walkerton and North Battleford, Sask., contaminated water trials.

But the same things that threaten Alberta's economy and environment also threaten its health. Rapid economic and urban expansion increase pollution in rivers, many of which will have less water in them due to rising temperatures, which will further concentrate those pollutants.¹⁹ Climate change could also bring more extreme weather events and greater drinking water demand to the province, both of which will strain treatment facilities.

There's no such thing as an absolutely safe water system, writes Steve Hruday, a professor of public health engineering at the University of Alberta and one of Canada's leading authorities on outbreaks of waterborne disease. All are designed for steady-state water conditions, so a sudden storm, mechanical failure or accident can throw them out of whack.²⁰ Hruday identified 81 outbreaks of waterborne disease in high-tech nations like Canada in the last 30 years, all of which happened because people did not have the technology or training to respond to those sudden events.

Notable outbreaks in Canada

As documented by Hrudehy and Hrudehy (96–118, 161–163, 316–327, 369–380).

Time and Place	Cause	Results
North Battleford, Sask., March–April 2001	Sewage outfall located upstream of water intake, coupled with maintenance at treatment plant	5,800–7,100 cases of illness
Walkerton, Ont., May–June 2000	Well contaminated by <i>E. coli</i> from manure spread on nearby farm after sudden storm	Seven dead, over 2,000 ill
Drumheller, Alta., February 1983	Heavy storm dumps 3,000-some litres of sewage into water, overwhelms plant	Two dead, 3,000 ill
Edmonton, Alta., October 1982–June 1983	Treatment plant deficiencies	2,150–28,800 ill

Most of the Sturgeon’s drinking water comes from EPCOR Water Services in Edmonton, and is pretty safe, Smith says. Alberta’s drinking water standards are among the best in Canada, meeting or beating federal guidelines, he adds. “I’m very confident in our water in Edmonton,” he says, adding that his studies show the city is more than equipped to meet or beat provincial standards for chemicals or micro-organisms.²¹

As for the rest of Alberta, things are generally pretty good. The province’s official provincial waterworks study (released in 2006) found that just three per cent of Alberta’s treatment plants had numerous, severe problems that needed addressing; just over half had little to no problems.²²

But the study also warned of trouble ahead. About half the plants in Alberta, for example, did not, in some way, meet the province’s current water treatment standards. It also cited a severe shortage of storage capacity in the south (dangerous in times of drought), numerous gaps in disease monitoring, and a lack of backup systems in many plants.²³ Its biggest concern was a shortage of trained plant operators. Roughly 11 per cent of Alberta’s treatment plants did not have people with the knowledge needed to run their equipment, mainly because communities

didn't have the money to pay for skilled operators.²⁴ Note that one of the main causes of the Walkerton disaster was the poor training of the people operating the town's treatment plant.²⁵

Smith says Alberta can solve many of these problems by regionalizing its water systems. A few large, well-managed water systems will have less chance of failure than many small, understaffed ones, he says. Alberta currently has 116 regional water systems, and the provincial waterworks study recommends this rise to 354 within 25 years.²⁶ This does come at a cost, adds Smith. Edmonton is currently providing water for communities up to 100 kilometres away, and cities have had to spend a lot on pipelines, storage tanks, and pumps to move the water.

The official waterworks study also recommended regionalization. It calculated that the province needed to spend \$290 million in the next three years simply to bring its water treatment plants up to code, and an additional \$884 million over the next quarter century to expand and consolidate water systems to meet future water needs.²⁷

People can never have perfectly safe drinking water, Hruddy writes, but they can, with a little bit of foresight and investment, have a water system safe enough so that they can drink from it without fear of death.²⁸ The key, he says, is to have a system that keeps working even if problems occur. That means having top-notch equipment, trained staff, regular monitoring and rigorous enforcement of standards at the treatment plant; protective measures for pollution sources in the watershed; and clear emergency response protocols for when things go wrong.

Alberta has many elements of this multi-barrier approach to water management in place, but shouldn't rest on its laurels yet, Smith says. "The hardware is there, but the people side requires constant vigilance."

To this day, Bruce Davidson continues to tour Ontario talking about Walkerton, and says he still encounters people who think disaster could never happen to them. “Because there was that idea that ‘this couldn’t happen here,’” he warns, “we made stupid mistakes and it did.”

Water for Life Summary: Municipalities

“It’s a pretty countryside,” says County Reeve Derril Butler, “and everyone wants a piece of it.” Unfortunately, he adds, when people take that piece, they often spoil it.

Our big concern with farms was cumulative effects; with industry, it was permanent effects. With cities, it’s concentration: since they draw upon and pollute so much water in such a small place, they can have profound affects on their watersheds. The very homes people live in represent a significant threat to water in Alberta, because of the waste they produce, the land they occupy, and the water they use. Fortunately, Albertans have made significant progress in addressing this threat.

Most efforts to cut pollution and consumption in municipalities will have to happen at a municipal and watershed level. Each watershed has different use and pollution challenges, and it’ll be up to local governments to decide how to meet them. Not every city needs St. Albert’s grit interceptors, for example, and some communities might already have the riparian zones Lac Ste. Anne County wants to create. It’s also local governments that control water rates and land use policy, two key controls of water quality and quantity protection. The watershed planning and advisory councils established by Water for Life, if fully utilized, could help communities co-ordinate their land use policies to protect riparian zones and perhaps set common standards for waste and storm-water.

Still, the province can help these efforts by providing financial aid and strategic direction. Water for Life calls on all Albertans to be 30 per cent more water efficient by 2014, and several communities (discussed later) have made impressive progress. The province is currently working on an online reporting system to track the amount of water licensees actually use, which should help Albertans track how close they are to that 30 per cent milestone. It has also distributed material on water conservation to public libraries, partnered with many NGOs (like Cows and Fish) to spread the good word about riparian zones and conservation, and published water quality reports for most treatment plants online.²⁹ The province has also made one very specific commitment to watershed protection in the Sturgeon: by declaring Big Lake to be a provincial park in 2005, it pledged to protect one of the largest wetlands in the watershed.

But the province's biggest contribution to solving the urban water problem has been what it *hasn't* done: it has not (with one exception) authorized any inter-basin transfers of water, built any massive new dams, or issued new water licenses in the South Saskatchewan.³⁰ Nor has it capped rising water prices by, say, handing out rebates, as it has done with gas prices, although, as discussed later, it will eventually have to raise the price of water further. These decisions, along with near constant trumpeting of water conservation from high-level ministers, send Alberta communities a clear message: don't abuse the water you have, as the province won't get you any more.

On the drinking water front, there's progress to report. The province has bit the bullet and actually plunked down some cash it needs for vital upgrades — now, if it ponies up the rest of it, Alberta will be fine. As of this writing, the province had committed \$160 million to bring water treatment plants up to current standards, or a little over half the amount recommended by the official waterworks report, and about \$2 million to train plant operators.³¹ It has also said it will

pay 90 per cent of the cost of any new regional drinking or wastewater systems, up from 85 per cent, and the full cost of any studies done to create them.³² This is still a long way from the \$884 million called for by the waterworks review, but it's an encouraging start.

The province can do a lot more in this area. It could, for example, pass stricter efficiency requirements for tubs, toilets, and other water-using devices, as Ontario did in the early '90s.³³ It could offer some sort of recognition, financial or otherwise, for communities that substantially reduce their water consumption. It could also link infrastructure grants to conservation targets, or even raise the price of water use to discourage waste (an idea discussed in more detail next chapter). But these measures (while helpful) might not be necessary this early in the Strategy. The province will need to use its financial hammer to encourage more conservation in the future, but it's enthusiastic cheerleading is probably enough at this point.

This concludes our survey of problems in the Sturgeon and the solutions the province is considering for them. Now we'll look ahead to see what Albertans, as a community, should be doing next. Our final chapter will examine how people's lives will have to change to protect the Sturgeon River for future generations, and what the river might yet become, if they put their minds and money to work.

¹ Alberta Environment has confirmed that leachate from the landfills is entering the Sturgeon, but in non-threatening amounts (Spencer Environment Management Studies 4-1, 4-2).

² Wilkie, 9. Alberta allocated 1,058,306,119,000 litres towards municipalities in 2003.

³ Oliver Brandes and Keith Ferguson, *The Future in Every Drop: The Benefits, Barriers and Practice of Urban Water Demand Management*, Victoria, B.C.: University of Victoria 2004, 8.

⁴ Aquality Environmental Consulting Ltd., 90.

⁵ A bioassay test on the leachate from the St. Albert dumps (where scientists put small fish in samples of the liquid to see what happened to them) presented to the provincial court suggests the leachate is harmful to life.

- ⁶ According to data obtained from Lorne Edinga of Alberta Environment, the average flow of the Sturgeon River near Fort Saskatchewan is about five cubic meters per second (see Fig. 1, Chapter 1).
- ⁷ Environment Canada, *The State of Municipal Wastewater Effluents in Canada*, Ottawa, Ont.: Ministry of Public Works 2001, 1–2.
- ⁸ Simon Thomas and Les Gammie, *2005 Edmonton Waterworks Annual Report*, Edmonton, Alta.: EPCOR Water Services Inc. 2006, 37. Based on total water treated and pumped into river system per year from 2003–05.
- ⁹ Environment Canada, *The State of Municipal Wastewater*, 12.
- ¹⁰ Bontus and Bodnaruk, v, 4–1, 4–2.
- ¹¹ Patricia Mitchell, “Water Quality Management in Lac Ste. Anne and Lake Isle: A Diagnostic Study,” Edmonton, Alta.: Alberta Environment 1999, 14, 31. Lac Ste. Anne County official Richard Neufeld estimates there are about 1,500 cottages around Lac Ste. Anne.
- ¹² de Villiers, 306.
- ¹³ Richard Neufeld, planning and development official for Lac Ste. Anne County, telephone interview by author, St. Albert, Alta., 4 August 2005.
- ¹⁴ Leah Jackson, environmental consultant for the City of St. Albert, telephone interview by author, Ottawa, Ont., 3 April 2006.
- ¹⁵ Ibid.
- ¹⁶ Joan Barber, economic development officer with the City of St. Albert, email interview by author, Ottawa, Ont., 3 January 2006; Gibbs and Brown Landscape Architects Ltd., 27. St. Albert tourism statistics based on 2005 data. Albertans spent about \$901.7 million on food and housing on outdoor activities in natural areas in 1996.
- ¹⁷ Note that the Walkerton outbreak was officially caused by a combination of two bacteria, *E. coli* O157:H7 and *Campylobacter jejuni*, which entered one of the town’s wells on or near May 12, 2000 (O’Connor 13).
- ¹⁸ Corinne J. Schuster et al., “Infectious Disease Outbreaks Related to Drinking Water in Canada, 1974–2001,” *Canadian Journal of Public Health* 96.4 (2005), 255; William Robertson, head of the microbiology section at Health Canada’s water quality and health bureau, telephone interview by author, Ottawa, Ont., 8 March 2006.
- ¹⁹ Schindler, “Cumulative Effects,” 21.
- ²⁰ Hruday and Hruday, 406.
- ²¹ Alberta is one of the few provinces that has made the Health Canada Guidelines for Drinking Water into binding law, Smith says. He adds that Alberta’s standards for turbidity (or cloudiness, which is associated with *E. coli*) are about five to 10 times lower than those set by Health Canada. Alberta is also the only province in Canada that requires all water to be treated before being consumed (no matter how “pure” the source).
- ²² The study used a four-point scale, where “one” meant “pretty good/few problems” and “four” meant “pretty bad/lots of problems.”
- ²³ Gary Drachenberg and Sutha Suthaker (Associated Engineering), *Waterworks Facility Assessment Report*, Edmonton, Alta.: Alberta Environment 2004, 3–7, 3–8.
- ²⁴ Ibid., 3–8, A–7.

- ²⁵ Dennis R. O'Connor, "The Events of May 2000 and Other Related Issues," *Report of the Walkerton Inquiry*, vol. 1, Toronto, Ont.: Ontario Ministry of the Attorney General 2002, 3–4.
- ²⁶ Gary Drachenberg and Sutha Suthaker (Associated Engineering), *Waterworks Facility Assessment Summary Report*, Edmonton, Alta.: Alberta Environment 2004, 5–1.
- ²⁷ Drachenberg and Suthaker, *Waterworks Facility Assessment Summary Report*, 3–1, 4–5. Many environmentalists and media observers criticized the province for waiting over a year before releasing this report to the public.
- ²⁸ Hrudey and Hrudey, 4.
- ²⁹ Alberta Environment, *Report on the Implementation*, 50–51.
- ³⁰ The official waterworks review recommends the province construct two regional water systems that involve inter-basin transfers. The Red Deer-Ponoka network would exchange water between the North and South Saskatchewan basins. It is currently awaiting authorization. The Stettler-Consort system would also involve such transfers. Both these transfers involve treated drinking water in regions with extreme water shortages (Drachenberg and Suthaker *Waterworks Facility Assessment Report* 5–6, 5–7). The Water Act bans all inter-basin transfers of water unless the Legislature passes a law (following some sort of public consultation on it) authorizing it (sect. 47, 48). This is a big loophole in the law, and could have serious repercussions if the province decides to use it extensively. However, judging from the province's reaction to the PRIME diversion and Meridian Dam projects (it dropped both almost as soon as they were suggested), the government does not appear particularly enthusiastic about inter-basin projects.
- ³¹ Hanneke Brooymans, "Price of Water Facility Upgrades: \$290 M," *Edmonton Journal*, 2 March 2006, B5.
- ³² Hanneke Brooymans, "Regional Water Systems Get Boost From Province," *Edmonton Journal*, 7 April 2006, B7.
- ³³ Brandes and Ferguson, *Future in Every Drop*, 46.