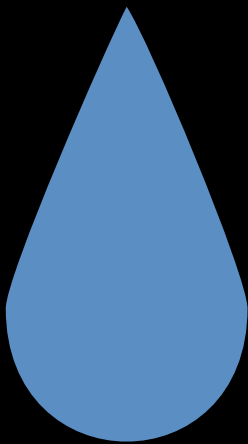
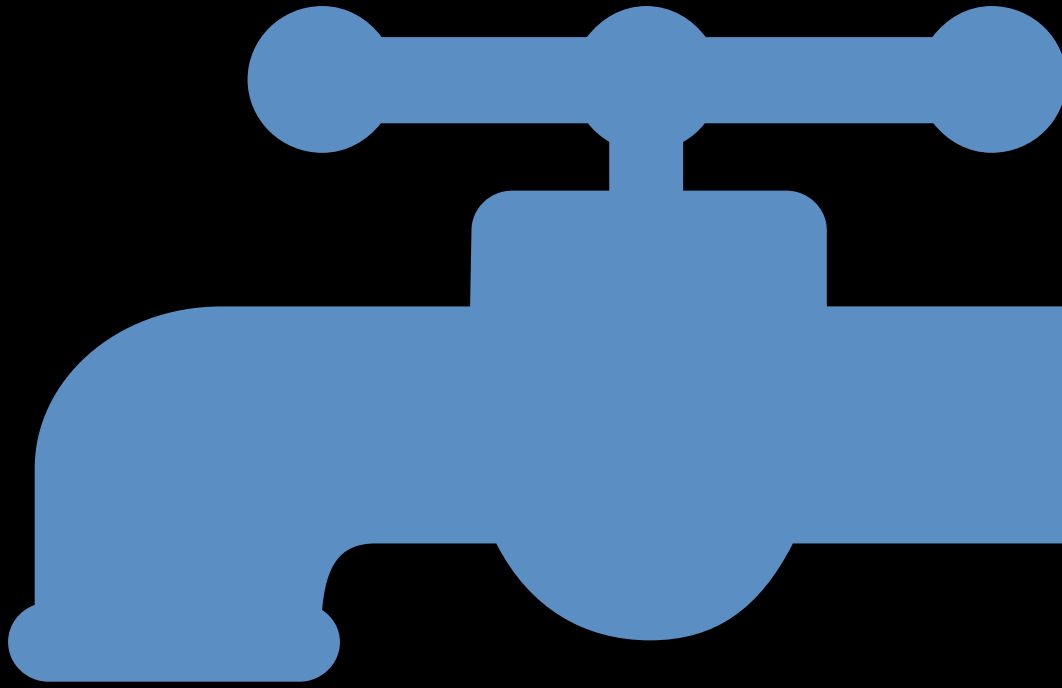




TAR SANDS REALITY CHECK



REALITY CHECK: Water and the Tar Sands

A PROJECT OF:



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ACKNOWLEDGEMENTS

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Toronto, Ontario M5V 2K6

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REALITY CHECK: COUNTERING INDUSTRY SPIN IN THE TAR SANDS

Big Oil is spending millions of dollars to greenwash the tar sands, Canada's fastest growing source of greenhouse gas pollution. It's time for a reality check. This is the first in a series of reports that will counter Big Oil's claims that the tar sands' impacts are under control. The reports offer a reality check on the failure of the oil and gas industry to prevent irreversible damage to our water, our air, our communities, our health and our wildlife. It's time to look past Big Oil's slick PR spin, and focus on the truth about the tar sands. It's time to stand up and demand the clean, safe and renewable energy future we deserve.

Visit tarsandsrealitycheck.com for the truth about the tar sands.

This report was prepared by Environmental Defence, with the support of:





EXECUTIVE SUMMARY

Water is the quintessential example of a shared resource in Canada. It's something, for the most part, we enjoy without substantial cost, and with the confidence that it's clean and safe for our day-to-day uses, such as cooking, drinking, swimming, gardening or irrigating our crops. But the industrial use of water in the Alberta tar sands is a different story. And companies are spending millions of dollars on glossy public relations campaigns with the hope that most Canadians won't notice the devastating impacts of the tar sands on water.

From 2011 to 2012, not one company was in compliance with Alberta's Directive 074, which requires modest progress in accelerating the cleanup of liquid tailings waste.

Industrial processes, such as tar sands mining, create toxic tailings lakes that are poisoning Canadian rivers, lakes and streams and the life that depends on those water bodies. This method of bitumen extraction requires enormous quantities of water — much of which is being drawn from Alberta's Athabasca River. The Athabasca River is an integral part of one of the largest watersheds in the world. The lack of ecologically based regulations regarding withdrawal rates during low flow periods means tar sands developers could continue to withdraw water from the Athabasca until the river can no longer support the ecosystems and life that depend on it.

The technology that the tar sands industry relies on has evolved over time. The very nature of extracting oil from the tar sands and making it profitable means that industry is constantly challenging itself to develop technologies to be able to do it faster and more economically. While extraction technologies are constantly improving, investments in environmental performance have not benefited from the same degree of support. The technology exists, for example, to dramatically reduce liquid tailings waste, which would help address the estimated 11 million litres of toxic waste from the tar sands that leak into the Athabasca River and watershed daily. Added up over a year, this is enough toxic waste to fill Toronto's Rogers Centre two and a half times.

11 million litres of toxic waste from the tar sands leak into Athabasca River and watershed daily. Added up over a year, this is enough toxic waste to fill Toronto's Rogers Centre two and a half times.



There is also little oversight in terms of provincial regulations on toxic tailings — the liquid waste generated during tar sands extraction. But even when regulations exist, they're often inadequately enforced. For example, from 2011 to 2012 not one company was in compliance with Alberta's Directive 074, which required modest progress in accelerating the cleanup of toxic tailings waste. Yet regulators did not punish companies for being out of compliance.

Basic monitoring is notably absent, allowing industry to continue using Canadians' shared water resources as a toxic dumping ground. Improvements in tailings practices and water use are an obvious and much needed place to begin making major improvements in the Alberta tar sands.

Globally, Canada's reputation on environmental issues is in tatters. Taking real steps to better tailings practices and

THE TAR SANDS

The Canadian tar sands, also known as the oil sands, are the largest industrial project on earth, yet few Canadians are aware of the rapid pace of growth and its impacts on our environment, economy, and society. Tar sands operations use at least three times as much freshwater per barrel of oil as conventional oil operations.



By relying more on energy conservation and renewable energy sources we can power our homes and businesses, without poisoning our water.

water use could help restore Canada's credibility at home and abroad.

At the same time, extreme weather caused by climate change is hitting harder and closer to home. And the devastating impacts of rapid tar sands growth are being seen more acutely in the local water, air, land and communities. The Canadian government and the tar sands industry are under a microscope with scrutiny not only from the general public, but from trade partners and other countries around the world for their failure to manage the reckless expansion of the tar sands.

It's important to remember that we have alternatives to expanding the tar sands. We have an opportunity to build a clean and safe energy future now — a future where our water resources are protected for generations to come. By relying more on energy conservation and renewable energy sources we can power our homes and businesses, without poisoning our water.

This report is a reality check on industry claims about water use and tar sands operations. Don't believe Big Oil's spin. It's time for the truth about the impacts of the tar sands on water.

REALITY CHECK: WATER AND THE TAR SANDS

Reality Check

Tailings lakes are toxic waste. They contain toxic heavy metals and other hydrocarbon pollutants. Tailings lakes continuously leak waste into the surrounding ecosystems. Currently, there is no enforcement of existing regulations for the management of tailings in the tar sands, which means toxic waste can continue to leak without consequences to the oil and gas companies while our water is being poisoned. Additionally, the Government of Alberta has failed to bring any measures into place to address legacy tailings.

Industry claims that tailings lakes are just water, clay, sand and some residual oil, and that with investment and innovation, they will settle faster and allow for reclamation sooner.¹ The reality is that toxic contaminants in tailings lakes include chemicals like hydrocarbons, naphthenic acids, ammonia, mercury, arsenic and lead, which are by-products of tar sands extraction.² As a result, the liquid in tailings

lakes is acutely toxic to aquatic life. Fish can't live in these lakes and industry is required to deter other wildlife, such as birds, from the area by using tools like sound cannons.^{3,4}

Tailings lakes currently cover 176 km² in open lakes and leak 11 million litres of toxic waste every day.^{5,6} As tailings lakes settle, water is removed off the top for reuse in tar sands operations. That means that toxics become more and more concentrated in the lakes over time.⁷

Tailings treatment and management was voluntary until 2009, when Directive 074 was introduced. This directive was supposed to curb the growth in tailings, but since its introduction, it has not been fully enforced. A report presented by the provincial regulator in June 2013 showed that not a single company was in compliance with these rules from 2011 to 2012. Yet there have been no penalties for oil companies.^{8,9}

The result? Oil companies have little incentive to change their practices and reduce the amount of tailings covering the northeastern Alberta landscape. And millions of litres of toxic liquid waste continue to leak into the watershed.

TAILINGS AND HEALTH RISKS

The tar sands create 250 million litres of toxic waste — every day. These toxic lakes contain hazardous chemicals like arsenic, lead and mercury that can cause health problems, such as cancer and brain damage. While many of the human health impacts are just beginning to be understood, it appears to be most linked to bioaccumulation in the food chain.¹⁰

In addition to putting human health at risk, evidence has shown that the toxic waste is damaging the wildlife that depends on the Athabasca River. Fish and other species are being negatively impacted in terms of their growth and reproductive cycles, among other effects.



TAILINGS LAKES vs. TAILINGS PONDS

Industry likes to use the phrase tailings ponds. The word, ponds, minimizes the size of these vast bodies of liquid waste from the tar sands. The truth is that these are huge open lakes. Tailings lakes are so big that they can be seen from space. Together, they cover an area 50 per cent bigger in size than the City of Vancouver.

Reality Check

Experts have shown that pollutants from the tar sands are negatively impacting water and aquatic life. To date, water monitoring in the tar sands region is inadequate, making it difficult to fully understand the impact the industry is having on our water.

Industry claims that the tar sands have no negative impact on water quality in the Athabasca River system. Experts have made it clear that the water quality data collected in the Athabasca region is of insufficient quality and quantity to make conclusions on the impacts of the tar sands on water.¹¹ Environment Canada has said that the water monitoring system for the Athabasca region “did not deliver data of sufficient quantity or quality to detect or quantify the effects of oilsands development.”¹²

While there isn't adequate water monitoring to assess exactly how the tar sands have



Orville Grandjambe pulls a deformed whitefish out of his net on the river Quatrefoche, a tributary to Lake Athabasca in northern Alberta. In recent years, the frequency of deformities, lesions and cancers found in fish caught in Lake Athabasca has increased dramatically. Local residents suspect the rapidly expanding tar sands operations further upstream as the cause of their health concerns.

impacted water, there is mounting evidence regarding the impacts of the tar sands on what lives in the water. Independent research suggests that fish and other species are being negatively impacted in terms of their growth and reproductive cycles, among other effects.¹³

While the Canadian Association of Petroleum Producers references a provincial regulation that prohibits the release of any water that does not meet defined quality standards, heavy metals including lead, mercury, and zinc, as well as polycyclic aromatic compounds — all of which have been shown to have adverse effects on animal life if higher than normal exposure levels are reached or exceeded — were discovered by University of Alberta researchers downstream from tar sands operations.^{14,15} Environment Canada scientists confirmed the findings, but were prevented from talking to the public and media.¹⁶

Sediment cores from lakes that are 35 to 90 km away from tar sands developments show that after tar sands development began, hydrocarbon pollutants linked to tar sands production increased. There are 2.5 to 23 times more pollutants in these remote lakes than there were in 1960.¹⁷ With inadequate monitoring in place, scientists are just beginning to understand the impacts of this increased concentration of toxics.

Impacted communities and First Nations have cited various cases of fish with growth deformities and other abnormalities that scientists have begun to connect to toxic pollution in the water systems from tar sands operations.¹⁸ This is despite industry claims that, “the oil and gas industry is highly regulated and takes strict measures to protect both surface water and groundwater quality.”¹⁹



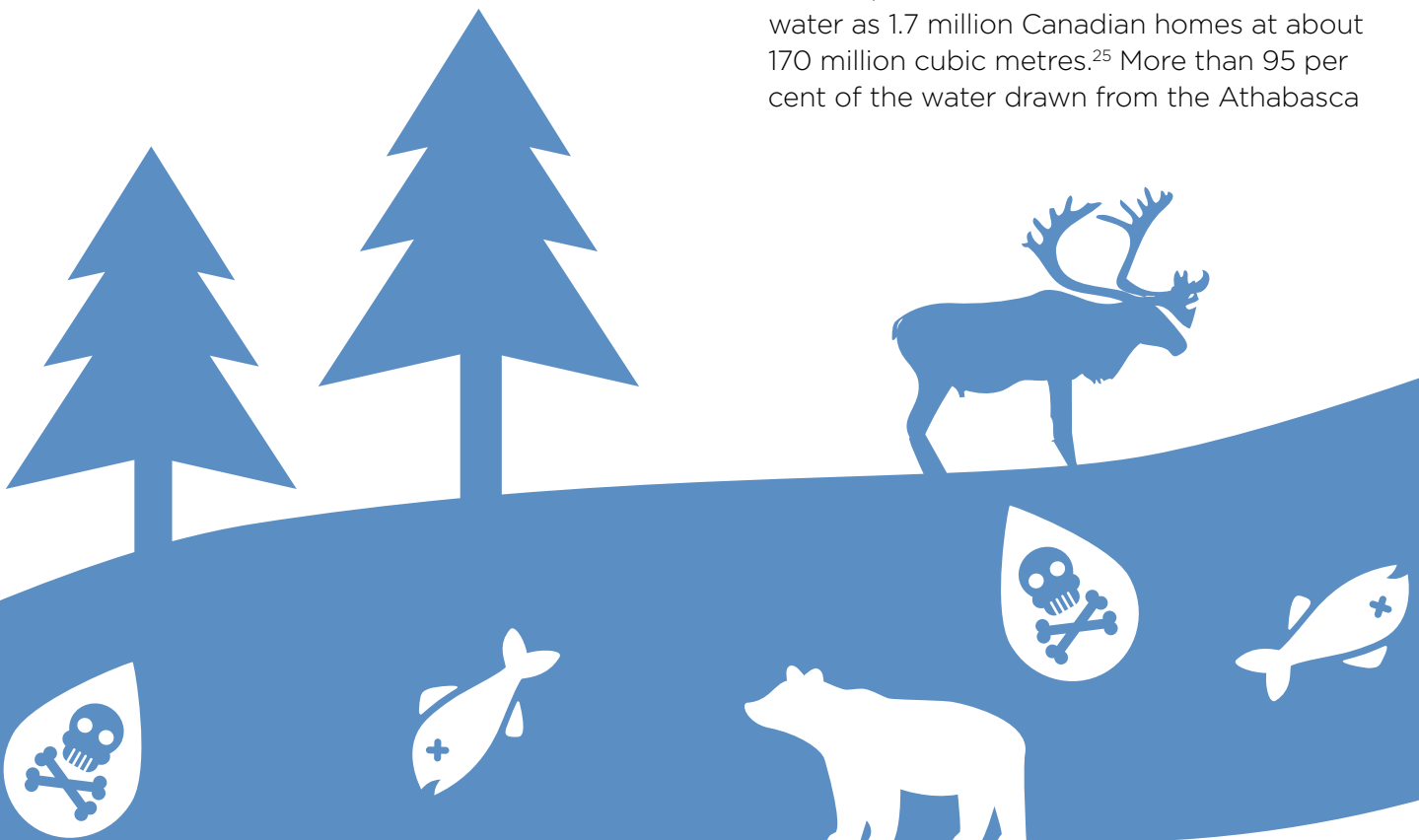
Reality Check

Tar sands companies are not required to stop withdrawing from the Athabasca River, even when fragile aquatic habitat is at risk.²⁰ More than 95 per cent of the water drawn from the Athabasca River and used in tar sands operations is too toxic to return to the natural water cycle.

Impacted communities and First Nations have cited various cases of fish with growth deformities and other abnormalities that scientists have begun to connect to toxic pollution in the water systems from tar sands operations.

While the Canadian Association of Petroleum producers cites “strict regulations restrict water withdrawal when river flow is low,” there are no enforced limits for tar sands operators regarding water withdrawals from the Athabasca River — not even if the water levels are becoming too low to support the life that depends on them.^{21,22,23} The absence of meaningful and enforced regulations around water usage is putting the health of the Athabasca River at risk.

Tar sands operations use at least three times as much freshwater per barrel of oil as conventional oil operations.²⁴ In 2011, tar sands operations used the same amount of water as 1.7 million Canadian homes at about 170 million cubic metres.²⁵ More than 95 per cent of the water drawn from the Athabasca





More than 95 per cent of the water drawn from the Athabasca River is too polluted to place back in the natural water cycle.

River is too polluted to place back in the natural water cycle. The polluted water is instead stored in toxic tailings lakes.²⁶

Recycle rates for water used in tar sands operations range from 40 to 90 per cent²⁷ and some companies have reduced the water used per barrel of oil produced.²⁸ However, *nearly all* of the water used is still too toxic to return to the water system.²⁹ Furthermore, the projected growth of the tar sands means that overall water consumption will increase.

If industry and government succeed in their goal of tripling tar sands production by 2030, fresh water usage will increase by 170 per cent.

Tar sands production is the largest user of water from the Athabasca River.³⁰ The oil industry often expresses water usage as a percentage of overall flow, but *when* the water is withdrawn is just as important as *how much* is withdrawn.³¹ The Athabasca River system has highs and lows. Expressing usage as an overall percentage hides the

fact that during low flow winter months the environmental impact of the water withdrawal is much bigger, with more negative effects on the river ecosystem, including on the reproductive patterns of fish and other aquatic species.³²

Under the current water management system, there is never a time when industry is required to stop withdrawing water, even if fish and aquatic habitat would be negatively impacted.³³

Due to the tar sands, the amount of water that is allowed to be withdrawn from the Athabasca River has nearly doubled in the last 12 years.³⁴ And because of climate change, the water flow in the Athabasca River is expected to decrease by 30 per cent by 2050.³⁵ Together, this paints a worrisome picture for the river system.

If industry and government succeed in their goal of tripling tar sands production between 2010 and 2030, growth in fresh water use will increase by 170 per cent. With the Athabasca River already under strain due to climate change and withdrawals during low flow periods, increasing pressure could fundamentally change the nature of the River's ecosystems.³⁶

CONCLUSION

Big Oil wants you to believe it is managing water well, but don't believe the slick spin. The tar sands industry is failing to manage water resources responsibly.

Despite statements and promises to manage and show leadership in reducing toxic liquid tailings waste, companies are not even in compliance with existing regulations. Furthermore, the regulations that exist are inadequate. There are no mandatory regulations that direct oil and gas companies to prevent toxic liquid waste from leaking into the watershed. There are no regulations in place to prevent Big Oil from threatening the vitality of the Athabasca River and the life that depends on it.

It's time for some important changes.

We need existing regulations, like Alberta's Directive 074, to be better enforced. Companies need to be penalized if they don't comply. And we need stronger, mandatory regulations so that responsible water management isn't something a company can opt out of. Regulations need to be adopted that integrate scientific criteria, like an ecosystem base flow, for deciding when and how much water can be withdrawn from the Athabasca River in order to ensure that ecosystems have a fighting chance at survival.³⁷

But it's not just better regulations that we need. We need industry to start behaving more responsibly. The reason there is so little regulation? Big Oil has lobbied repeatedly and loudly for as little regulation as possible in the tar sands — and in many cases industry has gotten its way. The recently presented policy from the Alberta government on wetlands management is just the most recent example of a government policy that caved to industry pressure at the expense of our shared environment.³⁸ The new policy will do little to protect wetlands, as industry successfully lobbied for enough loopholes to get a

free pass to continue reckless habitat destruction.

Industry is misleading the public when it says that it is treating our water responsibly.

It's time for Big Oil to walk the talk, and treat our shared resource with the respect that water deserves. Even as this report is being written there are four on-going, uncontrollable in situ tar sands oil spills that have been spewing oil for months into the environment and watershed near Cold Lake, Alberta. Neither industry or government know why they are happening or how to stop them. It's time industry stopped greenwashing the tar sands and started acting in ways that respect our shared resource, water.

We need improved monitoring of how the tar sands impact the watershed. The current monitoring is inadequate. We know that water is being used in huge quantities and we know that toxic liquid waste is seeping into the watershed and damaging the wildlife that depends on this watershed. But neither industry nor government have a clear picture of exactly what the impacts are on water from the tar sands. With inadequate monitoring, it's

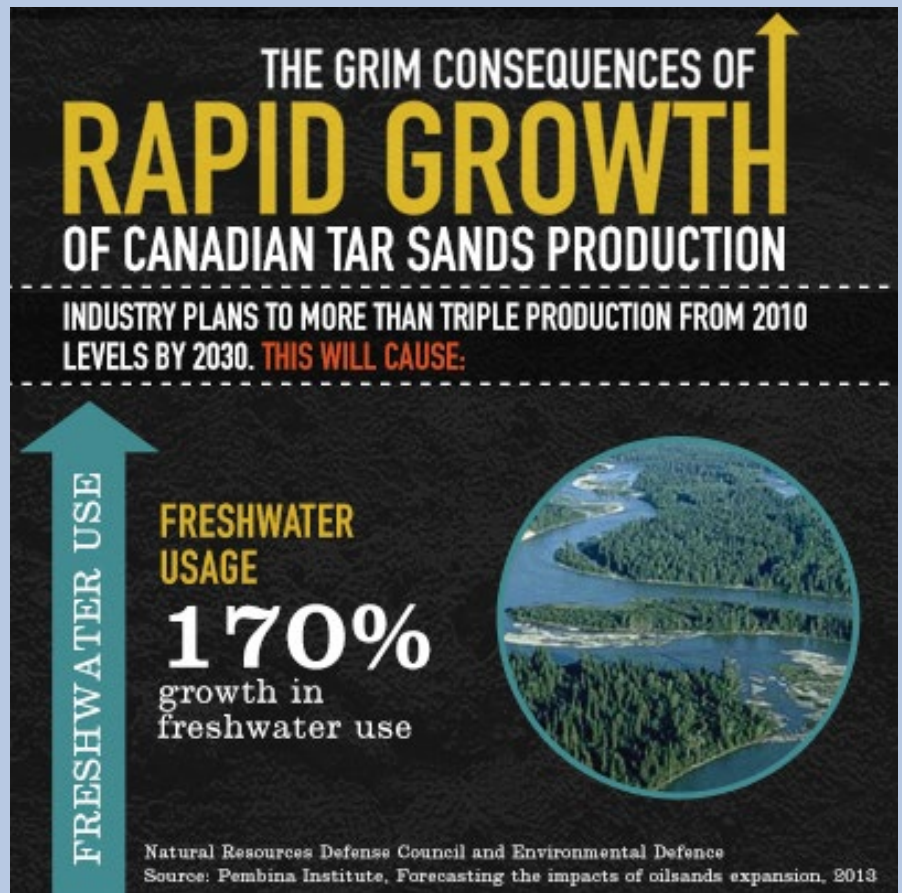
impossible to know exactly how much damage water use and leaking toxic waste are doing to the surrounding ecosystems. Canadians deserve to know the full picture about how the tar sands are affecting water.

Industry has a reckless plan to triple tar sands production by 2030.³⁹ This will increase fresh water use by 170 per cent.

If oil and gas companies want access to our shared resource, water, they need to show respect for that resource. We shouldn't be

giving water away to Big Oil without meaningful or enforced limits on volume during low flow periods, and without consequences for poisoning our rivers and lakes. Companies must focus on establishing best practices in existing operations rather than charging ahead with mismanaged and out of control development.

Until the Canadian government starts regulating the tar sands industry's use and pollution of water, and the tar sands companies have cleaned up the toxic mess they have already created, the U.S. and Canadian governments should not even be considering tar sands pipelines like Keystone XL or the proposed pipelines to Canada's East and West Coasts, which would facilitate an expansion of the tar sands. Approving Keystone XL would make the United States complicit in these unsustainable water withdrawals and the reckless spewing of toxic pollutants into the Athabasca River.



And we need to remember that there are better alternatives to tar sands oil and fossil fuels as a whole for powering our future.

Energy conservation and renewable energy can power our homes and businesses. We can have safe, clean affordable energy from renewable sources that don't pollute our air or water, and are better both for our economy, and our wallets.

Canada should be harnessing the power of green energy, something other countries around the world are already doing to create good jobs and help the environment. We need to build a strong green energy future, one that isn't mired in the polluting tar sands that tip us closer to climate change, and poison our water in the process.

**CANADIANS DESERVE BETTER.
SO DOES OUR WATER.**

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