In early October, hundreds of protesters gathered at a hydro dam construction site in Labrador. The largely-Inuit crowd carried signs saying, “Your decision impacts ME”, “It’s NOT too late to do what’s Right!” and “Science Doesn’t Lie.”

The protests continued for almost two weeks. Nine people were arrested. One protester cut through a chain link fence, allowing the demonstrators to occupy the construction site. At least 700 workers at the multi-billion dollar project were sent home as a result of the unrest.

The activists weren’t protesting the dam itself, which is being built at Muskrat Falls on the lower Churchill River by Nalcor Energy, a provincial Crown corporation. What they’re opposed to are plans to flood a 41-square-kilometre area upstream of the dam to make a reservoir.

**METHYLMERCURY CONCERNS**

Critics say that the flooding will release methylmercury into the water, and that this toxin will then be carried downstream into Lake Melville, a fjord opening into the Labrador Sea.

Methylmercury is the most toxic form of the element mercury. Found naturally in the environment, it is created when submerged organic material, which contains mercury, decomposes.

In humans, methylmercury affects the nervous system. It can cause serious brain and spinal cord damage. The developing fetus is most vulnerable to its effects.

If methylmercury collects in Lake Melville, scientists say it will gradually work its way up the food chain. As larger and larger organisms ingest the poison, it will become more concentrated. By the time the toxin is eaten by fish and seals, it will be ten

**ABOUT HYDROELECTRICITY**

Hydroelectric power is generated by the movement of water. It usually involves a dam that blocks a river.

A reservoir of water builds up behind the dam. That creates pressure, which forces the water down pipes that lead to an energy-generating turbine.

Hydroelectric power is the most widely-used renewable energy source. It represents 16 percent of total electricity production worldwide. China produces the most hydroelectricity, followed by Canada, Brazil, and the United States.

Hydropower doesn’t pollute the air, but it does have environmental impacts, affecting land use, homes, and natural habitats in the dam area.

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**DEFINITIONS**

**CROWN CORPORATION**: wholly-owned federal or provincial organization structured like a private or independent company

**DECOMPOSE**: to decay; to break down into smaller pieces

**ELEMENT**: any of the more than 100 known substances that cannot be separated into simpler substances and that singly or in combination make up all matter

**FJORD**: a long narrow inlet of the sea between steep cliffs

**RESERVOIR**: a natural or artificial pond or lake used for the storage and regulation of water

**SUBMERGE**: to go completely under water

**TURBINE**: an engine or a machine that uses the pressure of liquid or gas on a wheel to create power
millions of times more concentrated than it is in the water.

CONTAMINATING THE FOOD CHAIN
That’s a problem, because much of Lake Melville’s shoreline is within the boundaries of Nunatsiavut, a self-governing Inuit region within Newfoundland and Labrador. Some 2000 Inuit live here, and many of these people get their food from the lake.

The land and its resources are important to the Inuit culture and economy, and fishing for salmon and hunting for seals provide affordable food in a part of the country where groceries are very expensive. The people who live on the shores around the lake would be devastated if their food supply became contaminated.

DUELING SCIENTISTS
Before receiving approval from the government of Newfoundland and Labrador to begin the five-year project in 2012, Nalcor conducted an environmental assessment. It found there would be no measurable downstream effects from the flooding because any methylmercury that formed in the reservoir would break down as it moved downstream.

However, a four-year, independent study commissioned by the government of Nunatsiavut and released in April 2016 contradicted these findings. The Lake Melville Scientific Report stated that if Nalcor carries out its plan to cut down trees and then flood the land, high amounts of the poison would be funnelled into Lake Melville. Toxin levels in the lake would rise by as much as 380 percent, and methylmercury exposure in those who consume high amounts of local foods from the lake could increase by up to 1500 percent.

A UNIQUE ECOSYSTEM
Why did findings from the four-year study differ so much from Nalcor’s own assessment? The later research delved further into Lake Melville’s ecosystem, discovering that it is “incredibly efficient at accumulating methylmercury,” says lead author Amina Schartup from Harvard University.

That’s because the lake contains both saltwater and freshwater. Rather than the waters mixing, the freshwater rests on top of the saltwater. That means that fluffy organic matter in the water that would typically settle on the lake bottom remains suspended in a band. Here, bacteria gather to feed on the organic matter, turning it into deadly methylmercury. Marine plankton then feed on the toxin, are consumed by other organisms, and the poison works its way up the food chain.

The study found that because of this process, Lake Melville already has naturally high methylmercury levels. To determine how much higher levels might rise once the reservoir is filled, scientists simulated the effects of the flooding. They found it would increase toxin levels in Lake Melville by about 13 percent – if all the topsoil and vegetation is cleared beforehand. If just the trees are removed, as per Nalcor’s plans, toxin levels would rise much higher because more ‘fuel’ – more organic matter – would remain to be converted into methylmercury.

PUTTING ON THE PRESSURE
The solution, according to protestors, is for Nalcor to minimize the risks by clearing all vegetation and topsoil before filling the reservoir. In 2015, the Nunatsiavut government launched a campaign called ‘Make Muskrat Right’ encouraging the corporation to do just that.

Nalcor, however, refused. Its solution? To monitor methylmercury levels in the lake, and if safe levels are exceeded, to pay compensation to those who are affected.

The provincial government accepted Nalcor’s plan – but the President of Nunatsiavut didn’t.

“We’re not interested in compensation. We want to be able to continue our way of life,” said Johannes Lampe.

“We want to enjoy good health, and we want our children, grandchildren, and generations to come to know they don’t have to live in fear, that they can eat the fish, the seals and the birds from Lake Melville.”

DID YOU KNOW?
In Inuktitut, Nunatsiavut means “Our Beautiful Land.”

REACHING AN AGREEMENT
On October 25, the provincial government met with Indigenous leaders to try to work out a solution. After intense discussions, the two sides agreed that further independent assessments of the Muskrat Falls project would take place before flooding begins. Also, a committee of scientists and members from three Indigenous groups – Nunatsiavut, NunatuKavut and the Innu Nation – would look at ways to reduce possible methylmercury contamination. Finally, the province’s premier, Dwight Ball, promised to make all future decisions “using science-based research.”

“This is a huge step forward,” said Todd Russell, the president of the NunatuKavut Community Council. “The decisions that will be made, going forward...will be made by science and will incorporate the traditional knowledge of our people.” •
1. Explain what hydroelectric power is and how it is generated.

2. Describe the impacts of this type of power generation.

3. Where does Nalcor Energy plan to build a new hydro dam?

4. Explain why some people are opposed to this project.

5. Describe how methylmercury can affect people.

6. Explain how methylmercury is a danger to the people living near Lake Melville.

7. What were the findings of the environmental assessment conducted by Nalcor?

8. What were the findings of the environmental assessment conducted by the government of Nunatsiavut?

9. What does the government of Nunatsiavut want Nalcor to do before it floods the reservoir? Explain.

10. What did the two sides agree on in late October?
BETWEEN THE LINES

An inference is a conclusion drawn from evidence. A plausible inference is supported by evidence in the article and is consistent with known facts outside of the article.

What inference(s) can you draw from the fact that toxin levels in Lake Melville would rise by as much as 380 percent, and methylmercury exposure in those who consume high amounts of local foods from the lake could increase by up to 1500 percent, if Nalcor proceeds with its plan to cut down trees and flood the land to create a reservoir for its hydroelectric project?

BEYOND THE LINES

A tableau is a role play that enables students to see an event from various viewpoints. In a tableau, groups of four or five students assemble a frozen or statue-like scene, without using props. One at a time, students unfreeze and say one sentence that summarizes their character’s point-of-view using appropriate facial expressions and body language.

Have students create a tableau to show different perspectives on Nalcor’s plan to flood an area upstream of Lake Melville. Characters could include a protester, the premier, a Nalcor employee, and the chief executive officer (CEO) of Nalcor.

JUST TALK ABOUT IT

1. Protests are widely considered to be an important component of a democracy. In fact, freedom of speech and freedom of assembly are part of Canada’s Charter of Rights and Freedoms. However, protesters are also required to follow the rule of law, including respecting private property. With this in mind, for what reasons do you support protesters’ decision to cut a fence and occupy private property? For what reasons are you opposed to this action? Overall, are you more in favour of protesters’ actions, or more opposed? Explain.

2. If you were Newfoundland and Labrador Premier Dwight Ball, what position would you take on the issue of flooding the Muskrat Falls reservoir? Give reasons to support your response.

ONLINE

Note: The links below are listed at www.lesplan.com/en/links for easy access.

1. Watch a short animated video called “Hydropower 101” that explains hydroelectricity at https://www.youtube.com/watch?v=q8HmRLCgDAI

2. Watch CBC News coverage of the protest, “Protesters Cheer as Workers Leave Muskrat Falls,” at https://www.youtube.com/watch?v=ym-HqwSCPqw

3. Learn more about the costs and benefits of the Muskrat Falls megaproject at http://www.gov.nl.ca/lowerchurchillproject/backgrounders_7.htm and https://muskratfalls.nalcorenergy.com/environment/


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