



HOUSE OF COMMONS
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CANADA

SUSTAINING CANADA'S FRESHWATER FOR TODAY AND TOMORROW

**Report of the Standing Committee on Environment and
Sustainable Development**

Shannon Miedema, Chair

**MAY 2026
45th PARLIAMENT, 1st SESSION**

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**Shannon Miedema
Chair**

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NOTICE TO READER

Reports from committees presented to the House of Commons

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

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THE STANDING COMMITTEE ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

has the honour to present its

FIFTH REPORT

Pursuant to its mandate under Standing Order 108(2), the committee has studied freshwater and has agreed to report the following:

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LIST OF RECOMMENDATIONS

As a result of their deliberations committees may make recommendations which they include in their reports for the consideration of the House of Commons or the Government. Recommendations related to this study are listed below.

Recommendation 1

That the Government of Canada centre Indigenous governance in freshwater management and policies. 35

Recommendation 2

That the Government of Canada recognize the complexity of water management, necessitating the inclusion of all water stakeholders in discussions; that it prioritize breaking down silos and fostering innovation to enhance collaboration among stakeholders; and that it align water issue objectives with stakeholders' specific realities to effectively mobilize engagement. 42

Recommendation 3

That the Government of Canada create an intergovernmental water round table chaired by the federal environment minister that includes Indigenous representatives, representatives of provincial and territorial governments, and representatives of the Federation of Canadian Municipalities and the Canada Water Agency to outline water-related priorities for the country on an evolving basis. 42

Recommendation 4

That the Government of Canada consider establishing legal personhood for the St. Lawrence River to align with local First Nations laws and requests. 53

Recommendation 5

That the Government of Canada take a watershed approach when developing protections for freshwater ecosystems by:

- building institutional capacity and relationships based on watersheds and balancing ecological, social, economic, and cultural values across the watershed; and
 - harmonising legislation and policies with other levels of government and across jurisdictions, in keeping with respective jurisdictions, to ensure water management coherence across federal, provincial and territorial governments, and across the major watersheds.
- 61

Recommendation 6

That the Government of Canada modernize the *Canada Water Act* to ensure that it respects the jurisdictions of Quebec, the provinces and territories, municipalities and relations with Indigenous nations.

68

Recommendation 7

That the Government of Canada modernize the *Canada Water Act*, which has not been significantly updated since it originally became law in the 1970s, ensuring that it addresses climate change, *United Nations Declaration on the Rights of Indigenous Peoples*, and global water security challenges.

68

Recommendation 8

That the Government of Canada establish a co-governance framework, based on the principles of *United Nations Declaration on the Rights of Indigenous Peoples*, to guide the modernization of the *Canada Water Act*.

68

Recommendation 9

That the Government of Canada proceed as soon as possible to a meaningful modernization of the *Canada Water Act* through a rigorous co-development process with Indigenous peoples.

68

Recommendation 10

That the Government of Canada leverage the knowledge of local and regional networks involved in water management through engagement to make decisions.

69

Recommendation 11

That the Government of Canada incorporate Canada's national commitments of conserving and restoring 30% of federal lands by 2030. 69

Recommendation 12

That the Government of Canada prioritize support for aquatic invasive species prevention, decontamination, and enforcement efforts. 71

Recommendation 13

That the Government of Canada recognize the importance of wetlands to Canada's freshwater ecosystems. 73

Recommendation 14

That the Government of Canada ensure that publicly-funded infrastructure programs include the creation of natural infrastructure and support nature-based solutions in addition to the hard engineering (conventional built infrastructure). 73

Recommendation 15

That the Government of Canada support the development and maintenance of healthy fisheries by leveraging conservation opportunities through recreational fisheries. 75

Recommendation 16

That the Government of Canada reinstate the recreational fisheries conservation partnerships program. 75

Recommendation 17

That, given the important role of groundwater in the hydrological system, the Canada Water Agency, in keeping with respective jurisdictions, dedicate sufficient attention and resources to the role of groundwater in ensuring water security and supporting adaptation to climate change in Canada. 90

Recommendation 18

That the Government of Canada recognize the strategic value of groundwater and work with other levels of government and with scientists to take measures to protect groundwater from depletion and pollution, especially where it is a source of drinking water. 91

Recommendation 19

That the Government of Canada include groundwater issues in the modernization of the *Canada Water Act* and in the activities of the Canada Water Agency, in keeping with respective jurisdictions, and in collaboration with Indigenous communities, recognizing that climate change will cause continued thawing and drying in Canada, and that changing surface water availability will place increasing demands on precious groundwater resources. 91

Recommendation 20

That the Government of Canada reflect the science and anticipate changes due to the climate crisis, particularly for biodiversity conservation and climate adaptation. 101

Recommendation 21

That the Government of Canada address the climate crisis with urgency and priority to avoid the worst impacts of climate change, which includes significant threats to Canada's freshwater systems. 101

Recommendation 22

That the Government of Canada prioritize climate change and its impacts on freshwater when considering freshwater policies. 101

Recommendation 23

That the Government of Canada, given that the impacts of climate change vary greatly across Canada, apply regional approaches to freshwater protection in policy creation. 101

Recommendation 24

That the Government of Canada work collaboratively with provinces and territories to establish freshwater security funds to help with climate mitigation efforts (such as dealing with droughts, flooding, and wildfires). 101

Recommendation 25

That the Government of Canada establish a Youth Climate Corps to train and employ young Canadians to address labour gaps in the environmental sector, including in freshwater management, data analysis, and research, as set out in Budget 2025, which announced 40 million dollars for the creation of a Youth Climate Corps. 101

Recommendation 26

That the Government of Canada recognize the importance of water to Canada's agriculture industry in increasing food production and addressing global food insecurity. 103

Recommendation 27

That the Government of Canada consider the potential impacts of future and existing legislation and regulation on agriculture operations to ensure that fresh water and food production are not negatively impacted. 103

Recommendation 28

That the Government of Canada improve the federal regulatory approval process for plant science technologies that reduce the amount of water needed to grow food. 104

Recommendation 29

That the Government of Canada support the Lake Diefenbaker irrigation project, including through funding. 106

Recommendation 30

That the Government of Canada recognize irrigation for its environmental and climate change adaptation benefits and implement policy that encourages, rather than inhibits, its development and maintenance, in keeping with respective jurisdictions. 106

Recommendation 31

That the Government of Canada establish private land conservation programs on a scale similar to those in the United States and Europe. 109

Recommendation 32

That the Government of Canada invest in the continued growth and scaling up of the ALUS [Alternative Land Use Services] program with a major funding commitment over five years to continue to engage private landowners in land and water stewardship practices that help address the triple crises of biodiversity loss, climate change and climate change's impact on freshwater. 109

Recommendation 33

That the Canada Water Agency play a facilitating role in convening stakeholders from agriculture, Indigenous communities, civil society, and the agricultural value chain to advance water management goals, acting primarily as a convener and enabler in collaboration with the agricultural sector, in keeping with respective jurisdictions. 110

Recommendation 34

That Environment and Climate Change Canada and Health Canada ensure that toxics management demonstrates our right to a healthy environment. 114

Recommendation 35

That the Government of Canada and industry be open and transparent in the management of radioactive waste and its transportation; Indigenous Peoples and Canadians have a right to access information, to engage in decision-making, and to know the risks. 123

Recommendation 36

That the Government of Canada put in place an independent agency, arms-length from government and industry, to oversee radioactive waste management and decommissioning. 123

Recommendation 37

That Environment and Climate Change Canada and Health Canada proceed without delay with the final assessment of per- and polyfluoroalkyl (PFAS) substances as a class under the *Canadian Environmental Protection Act, 1999*, and that they implement appropriate regulatory actions to protect human health and the environment, such as PFAS phaseouts with defined essential uses.

130

Recommendation 38

That Environment and Climate Change Canada and Health Canada ensure all per- and polyfluoroalkyl (PFAS) substances are included in a single class and regulated under the *Canadian Environmental Protection Act, 1999*.

130

Recommendation 39

That Environment and Climate Change Canada and Health Canada define essential uses of per- and polyfluoroalkyl substances (PFAS), as well as the priorities for their phaseout.

131

Recommendation 40

That the Government of Canada promote per- and polyfluoroalkyl (PFAS)-free solutions.

131

Recommendation 41

That the Government of Canada work with provinces, territories, municipalities and Indigenous communities to prohibit the dumping of raw sewage into freshwater bodies.

151

Recommendation 42

That Health Canada, working with the Public Health Agency of Canada, incorporate wastewater monitoring as a permanent vehicle for better understanding the public health profiles of Canadian communities and more accurately predicting public health outbreaks; that the Public Health Agency of Canada enter into joint funding agreements, in keeping with respective jurisdictions, with provinces, territories and Indigenous communities to support wastewater monitoring at the local level, focusing especially on smaller urban centres and rural areas where federal and provincial wastewater monitoring may not exist. 152

Recommendation 43

That the Government of Canada work with provinces, territories, municipalities, and First Nations communities to ensure all Canadians have access to safe, clean, and affordable drinking water, especially in small, rural, remote, and First Nations communities. 159

Recommendation 44

That the Government of Canada establish a fund through the Federation of Canadian Municipalities for water system diagnostics to assist municipalities in better detecting system leaks and other system weaknesses in advance. 161

Recommendation 45

That the Government of Canada provide greater support to ensure the cybersecurity of Canada's water and wastewater infrastructure, which are strategic assets. 162

Recommendation 46

That the Government of Canada create a dedicated, sustainable long-term fund for upgrades to municipal water infrastructure. 165

Recommendation 47

That the Government of Canada renew funding to the Federation of Canadian Municipalities for municipalities to develop water asset management plans to better predict their future water system upgrade needs. 165

Recommendation 48

That the Government of Canada establish a fund through the Federation of Canadian Municipalities to help municipalities prepare engineering plans for water system upgrades well in advance of funding opportunities becoming available, so that municipalities can be ready to take advantage of them when they arrive; and, that the application timelines for water infrastructure funding be increased to allow municipalities enough time to prepare the engineering plans required to support successful applications. 165

Recommendation 49

That the Government of Canada actively support Canadian academic institutions that wish to consolidate and increase Canada's scientific knowledge and professional expertise in water management, including in partnership with the United Nations University Institute for Water, Environment and Health. 175

Recommendation 50

That the Government of Canada increase its long-term support for Indigenous freshwater monitoring and research, thereby engaging more Indigenous people in water stewardship, utilizing Indigenous traditional knowledge, and ensuring more complete coverage of freshwater monitoring across Canada. 180

Recommendation 51

That the Government of Canada assist local communities in freshwater data-monitoring and governance and financially assist local organizations with their concerns. 180

Recommendation 52

That the Government of Canada work with all levels of government to develop a coordinated model for standardized data collecting and reporting. 182

Recommendation 53

That the Government of Canada take immediate action, including to establish a coordinated model for standardized data collection and reporting, leveraging watersheds for research and innovation, and investing in mission-driven research to conserve and strategically leverage water as a vital asset. 182

Recommendation 54

That the Canada Water Agency establish, in collaboration with provinces and territories, standards for the collection, evaluation and dissemination of good quality water data, knowledge, including Indigenous knowledge, as well as for community-based water-monitoring and -management tools. 183

Recommendation 55

That the Government of Canada analyze human health impacts in freshwater data collection and analysis (surface level and groundwater). 183

Recommendation 56

That the Government of Canada, in collaboration with provinces, territories, and First Nations communities, provide funding and support for data collection, management, and analysis which includes:

- supporting partnerships with First Nations communities that respect existing rights and advance collaboration, including through community-led initiatives, on freshwater monitoring and stewardship;
- funding and supporting collaboration with other levels of government and non-governmental agencies and organizations that are best positioned to establish key partnerships and relationships, while leveraging existing systems and avoiding duplication; and
- investing in grey (traditional) and green (natural) infrastructure projects that protect freshwater environments, including nature-based solutions and the restoration and rebuilding of the National Long-term Water Quality Monitoring Program, where such investments improve water quality and support evidence-based decision-making. 183

Recommendation 57

That the Government of Canada, in keeping with respective jurisdictions, conduct a health study of the health impacts of tailings ponds on populations living near tailings ponds and the oil sands. 195

Recommendation 58

That the Government of Canada, with provincial governments, reassess its regulations related to tailings pond management due to the negative impacts of tailing ponds on nearby communities. 195

Recommendation 59

That the Government of Canada, in keeping with respective jurisdictions, conduct or provide support for a study of the cumulative impacts of tailings ponds on human health, and that it ensure that this study is designed with local Indigenous communities. 195

Recommendation 60

That the Government of Canada, in collaboration with provincial, territorial, municipal and Indigenous governments, consider whether, in the case of an industrial accident that could affect the health of people in nearby or downstream communities, not just the company responsible, but also relevant government regulators, should take responsibility for ensuring that appropriate notification is given and received. 203

Recommendation 61

That the Government of Canada prioritize finding ways to use its existing areas of jurisdiction to better protect Indigenous rights in areas affected by oil sands projects. 218

Recommendation 62

That Fisheries and Oceans Canada and Environment and Climate Change Canada support the development of surface water quality guidelines that include chronic toxicity testing on fish, in addition to acute toxicity testing. 218

Recommendation 63

That the Government of Canada consider setting model guidelines for naphthenic acids in water, with a view to providing information about safe levels of not just acute, but also chronic, exposure. 219

Recommendation 64

That the Government of Canada support complete water quality monitoring in the Athabasca region, including testing for naphthenic acids, PAHs and substances known to be endocrine disruptors. 219

Recommendation 65

That the Government of Canada explore all options of administration and enforcement of the *Canadian Environmental Protection Act, 1999* and the *Fisheries Act* (e.g., making regulations under these acts) in order to protect environmental and human health from substances found in oil sands process-affected water. 219

Recommendation 66

That the Government of Canada, through its research funding mechanisms, support research related to the removal of toxins from oil sands process-affected water. 224

Recommendation 67

That the Impact Assessment Agency of Canada work collaboratively with Indigenous communities to identify any potential impacts on Indigenous people, and develop appropriate mitigation or other accommodation proposals that, if implemented, could address potential impacts; and that the Agency explore opportunities to work in partnership with communities in the conduct of impact assessments, as well as contributing to the result of the assessments conducted under their own Indigenous laws, processes or cultural protocols, into the impact assessment process. 227

Recommendation 68

That the National Research Council explore establishing research and development facilities specifically focused on the development and testing of water technology products and services. 240

Recommendation 69

That the Government of Canada better support the commercialization of clean technology to monitor and improve water quality. 242

Recommendation 70

That the Government of Canada provide more direct support to water technology accelerators, including matching funds for provincial investments in water start-ups, and in the form of grants and low-interest repayable loans, to water technology enablers and accelerators such as AquaAction, McGill’s Dobson Center for Entrepreneurship, Ontario’s MaRS Discovery District, and ForeSight. 242

Recommendation 71

That the Government of Canada work with the Federation of Canadian Municipalities to expand the scope of the Green Municipal Fund to include funding for water technology pilot projects at the municipal level. 242

Recommendation 72

That the Government of Canada extend the new Clean Technology Manufacturing Investment Tax Credit to encourage water technology investment, as was done by the United States Department of Commerce. 243

Recommendation 73

That Innovation, Science and Economic Development Canada compile a comprehensive inventory of United States federal and state government programs available to support that country’s water technology sector, including grants, low-cost repayable loans, tax credits, and “buy American” policies, in order to assess Canada’s relative competitiveness. 244

Recommendation 74

That the Government of Canada ensure coordination between Innovation, Science and Economic Development Canada’s clean technology programs and the Canada Water Agency’s efforts in freshwater protection. 244

Recommendation 75

That the Government of Canada make addressing the global water crisis a foreign policy objective with a view to helping the world strengthen food security and gender equality and promote conflict resolution between countries that share water resources; that in pursuing a water-related foreign policy, the government collaborate with the Canada-based United Nations University Institute for Water, Environment and Health, the International Development Research Centre, and the International Institute for Sustainable Development. 252

Recommendation 76

That the Government of Canada follow up on commitments made at the G7 Climate, Energy and Environment Ministers' Meeting (Torino, April 29–30, 2024) to identify common goals and strategies among G7 nations for helping to address the global water crisis. 253

Recommendation 77

That the Government of Canada collaborate with the United Nations University Institute for Water, Environment and Health and other Canada-based entities to establish a global water innovation hub to promote Canadian companies and academic institutions and the solutions they offer to the global water crisis; that this hub also assist with the transfer of knowledge and expertise from the Canadian water sector to those involved in water management and protection in other countries, especially developing countries. 253

Recommendation 78

That the Government of Canada take an active role in the next United Nations Water Conference in 2026 co-hosted by Senegal and the United Arab Emirates in 2026 and take steps to host or co-host the next UN Water Conference in 2028 or 2029. 253

Recommendation 79

That the Government of Canada, as part of efforts to promote Canada as a global water leader, create an international twinning program for Canadian water utilities, including those operating in or on behalf of First Nations, to assist utilities in developing countries with adopting best practices and technologies. 253

Recommendation 80

That the Government of Canada place a priority on promoting Canada's status as a global water nation and leader by engaging systematically, on an ongoing basis, with all international agencies involved in advancing the international water agenda. 253

Recommendation 81

That, in future, the Government of Canada actively participate in all international freshwater conferences and relevant fora. 253

Recommendation 82

That the Government of Canada, through Global Affairs Canada, develop and publish a global water strategy, on the model of the U.S. Global Water Strategy, that seeks to outline and promote Canada's foreign policy interests related to freshwater; that this strategy be tied in part to the export interests of Canada's watertech sector and to Canada's reputation for promoting global peace and security, in this case water security. 254

Recommendation 83

That the Government of Canada, through the Privy Council Office, conduct a comprehensive analysis of all existing federal water policies, laws, regulations, and programs with a view to implementing a truly whole-of-government approach to freshwater management and protection in Canada, one that strengthens ties among all federal departments and agencies with responsibility for freshwater issues. 260

Recommendation 84

That the Canada Water Agency ensure that it respects the mandates and jurisdiction of provinces, territories, and municipalities. 260

Recommendation 85

That the Canada Water Agency ensure that it does not duplicate the work of other water management entities including, but not limited to, those set up by provinces, territories, municipalities, watershed districts, and drainage basin organizations. 260

Recommendation 86

That the Government of Canada align Innovation, Science and Economic Development Canada's cleantech support programs with the Canada Water Agency's priorities and action plans for improving freshwater management and protection in Canada. 260

Recommendation 87

That the Canada Water Agency work with all industries, including those not typically included in water governance discussions, as well as work within the unique regional considerations of water management and water issues of the provinces. 261

Recommendation 88

That the Government of Canada invest sufficient human and financial resources to address challenges concerning freshwater: restoration, new technology, fish population recovery, infrastructure, etc. 261



SUSTAINING CANADA'S FRESHWATER FOR TODAY AND TOMORROW

1. INTRODUCTION

Freshwater - found in rivers, lakes, underground sources, ice, and snow¹ - is vital for sustaining life. It supports ecosystems, allows for sanitation, makes agriculture possible, is critical to many industries and is, therefore, crucial to us all. However, clean and accessible freshwater can be taken for granted despite its essential nature. In undertaking a study of freshwater, the Committee recognized the opportunity and responsibility to reflect the voices of a variety of stakeholders, in order to help guide Canada's future freshwater governance.

This introductory section outlines the processes undertaken, during the 43rd and 44th parliaments, by the House of Commons Standing Committee on Environment and Sustainable Development (the Committee) that led to this report. It then briefly provides an overview of freshwater in Canada, including threats to freshwater, and opportunities for improved management.

A. The Committee's Study on Freshwater

The impetus for the Committee's study of freshwater was private member's business M-34, *Instruction to the Standing Committee on Environment and Sustainable Development*, moved 29 October 2020² and agreed to by the House of Commons on 3 February 2021 (43rd Parliament, 2nd session).³ On 26 April 2022, the Committee adopted the following motion:

That the motion adopted on [3 February 2021], governing the study of freshwater be amended by replacing, in the last paragraph, the word "seven" with the word "eight." The motion, as amended, read as follows:

1 Government of Canada, [Water in Canada](#), 2013.

2 House of Commons, Hansard, [Motion M-34, Instruction to the Standing Committee on Environment and Sustainable Development](#), 29 October 2020.

3 House of Commons, Hansard, [Vote on motion M-34](#), 3 February 2021.



- That, pursuant to Standing Order 108(2), the committee undertake a comprehensive study of federal policies and legislation relating to freshwater, and more specifically focusing on:
 - a. the key legislative instruments of federal freshwater policy, including but not limited to the [*Canada Water Act*], the [*Fisheries Act*], the [*Migratory Birds Convention Act*], the [*Canadian Navigable Waters Act*], the [*Canadian Environmental Protection Act, 1999*], and the [*Impact \ Assessment Act*];
 - b. the key organizational components of federal freshwater policy, including but not limited to Environment [and Climate Change] Canada, Fisheries and Oceans Canada, Health Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, Infrastructure Canada, Transport Canada, Public Safety Canada, Crown-Indigenous Relations and Northern Affairs Canada, Indigenous Services Canada, and Global Affairs Canada;
 - c. the relationship between the federal government and the provinces, territories, Indigenous peoples, and local governments relating to freshwater protection and management;
 - d. various international treaties governing Canada's freshwater interests and obligations;
 - e. present and future research needs relating to freshwater management and protection;
 - f. the pressures on Canada's freshwater resources, including with respect to climate change, flooding and drought; and
 - g. the creation of a Canada Water Agency.
- That the committee (i) schedule no fewer than eight meetings, (ii) report its findings and recommendations to the House within one year following the adoption of this motion, and (iii) take into consideration the evidence and documentation received by

the committee during the 2nd session of the 43rd Parliament on the subject.⁴

On 19 October 2023, the Committee agreed to increase the number of meetings on freshwater, as follows:

That, notwithstanding the motion of freshwater adopted on Tuesday, April 26, 2022, the committee shall convene thirteen meetings, after the tenth meeting the committee will assess the possibility of extending the number of meetings and be prepared to interrupt these meetings as necessary to address other business.⁵

The following motion on 13 February 2024 added four more meetings on freshwater:

That in reference to the water study the committee hold two additional meetings after its 13th meeting to hear from witnesses, with each panel including one witness suggested by each party as per usual; that the committee also hold a further additional two meetings exclusively dedicated to hearing from representatives of those provinces and territories able to attend.⁶

During the 43rd Parliament, 2nd Session, a call for briefs was issued and 56 briefs⁷ were subsequently received in 2021. The study continued during the 44th Parliament, 1st Session.

Over 21 meetings, the Committee hosted 179 witness appearances.⁸ During the 44th Parliament, the Committee also received 56 briefs⁹ in 2023–2024, in addition to over 70 other documents related to freshwater, such as correspondence, reference documents, and written responses to questions asked during Committee meetings. The Committee sincerely thanks all witnesses and authors of written submissions for sharing their expertise and insights on the vast and important topic of freshwater.

4 House of Commons, Standing Committee on Environment and Sustainable Development (ENVI), [*Minutes of Proceedings*](#), 26 April 2022.

5 ENVI, [*Minutes of Proceedings*](#), 19 October 2023.

6 ENVI, [*Minutes of Proceedings*](#), 13 February 2024.

7 ENVI, [*Freshwater*](#), “Briefs.”

8 Some witnesses appeared during multiple meetings because they had their testimony cut short by votes or other committee business and they were reinvited to an additional meeting to make up lost time.

9 ENVI, [*Freshwater*](#), “Briefs.”



The Committee agreed to include evidence collected during three related studies in its report on freshwater. On 20 March 2023, the Committee agreed to study the Kearl Oil Sands Mine tailings pond seepage and overflow, referred to as “Toxic Leak of Tailings Ponds,”¹⁰ and agreed “that the evidence gathered during these meetings [would] be taken into consideration during the study of Freshwater.”¹¹ Testimony was received through 29 witness appearances over 5 meetings, as well as 3 briefs and 45 other written submissions.¹² On 18 June 2024, the Committee agreed to include the evidence from its study of Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting (short title: National Strategy on Food and Drought Forecasting Act)¹³ in the report on freshwater. The Committee’s evidence included 10 witness appearances over 2 meetings, 1 brief and 4 other written submissions. Also on 18 June 2024, the Committee agreed to incorporate testimony into this report that was heard during the June 2024¹⁴ meetings of the House of Commons Standing Committee on Indigenous and Northern Affairs’ study of Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands (First Nations Clean Water Act).¹⁵ The Committee is grateful for the time and the perspectives that all of the witnesses and authors of written submissions shared during these three studies.

At the time of the dissolution of the 44th Parliament, the Committee had not tabled a report with its findings from the study. During the 45th Parliament, on 8 December 2025, the Committee agreed to draft a report on this study, according to the following motion:

That, pursuant with Standing Order 108(2), the committee undertake a study on freshwater without receiving new testimony, and that the testimony and documents received by the committee during the First Session of the 44th Parliament concerning the study be made available to

10 ENVI, [Toxic Leak of Tailings Ponds](#).

11 ENVI, [Minutes of Proceedings](#), 20 March 2023.

12 Briefs submitted to ENVI are found on the Committee’s website. Other written submissions, such as reference documents, correspondence, and written responses to questions are not typically available through the Committee website but can be obtained upon request to the Committee clerk.

13 ENVI, [Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting](#).

14 Meetings were held on 12 June, 17 June and 19 June 2024 at the House of Commons Standing Committee on Indigenous and Northern Affairs during which 16 witness appearances occurred.

15 House of Commons, Standing Committee on Indigenous and Northern Affairs, [Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands](#).

the committee and taken into consideration by the committee during the current session; that the committee proceed to the drafting of a report.¹⁶

B. Freshwater in Canada: Abundance, Threats and Opportunities

Canada is a water-rich nation, with 20% of the world's total freshwater.¹⁷ However, in terms of the world's renewable supply of freshwater, Canada has 7%.¹⁸ Renewable freshwater is water that is regularly replenished, such as by precipitation, in rivers, lakes and aquifers.¹⁹ Non-renewable freshwater is "water that is stored in deep aquifers, ice caps and glaciers that have a negligible rate of recharge on a human time scale."²⁰ Daniel Wolfish (Acting Assistant Deputy Minister, Canada Water Agency, Department of the Environment) put Canada's renewable water supply in context as follows:

Canada has the third largest renewable supply of freshwater in the world, about 7% of the global renewable supply. While Canada is a water-rich country, a significant amount of Canada's renewable freshwater supply is not easily accessible. Much of Canada's freshwater is stored as ice and about 60% of Canada's freshwater flows north into the Arctic Ocean, away from the majority of the population.²¹

Diane Orihel (Associate Professor in Aquatic Ecotoxicology, Queen's University) emphasized the importance of considering water along the entire hydrological cycle when studying, protecting, or managing it:

First, while it's true that water accumulates in water bodies such as lakes and rivers, in reality water is much more than that. Water is dynamic and exists in many forms and in many places. Water is frozen in glaciers, exists as a gas in the atmosphere, flows underground in spaces between soil particles and exists within our own bodies. Water can be and is contaminated at any and all of these stages. My message here is that if we are to truly protect and manage Canada's water, we must do so throughout its entire hydrologic cycle.²²

16 ENVI, *Minutes of Proceedings*, 8 December 2025.

17 Environment and Climate Change Canada, *Toward the Creation of a Canada Water Agency: Discussion Paper*, p. 4.

18 Ibid.

19 Statistics Canada, Freshwater in Canada, "*Appendix C Glossary*."

20 Ibid.

21 ENVI, *Evidence*, 24 October 2023, 1100 (Daniel Wolfish, Assistant Deputy Minister, Canada Water Agency, Department of the Environment).

22 ENVI, *Evidence*, 30 November 2023, 1235 (Diane Orihel, Associate Professor in Aquatic Ecotoxicology, Queen's University).



Some witnesses viewed water as much more than a natural resource to be managed and exploited: The Committee heard from several witnesses, including Indigenous witnesses, that “water is life.”²³

The Committee also heard about the many serious threats to freshwater in Canada, as well as about how communities and governments are working to address them in a coordinated way. Such threats include impacts of climate change (such as floods and droughts); pollution from toxic chemicals and excess nutrients; invasive species; biodiversity loss; and the depletion of water sources. In recognition of these threats, through the leadership of its National Freshwater Scientific Program, Environment and Climate Change Canada is producing “a road map, developed inclusively and collaboratively, to identify the most urgent freshwater challenges in Canada.”²⁴

The Committee explored the future of freshwater in Canada, examining opportunities and possibilities such as empowering those who work at the local watershed level, increasing interjurisdictional cooperation, and encouraging innovation. Witnesses discussed the importance of *national leadership* on water, acknowledging the need to respect and enable work at local, provincial/territorial, and Indigenous government levels. For instance, Alexandre Lillo (Law Professor, Université du Québec à Montréal, As an individual) observed that reports on water law and governance have been calling for “Canada-wide management of water” for over 50 years.²⁵ According to John Pomeroy (Distinguished Professor and Canada Research Chair, University of Saskatchewan, As an individual):

We need national water leadership, not federal water leadership. I have to say that we need to get out of Ottawa and into the provinces, territories and communities to see what's going on.²⁶

23 ENVI, [Evidence](#), 23 November 2023, 1315 (Eugene Nicholas, Director of Environment, Mohawk Council of Kanesatake); ENVI, [Evidence](#), 23 November 2023, 1320 (Eddy Charlie, Co-Organizer, Victoria Orange Shirt Day, As an individual); ENVI, [Evidence](#), 24 April 2023, 1215 (Sandy Bowman, Mayor, Regional Municipality of Wood Buffalo).

24 ENVI, [Evidence](#), 11 June 2024, 1610 (Daniel Wolfish).

25 ENVI, [Evidence](#), 21 November 2023, 1105 (Alexandre Lillo, Law Professor, Université du Québec à Montréal, As an individual).

26 ENVI, [Evidence](#), 1 February 2024, 1725 (John Pomeroy, Distinguished Professor and Canada Research Chair, University of Saskatchewan, As an individual).

The Canadian Water and Wastewater Association urged:

As our country, and our world, face the ever[-]increasing effects of climate change, we can no longer work in independent silos. [The] global [water] crisis requires a bold, integrated vision and a coordinated National Water Strategy for Canada.²⁷

The Committee hopes that the observations and recommendations contained within this report will contribute to a national discussion on the governance of Canada's freshwater.

2. SHARED JURISDICTION FOR FRESHWATER

The legal responsibility for water management in Canada is shared between the federal, provincial, territorial, and municipal governments. As described by the Government of Canada:

Canadian provinces and one of the territories have the primary jurisdiction over most areas of water management and protection. Most of those governments delegate certain authorities to municipalities, especially the drinking water treatment and distribution and wastewater treatment operations of urban areas. They may also delegate some water resource management functions to local authorities that may be responsible for a particular area or river basin. Most major uses of water in Canada are permitted or licensed under provincial water management authorities.²⁸

The basis for the division of responsibilities related to water between Parliament and the provinces in Canada is the constitution. This chapter of the Committee's report lists the sections of the constitution that provide authority to Parliament and the provinces over water. It also provides an overview of interpretation in the courts of these sections of the constitution relevant to water. Next, it describes the way in which Parliament has applied its authority—federal acts—and explains which federal departments and agencies administer them. The chapter then addresses the affirmation of Indigenous rights through the *Constitution Act, 1982*, and discusses Indigenous governance and co-management of water. Next, Canada-United States transboundary co-operation on water is summarized. Finally, some examples of successful interjurisdictional cooperation on water are explored.

27 Canadian Water and Wastewater Association, [Brief submitted to ENVI](#), 6 May 2021, p. 1.

28 Government of Canada, [Water governance and legislation: shared responsibility](#).



A. Constitutional Basis of Shared Jurisdiction Over Freshwater

In accordance with Canada's constitution,²⁹ legislative powers are shared between Parliament and the provinces.³⁰ Some aspects of federal water management fall under the constitutional authority of the federal government and others to provincial governments. As a result, freshwater is referred to as an area of shared, or concurrent, jurisdiction. The following part of the report outlines the particular sections of the constitution that assign authority for areas of responsibility relevant to freshwater management.

1) *Constitution Act, 1867* and the Division of Powers

a) Parliament's Authority

Section 91 of the *Constitution Act, 1867* assigns exclusive legislative authority for a number of topics to Parliament. Sections 92 and 92A list areas for which provincial legislatures have exclusive authority to make laws (92A was added by a 1982 amendment on "non-renewable natural resources, forestry resources and electrical energy"). "Water" is not a subject listed for either Parliament or the provinces. Instead, certain topics relating to water fall within other topics listed in sections 91 and 92. This is also the case for matters pertaining to the "environment" more generally, as well as for those pertaining to "health." As neither health nor environment is listed in the *Constitution Act, 1867* as a head of power, various aspects of these topics may be addressed by either Parliament or the provincial legislatures. If there is a disagreement about whether a legislature has overstepped its constitutional powers in passing a law, courts may be required to decide on the matter.³¹ Table 1 provides an overview of the sections of the *Constitution Act, 1867* that give Parliament legislative authority over some areas relevant to the governance of freshwater.

29 See [Constitution Act, 1867](#), 30 & 31 Victoria, c. 3 (U.K.).

30 Territorial legislatures and governments do not have legislative powers under the *Constitution Act, 1867*, but Parliament has delegated them the authority to make laws and decisions concerning certain matters.

31 For more information on the division of powers, see Isabelle Brideau, Laurence Brosseau and Allison Lowenger, [The Distribution of Legislative Powers: An Overview](#), Publication no. 2019-35-E, Library of Parliament, 3 January 2019; and Penny Becklumb, [Federal and Provincial Jurisdiction to Regulate Environmental Issues](#), Publication no. 2013-86-E, Library of Parliament, 29 October 2019.

**Table 1—Constitutional Sources of Parliament's Authority for
Selected Topics Related to Freshwater**

Section of the <i>Constitution Act, 1867</i>	Legislative Authority Assigned to Parliament
91(24)	"Indians ^a and lands reserved for the Indians"
91(27)	Criminal law power
91(29) and 92(10)) ^b	Federal works and undertakings
91(10)	Navigation and shipping
91(12)	Sea coast and inland fisheries
108 (which establishes that provincial public works and property that are listed in the Third Schedule of the <i>Constitution Act, 1867</i> are the property of Canada)	Canals, harbours, rivers and lake improvements

- Note:
- a. In addition to referring to First Nations, the term "Indians" has been found by the courts to include both Inuit (*Reference as to whether "Indians" includes in s. 91 (24) of the B.N.A. Act includes Eskimo in habitants of the Province of Quebec*, [1939] SCR 104) and Métis (*Daniels v. Canada (Indian Affairs and Northern Development)*, 2016 SCC 12).
 - b. While section 92(10) establishes that provinces have jurisdiction over local works and undertakings, sections 92(10)(a), (b) and (c) list a number of exceptions, including "[s]uch Works as, although wholly situate within the Province, are before or after their Execution declared by the Parliament of Canada to be for the general Advantage of Canada or for the Advantage of Two or more of the Provinces." (Section 92(10)(c)).

Sources: Table prepared by the Library of Parliament using data obtained from the [Constitution Act, 1867](#); and Alexandra Bailey, Centre for Constitutional Studies, *Water Law: The Interjurisdictional Context*, 1 August 2008.

The criminal law power (section 91(27)) is the basis of the *Canadian Environmental Protection Act, 1999*,³² a key piece of federal legislation for regulating pollutants. The valid use of the criminal law power in this instance was confirmed in *R. v. Hydro-Québec*.³³ Another important law, the *Fisheries Act*, regulates pollution that enters waters frequented by fish, and is based on the sea coast and inland fisheries power (section 92(1)). Other sources of Parliament's authority in relation to water include Taxation (section 91(3)), Trade and Commerce (section 91(24)), Public debt and property

32 [Canadian Environmental Protection Act, 1999](#), S.C. 1999, c. 33.

33 [R. v. Hydro-Québec](#), [1997] 3 S.C.R. 213.



(the spending power, section 91(1A)) and “Peace, order, and good government,” which is part of the introduction to section 91.

b) Provincial Authority

Provinces largely have primary jurisdiction in relation to water management and protection. The authority of provinces to make laws relating to water is based on certain sections of the *Constitution Act, 1867*, as laid out in Table 2.

Table 2—Constitutional Sources of Provinces’ Authority for Certain Aspects of Freshwater

Section of the <i>Constitution Act, 1867</i>	Legislative Authority Assigned to Provinces
92(8)	“Municipal Institutions in the Province”
92(10)	“Local Works and Undertakings”
92(13)	“Property and Civil Rights in the Province”
92(16)	“Generally all Matters of a merely local or private Nature in the Province”
109	“All Lands, Mines, Minerals, and Royalties belonging to the several Provinces of Canada, Nova Scotia, and New Brunswick at the Union” ^a

Notes: a. The following excerpt (paras. 3–4) from Chief Justice Lord Henry Strong’s reasons in the Supreme Court of Canada reference *In Re Provincial Fisheries*, (1896) 26 SCR 444 (which was affirmed by the Judicial Committee of the Privy Council) explains section 109 in the context of water:

Question 1: Did the beds of all lakes, rivers, public harbours, and other waters, or any and which of them, situate within the territorial limits of the several provinces and not granted before confederation, become under the British North America Act the property of the Dominion or the property of the province in which the same respectively are situate? And is there in that respect any and what distinction between the various classes of waters, whether salt waters or fresh waters, tidal or non-tidal, navigable or non-navigable, or between the so-called great lakes, such as Lakes Superior, Huron, Erie, &c., and other lakes, or the so-called great rivers, such as the St. Lawrence River, the Richelieu, the Ottawa, &c., and other rivers, or between waters directly and immediately connected with the sea-coast and waters not so connected, or between other waters and waters separating (and so far as they do separate) two or more provinces of the Dominion from one another, or between other waters and waters separating (and so far as they do separate) the Dominion from the territory of a foreign nation?

Answer: At the time of confederation, the beds of all lakes, rivers, public harbours and other waters within the territorial limits of the several provinces which had not been granted by the Crown were vested in the Crown as representing the provinces respectively, and there was no

distinction in this respect between any of the waters specifically mentioned in the first question propounded by the order in council. The ungranted beds of all such streams and waters were therefore lands belonging to the several provinces in which the same were situated, and under section 109 of the British North America Act became upon confederation vested in the Crown in right of the several provinces, subject only to the exception respecting existing trusts and interests mentioned in that section, and excepting the beds of public harbours, which, by the operation of section 108, were vested in the Dominion.

Sources: Table prepared by the Library of Parliament using data obtained from the [Constitution Act, 1867](#); and Alexandra Bailey, Centre for Constitutional Studies, *Water Law: The Interjurisdictional Context*, 1 August 2008.

Provinces delegate many powers to municipalities, including for drinking water and wastewater.³⁴ Municipal government is not an order of government recognized in the *Constitution Act, 1867*. Rather, municipalities are established by provincial legislatures.³⁵

In recent decades, the federal government has devolved³⁶ responsibilities and legislative powers similar to those of the provinces to the Yukon Territory and the Northwest Territories.³⁷ These powers include water management, land and water inspections and cumulative impact monitoring.³⁸ Nunavut is also in the process of having powers transferred to it through devolution.³⁹

34 Government of Canada, [Water governance and legislation: shared responsibility](#).

35 Government of Canada, [The constitutional distribution of legislative powers](#).

36 The Government of Canada explains devolution on its web page [Provinces and Territories](#):

There is a clear constitutional distinction between provinces and territories. While provinces exercise constitutional powers in their own right, the territories exercise delegated powers under the authority of the Parliament of Canada.

Historically, this authority has meant that the North was largely governed by federal officials. However, over the past 40 years, major changes have occurred in the governance of the territories. Federal statutes have established a legislative assembly and executive council for each territory and province-like powers are increasingly being transferred or “devolved” to territorial governments by the Government of Canada. This process, known as “devolution,” provides greater local decision-making and accountability.

37 Government of Canada, [Yukon devolution](#); Government of Canada, [Northwest Territories devolution](#).

38 Government of Canada, [Northwest Territories Devolution—Delegated Authorities Before and After Devolution](#).

39 Government of Canada, [Nunavut devolution](#).



c) Interpretation Through the Courts

While the heads of power listed in the *Constitution Act, 1867* were historically considered distinct from each other,⁴⁰ Canadian courts now recognize that there can be legitimate overlap between them.⁴¹ Complex statutes often address many interrelated policy issues. When courts are called upon to decide whether a legislature or government has acted outside of its constitutional authority, they may seek to determine the dominant purpose, main thrust, or “pith and substance” of a law. This can help the courts determine whether the law falls within federal or provincial jurisdiction. In some cases, there can be valid federal and provincial legislation dealing with different aspects of the same subject.⁴² Environmental legislation can be particularly challenging to categorize within the enumerated heads of power. The Supreme Court of Canada has repeatedly recognized that the environment “does not comfortably fit within the existing division of powers without considerable overlap and uncertainty”⁴³ due to its “pervasive and diffuse nature.”⁴⁴

B. How the Federal Government Exercises its Jurisdiction Over Freshwater

Environment and Climate Change Canada (ECCC), the lead federal department on the management of freshwater, provides the following overview of the federal government’s role in relation to freshwater:

When it comes to water governance in Canada, the federal government has jurisdiction related to fisheries, navigation, federal lands, and international relations, including responsibilities related to the management of boundary waters shared with the United States, including relations with the International Joint Commission.⁴⁵ It also has significant responsibilities for agriculture, health and the environment, and plays a significant role supporting aquatic research and technology, and ensuring national policies and standards are in place on environmental and health-related issues.

To fully understand the federal government’s role in water management in Canada, it is important to first understand the interests and mandates of the departments involved

40 [*Canada \(Attorney General\) / Ontario \(Attorney General\)*](#), 1937 CanLII 362 (UK JCPC).

41 [*R. v. Big M Drug Mart Ltd.*](#), [1985] 1 SCR 295, para. 154; [*R. v. Hydro-Québec*](#), [1997] 3 SCR 213, para. 113; and [*References re Greenhouse Gas Pollution Pricing Act*](#), 2021 SCC 11, para. 51.

42 [*Canadian Western Bank v. Alberta*](#), 2007 SCC 22, para. 30.

43 [*Friends of the Oldman River Society v. Canada \(Minister of Transport\)*](#), [1992] 1 SCR 3.

44 [*R. v. Hydro-Québec*](#), [1997] 3 SCR 213, paras. 86 and 112.

45 The International Joint Commission is discussed below.

in program delivery. Within the federal government, over 20 departments and agencies have unique responsibilities for freshwater. As all levels of government hold key policy and regulatory levers which apply to water management, a central challenge is to ensure that these levers are developed and used collaboratively.⁴⁶

Having over 20 federal departments and agencies with some responsibility for water was described as overly fragmented and confusing to navigate by some witnesses during the Committee's study.⁴⁷ However, it was also acknowledged that because water is critical to so many facets of life, society, and the economy, its governance is necessarily relevant to the mandates of many departments.⁴⁸ Furthermore, there is overlap between the applicable heads of power assigned through the *Constitution Act, 1867*, the mandates of federal departments and agencies, and the laws that departments and agencies administer. The main areas of responsibility for each department and agency in relation to freshwater, including the legislative bases for these, are summarized in Table 3. For more information, Appendix A contains Environment and Climate Change Canada's description of the breadth of activities undertaken by federal entities with unique responsibilities for freshwater.

Table 3—Key Roles of Federal Departments and Agencies with Selected Responsibilities Related to Freshwater

Department or Agency	Key Roles Related to Freshwater
Agriculture and Agrifood Canada	Researches, develops, and promotes the sustainable management of water resources on farms, including through funding programs.
Canada Border Services Agency	Through border inspections, fulfills obligations of the <i>Aquatic Invasive Species Regulations</i> under the <i>Fisheries Act</i> .
Canadian Coast Guard (a special operating agency within the Department of National Defence)	Administers the ship-source marine pollution response regime pursuant to the <i>Canada Shipping Act, 2001</i> .
Crown-Indigenous Relations and Northern Affairs Canada	Has water management responsibilities in Nunavut, and some water management responsibilities in the Northwest Territories and Yukon, as per the <i>Department of Crown-Indigenous Relations and Northern Affairs Act</i> ,

46 Government of Canada, [Water governance: federal policy and legislation](#).

47 ENVI, [Evidence](#), 1 February 2024, 1725 (John Pomeroy); ENVI, [Evidence](#), 30 November 2023, 1300 (Marc Hudon, Member, Forum for Leadership on Water); ENVI, [Evidence](#), 12 December 2023, 1245 (Mathieu Madison, President of the Board of Directors, Regroupement des organismes de bassins versants du Québec); ENVI, [Evidence](#), 11 June 2024, 1740 (Brendan Mulligan, Senior Scientist, Groundwater, Water Resources, Department of Environment, Government of Yukon).

48 ENVI, [Evidence](#), 13 February 2024, 1645 (Aislin Livingstone, Program Manager, DataStream).



Department or Agency	Key Roles Related to Freshwater
	<i>Northwest Territories Act, Mackenzie Valley Resource Management Act, Nunavut Planning and Project Assessment Act, Nunavut Waters and Nunavut Surface Rights Tribunal Act, Arctic Waters Pollution Prevention Act, and Dominion Water Power Act.</i>
Environment and Climate Change Canada	Is the lead federal department on water matters not assigned to other departments as per the <i>Department of Environment Act</i> ; is responsible for water pollution prevention under the <i>Canadian Environmental Protection Act, 1999</i> , the pollution prevention provisions of the <i>Fisheries Act</i> , and the <i>Migratory Birds Convention Act, 1994</i> ; and has responsibilities related to the <i>International River Improvements Act</i> .
Fisheries and Oceans Canada	Is responsible for the protection of freshwater fish and fish habitat as per the <i>Fisheries Act</i> and <i>Species at Risk Act</i> .
Global Affairs Canada	Is responsible for treaties, agreements, and cooperation between Canada and the United States on transboundary waters.
Health Canada	Is responsible for the Guidelines for Canadian Drinking Water Quality, developed through the Federal-Provincial-Territorial Committee on Drinking Water; also has pollution prevention responsibilities as per the <i>Canadian Environmental Protection Act, 1999</i> .
Impact Assessment Agency of Canada	Is responsible for impact assessments of projects involving freshwater, as per the <i>Impact Assessment Act</i> .
Indigenous Services Canada	Provides funding for water and wastewater systems in First Nations communities and is responsible for source water protection on reserves.
Infrastructure Canada	Manages funds for water and wastewater infrastructure.
Innovation, Science and Economic Development Canada	Manages funding programs related to water technology and Canada's Regional Development Agencies.
National Research Council Canada	Conducts freshwater research and develops national model codes (e.g., model building codes) relevant to water use in buildings.
Natural Resources Canada	Is the lead department on groundwater quantity and mapping; is responsible for flood hazard identification and mapping; and regulates the water flow of certain energy-using products under the <i>Energy Efficiency Act</i> .
Parks Canada Agency	Is responsible for the protection of waters and aquatic species at risk in national parks and marine conservation areas.
Public Safety Canada	Is responsible for flood response and recovery as per the <i>Emergency Management Act</i> .
Statistics Canada	Collects and provides freshwater statistics and data.

Department or Agency	Key Roles Related to Freshwater
Transport Canada	Protects navigable waters (<i>Canadian Navigable Waters Act</i>); is responsible for water pollution prevention and response as per the <i>Canada Shipping Act, 2001</i> , certain international marine conventions, the <i>Arctic Waters Pollution Prevention Act</i> , and the <i>Wrecked, Abandoned or Hazardous Vessels Act</i> .
Department of National Defence	Helps respond to domestic emergencies like floods.
Canadian Space Agency	Provides earth observation satellite data.
Natural Science and Engineering Research Council	Manages research grant funding related to freshwater.
Public Health Agency of Canada	Is involved in the <i>Canada-Quebec Agreement on the St. Lawrence</i> and some monitoring of disease in water and wastewater.

Sources: Prepared by the Library of Parliament based on: Department of Agriculture and Agri-Food, Written response to questions from ENVI, 13 August 2021; Department of Crown-Indigenous Relations and Northern Affairs, Written response to questions from ENVI, 2021; Department of the Environment, Written response to questions from ENVI, 9 July 2021; Department of Fisheries and Oceans, Written response to questions from ENVI, 2021; Department of Foreign Affairs, Trade and Development, Written response to questions from ENVI, 2023; Department of Indigenous Services, Written response to questions from ENVI, 2021; Office of Infrastructure Canada, Written response to questions from ENVI, 22 June 2021; Department of Industry, Written response to questions from ENVI, 2021; Department Natural Resources, Written response to questions from ENVI, 2021; Department of Public Safety Canada, Written response to questions from ENVI, 21 June 2021; Department of Transport, Written response to questions from ENVI, 2021; [*Canada-Quebec Agreement on the St. Lawrence*](#); [*Canada Shipping Act, 2001*](#), S.C. 2001, c. 26; [*Canadian Navigable Waters Act*](#), R.S.C., 1985, c. N-22; [*Arctic Waters Pollution Prevention Act*](#), R.S.C., 1985, c. A-12; [*Wrecked, Abandoned or Hazardous Vessels Act*](#), S.C. 2019, c. 1; [*Emergency Management Act*](#), S.C. 2007, c. 15; [*Energy Efficiency Act*](#), S.C. 1992, c. 36; [*Impact Assessment Act*](#), S.C. 2019, c. 28, s. 1; [*Canadian Environmental Protection Act, 1999*](#), S.C. 1999, c. 33; [*Species at Risk Act*](#), S.C. 2002, c. 29; [*Fisheries Act*](#), R.S.C., 1985, c. F-14; [*Migratory Birds Convention Act, 1994*](#), S.C. 1994, c. 22; [*International River Improvements Act*](#), R.S.C., 1985, c. I-20; [*Department of Environment Act*](#), R.S.C., 1985, c. E-10; [*Dominion Water Power Act*](#), R.S.C., 1985, c. W-4; [*Nunavut Waters and Nunavut Surface Rights Tribunal Act*](#), S.C. 2002, c. 10; [*Department of Crown-Indigenous Relations and Northern Affairs Act*](#), S.C. 2019, c. 29, s. 337; [*Northwest Territories Act*](#), S.C. 2014, c. 2, s. 2; [*Mackenzie Valley Resource Management Act*](#), S.C. 1998, c. 25; [*Nunavut Planning and Project Assessment Act*](#), S.C. 2013, c. 14, s. 2; Environment and Climate Change Canada, [*Toward the Creation of a Canada Water Agency: Discussion Paper*](#), pp. 8–11; departmental websites.



1) *Constitution Act, 1982 and the Inherent Right of Self-Government*

When considering jurisdiction and water in Canada, it is important to note that section 35(1) of the *Constitution Act, 1982* recognizes and affirms the “existing aboriginal and treaty rights” of First Nations, Inuit, and Métis peoples.⁴⁹ The inherent right of self-government is recognized as a section 35 right.⁵⁰ As the Centre for First Nations Governance has written: “[t]he inherent right of self-government that we have today in Canadian law comes from the sovereignty we exercised prior to contact with Europeans. It is inherent because it existed before European colonization and the imposition of Euro-Canadian law.”⁵¹ In addition to the recognition of Indigenous rights under the Constitution, Canada is also a signatory to the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP),⁵² which it formally endorsed in 2010.⁵³ In 2021, Parliament passed the *United Nations Declaration on the Rights of Indigenous Peoples Act*⁵⁴ to “affirm the Declaration as a universal international human rights instrument with application in Canadian law” (section 4(a)) and “provide a framework for the Government of Canada’s implementation of the Declaration” (section 4(b)). The Government of Canada’s *United Nations Declaration on the Rights of Indigenous Peoples Act: Action Plan*⁵⁵ (Action Plan) was released in June 2023. The Action Plan sets out a number of priorities, some of which relate to all Indigenous peoples in Canada (“cross-cutting priorities”) and some of which are written specifically for either First Nations, Inuit or Métis peoples. In addition to broad priorities relating to rights to self-determination and self-government, one of the priority areas of the Action Plan specifically relates to lands, territories, and resources:⁵⁶

The goal of [the lands, territories, and resources] priority area is to ensure a Canada where:

49 [Constitution Act, 1982](#), s. 35.

50 Government of Canada, “[Part I—Policy Framework: The Inherent Right of Self-Government is a Section 35 Right](#),” *The Government of Canada’s Approach to Implementation of the Inherent Right and the Negotiation of Aboriginal Self-Government*.

51 Centre for First Nations Governance, [Our Inherent Rights](#).

52 Government of Canada, [United Nations Declaration on the Rights of Indigenous Peoples](#), Resolution 61/295 adopted by the United Nations General Assembly on 13 September 2007.

53 Government of Canada, News Release, “[Canada Endorses the United Nations Declaration on the Rights of Indigenous Peoples](#),” 12 November 2010.

54 [United Nations Declaration on the Rights of Indigenous Peoples Act](#), S.C. 2021, c. 14.

55 Government of Canada, [The United Nations Declaration on the Rights of Indigenous Peoples Act: Action Plan](#), 2023.

56 Ibid.

- Indigenous peoples exercise and have full enjoyment of their inherent rights, including the right to own, use, develop and control lands and resources within their territories.
- Indigenous jurisdiction over lands and resources is fully exercised and respected, including through processes for harmonization where necessary.
- The Government of Canada fully respects Indigenous title and rights, and the sacred relationship and responsibilities of Indigenous peoples to their lands, waters and resources, including through its laws, policies and practices.⁵⁷

Since the Committee heard testimony as part of this study, the Government of Canada has published two progress reports on the implementation of UNDRIP.⁵⁸

C. Indigenous Involvement in Water Governance, Including Co-Management

In its brief to the Committee, the Assembly of First Nations noted some of the challenges that may prevent Indigenous people from being meaningfully involved in freshwater governance:

The current multi-jurisdictional freshwater authority between First Nations, and the federal, provincial, and territorial governments is complex. While water flows through many First Nations' territorial boundaries, there exist multiple challenges for First Nations that consist of jurisdictional fragmentation, lack of recognized authority, decision-maker status, and a lack of state governmental or industry accountability on freshwater protection. These challenges result in water protection gaps, poor sharing of information, a disconnect between diverse policies and programs, and difficulties in water monitoring and regulations.^[59] Overall, there remain challenges to ensuring the full and meaningful participation of First Nations in decision-making processes related to water.⁶⁰

To increase the involvement and influence of Indigenous people and their governance approaches on water in Canada, some witnesses encouraged the idea of Indigenous co-

57 Government of Canada, [*The United Nations Declaration on the Rights of Indigenous Peoples Act: Action Plan, 2023*](#), p. 33.

58 Government of Canada, [*Third annual progress report on implementation of the United Nations Declaration on the Rights of Indigenous Peoples Act*](#), June 2024; Government of Canada, [*Fourth annual progress report on implementation of the United Nations Declaration on the Rights of Indigenous Peoples Act*](#), August 2025.

59 Karen Bakker and Christina L. Cook, "[*Water Governance in Canada: Innovation and Fragmentation*](#)," *International Journal of Water Resources Development*, 2011, 27, pp. 275–289.

60 Assembly of First Nations, [*Brief submitted to ENVI*](#), 23 November 2023, p. 2.



governance of natural resources such as water.⁶¹ Others promoted the process of “co-development,” which was described by the Centre for Indigenous Environmental Resources:

In the context of Indigenous-Crown relations, ‘co-development’ is used to describe a collaborative process of designing and developing legislative, program, and policy initiatives undertaken by the Government of Canada and provincial and territorial governments in partnership with Indigenous nations. Parties engaged in co-development work together on the matter at hand (such as a plan, policy, or law) throughout the entire development process, crafting acceptable options, until mutual agreement is reached on a final version. Co-development is an important tool under the framework of collaborative governance. Recent examples at the federal level include co-development of federal Indigenous fiscal policies, the *Indigenous Languages Act*, and the *First Nations Clean Water Act*.⁶²

Co-development of legislation or policy can be contrasted by a situation in which a government first develops legislation or a policy, then consults Indigenous groups afterwards. Indigenous groups require capacity and resources to engage in co-development or in co-governance of shared waters. Andrew Stegemann (Former National Director, Our Living Waters, As an Individual) emphasized the federal government’s responsibilities as follows:

First, the Government of Canada should meaningfully advance its commitment to reconciliation with [I]ndigenous peoples by developing pathways and providing resources for the co-governance of shared waters with [I]ndigenous nations, including recognizing and upholding inherent [I]ndigenous water rights and authority, and fulfilling the Truth and Reconciliation Commission's calls to action and the United Nations Declaration on the Rights of Indigenous Peoples.⁶³

61 E.g., ENVI, [Evidence](#), 21 November 2023, 1210 (Andrew Stegemann, Former National Director, Our Living Waters, As an individual); ENVI, [Evidence](#), 21 November 2023, 1155 (Jesse Zeman, Executive Director, B.C. Wildlife Federation); ENVI, [Evidence](#), 21 November 2023, 1120 (Wyatt Petryshen, Science Policy Advisor, Wildsight).

62 Centre for Indigenous Environmental Resources, [Brief submitted to ENVI](#), 7 February 2024.

63 ENVI, [Evidence](#), 21 November 2023, 1210 (Andrew Stegemann).

Water is of spiritual significance to Indigenous peoples, and is often referred to as “sacred.”⁶⁴ Increased Indigenous governance of water in Canada could support implementation of UNDRIP and could further reconciliation.

Recommendation 1

That the Government of Canada centre Indigenous governance in freshwater management and policies.

D. Canada–United States Transboundary Co-operation Related to Freshwater

“[W]here water flows over borders, border-blind management must follow.”⁶⁵

Gregory McClinchey, Director,
Policy and Legislative Affairs, Great Lakes Fishery Commission

Canada and the United States share so many transboundary waters (figure 1) that the border between the two countries has been referred to as “the fourth coast.”⁶⁶ Environment and Climate Change Canada frames the significance of international transboundary water management as follows:

Canada and the United States share many waterways, from the Great Lakes, which are among the world’s largest bodies of freshwater, to rivers that mark or cross the border between the two countries. These transboundary basins are home to the majority of the Canadian population, with much of the economy directly dependent on the industrial, agricultural, transportation, and recreational benefits these water resources bring. Decisions made within the water basins of one country can have consequences for the other. This places a premium on effective governance institutions for both countries.⁶⁷

64 Standing Committee on Indigenous and Northern Affairs (INAN), [Evidence](#), 19 June 2024, 1725 (Dr. Dawn Martin-Hill, Full Professor, Indigenous Studies Department, McMaster University, As an Individual); ENVI, [Evidence](#), 7 December 2023, 1300 (Andrew Stegemann); ENVI, [Evidence](#), 24 April 2023, 1110 (Chief Gerald Antoine, Dene National Chief, Regional Chief, Assembly of First Nations, Northwest Territories, Dene Nation).

65 ENVI, [Evidence](#), 15 February 2024, 1700 (Gregory McClinchey, Director, Policy and Legislative Affairs, Great Lakes Fishery Commission).

66 Ibid.

67 Environment and Climate Change Canada, [Water governance and legislation: international](#).



Merrell-Ann Phare, Commissioner for the Canadian Section of the International Joint Commission, an organization created by Canada and the United States for the management of their shared waters, further emphasized that “[a]n effective relationship with the U.S. is imperative to any Canadian approach to freshwater management. An estimated 80% of the Canadian population lives in Canada-U.S. shared watersheds. These transboundary waters are also the traditional territories of many [F]irst [N]ations, Métis and tribal nations.”⁶⁸

Figure 1—Map Indicating Drainage Basins Located Along the Canada–United States Border



Notes: Canada–United States transboundary drainage basins are indicated in yellow.

A drainage basin is an area of land that drains all precipitation received into a particular river or set of rivers (Open Government, [Drainage Basins](#)).

Source: Government of Canada, [Water governance and legislation: international](#).

E. Examples of Interjurisdictional Cooperation on Water

Governance of water across borders or across levels of government presents challenges. For example, in its brief to the Committee, the Mining Association of Canada expressed that the overlap of responsibilities for water between federal and provincial

⁶⁸ ENVI, [Evidence](#), 15 February 2024, 1540 (Merrell-Ann Phare, Commissioner, International Joint Commission, Canadian Section).

governments can be problematic for its members, with mine operators sometimes receiving “conflicting directives” from the two levels of government.⁶⁹

The Committee heard about examples of successful interjurisdictional (e.g., international, interprovincial, and regional) water management. For instance, the European Union’s Water Framework Directive,⁷⁰ enacted in 2000, establishes a framework for water protection, but allows European Union Member States to adopt measures of their choosing to achieve the objectives of the directive.⁷¹ The examples presented below were discussed in detail by witnesses and offer suggested good practices that could be applied to Canada’s national water governance, including to the new Canada Water Agency.⁷²

1) Prairie Provinces Water Board

The Prairie Provinces Water Board consists of federal and provincial representatives who manage the flow of water through the three prairie provinces, as well as its quality.⁷³ Nadine Stiller (Chair, Prairie Provinces Water Board) explained the need for cooperation on water allocation between Alberta, Saskatchewan, and Manitoba, along with the history of the Prairie Provinces Water Board:

In the Prairies, water generally flows eastward from the Rockies in Alberta through Saskatchewan to Manitoba before draining into Lake Winnipeg and Hudson Bay. Managing water effectively across the Prairies is critical for both economic prosperity and the well-being of its residents, including a significant [I]ndigenous population. This unique system relies heavily on snow-melt runoff, so precipitation variability makes the region highly susceptible to extreme conditions like droughts and floods. Droughts that are long lasting after multiple years pose the greatest challenge. Climate change is intensifying these variations, making strong interjurisdictional collaboration essential.

69 Mining Association of Canada, [Brief submitted to ENVI](#), 7 May 2021.

70 ENVI, [Evidence](#), 23 November 2023, 1210 (Julian Aherne, Associate Professor, School of Environment, Trent University).

71 European Union, EUR-Lex, [Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy](#), Official Journal No. L 327, 22 December 2000, pp. 1–72.

72 The Canada Water Agency was created by the Government of Canada to “work together with the provinces, territories, Indigenous communities, local authorities, scientists, and others to keep our water safe, clean and well-managed” and is discussed in more detail in a subsequent chapter of this report. (Government of Canada, [Canada Water Agency](#)).

73 ENVI, [Evidence](#), 5 December 2023, 1310 (Wanda McFadyen, Executive Director, Assiniboine River Basin Initiative); ENVI, [Evidence](#), 30 January 2024, 1800 (Shawn Jaques, President and Chief Executive Officer, Water Security Agency).



The Prairie Provinces Water Board was established in 1948 by the three provinces and the federal government. However, by the 1960s, the growing water demands from provinces indicated the need for a more robust system. In 1969, the master agreement on apportionment was established, and the board focused on the equitable sharing of transboundary waters in the Prairies. While it has no enforcement mechanism, the agreement is a powerful instrument that fosters co-operation, enables dispute resolution between provinces and has proven its function for over 50 years.⁷⁴

Nadine Stiller explained the three factors to which she attributes the Prairie Provinces Water Board's success:

First, the master agreement on apportionment commits provinces to a fair portioning of water, protecting both water quantity and quality. Provinces benefit from long-term planning certainty through knowing their water allocation and responsibilities.

Second, consensus-based decision-making allows issues to be addressed before they escalate into conflicts.

Third, the board, comprised of senior water resource officials, fosters collaboration across similar mandates and shared goals with equal decision-making power.⁷⁵

2) The International Joint Commission

The International Joint Commission (IJC) “is a binational, impartial organization that is mandated by the governments of Canada and the U.S., through the [*Boundary Waters Treaty*] of 1909, to work toward the prevention and resolution of disputes in shared waters along the boundary.”⁷⁶ Merrell-Ann Phare, Commissioner, International Joint Commission, Canadian Section, outlined the model by which the IJC operates:

It's important for you to know that IJC commissioners, while we're appointed by the Prime Minister and President respectively, we do not take direction from our respective governments when we make decisions. We work as a commission to find consensus and identify solutions that are in the best interest of both countries. With that, though, we operate by the mandates given to us from the governments. The scope of our work is defined by our governments. Our conclusions are based on the best available science and informed by the knowledge and networks of hundreds of experts and local citizens on binational boards and committees. We develop a common binational fact base and

74 ENVI, [Evidence](#), 18 April 2024, 1535 (Nadine Stiller, Chair, Prairie Provinces Water Board).

75 Ibid.

76 ENVI, [Evidence](#), 15 February 2024, 1540 (Merrell-Ann Phare).

then propose options in the best interest of shared waters. It's a model that has served us well for 115 years.⁷⁷

Global Affairs Canada (GAC) further explained the significance of the IJC's work for transboundary water management:

Through its Boards of Control, the IJC oversees the operation of dams and diversions in the Great Lakes and other transboundary watersheds for which an IJC approval was required and given. The role of the Commission has evolved over time through "references" from the Governments of Canada (on which GAC leads) and the U.S. Through these references, Governments request the Commission to study issues and make recommendations. If Governments accept the recommendations, then the IJC implements them. The Commission has also taken on the roles given to it by the Canadian and U.S. governments under the [*Canada-U.S. Air Quality Agreement*] (signed in 1991) and the [Great Lakes Water Quality Agreement] (GLWQA), which dates from 1972 and was most recently amended in 2012. The GLWQA recognizes the shared natural values of the transboundary watershed and commits to maintaining and restoring the "chemical, physical, and biological" integrity of the water.⁷⁸

Although it is a formal international organization, the IJC also engages with groups active at the local watershed level. For example, through its International Watersheds Initiative, the IJC works at the local watershed level, in collaboration with state, provincial and Indigenous governments, "to create transboundary collaboration for the best interests of the shared waters."⁷⁹ The relative independence of the IJC, with its science- and consensus-based model, stand out as features of the IJC.⁸⁰

3) Great Lakes Fishery Commission

Another example of successful interjurisdictional cooperation on freshwater is the Great Lakes Fishery Commission (the Commission). The Commission was established by the 1954 *Convention on Great Lakes Fisheries*,⁸¹ which was signed by Canada and the United States. The Commission was formed when, "due to human activities, threats were multiplying and damaging the Great Lakes ecosystem/economy, and provincial, state,

77 Ibid.

78 Global Affairs Canada, Written response to questions from ENVI, 2024, pp. 6–8.

79 ENVI, *Evidence*, 15 February 2024, 1555 (Merrell-Ann Phare).

80 Ibid., 1540.

81 Great Lakes Fishery Commission, *Convention on Great Lakes Fisheries between the United States of America and Canada*.



and national governments were mired in jurisdictional silos.”⁸² The Commission was assigned responsibility to achieve the following:

- To help the various regulatory and management agencies work together;
- To formulate and drive a freshwater science program upon which to base healthy ecosystem and fishery management decisions; and
- To formulate and deliver invasive species control. For example, sea lamprey, an invasive predator, was ravaging Great Lakes fish stock hence requiring coordinated mitigation as all pre-treaty control efforts had failed.⁸³

The Commission’s submitted brief describes its success in reducing Canada-U.S. conflicts over water and in improving resource management:

By considering Great Lakes problems in a holistic manner, success was finally attained for all involved. The Commission’s sea lamprey control program is the only example of any marine vertebrate being successfully controlled on an ecosystem-wide basis in the world. None of this would have been possible without sustained binational cooperation—prompted by the Commission - involving the Province of Ontario, the Great Lakes States, Indigenous governments, and the federal governments of Canada and the US.⁸⁴

Gregory McClinchey (Director, Policy and Legislative Affairs, Great Lakes Fishery Commission) observed a difference in the Canadian and U.S. approaches to water and foreign policy, suggesting that Canada does not view water as a foreign policy matter in the same way as the United States does. He explained that the Great Lakes Fishery Commission interfaces with the Department of State in the United States but, in Canada, it does not interface with the equivalent department, Global Affairs Canada. Instead, it interfaces with Fisheries and Oceans Canada. In Mr. McClinchey’s view, “[w]e can’t afford to view boundary waters as just domestic resources because our trading partners [the United States] see them through a foreign policy lens... It’s a matter of priority.” Moving overall Canadian responsibility for the Great Lakes Fishery Commission to Global Affairs Canada has been discussed over the years, and when asked about it by a committee member, Mr. McClinchey elaborated:

82 Great Lakes Fishery Commission, [Brief submitted to ENVI](#), 7 May 2021.

83 Ibid.

84 Ibid.

In the United States, we are structured. We have an interface into government, so we interface with the U.S. Department of State. Congress appropriates money to the State Department, the State Department exchanges financial accountability and dollars with us, and then we work with partners across the spectrum to execute our programming. That works very well and has allowed multiple partnerships to spring up over the years that have saved the Government of the United States and the various state governments millions and even hundreds of millions of dollars.

In Canada, it's slightly different. We have an interface where Parliament appropriates money to the Department of Fisheries and Oceans, and then the discussion goes between us and the Department of Fisheries and Oceans. The nuance there is that we also contract with the Department of Fisheries and Oceans, which has created some challenges and some barriers to those partnerships. In order to remedy that conflict of interest and certainly to allow partnerships to expand more broadly, we've recommended a mirror process to that in the United States, where we would be nested within Global Affairs Canada, interface with them on budget accountability and all of those kinds of things, and still work hand in glove with the Department of Fisheries and Oceans and the other partnerships that spring out of that.⁸⁵

The Committee notes that, subsequent to this testimony, in May 2024, the House of Commons Standing Committee on Foreign Affairs and International Development tabled a report recommending that the Government “transfer[...] responsibility for the Great Lakes Commission to Global Affairs Canada.”⁸⁶ The 16 September 2024 government response to that report states that the “Government of Canada notes its intent to transfer ministerial responsibilities associated with the [Great Lakes Fishery Commission] to the Minister of Foreign Affairs.”⁸⁷ On 6 November 2024, the Government of Canada transferred responsibility for the Great Lakes Fishery Commission to the Minister of Foreign Affairs by Order in Council.⁸⁸

F. Conclusion: Shared Jurisdiction

The Committee heard from many witnesses and authors of briefs about the need for all involved parties to work together to manage freshwater in Canada. The Committee sees an opportunity to make shared jurisdiction over water a strength of the Canadian system of government rather than a liability. Municipalities, Indigenous governments, provinces

85 ENVI, *Evidence*, 15 February 2024, 1720 (Gregory McClinchey).

86 House of Commons Standing Committee on Foreign Affairs and International Development, Report 26, *Governance of the Great Lakes Fishery Commission*, 10 May 2024.

87 Government of Canada, *Government Response to the Twenty-Sixth Report of the Standing Committee on Foreign Affairs and International Development*, 16 September 2024.

88 *Order Transferring from the Minister of Fisheries and Oceans to the Minister of Foreign Affairs the Powers, Duties and Functions in Relation to the Great Lakes Fishery Commission*, SI/2024-52.



and territories, the federal government, and all stakeholders must work collaboratively and cooperatively and have a forum in which to communicate about shared freshwater concerns. The Committee encourages the Canada Water Agency to learn from the good practices of successful models of interjurisdictional cooperation, such as the Prairie Provinces Water Board, the International Joint Commission and the Great Lakes Fishery Commission.

Recommendation 2

That the Government of Canada recognize the complexity of water management, necessitating the inclusion of all water stakeholders in discussions; that it prioritize breaking down silos and fostering innovation to enhance collaboration among stakeholders; and that it align water issue objectives with stakeholders' specific realities to effectively mobilize engagement.

Recommendation 3

That the Government of Canada create an intergovernmental water round table chaired by the federal environment minister that includes Indigenous representatives, representatives of provincial and territorial governments, and representatives of the Federation of Canadian Municipalities and the Canada Water Agency to outline water-related priorities for the country on an evolving basis.

3. WATER AND RIGHTS

During its study on freshwater, the Committee heard about the human right to water as contained in various international agreements, about Indigenous peoples' inherent right to water, and about the rights of water itself. These topics are discussed in the sections that follow.

A. The Human Right to Water

The human right to water has been considered by international bodies over several decades and enshrined in certain international agreements; this section provides background about such discussions and decisions.

The universal right to safe and clean drinking water was first recognized by the United Nations (UN) General Assembly on 28 July 2010,⁸⁹ in a resolution on which Canada

89 UN General Assembly (UNGA), "[The human right to water and sanitation](#)," A/RES/64/292, 28 July 2010.

abstained.⁹⁰ The resolution recognized “the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights.”⁹¹ It also called upon States

to provide financial resources, capacity-building and technology transfer, through international assistance and cooperation, in particular to developing countries, in order to scale up efforts to provide safe, clean, accessible and affordable drinking water and sanitation for all.⁹²

In September 2010, the UN Human Rights Council affirmed that the right to safe and clean drinking water derives from the right to an adequate standard of living and is inextricably linked to other binding human rights, such as the right to life.⁹³

In 2013, a resolution affirming the human right to safe drinking water and sanitation passed at the UN Human Rights Council. A subsequent 2013 UN General Assembly resolution “reaffirming” the human right to safe drinking water and sanitation passed with consensus—that is, with no abstentions or absences—indicating, according to law professor Karen Busby, that it might “help establish the customary right to water and sanitation as part of a legally binding international human rights law framework.”⁹⁴

According to the Office of the High Commissioner of Human Rights, since 2015, the General Assembly and the UN Human Rights Council have recognized both the right to safe drinking water and the right to sanitation as closely related, but distinct, human rights.⁹⁵

Canada has ratified several UN human rights treaties that contain specific obligations relating to water. The *Convention on the Rights of the Child* recognizes the right of all children to the highest attainable standard of health, and requires that member states take appropriate measures to implement this right, including through the provision of clean drinking water.⁹⁶ The *Convention on the Elimination of All Forms of Discrimination against Women* recognizes that women in rural areas have the right to adequate water

90 UN General Assembly, [General Assembly official records, 64th session: 108th plenary meeting](#), 28 July 2010.

91 UN General Assembly, [“The human right to water and sanitation,” A/RES/64/292](#), 28 July 2010.

92 Ibid.

93 UN Human Rights Council, [“Human rights and access to safe drinking water and sanitation,” A/HRC/RES/15/9](#), 30 September 2010.

94 Karen Busby, [“Troubling Waters: Recent Developments in Canada on International Law and the Right to Water and Sanitation,” Canadian Journal of Human Rights](#), 2016, 5:1, p. 11.

95 Office of the UN High Commissioner for Human Rights, [About water and sanitation](#).

96 UN, [Convention on the Rights of the Child](#), 20 November 1989, article 24.



supply.⁹⁷ The *Convention on the Rights of Persons with Disabilities* requires that member states take appropriate steps to ensure equal access by persons with disabilities to clean water services.⁹⁸

Finally, Canada has affirmed the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP) “as a universal international human rights instrument with application in Canadian law” and, in passing the UNDRIP Act, which became law on 21 June 2021, has provided “a framework for the Government of Canada’s implementation of the Declaration.”⁹⁹ UNDRIP recognizes that:

Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.”¹⁰⁰

It also requires States to cooperate in good faith with Indigenous peoples “in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.”¹⁰¹

In a 2016 analysis, Karen Busby explained the importance of recognizing human rights:

[T]he recognition of a human right in international law requires states to adopt action plans towards the protection and progressive realization of the right, prioritize the needs of the most marginalized and disadvantaged and give human rights priority over other considerations, such as economic development.¹⁰²

Although Canada’s obligations under international treaties are not directly enforceable in Canadian law, when interpreting legislation, courts will generally presume that

97 UN, *Convention on the Elimination of All Forms of Discrimination against Women*, 18 December 1979, article 14.

98 Ibid., Article 28.

99 *United Nations Declaration on the Rights of Indigenous Peoples Act*, S.C. 2021, c. 14, s. 4.

100 *United Nations Declaration on the Rights of Indigenous Peoples*, 13 September 2007, article 25.

101 Ibid., article 32.

102 Karen Busby, “*Troubling Waters: Recent Developments in Canada on International Law and the Right to Water and Sanitation*,” *Canadian Journal of Human Rights*, 2016, 5:1, p. 5.

Parliament intended to enact legislation that is consistent with Canada's international obligations.¹⁰³

On 13 June 2023, Bill S-5, An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act (short title: Strengthening Environmental Protection for a Healthier Canada Act)¹⁰⁴ received Royal Assent, becoming law. Bill S-5 included amendments such that the Government of Canada now recognizes that every individual in Canada has a right to a healthy environment as provided under the *Canadian Environmental Protection Act, 1999* (CEPA). The Government of Canada now also has a duty to protect the right to a healthy environment when making decisions under CEPA. According to the Act, "healthy environment" means an environment that is clean, healthy and sustainable.¹⁰⁵

On 2 December, 2024, Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands (short title: First Nations Clean Water Act),¹⁰⁶ was adopted at the House of Commons Standing Committee on Indigenous and Northern Affairs (INAN) committee and referred back to the House of Commons for Third Reading prior to the dissolution of the 44th Parliament.¹⁰⁷ According to the summary of the bill, it

affirms that the inherent right to self-government, recognized and affirmed by section 35 of the *Constitution Act, 1982*, includes the jurisdiction of First Nations in relation to water, source water, drinking water, wastewater and related infrastructure on, in and under First Nation lands. It sets out principles, such as substantive equality, to guide the provision for First Nations of clean and safe drinking water and the effective treatment and disposal of wastewater on First Nation lands. It provides for minimum standards for water quality and quantity and

103 See Laura Barnett, *Canada's Approach to the Treaty-Making Process*, Library of Parliament, Publication No. 2008-45-E, 1 April 2021.

104 LEGISinfo, [Bill S-5, An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act \(short title: Strengthening Environmental Protection for a Healthier Canada Act\)](#).

105 Ibid.

106 LEGISinfo, [Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands \(short title: First Nations Clean Water Act\)](#).

107 Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands, subsequently died on the *Order Paper* when the 44th Parliament dissolved.



wastewater effluent. It also provides pathways to facilitate source water protection.¹⁰⁸

B. Indigenous Peoples' Inherent Rights to Water

The Committee also heard from several witnesses specifically about Indigenous peoples' inherent rights to water and the importance of upholding these rights.¹⁰⁹ This topic is touched on here and discussed further in the chapter on Indigenous Peoples and Considerations Related to Water.¹¹⁰

Chief Billy-Joe Tuccaro (Mikisew Cree First Nation) summarized the Mikisew Cree relationship with water and their treaty with Canada, noting the importance of water for the expression of their inherent rights:

For as long as the sun shines, grass grows and the rivers flow— this is what we were promised in Treaty 8. It was understood by our ancestors that this [treaty] was about the spirit and intent to recognize a nation- to-nation relationship. Our way of life and who we are as Mikisew people depend on water for all aspects of our traditional cultural inherent rights. It connects us to our ancestors. It is what connects us as human beings. For us, water is boss.¹¹¹

Joanne Wilkinson (Senior Assistant Deputy Minister, Regional Operations Sector, Department of Indigenous Services) explained that the Government of Canada, among many other aims, intended to affirm in the proposed First Nations Clean Water Act (Bill C-61):

[T]he inherent right of [F]irst [N]ations to self-government, including jurisdiction over water, source water, drinking water, waste water, and related infrastructure on, in, and under [F]irst [N]ation lands; ensuring consistency with section 35 of the Constitution

108 LEGISinfo, [Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands](#), Text of the Bill, Second Reading, "Summary."

109 See, for example, ENVI, [Evidence](#), 27 February 2024, 1715 (Hon. J. Michael Miltenberger, Special Advisor, Centre for Indigenous Environmental Resources); ENVI, [Evidence](#), 27 February 2024, 1555 (Chief Billy-Joe Tuccaro, Mikisew Cree First Nation); INAN, [Evidence](#), 17 June 2024, 1105 (Merrell-Ann Phare, Lawyer, As an individual).

110 For more information on this topic, see Robert Mason and Michael Chalupovitsch, Library of Parliament, [The Rights of Nature: Canadian and International Developments in Granting Legal Rights to Rivers](#), *HillNote*, 22 April 2021.

111 ENVI, [Evidence](#), 27 February 2024, 1555 (Chief Billy-Joe Tuccaro).

Act, 1982, and the United Nations Declaration on the Rights of Indigenous Peoples[...].¹¹²

Several First Nations witnesses whose testimony was included in the Committee's study of freshwater were supportive of Bill C-61, specifically because it affirmed their treaty rights to water. For example, Chief Roy Fox (Kainai Tribe) said "Of course, we will support any legislation that confirms our ownership of our water in, on, under and boundary to our reserve lands, as well as our inherent right to govern that water."¹¹³ Chief Ouray Crowfoot (Siksika Nation) shared a similar sentiment: "It has taken over 147 years, but finally Canada is set to recognize our treaty rights to the water on, in and under our lands, and our inherent right to govern the water according to our traditional values."¹¹⁴

The Honourable J. Michael Miltenberger (Special Advisor, Centre for Indigenous Environmental Resources) told the Committee about the Centre for Indigenous Environmental Resources' experience with the benefits of collaborative governance structures for good water governance, which he said had worked well at recognizing the rights and authority of Indigenous nations.¹¹⁵ He noted that Collaborative Leadership Initiative in Manitoba had brought together Indigenous governments and municipal leaders to build trust, learn about each other's communities and water challenges, and "begin to think like a region."¹¹⁶

Legal rights to water can deal with both volume and quality. Provinces and territories of Canada vary in the way they distribute such rights—as explained in a 2007 fact sheet¹¹⁷ from the Program on Water Governance.¹¹⁸ Deborah Carlson (Staff Lawyer, West Coast Environmental Law Association) described the water allocation regime contained in

112 INAN, [Evidence](#), 12 June 2024, 1640 (Joanne Wilkinson, Senior Assistant Deputy Minister, Regional Operations Sector, Department of Indigenous Services).

113 INAN, [Evidence](#), 19 June 2024, 1730 (Chief Roy (Makiinima) Fox, Kainai Tribe).

114 INAN, [Evidence](#), 19 June 2024, 1740 (Chief Ouray (Nio'skai'stamik) Crowfoot, Siksika Nation).

115 ENVI, [Evidence](#), 27 February 2024, 1715 (Hon. J. Michael Miltenberger).

116 Ibid.

117 Program on Water Governance, [Fact Sheet: Water Rights Across Canada](#), in: Randy Christensen and Anastasia M. Lintner, "Trading Our Common Heritage? The Debate over Water Rights Transfers in Canada" in *Eau Canada*, Ed. Karen Bakker, UBC Press: 2007.

118 Program on Water Governance, [Program on Water Governance](#).



British Columbia's *Water Sustainability Act*,¹¹⁹ which could be used to restrict use in order to protect fish in a time of water scarcity after repeated hot, dry summers.¹²⁰

The Committee heard, during discussion of Bill C-61, that some Indigenous groups, including some from the Blackfoot Confederacy, believe that they are not treated fairly with respect to Alberta's "first in time, first in right" approach to water allocation. As Chief Troy Knowlton (Piikani Nation) described:

[T]he federal government and the Blackfoot nations signed onto a treaty in 1877. Alberta came into Confederation in 1905. Our agreement is not with the province. In terms of anything that happens on the federal lands, what part do we feel the federal government ought to play? You ought to be behind us or in front of us or beside us in any battles that we're going to have with Alberta. That's federal jurisdiction. Your obligation, the fiduciary responsibility of Canada, is to protect the [F]irst [N]ations you signed treaty with. If that means opposing Alberta, which we know is going to happen, then we have to fight this together.¹²¹

Samuel Crowfoot (Council Member, Siksika Nation) explained the conflicting perspectives of the Siksika Nation's and the provincial government in Alberta about water rights:

Alberta has not been a responsible steward of our water. No Blackfoot nation has ever accepted Alberta's assertion of control over water on our lands, and no court has confirmed that Alberta has any jurisdiction over our water on our reserve lands. In fact, in 2006, an expert report commissioned by the Government of Canada concluded that water on reserve lands could not be governed by provincial water laws due to subsection 91(24) of the Constitution Act. [...]

The recognition of our treaty rights is historic and long overdue.¹²²

C. Recognizing Indigenous Water Rights

Several briefs submitted to the Committee called for the federal government to recognize and respect Indigenous water rights¹²³ and fully implement its commitments

119 British Columbia, [Water Sustainability Act](#).

120 ENVI, [Evidence](#), 30 January 2024, 1640 (Deborah Carlson, Staff Lawyer, West Coast Environmental Law Association).

121 INAN, [Evidence](#), 19 June 2024, 1800 (Chief Troy (Kiaayo'toka) Knowlton, Piikani Nation).

122 INAN, [Evidence](#), 19 June 2024, 1800 (Samuel (Siipiinaomahka) Crowfoot, Council Member, Siksika Nation).

123 See, for example, Dr. Carolyn Johns, [Brief submitted to ENVI](#), 10 June 2021, p. 4; Ottawa Riverkeeper, [Brief submitted to ENVI](#), 11 June 2021; POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, [Brief Submitted to ENVI](#), 10 June 2021, p. 2.

to ensure safe drinking water for First Nations.¹²⁴ Many expressed support for implementation of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).¹²⁵ During the course of the Committee's study on freshwater, Canada's UNDRIP Act was passed.

The Canadian Environmental Law Association expressed in a brief its recognition, support for and affirmation that the Indigenous peoples of Canada have a "sacred relationship with water, recognizing that all life requires water."¹²⁶ It then goes on to explain that this sacred relationship is recognized in Article 25 of UNDRIP:

Article 25 states that "Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard".^[127] Additionally, UNDRIP provides that Indigenous peoples have the right to participate in the creation of institutions that may affect their rights.^[128] The TRC Calls to Action 45–47 call for a restructuring of legal, governance and institutional structures in Canada to permit the participation of Indigenous peoples.^[129]¹³⁰

The Assembly of First Nations also highlighted Article 25 of UNDRIP in its 2021 brief.¹³¹

D. Water's Rights (and Rights of Nature)

As well as hearing about people's rights to water, the Committee heard from witnesses and in briefs about the possibility of recognizing water as having its own inherent

124 See, for example, Dr. Carolyn Johns, [Brief submitted to ENVI](#), 10 June 2021, p. 4.

125 See, for example, POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, [Brief Submitted to ENVI](#), 10 June 2021, p. 2.

126 Canadian Environmental Law Association, [Brief submitted to ENVI](#), 11 June 2021.

127 United Nations General Assembly, [United Nations Declaration on the Rights of Indigenous Peoples](#), resolution adopted 13 September 2007, article 25.

128 Ibid., supra note 9, articles 18–19.

129 Truth and Reconciliation Commission of Canada, Truth and Reconciliation Commission of Canada: Calls to Action (2015), arts 45–47, [online](#).

130 Canadian Environmental Law Association, [Brief submitted to ENVI](#), 11 June 2021.

131 Assembly of First Nations, [Brief submitted to ENVI](#), 11 June 2021, p. 6.



rights—such as the right of a river to flow freely; members heard about certain efforts to assert such rights, such as by giving water entities legal personhood.

A number of witnesses talked about the inherent rights of water or of nature broadly: Mumta Ito (Founder and President, Nature's Rights) emphasized the need for people to rebuild their relationship with nature.¹³² Alexandre Lillo (Law Professor, Université du Québec à Montréal, As an individual) expressed the idea that people should be enabled to “imagine the possibility of a representation of water as an autonomous entity, as a fully-fledged actor in itself.”¹³³ He went on:

[W]ater influences our ways of life and our ways of doing things, just as we influence its nature and composition. And this cooperation should enable us to seize the opportunity to take a step forward in the process of reconciliation with the [F]irst [N]ations, both by incorporating an [I]ndigenous representation and by applying their governance modes.¹³⁴

Amélie Delage (Intern, Pro Bono Student Canada, McGill University, International Observatory on Nature's Rights) advocated for a move “from an anthropocentric perspective to an ecocentric vision of nature.”¹³⁵ Yenny Vega Cárdenas (President, International Observatory on Nature's Rights) explained that water is often seen either as a common good to which access is a human right, or, conversely, as a commodity; however, she suggested, both perspectives fail to take into account that “water is a vital and sacred element that enables life on earth for all species. Water is life itself, as the [F]irst [N]ations say. It has a spirit, it is alive.”¹³⁶

Sylvie Paquerot (Retired Associate Professor, As an individual) expressed the view that “[i]n most countries, including Canada, the imperatives of economic development systematically take precedence over conserving the environments in which we live.” She noted that “the primacy of the needs of ecosystems is not recognized by almost any jurisdiction in Canada.”¹³⁷

132 ENVI, [Evidence](#), 15 February 2024, 1650 (Mumta Ito, Founder and President, Nature's Rights).

133 ENVI, [Evidence](#), 21 November 2023, 1105 (Alexandre Lillo).

134 Ibid.

135 ENVI, [Evidence](#), 30 January 2024, 1630 (Amélie Delage, Intern, Pro Bono Student Canada, McGill University, International Observatory on Nature's Rights).

136 ENVI, [Evidence](#), 30 January 2024, 1630 (Yenny Vega Cárdenas, President, International Observatory on Nature's Rights).

137 Sylvie Paquerot, Speaking notes submitted to ENVI, 30 January 2024.

E. Water as a Legal Person

The Committee heard about how the municipality of Minganie, in Quebec and the Innu Council of Ekuanitshit had adopted resolutions asserting legal personhood for Muteshekau-shipu, also known as the Magpie River. The rights that were asserted for the Magpie River include the right to maintain its natural biodiversity, the right to perform essential functions within its ecosystem, and the right to have legal standing in courts.¹³⁸ This assertion is the first of its kind in Canada.¹³⁹

In recent years, certain ecosystems—including rivers—have been granted rights and legal personhood in several countries.¹⁴⁰ Although the context varies, the aim of such developments is generally to allow a river—through a legal guardian—to bring cases to a court on its own behalf.¹⁴¹ For example, a river with legal personhood could, through its representatives, seek a court order to stop actions that cause it harm, such as excessive pollution, regardless of whether a human being's rights or legal interests are engaged.

Yenny Vega Cárdenas expressed the view that the symbolic importance of granting legal status could change the way people think about water; she suggested that legal status, “would change our relationship with the river. We would honour it and respect it because it would have rights as a legal person.”¹⁴²

Sylvie Paquerot noted that granting legal personhood to companies has not had exclusively positive effects and explained that the main argument used by many of those who promote legal personhood for water is that “insofar as we have granted these rights to legal entities, to companies, we need to establish a balance by also giving them to nature.”¹⁴³ She expressed the view that this was a valid argument, but shared her concern that when it comes to the language of rights, “the only tools we have are obligations and responsibility, because the application of stated rights has always

138 Robert Mason and Michael Chalupovitsch, Library of Parliament, “[The Rights of Nature: Canadian and International Developments in Granting Legal Rights to Rivers](#),” *HillNote*, 22 April 2022.

139 ENVI, [Evidence](#), 30 January 2024, 1720 (Yenny Vega Cárdenas).

140 Robert Mason and Michael Chalupovitsch, Library of Parliament, “[The Rights of Nature: Canadian and International Developments in Granting Legal Rights to Rivers](#),” *HillNote*, 22 April 2022.

141 Ibid.

142 ENVI, [Evidence](#), 30 January 2024, 1700 (Yenny Vega Cárdenas).

143 ENVI, [Evidence](#), 30 January 2024, 1815 (Sylvie Paquerot, Retired Associate Professor, As an individual).



required political will. We can write all we want into law, but as long as we don't have the political will to apply it, we won't achieve the desired outcome."¹⁴⁴

The Committee heard from Aaron Atcheson (Partner, Miller Thomson LLP, As an individual) that there could be a number of pitfalls to the approach of assigning legal personhood to water. While he did feel that local Indigenous groups could be among those who speak for nature, and for waterways in particular, he emphasized the difficulty that could arise if more than one group wanted to represent a waterway. He noted the complexities of deciding whether experts and those with knowledge of a waterway should themselves be its guardians or should be made available to the guardians for providing advice.¹⁴⁵ He also noted the risk of having people represent a waterway whose intention could be to prevent infrastructure development from a "not-in-my-backyard" mentality, even if there could be overall benefits.¹⁴⁶

In its brief, the Observatoire international des droits de la Nature recommended that the St. Lawrence River be given legal status. They argue:

The current legal paradigm that sees water as a resource is ineffective because the State, the current stewardship of the water, generally finds itself in a conflict of interest since it grants certificates of authorization for various projects that sometimes infringe on the rights of Rivers and its inhabitant species.¹⁴⁷

The brief outlines the steps that the Observatoire international des droits de la Nature believes could be better protect rivers and lakes and could allow them to "fulfil their essential functions"¹⁴⁸ in the ecosystem.

When asked about the possibility of granting personhood to the St. Lawrence River, Sylvie Paquerot emphasized that in her 50 years of experience, she had found that it is not rights themselves that make the biggest difference, but the obligations and responsibilities of public authorities to uphold such rights; for this reason, she said, it is more likely that a river's rights can be protected by "strengthening responsibility and imposing sanctions" than by asserting rights.¹⁴⁹

144 Ibid.

145 ENVI, [Evidence](#), 30 January 2024, 1730 (Aaron Atcheson, Partner, Miller Thomson LLP, As an individual).

146 Ibid.

147 Observatoire international des droits de la Nature, [Brief submitted to ENVI](#), November 2023.

148 Ibid.

149 ENVI, [Evidence](#), 30 January 2024, 1815 (Sylvie Paquerot).

Recommendation 4

That the Government of Canada consider establishing legal personhood for the St. Lawrence River to align with local First Nations laws and requests.

4. WATERSHED MANAGEMENT

“Watersheds are nature’s infrastructure.”¹⁵⁰

Coree Tull, Co-Chair,
BC Watershed Security Coalition

A. Introduction

As Beatrix Beisner (Professor and Researcher, Université du Québec à Montréal, As an individual) explained, “The watershed of a waterbody is ... simply defined as the entire land area drained by a body of water, including groundwater aquifers.”¹⁵¹ The boundaries of a watershed are defined by the landscape’s topography.¹⁵² Watersheds may cross political boundaries, therefore interjurisdictional cooperation may be required for effective watershed management.¹⁵³

The benefits of a healthy watershed include “ecosystem services” i.e., services provided by ecosystems that are enjoyed by people. Ecosystem services include improved water quality, carbon storage opportunities, increased resilience in the face of climate change threats, and reduced risk of invasive species colonization.¹⁵⁴ They may provide economic benefits, such as reduced water treatment costs, reduced flood mitigation costs, increased revenues and job opportunities in outdoor recreation, and increased property values.¹⁵⁵

150 ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull, Co-Chair, BC Watershed Security Coalition).

151 ENVI, [Evidence](#), 30 November 2023, 1230 (Beatrix Beisner, Professor and Researcher, Université du Québec à Montréal, As an individual).

152 Guangyu Wang et al., “[Integrated watershed management: evolution, development and emerging trends](#),” *Journal of Forestry Research*, Vol. 27, 30 June 2016, pp. 967–994.

153 Alison Dyke and Leonie Pearson, [New borderlands of water governance must transcend traditional boundaries](#), Stockholm Environment Institute, 25 August 2021.

154 United States Environmental Protection Agency, Healthy Watersheds Protection, [Benefits of Healthy Watersheds: Ecosystem Benefits and Services](#).

155 Ibid.



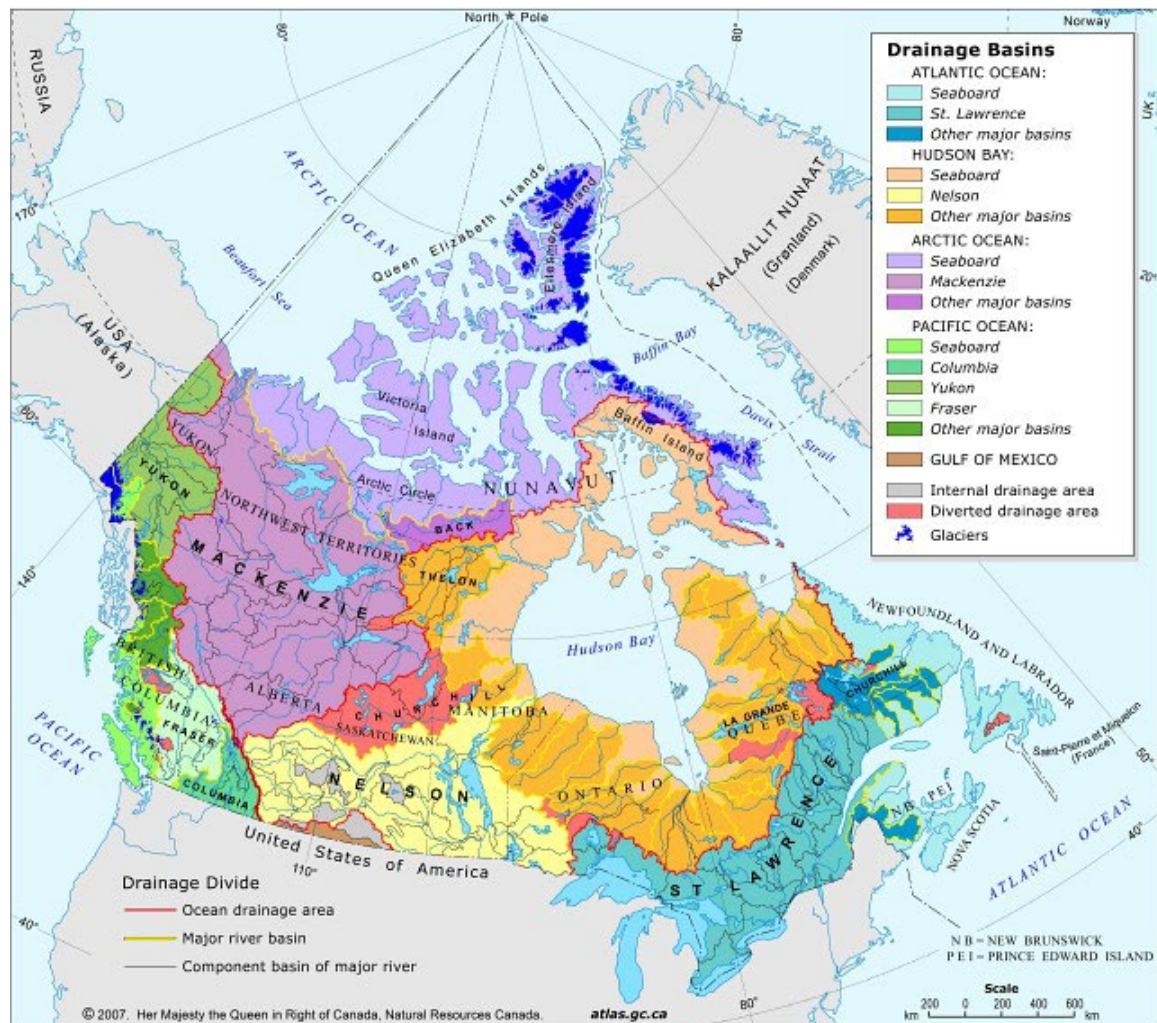
This chapter begins by illustrating the four large watersheds in Canada and outlining the main threats to their health, which include pollution; habitat loss; habitat fragmentation; excessive water extraction; invasive species; climate change; and alteration of water flows due to dams and reservoirs. It then describes some of Canada's biodiversity goals and how they relate to watersheds. Next, the chapter presents the benefits of an integrated watershed management approach and examines models of integrated watershed management. It explores a perceived gap in funding for watershed-related work in British Columbia. The chapter then discusses suggested updates to the *Canada Water Act*,¹⁵⁶ a key piece of legislation enabling inter-jurisdictional agreements on water management, including at the watershed level. Next, it explores ways to combat aquatic invasive species. Finally, this chapter discusses the conservation and restoration of both wetlands and recreational fisheries.

B. Watersheds in Canada

Most areas of Canada are part of one of four large watersheds, flowing into either the Pacific, Arctic, or Atlantic Ocean, or into Hudson's Bay. Within these are many smaller watersheds, as illustrated in Figure 2.

156 [*Canada Water Act*](#), R.S.C., 1985, c. C-11.

**Figure 2—Map of Canada indicating major watersheds
(also referred to as drainage basins or catchment basins).**



Source: Natural Resources Canada, “[Reference Maps](#),” The Atlas of Canada.

1) Health of Watersheds in Canada and Threats They Face

In its brief, Birds Canada lamented that “the best publicly available reporting on the status of watersheds across Canada”¹⁵⁷ – the *Watershed Reports* – is being produced not by the federal government, but by non-governmental organizations. They concluded:

157 Birds Canada, [Brief submitted to ENVI](#), 7 June 2021.



“The federal government clearly has the expert capacity and resources to provide Canadians with comprehensive data on the health of our waters but does not do so.”¹⁵⁸

The Watershed Reports, which were initiated by the World Wildlife Fund and are now stewarded by the Water Rangers (both non-governmental organizations), assessed the health of Canada’s 25 major watersheds in 2017, 2020 and 2025.¹⁵⁹ The watersheds were assessed for the following seven threats:

- pollution;
- habitat loss;
- habitat fragmentation;
- overuse of water;
- invasive species;
- climate change; and
- alteration of flows (e.g., due to dams and reservoirs).

Health of the watersheds was indicated by:

- water flow;
- water quality;
- fish; and
- benthic invertebrates.¹⁶⁰

Almost every watershed assessed showed some degradation of health, and many watersheds were data deficient in one or more indicators.¹⁶¹

158 Ibid.

159 Water Rangers, [Watershed Reports](#).

160 Benthic invertebrates are small organisms without backbones that live in or on the bottom sediments of waterbodies. The benthic invertebrate community is strongly affected by its environment, therefore it is a good indicator of environmental quality. (Ottawa Riverkeeper, [Benthic Invertebrates](#)).

161 Water Rangers, [Watershed Reports](#).

Ottawa Riverkeeper suggested to the Committee that the federal government should support the development of what it called “integrated watershed health assessments”¹⁶² for Canada’s major watersheds, to allow the government to understand watershed health and thus prioritize spending on monitoring, enforcement and restoration accordingly.¹⁶³

C. Biodiversity Within Watersheds

1) United Nations Convention on Biological Diversity

The United Nations (UN) Convention on Biological Diversity (CBD)¹⁶⁴ entered into force in 1993. Canada is one of 196 Parties to this international, legally binding treaty. Among the commitments in the CBD, Parties agreed to conserve biodiversity and “use its components sustainably.”¹⁶⁵ All Parties are required to have a National Biodiversity Strategy and Action Plan that outlines that country’s domestic efforts to advance the principles of the CBD.

Canada and China co-hosted the 15th meeting of the Conference of the Parties to the UN CBD in December 2022 in Montréal, Quebec. During this meeting, the parties agreed to the Kunming–Montreal Global Biodiversity Framework,¹⁶⁶ of which a major focus is “halting and reversing biodiversity loss by 2030 and restoring biological diversity levels by 2050.”¹⁶⁷ Parties were required to develop an updated National Biodiversity Strategy and Action Plan that aligns with the *Kunming–Montreal Global Biodiversity Framework* by the end of 2024. Canada’s most recent National Biodiversity Strategy, published in 2024, is *Canada’s 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada*.¹⁶⁸ This National Biodiversity Strategy aims to protect watersheds, including by

162 Ottawa Riverkeeper, [Brief submitted to ENVI](#), 11 June 2021, p. 3.

163 Ibid.

164 According to the [Convention on Biological Diversity](#), “‘Biological diversity’ means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.” The term “biodiversity” is typically used interchangeably with “biological diversity.”

165 Government of Canada, [Toward a 2030 Biodiversity Strategy for Canada: Halting and reversing nature loss](#).

166 UN Environment Programme, Convention on Biological Diversity, [Kunming–Montreal Global Biodiversity Framework](#), 18 December 2022.

167 Ibid.

168 Government of Canada, [Canada’s 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada](#).



limiting the pollution that reaches waterbodies, by supporting Indigenous-led watershed management activities, and by controlling aquatic invasive species.¹⁶⁹

D. Integrated Watershed Management

“Integrated watershed management” involves considering together the land, water, wildlife, and other natural resources within the boundaries of the watershed. As defined in the Canadian Council of Ministers of the Environment’s 2016 Summary of Integrated Watershed Management Approaches Across Canada:

Integrated Watershed Management ... is a continuous adaptive process of managing human activities and ecosystems at the watershed scale that integrates multiple concepts and methods, including water and land use planning and management (e.g., protected areas, source water protection, etc.), and evaluates and manages cumulative effects from multiple environmental stressors.¹⁷⁰

Conservation Ontario’s brief explained that an integrated watershed management approach encompasses the following principles:

- Human activities and natural resources are managed together i.e., the connected interests of ecosystems, the economy, and people and considered together;
- A wide variety of stakeholders are collaborated with, enabling shared priority-setting, decision-making and implementation of plans;
- Decisions are taken at the watershed level and informed by science; and
- Implemented plans are monitored and subsequently updated in response to results and emerging/uncertain conditions (an “adaptive management model”).¹⁷¹

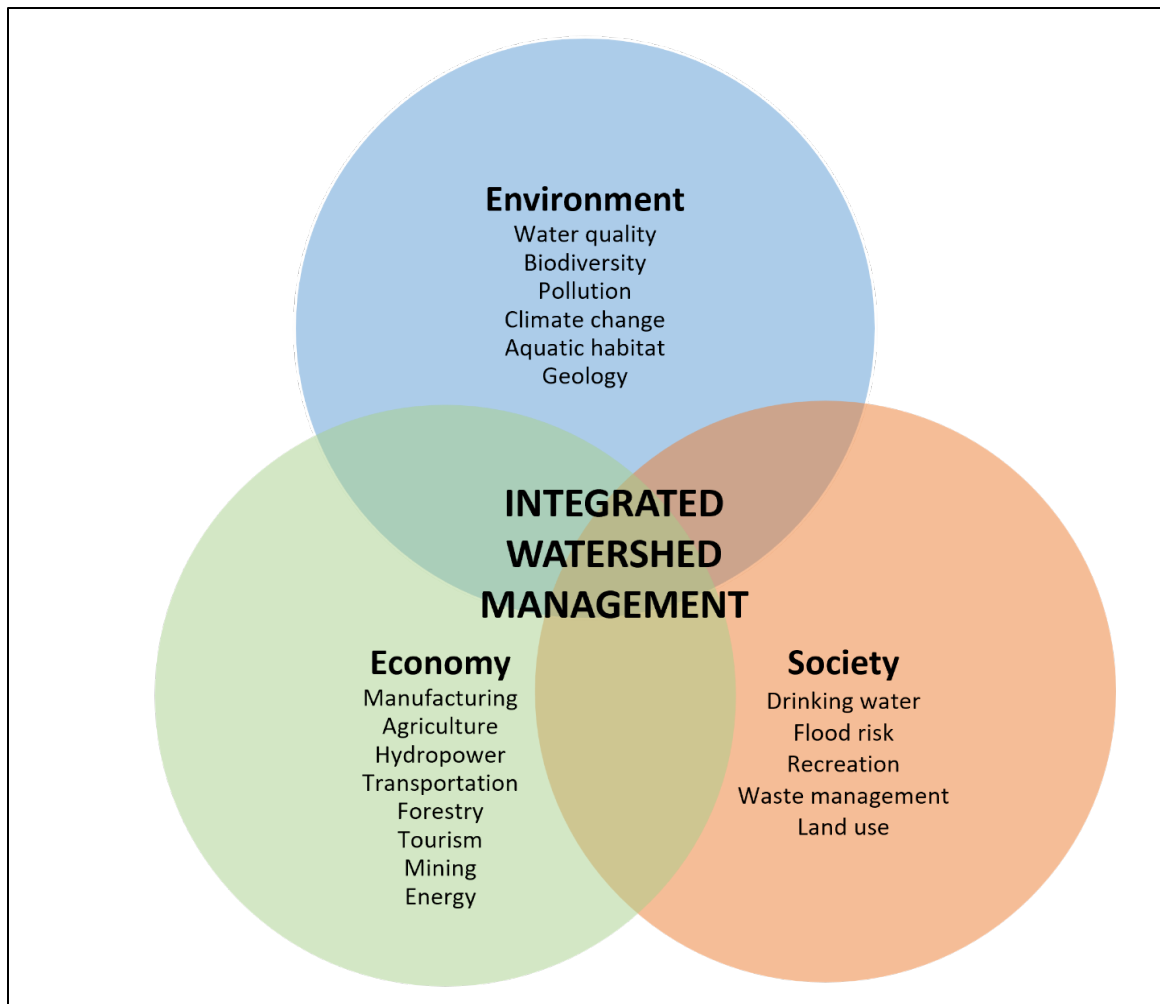
Integrated watershed management recognizes that natural resources and human activities must be managed together because they influence each other, as illustrated in Figure 3.

169 Ibid.

170 Canadian Council of Ministers of the Environment, *Summary of Integrated Watershed Management Approaches Across Canada*, 2016, p. 3.

171 Conservation Ontario, *Brief submitted to ENVI*, 25 May 2021.

Figure 3—Illustration of How an Integrated Watershed Management Approach Considers the Environment, Society and the Economy as Interconnected



Source: Figure recreated by the Library of Parliament based on Conservation Ontario, [*Integrated Watershed Management*](#).



Numerous witnesses expressed support for integrated watershed management.¹⁷² For example, Mathieu Madison (President of the Board of Directors, Regroupement des organismes de bassins versants du Québec) discussed the importance of integrated watershed management and working together with all stakeholders:

It's complicated to talk about water quality, flooding and ecosystems. It's even more complicated to consider all the challenges, interests and concerns that sometimes differ from one water stakeholder to the next. It would be a mistake to try to simplify these complexities. Instead, we recommend working in an inclusive way, involving everyone in the discussion and holding extensive conversations with all water stakeholders. The goal is to identify the additional steps required to ensure collaboration and build consensus.¹⁷³

Wanda Mac Fadyen (Executive Director, Assiniboine River Basin Initiative) described her organization's view of integrated watershed management and its importance:

The most important thing is transboundary communication, education, information sharing and co-operation on a watershed management scale... Integrated watershed management relates not only to water quality and quantity but also to increasing awareness about the importance and value of water—not only surface water but also groundwater. This management should consider ecosystem health, biodiversity, fish, wildlife and wetlands through applied best management practices and incentive opportunities for landowners.¹⁷⁴

Larissa Holman (Director, Science and Policy, Ottawa Riverkeeper) highlighted that integrative watershed management models are most effective when they are applied throughout an entire watershed or region.¹⁷⁵ Ms. Holman emphasized the importance of consistent data collection within a watershed—with resulting data made readily available—in order to track changes and the effectiveness of management measures over time.¹⁷⁶

172 See, for example, Ottawa Riverkeeper, [Brief submitted to ENVI](#), 11 June 2021, p. 4; POLIS Project on Ecological Governance, [Brief submitted to ENVI](#), 10 June 2021, p. 3; International Observatory on Nature's Rights, [Brief submitted to ENVI](#), November 2023, p. 8; Frederick Wrona and Kelly Munkittrick, [Brief submitted to ENVI](#), 17 March 2024, p. 1; Canadian Environmental Law Association, [Brief submitted to ENVI](#), 11 June 2021, p. 2; Canadian Water Network, [Brief submitted to ENVI](#), 11 June 2021, p. 13; Conservation Ontario, [Brief submitted to ENVI](#), 25 May 2021.

173 ENVI, [Evidence](#), 12 December 2023, 1245 (Mathieu Madison).

174 ENVI, [Evidence](#), 30 November 2023, 1240 (Wanda MacFadyen).

175 ENVI, [Evidence](#), 13 February 2024, 1735 (Larissa Holman, Director, Science and Policy, Ottawa Riverkeeper).

176 Ibid.

Recommendation 5

That the Government of Canada take a watershed approach when developing protections for freshwater ecosystems by:

- **building institutional capacity and relationships based on watersheds and balancing ecological, social, economic, and cultural values across the watershed; and**
- **harmonising legislation and policies with other levels of government and across jurisdictions, in keeping with respective jurisdictions, to ensure water management coherence across federal, provincial and territorial governments, and across the major watersheds.**

1) Watershed-Based Work by Conservation Authorities (ON) and *Organismes de bassins versants* (QC)

Conservation Authorities in Ontario and *Organismes de bassins versants* (watershed organizations) in Quebec were presented to the Committee as examples of successful integrated watershed management.¹⁷⁷ This section provides more information about how such organizations operate in their respective provinces.

Conservation authorities are public organizations governed by Ontario's *Conservation Authorities Act*, which work at the local watershed level.¹⁷⁸ Ontario's 36 conservation authorities cover watersheds in which nearly 95% of its population lives.¹⁷⁹ Their roles and responsibilities, delivered on behalf of the province and of municipalities, typically include:

- Natural hazard management, including flood and erosion control, and drought/low flow programs;

177 Aqua Forum, Centre d'interprétation de l'eau, de Gaspé Beaubien Foundation, Regroupement des organismes de bassins versants du Québec, Réseau Environnement, Sanexen Environmental Services Inc., Stratégies Saint-Laurent, [Brief submitted to ENVI](#), 27 April 2021.

178 Ralph Pentland, FLOW Member, Written response to questions from ENVI, Potential Lessons from Ontario's Conservation Authorities, 2023.

179 Conservation Ontario, [Brief submitted to ENVI](#), 25 May 2021.



- Drinking water source protection (under the [Ontario] *Clean Water Act*);¹⁸⁰
- Surface and groundwater monitoring programs and watershed health assessments; and
- Regulation of development and activities in sensitive/ potentially hazardous lands (such as floodplains, shorelines and wetlands) and related public safety through a permitting process.¹⁸¹

Laura Reinsborough (Riverkeeper and Chief Executive Officer, Ottawa Riverkeeper) observed that Ontario conservation authorities “have developed excellent flood-mapping capabilities, as well as flood and drought forecasting.”¹⁸²

Ralph Pentland (Member, Forum for Leadership on Water), who served on the Rideau Valley Conservation Authority, explained the unique funding model of Ontario’s conservation authorities and how it has contributed to their longevity as a successful model of integrated watershed management:

For most [watershed management initiatives] being suggested, there's a nice start and you fund them up front, and then they die over the years. These conservation authorities have lasted for 70 years, mostly because they're self-financing. They are financed through a per capita levy on municipalities. They've been around for 70 years and are still very healthy. My [conservation] authority, for example, has a budget of \$10 million or something. As a citizen, I probably pay \$10 a year to support that. It's very good value. They do very good work in a lot of areas.¹⁸³

Mathieu Madison explained that there are 40 not-for-profit watershed organizations in Quebec which provide “integrated water resource management at the watershed level” or “regional water governance.”¹⁸⁴ He explained that watershed organizations in Quebec bring together multiple users of water to “find common ground and reach a consensus ...

180 [Clean Water Act](#), S.O. 2006, c. 22.

181 Ralph Pentland, FLOW Member, Written response to questions from ENVI, Potential Lessons from Ontario’s Conservation Authorities, 2023.

182 ENVI, [Evidence](#), 9 April 2024, 1710 (Laura Reinsborough, Riverkeeper and Chief Executive Officer, Ottawa Riverkeeper).

183 ENVI, [Evidence](#), 12 December 2023, 1330 (Ralph Pentland, Member, Forum for Leadership on Water).

184 ENVI, [Evidence](#), 12 December 2023, 1245 (Mathieu Madison).

for how to share water in the area.”¹⁸⁵ He noted that, through Quebec’s model, watershed organizations receive funding from the provincial government.¹⁸⁶

Larissa Holman pointed out that *organismes de bassins versants* in Quebec have less funding and fewer powers than do conservation authorities in Ontario.¹⁸⁷ Mathieu Madison agreed that Quebec’s regional governance model is “completely different” from Ontario’s. Mathieu Madison saw an opportunity for Quebec and Ontario’s watershed organizations to learn from each other, but he noted that these watershed organizations do not currently have the mandate to work together.¹⁸⁸ He identified a potential role for the Canada Water Agency to be a national platform for facilitating watershed cooperation across Canadian political boundaries.¹⁸⁹

2) Funding for watershed-related work in British Columbia

The Committee heard from some witnesses that British Columbia is underfunded for watershed-related initiatives compared with other areas of the country. Anna Warwick Sears (Executive Director, Okanagan Basin Water Board) observed that most of the freshwater funding from the Canada Water Agency went toward the Great Lakes and eastern Canada.¹⁹⁰ In her view, the allocation of freshwater funding “could be a lot more equitable” in Canada.¹⁹¹ Zita Botelho (Director, Watersheds BC) described the need for financial support and engagement from the federal government in British Columbia:

Over the last 15 years, the federal government has been weakly engaged in freshwater issues in B.C. Recognizing the diversity of freshwater challenges across the country, B.C. continues to see little federal engagement relative to other regions. Today, I'm here to talk to you about a win-win-win opportunity for the federal government. The conditions in B.C. are both urgent and optimal for the federal government to actively collaborate with the Province of B.C., the NGO community and [F]irst [N]ations.¹⁹²

185 Ibid., 1300.

186 Ibid., 1305.

187 ENVI, [Evidence](#), 13 February 2024, 1735 (Larissa Holman).

188 ENVI, [Evidence](#), 12 December 2023, 1305 (Mathieu Madison).

189 Ibid.

190 ENVI, [Evidence](#), 18 April 2024, 1610 (Anna Warwick Sears, Executive Director, Okanagan Basin Water Board).

191 Ibid.

192 ENVI, [Evidence](#), 30 November 2023, 1130 (Zita Botelho, Director, Watersheds BC).



Daniel Wolfish acknowledged that there is disparity of federal freshwater funding between different regions of Canada. He attributed some of this to the long-standing agreements in place for federal funding in the Great Lakes region and along the St. Lawrence River. He mentioned that progress was being made with the Province of Manitoba to secure an agreement regarding funding for Lake Winnipeg. He described some work underway to pursue agreements for future federal freshwater funding for British Columbia:

We're at the stage where we need to do that now in a few other places—the Fraser, the Mackenzie and the Wollastoq being key places where we need to start to move forward. Our goal is to continue to work with people in the Fraser and the Government of British Columbia to identify the kind of science we need to do. Using that science, how can we start to develop the appropriate types of targets? What are the gaps in information that we have? From there, we can start working on an action plan. I think those will take some time for us to do, but the goal would be to go, through that collaboration, from early conversations to ones where we can make a solid case for investment.¹⁹³

Several witnesses asked that the Government of Canada invest \$400 million in the British Columbia watershed security fund, to which the province of British Columbia had already committed \$100 million.¹⁹⁴ Oliver Brandes (Co-Director, POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, As an individual) also expressed support for a B.C. watershed security fund and noted that it could be a funding model to emulate in other regions, including the North, the Prairies, and the East Coast.¹⁹⁵ Coree Tull (Co-Chair, BC Watershed Security Coalition) elaborated on the need for funding and the value of healthy watersheds:

Federal reporting demonstrates a long-standing disparity in investment in fresh water, with British Columbia receiving zero direct funding under various fresh water action plans in the last two decades. This discrepancy was underscored by the recent funding announcement under the freshwater action plan, which again left B.C. off the list of funding priorities. It is time to address these regional inequities.

Healthy watersheds not only reduce risks to community health and security but also mitigate climate impacts on economic sectors like agriculture, fresh water, tourism, breweries, pulp and paper, and oil and gas. In addition, investing in fresh water and

193 ENVI, [Evidence](#), 11 June 2024, 1640 (Daniel Wolfish).

194 ENVI, [Evidence](#), 1 February 2024, 1550 (Justine Nelson, Executive Director, Rivershed Society of British Columbia); ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull); ENVI, [Evidence](#), 21 November 2023, 1125 (Jesse Zeman).

195 ENVI, [Evidence](#), 8 February 2024, 1610 (Oliver Brandes, Co-Director, POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, As an individual).

watersheds creates vital local employment opportunities with local economic benefits.¹⁹⁶

Zita Botelho added that “[i]nvesting in watershed security is a proactive step toward climate resilience, which not only safeguards our communities, but also saves money in the long run.”¹⁹⁷

E. Watersheds and The *Canada Water Act*

As mentioned earlier in this chapter, the alteration of flows and the overuse of water are key threats to healthy watersheds. The *Canada Water Act* is the key piece of federal legislation related to water management. It provides a “framework for cooperation with provinces and territories in the conservation, development and use of Canada’s water resources, in matters including regulation, apportionment, and monitoring,” and establishes “inter-jurisdictional water boards to address transboundary water issues.”¹⁹⁸

196 ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull).

197 ENVI, [Evidence](#), 30 November 2023, 1130 (Zita Botelho).

198 ENVI, [Evidence](#), 31 October 2023, 1115 (Daniel Wolfish).



The Committee heard from many witnesses¹⁹⁹ and many authors of briefs²⁰⁰ about the importance of updating the over-50-year-old *Canada Water Act*. Some people provided specific recommendations for the improvement of the *Canada Water Act*. For example, James Famiglietti (Professor, Arizona State University, As an individual) and the International Association of Hydrogeologists recommended that the *Canada Water Act* be modernized to include groundwater, as it currently only specifies surface water.²⁰¹ Haseen Khan (Director, Water Resources Management Division, Department of Environment and Climate Change, Government of the Province of Newfoundland and Labrador) advised that:

A modernized [*Canada Water Act*] should capture key themes of ecosystem-based management, stakeholder engagement, [adaptive] governance, additional innovation, research and development, and science-based and traditional knowledge-based decision-making, risk management, cross-sectoral collaboration and policy coherence.²⁰²

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- 199 ENVI, [Evidence](#), 21 November 2023, 1210 (Andrew Stegemann); ENVI, [Evidence](#), 21 November 2023, 1105 (Alexandre Lillo); ENVI, [Evidence](#), 21 November 2023, 1215 (Deborah Curran); ENVI, [Evidence](#), 4 June 2024, 1640 (Haseen Khan, Director, Water Resources Management Division, Department of Environment and Climate Change, Government of the Province of Newfoundland and Labrador); ENVI, [Evidence](#), 8 February 2024, 1530 (Oliver Brandes); ENVI, [Evidence](#), 8 February 2024, 1655 (Mathieu Laneuville, President and Chief Executive Officer, Réseau Environnement); ENVI, [Evidence](#), 27 February 2024, 1755 (Hon. J. Michael Miltenberger); ENVI, [Evidence](#), 11 June 2024, 1735 (Heather Jirousek, Director, Water Resources, Department of Environment, Government of Yukon).
- 200 Birds Canada, [Brief submitted to ENVI](#), 7 June 2021; Global Water Futures, [Brief submitted to ENVI](#), 11 May 2021; Institut national de la recherche scientifique, [Brief submitted to ENVI](#), 7 May 2021; Dr. Carolyn Johns, [Brief submitted to ENVI](#), 10 June 2021; Water Security for Canadians Initiative, [Brief submitted to ENVI](#), 14 May 2021; Freshwater Alliance, FLOW, Our Living Waters, and Rivershed Society of British Columbia, [Brief submitted to ENVI](#), 10 June 2021; Chandra Madramootoo, [Brief submitted to ENVI](#), 11 June 2021; POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, [Brief submitted to ENVI](#), 10 June 2021; Ryerson Urban Water, [Brief submitted to ENVI](#), 7 May 2021; Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023; Canadian Coalition for Healthy Waters, [Brief submitted to ENVI](#), undated, published on ENVI website 4 April 2024; Canadian Environmental Law Association, [Brief submitted to ENVI](#), 2 November 2023; Centre for Indigenous Environmental Resources, [Brief submitted to ENVI](#), 7 February 2024; Council of the Great Lakes Region, [Brief submitted to ENVI](#), 27 February 2024; Ducks Unlimited Canada, [Brief submitted to ENVI](#), 22 June 2023; Forum for Leadership on Water, [Brief submitted to ENVI](#), 25 October 2023; Government of Yukon, [Brief submitted to ENVI](#), 11 June 2024; International Association for Great Lakes Research, [Brief submitted to ENVI](#), 23 November 2023; Living Lakes Canada, [Brief submitted to ENVI](#), 22 February 2024; Réseau Environnement, [Brief submitted to ENVI](#), undated, published on ENVI website 14 February 2024.
- 201 ENVI, [Evidence](#), 6 February 2024, 1550 (James Famiglietti, Professor, Arizona State University, As an individual); International Association of Hydrogeologists, [Brief submitted to ENVI](#), 1 May 2024.
- 202 ENVI, [Evidence](#), 4 June 2024, 1640 (Haseen Khan).

The following were the recommendations of the Canadian Coalition for Healthy Waters in relation to modernizing the *Canada Water Act*:

- Ensure that the Act is consent-based and rooted in government-to-government relationships via a co-drafting process with Indigenous Nations, notably following guidelines via the implementation of the United Nations Declaration on the Rights of Indigenous Peoples Act in Canada;
- Ensure that the Act enshrines targets for conservation and restoration of freshwater in Canada, for example, by contributing to Canada achieving its international commitments to restoring and protecting 30 percent of [its] freshwater by 2030;
- Utilize a cooperative approach to water management that respects the jurisdiction of provincial, territorial, Indigenous, and municipal governments;
- Create a *Canada Water Act* that accurately reflects the realities and science of climate change we are seeing today and anticipating for tomorrow.²⁰³

A number of witnesses and authors of briefs underscored the importance of advancing reconciliation with Indigenous peoples through the renewal of the *Canada Water Act*.²⁰⁴ Some of these witnesses and authors recommended that revisions be co-drafted with

203 Canadian Coalition for Healthy Waters, [Brief submitted to ENVI](#), undated, published on ENVI website 4 April 2024.

204 ENVI, [Evidence](#), 8 February 2024, 1535 (Oliver Brandes); ENVI, [Evidence](#), 21 November 2023, 1210 (Andrew Stegemann); ENVI, [Evidence](#), 27 February 2024, 1755 (Hon. J. Michael Miltenberger); ENVI, [Evidence](#), 11 June 2024, 1735 (Heather Jirousek).

Global Water Futures, [Brief submitted to ENVI](#), 11 May 2021; Institut national de la recherche scientifique, [Brief submitted to ENVI](#), 7 May 2021; Water Security for Canadians Initiative, [Brief submitted to ENVI](#), 14 May 2021; Freshwater Alliance, FLOW, Our Living Waters, and Rivershed Society of British Columbia, [Brief submitted to ENVI](#), 10 June 2021; POLIS Project on Ecological Governance, [Brief submitted to ENVI](#), 10 June 2021 brief; Ryerson Urban Water, [Brief submitted to ENVI](#), 7 May 2021; World Wildlife Fund-Canada, [Brief submitted to ENVI](#), undated, published on the ENVI website, 13 May 2021; Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023; Centre for Indigenous Environmental Resources, [Brief submitted to ENVI](#), 7 February 2024; Congress of Aboriginal Peoples, [Brief submitted to ENVI](#), November 2023; Ducks Unlimited Canada, [Brief submitted to ENVI](#), 22 June 2023; Forum for Leadership on Water, [Brief submitted to ENVI](#), 25 October 2023; Government of Yukon, [Brief submitted to ENVI](#), 11 June 2024.



Indigenous peoples.²⁰⁵ The concept of co-drafting is explored in more detail in the chapter of this report dealing with federal and provincial jurisdiction.

Daniel Wolfish informed the Committee that he expects the Canada Water Agency to review and prepare amendments to modernize the *Canada Water Act*.²⁰⁶ In reflection of the consensus it received, the Committee recommends:

Recommendation 6

That the Government of Canada modernize the *Canada Water Act* to ensure that it respects the jurisdictions of Quebec, the provinces and territories, municipalities and relations with Indigenous nations.

Recommendation 7

That the Government of Canada modernize the *Canada Water Act*, which has not been significantly updated since it originally became law in the 1970s, ensuring that it addresses climate change, *United Nations Declaration on the Rights of Indigenous Peoples*, and global water security challenges.

Recommendation 8

That the Government of Canada establish a co-governance framework, based on the principles of *United Nations Declaration on the Rights of Indigenous Peoples*, to guide the modernization of the *Canada Water Act*.

Recommendation 9

That the Government of Canada proceed as soon as possible to a meaningful modernization of the *Canada Water Act* through a rigorous co-development process with Indigenous peoples.

205 ENVI, [Evidence](#), 8 February 2024, 1535 (Oliver Brandes); ENVI, [Evidence](#), 21 November 2023, 1210 (Andrew Stegemann); Global Water Futures, [Brief submitted to ENVI](#), 11 May 2021; Water Security for Canadians Initiative, [Brief submitted to ENVI](#), 14 May 2021; Freshwater Alliance, FLOW, Our Living Waters, and Rivershed Society of British Columbia, [Brief submitted to ENVI](#), 10 June 2021; POLIS Project on Ecological Governance, [Brief submitted to ENVI](#), 10 June 2021.

206 ENVI, [Evidence](#), 31 October 2023, 1115 (Daniel Wolfish).

Recommendation 10

That the Government of Canada leverage the knowledge of local and regional networks involved in water management through engagement to make decisions.

Recommendation 11

That the Government of Canada incorporate Canada's national commitments of conserving and restoring 30% of federal lands by 2030.

F. Aquatic Invasive Species: Significant Threats to Watershed Health

As noted earlier in this chapter, invasive species are one of the major threats to watershed health.²⁰⁷ The Committee heard about the ecological and economic consequences that result from aquatic invasive species.²⁰⁸ The Committee also heard about how difficult it is to respond to invasive species once they have moved into a waterbody, making it particularly important to prevent their spread.²⁰⁹ David O'Connor (Project Manager, Invasive Species, Regional Environmental Council of Estrie) characterized aquatic invasive species as "biological pollutants"²¹⁰ because of their potential for large negative impacts:

Less than a millilitre of water contaminated by a species such as the zebra mussel, the quagga mussel or the spiny water flea can have major repercussions for our indigenous species, destroy the recreation and tourism economy, and create major costs for our municipalities for modifying and managing their water facilities.²¹¹

Aquatic invasive species coming into Canada, often accidentally from other countries via shipping, is a significant concern. International standards to help limit the spread of aquatic invasive species are set out in the *International Convention for the Control and*

207 Water Rangers, [Watershed Reports](#).

208 ENVI, [Evidence](#), 27 February 2024, 1720 (Jimmy Bouchard, Support Representative, Conseil régional de l'environnement et du développement durable du Saguenay-Lac-St-Jean); ENVI, [Evidence](#), 2 November 2023, 1230 (Mark Ryckman, Manager of Policy, Ontario Federation of Anglers and Hunters); ENVI, [Evidence](#), 18 April 2024, 1615 (Anna Warwick Sears); ENVI, [Evidence](#), 21 November 2023, 1140 (Jesse Zeman).

209 ENVI, [Evidence](#), 18 April 2024, 1615 (Anna Warwick Sears).

210 ENVI, [Evidence](#), 21 November 2023, 1225 (David O'Connor, Project Manager, Invasive Species, Regional Environmental Council of Estrie).

211 Ibid.



*Management of Ships' Ballast Water and Sediments.*²¹² These international standards are reflected in Canadian law through the *Ballast Water Regulations*²¹³ under the *Canada Shipping Act, 2001*,²¹⁴ which are administered by Transport Canada. Fisheries and Oceans Canada is the federal lead for administering the *Aquatic Invasive Species Regulations*²¹⁵ under the *Fisheries Act*.²¹⁶ It is partnered with Canada Border Services Agency, who helps administer the *Aquatic Invasive Species Regulations* at Canada's border, such as by inspecting vessels for invasive species. The Committee heard about how provinces and conservation groups, such as the Ontario Federation of Anglers and Hunters, also work to prevent and respond to aquatic invasive species.²¹⁷

Interprovincial spread of invasive species within Canada is also an important issue. Anna Warwick Sears warned about the need for federal action to prevent the spread of invasive mussels into British Columbia:

The Government of Canada is investing heavily in managing aquatic invasive species in the Great Lakes, but right now, zero dollars are being invested to prevent the invasion of zebra and quagga mussels into western Canada. These invasive mussels are typically brought in by mussel-fouled boats. Most of these mussel-fouled boats are coming from eastern Canada, which means it's an interprovincial issue and merits federal involvement.

The Columbia, Kootenay, Okanagan and Fraser basins are all at risk from these mussels because of [their] water chemistry. There are projections that the invasive mussels will [cost] B.C. more than \$139 million annually. The [Canada Border Services Agency] must also be involved because invasive mussels have just been detected in the Snake River [in the United States], which is also part of the Columbia basin. Federal resources are urgently needed right now for the B.C. invasive mussel defence program.²¹⁸

David O'Connor noted that, "Outside the Great Lakes and watercourses where commercial vessels navigate, pleasure craft are the main source of contamination by

212 International Maritime Organization (IMO), *International Convention for the Control and Management of Ships' Ballast Water and Sediments*.

213 *Ballast Water Regulations*, SOR/2021-120.

214 *Canada Shipping Act, 2001*, S.C. 2001, c. 26.

215 *Aquatic Invasive Species Regulations*, SOR/2015-121.

216 *Fisheries Act*, R.S.C., 1985, c. F-14.

217 ENVI, *Evidence*, 2 November 2023, 1230 (Mark Ryckman); ENVI, *Evidence*, 21 November 2023, 1140 (Jesse Zeman); ENVI, *Evidence*, 11 June 2024, 1720 (Kate Rich, Assistant Deputy Minister, Policy, Environment and Protected Areas, Government of Alberta).

218 ENVI, *Evidence*, 18 April 2024, 1530 (Anna Warwick Sears).

invasive aquatic species.”²¹⁹ In his capacity developing a regional strategy to combat aquatic invasive species in the Estrie region of Quebec (a project funded by Fisheries and Oceans Canada) he has studied strategies from other jurisdictions extensively.²²⁰ As a result of this work, Dr. O'Connor recommended that Canada institute pleasure craft inspection and decontamination at a regional level to control the spread of invasive species from one waterbody to another. He compared how some parts of the United States combat invasive species to the current approach taken in Canada:

I believe we are ten to 15 years behind the Western Aquatic Invasive Species Resource Center, an organization that brings together the states and provinces in western North America. At the border, in several states, the organization operates a boat inspection and decontamination station that is open 14 hours a day, seven days a week, 365 days a year. It is illegal to pass one of these stations with a boat without stopping, regardless of whether it is a kayak or a water sports craft. These activities are funded by renewals of boat registrations and licences. A portion of the money collected is therefore used to support this effort.

In addition, I believe we are five to ten years behind New York state, which spends over \$9 million per year just on a program that makes it possible to have individuals responsible for meeting people at boat launches and for inspecting and decontaminating boats. It is essential that the federal government play a role to help municipalities, regions and provinces better manage invasive aquatic species.²²¹

Recommendation 12

That the Government of Canada prioritize support for aquatic invasive species prevention, decontamination, and enforcement efforts.

G. Wetlands as Natural Infrastructure for Watershed Health

The Committee heard about the importance of wetlands to multiple aspects of watershed health. For example, Adam Weir (Fisheries Biologist, Ontario Federation of Anglers and Hunters) explained:

[Wetlands are] incredibly important. They are known as “nature's sponge”. Also, in terms of biodiversity, the importance of wetlands cannot be overstated. That is coming not just from my background as a fisheries biologist but on multiple levels across the

219 ENVI, *Evidence*, 21 November 2023, 1225 (David O'Connor).

220 Ibid.

221 Ibid.



board. You'd be looking at the serious importance that wetlands provide to fish, wildlife, humans, Canadians—all of the above.²²²

However, the Committee also heard that wetlands—and the ecosystem services they provide—are under threat:

The decline in Canada's inventory of natural assets such as wetlands and forests has removed critical infrastructure that helps protect water quality from activities that affect freshwater systems. Without sufficient natural infrastructure, we see impacts on water quality. Soil erosion and sedimentation can harm aquatic plants and wildlife and create an environment favourable to the development of algae blooms and pathogens. Runoff of nutrients, pesticides, organic matter and pathogens threatens aquatic life, drinking water systems and our food supply.²²³

Maria José Maezo (Agri-Environmental Consultant, Fédération de l'UPA Outaouais-Laurentides) explained how Alternative Land Use Services (ALUS) works with agricultural producers on their own lands to “cultivate nature” and “implement green infrastructure projects that improve biodiversity and water quality,”²²⁴ including wetlands. Brian Gilvesy (Chief Executive Officer, ALUS) reported that, among ALUS projects, they observed the greatest benefits in reducing nutrient runoff to Lake Erie from restored or created wetlands.²²⁵ He discussed wetlands’ benefits in relation to severe weather events and biodiversity:

Wetlands restored by farmers help manage rising watercourse levels by slowing water flows and support groundwater recharge by capturing and absorbing excess water. They also protect food security by reducing the effects of severe weather as well as enhancing wildlife habitat to support birds, pollinators and other beneficial insects and insectivores.²²⁶

Robert Sopuck (Former Member of Parliament, As an individual) cautioned that farmers may require public subsidies in order to maintain and restore wetlands on private lands.²²⁷ Mr. Sopuck elaborated on wetlands as natural infrastructure:

222 ENVI, [Evidence](#), 1 February 2024, 1555 (Adam Weir, Fisheries Biologist, Ontario Federation of Anglers and Hunters).

223 ENVI, [Evidence](#), 30 November 2023, 1125 (Bryan Gilvesy, Chief Executive Officer, ALUS).

224 ENVI, [Evidence](#), 1 February 2024, 1710 (Maria José Maezo, Agri-Environmental Consultant, Fédération de l'UPA Outaouais-Laurentides).

225 ENVI, [Evidence](#), 30 November 2023, 1125 (Bryan Gilvesy).

226 Ibid.

227 ENVI, [Evidence](#), 12 December 2023, 1325 (Robert Sopuck, Former Member of Parliament, As an individual).

Wetlands, whether natural or constructed, also improve water quality and sequester carbon. I recommend that all publicly funded infrastructure programs include the creation of natural infrastructure and support nature-based solutions in addition to the hard engineering.²²⁸

Coree Tull (Co-Chair, BC Watershed Security Coalition) also discussed the value of wetlands as natural infrastructure:

The International Institute for Sustainable Development notes that natural infrastructure like forests and wetlands, which are a critical feature of our watersheds, offers services at a lower cost than traditional built infrastructure, and these natural defences are not only cheaper to build but also more cost-effective to maintain, and they appreciate over time.²²⁹

Recommendation 13

That the Government of Canada recognize the importance of wetlands to Canada's freshwater ecosystems.

Recommendation 14

That the Government of Canada ensure that publicly-funded infrastructure programs include the creation of natural infrastructure and support nature-based solutions in addition to the hard engineering (conventional built infrastructure).

H. Recreational Fisheries Conservation and Restoration Within Watersheds

Recreational fishing is one of the activities that rely on healthy watersheds.²³⁰ Mark Ryckman (Manager of Policy, Ontario Federation of Anglers and Hunters) discussed the potential economic and other benefits of healthy recreational fisheries, as well as some of the threats to those fisheries, such as land use change, pollution, invasive species, and climate change:

Ontario's 1.4 million licensed anglers contribute \$2.2 billion to the provincial economy every year. Across the country, three million people fish, and in 2018, \$10 billion was spent on fishing alone. This spending contributed \$7 billion to the total GDP, supported

228 ENVI, [Evidence](#), 21 November 2023, 1205 (Robert Sopuck).

229 ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull).

230 T. Bjornson and Associate Consulting Inc., [Brief submitted to ENVI](#), 2 December 2022; ENVI, [Evidence](#), 21 November 2023, 1225 (David O'Connor); ENVI, [Evidence](#), 1 February 2024, 1545 (Adam Weir).



an estimated 58,000 jobs across the country and generated \$3.5 billion in labour income.

As impressive as those numbers are, they pale in comparison to the intangible values. Recreational fishing is deeply rooted in Canadian culture and tradition. It enhances quality of life, creates a connection to nature and is associated with multiple mental, physical and nutritional health benefits. Healthy fisheries also play a key role in the culture and food security for [I]ndigenous peoples across the country.

However, these values are under threat. Healthy and sustainable recreational fisheries are dependent on healthy and sustainable freshwater resources. Development is destroying fish habitat; pollutants like phosphorus are causing harmful algal blooms and massive fish die-offs; contaminants are driving warnings about consuming fish; aquatic invasive species are displacing native species and altering ecosystem function; and microplastics are being increasingly found in fresh water and the fish that rely on it. That is not to mention that climate change is threatening to reorganize entire fish communities across Canada.²³¹

Representatives from the Ontario Federation of Anglers and Hunters and Robert Sopuck mentioned the successes of a past federal funding program, the Recreational Fisheries Conservation Partnerships Program, which ran from 2013 to 2019, whose aim was “to encourage cooperation and support projects led by recreational fishing and angling groups, as well as conservation organizations, aimed at restoring recreational fisheries habitat.”²³² Adam Weir called for the reinstatement of such a funding program:

There's a need to reinvigorate a program similar to the recreational fisheries conservation partnerships program to restore, rebuild and rehabilitate Canada's recreational fisheries habitat. This can be achieved by providing funding to recreational fishing groups and conservation organizations like [the Ontario Federation of Anglers and Hungers] to undertake projects that support these objectives.²³³

The Committee recognizes that healthy watersheds benefit recreational fish species and the industry that depends upon them. In response to the stakeholder input it received, the Committee recommends:

231 ENVI, [Evidence](#), 2 November 2023, 1230 (Mark Ryckman).

232 Government of Canada, Recreational Fisheries Conservation Partnerships Program - Round Two Projects Funded Across Canada, “[Backgrounder](#),” 2014; Government of Canada, The Government of Canada Announces \$28 Million to Support Recreational Fisheries Conservation Projects over the next three years, “[News Release](#),” 2016.

233 ENVI, [Evidence](#), 1 February 2024, 1545 (Adam Weir).

Recommendation 15

That the Government of Canada support the development and maintenance of healthy fisheries by leveraging conservation opportunities through recreational fisheries.

Recommendation 16

That the Government of Canada reinstate the recreational fisheries conservation partnerships program.

I. Conclusion: Watersheds

Effective watershed management is complex: there are multiple facets of watershed health, there are many stakeholders involved in integrated watershed management, and there is often a need to work across political boundaries. As such, cooperation and communication are imperative to watershed management. The interconnected nature of watersheds means that watershed management efforts can yield positive benefits in diverse areas. For example, multiple witnesses highlighted the opportunity to address biodiversity loss, climate change, and water management issues through the protection and restoration of nature, such as at the watershed level.²³⁴ The Committee encourages the application of integrated watershed management throughout Canada.

5. GROUNDWATER

A. Introduction to Groundwater

“Groundwater constitutes 99% of the earth’s liquid fresh water, serves as an important link among atmosphere, soils, and surface water, and is key to freshwater resilience under climate change.”²³⁵

Beth Parker, Professor, University of Guelph, Director,
Morwick G360 Groundwater Research Institute, As an individual

234 E.g., ENVI, *Evidence*, 27 February 2024, 1600 (Elizabeth Hendriks, Vice-President, Restoration and Regeneration, World Wildlife Fund-Canada).

235 ENVI, *Evidence*, 6 February 2024, 1710 (Beth Parker, Professor, University of Guelph, Director, Morwick G360 Groundwater Research Institute, As an individual).



Groundwater is water that has infiltrated into the ground; it gathers in areas where permeable geographic deposits are found near the surface. Even in Canada, where surface water is relatively abundant, there is much more groundwater than surface water.²³⁶

According to the Government of Canada's information, based on 1996 data, about 30% of people living in Canada relied on groundwater for drinking water and household use.²³⁷ While in most provinces and territories, the number of residents reliant on groundwater is between 25% and 45%,²³⁸ the Committee heard from witnesses that 100% of people in Prince Edward Island²³⁹ and 97% in Yukon depend on groundwater.²⁴⁰ Steven Frey (Director of Research, Aquanty) noted that "in many rural areas and [F]irst [N]ation lands [groundwater] is often the sole source of water for both people and livestock."²⁴¹

A comprehensive study of groundwater in Canada was completed in 2009. The Council of Canadian Academies' 2009 Report, *The Sustainable Management of Groundwater in Canada* was authored by the Expert Panel on Groundwater, upon request from the Minister of Natural Resources, to assess what was needed "to achieve sustainable management of Canada's groundwater resources, from a science perspective."²⁴² Robert Sopuck (Former Member of Parliament) drew the Committee's attention to the following statement from the report:²⁴³

Groundwater is vital for Canada's health, environment and economy. Nearly a third of Canada's population, some 10 million people, depends on groundwater for safe drinking water and more than 80% of Canada's rural population depends on groundwater for its entire water supply. Canada's groundwater, however, is increasingly under threat from

236 Government of Canada, [Water sources: groundwater](#).

237 Environment and Climate Change Canada, Water sources: groundwater, "[Groundwater Use](#)."

238 Government of Canada, Water sources: groundwater. With data from: Statistics Canada, Environment Accounts and Statistics Division, special compilation using data from Environment Canada, Municipal Water Use Database; and Statistics Canada, 1996, Quarterly Estimates of the Population of Canada, the Provinces and the Territories, 11-3, Catalogue no. 91-001, Ottawa.

239 ENVI, [Evidence](#), 4 June 2024, 1635 (Sean Ledgerwood, Acting Manager, Water and Air Monitoring, Department of Environment, Energy and Climate Action, Government of Prince Edward Island).

240 ENVI, [Evidence](#), 11 June 2024, 1730 (Brendan Mulligan).

241 ENVI, [Evidence](#), 13 February 2024, 1655 (Steven Frey, Director of Research, Aquanty, As an individual).

242 Council of Canadian Academies, [The Sustainable Management of Groundwater in Canada](#), 2009.

243 ENVI, [Evidence](#), 21 November 2023, 1205 (Robert Sopuck).

factors such as urbanization, climate change, burgeoning energy production, intensification of agriculture and contamination.²⁴⁴

The issues explored in *The Sustainable Management of Groundwater in Canada*—over 15 years ago—remain pressing concerns today. These threats to groundwater, along with others raised during the Committee's study, are explored further in this section of the report. It begins by providing background information on groundwater. It then considers the views of witnesses who believe that groundwater is underappreciated or overlooked in Canada. Next, it presents some of the main threats to groundwater that the Committee heard about, and describes progress being made towards addressing these threats. Then, it presents ideas the Committee heard about the governance of groundwater and other issues relevant to the study.

B. More About Groundwater

An “underground formation of permeable rock or loose material [that] can produce useful quantities of water when tapped by a well”²⁴⁵ is known as an aquifer. As ECCC describes:

Aquifers come in all sizes and their origin and composition is varied. They may be small, only a few hectares in area, or very large, underlying thousands of square kilometres of the earth's surface. They may be only a few metres thick, or they may measure hundreds of metres from top to bottom.²⁴⁶

The Committee heard that the presence of reliable groundwater is important for adaptation to climate change. According to James Famiglietti (Professor, Arizona State University, As an individual), “[p]rotection of Canada's groundwater supply is paramount as a buffer against drought, for climate adaptation and resilience, and for sustainable food production.”²⁴⁷ He also explained:

Changing surface water availability means that groundwater, which already supplies about one-third of Canada's drinking water, will become increasingly called upon to fill emerging gaps in surface water availability.²⁴⁸

244 Canadian Council of Academies, *The Sustainable Management of Groundwater in Canada*, “[Summary](#),” 11 May 2009.

245 Government of Canada, [Water sources: groundwater](#).

246 Ibid.

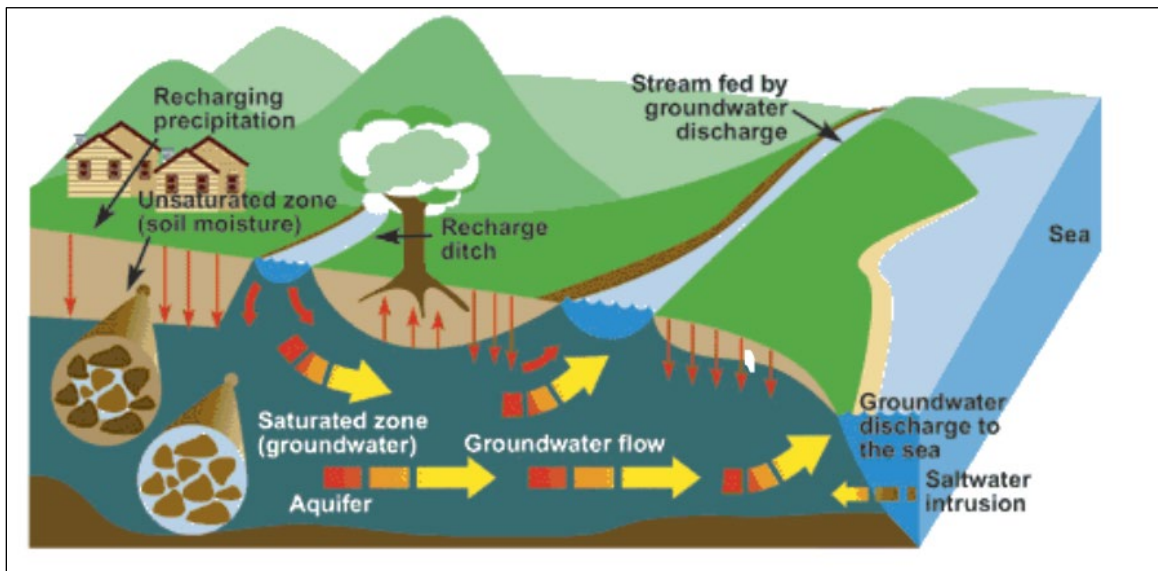
247 ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

248 Ibid.



Immediately below the earth's surface is an area called an unsaturated zone, which normally contains many tiny air pockets. Further down, below the level referred to as the water table, all spaces are filled with water. This area is referred to as the saturated zone, and is where groundwater is found. As illustrated in Figure 4, water can flow between the surface, the unsaturated zone (where it exists as soil moisture), and the saturated zone (where it exists as groundwater). Precipitation may recharge²⁴⁹ depleted groundwater, and groundwater may discharge to surface waters.²⁵⁰

Figure 4—Illustration of Water Flow Related to Groundwater



Source: Government of Canada, [Water sources: groundwater](#).

A number of witnesses noted the connections between groundwater and surface water.²⁵¹ For example, Beth Parker (Professor, University of Guelph, Director, Morwick G360 Groundwater Research Institute, As an individual) suggested:

[I]t's important to think of groundwater and surface water as one resource. As I mentioned ..., groundwater discharges to surface water and sustains those flows

249 Recharge refers to water entering a groundwater system, such as from melting snow and rainfall. (Government of Canada, [Water sources: groundwater](#)).

250 Government of Canada, [Water sources: groundwater](#).

251 E.g., ENVI, [Evidence](#), 13 February 2024, 1655 (Steven Frey); ENVI, [Evidence](#), 1 February 2024, 1545 (Alain Pietroniro, Professor, Department of Civil Engineering, University of Calgary, As an individual); ENVI, [Evidence](#), 6 February 2024, 1550 (Marie Larocque, Professor, Université du Québec à Montréal, As an individual).

throughout the seasons. Surface water can discharge back to groundwater. They're inextricably linked.²⁵²

Steven Frey explained, in the same vein, that to understand the hydrological system, researchers “look at groundwater and surface water in a holistic manner, fully coupled.”²⁵³ He further explained:

Across Canada, groundwater makes up anywhere from 30% to 100% of the water that you see in rivers. A lot of the research effort and modelling efforts have thus far focused only on surface water. It's the water we see. But in times of drought, the water that flows in the rivers is groundwater that's discharging and that supports ecosystems. It supports waste-water assimilation. It supports irrigation demands. It supports municipal drinking water supplies.²⁵⁴

Although they are interconnected, groundwater behaves differently from surface water. Surface water is typically concentrated in lakes, rivers, streams and wetlands. In contrast, below the earth's surface, water is widely distributed; it is found “almost everywhere:” in the spaces between particles of soil, sand, and gravel; in rock crevices; and between large pieces of limestone.²⁵⁵ As ECCC explains:

The water filling these openings is usually within 100 metres of the surface. Much of the earth's freshwater is found in these spaces. At greater depths, because of the weight of overlying rock, these openings are much smaller, and therefore hold considerably smaller quantities of water.²⁵⁶

Groundwater moves much more slowly than surface water, depending on the geological material it flows through:

Groundwater can flow a few centimetres to a few metres a day in sand or gravel aquifers, and tens of metres a day (rapid) or more in some highly fractured bedrock aquifers. In some aquitards,²⁵⁷ the water may move less than a few millimetres in a day (slow). In general, groundwater moves from areas of recharge toward areas of discharge such as springs, streams, lakes or wetlands, etc. Water infiltrating or recharging in the hills or uplands of a river valley travels down to the water table aquifer, then moves

252 ENVI, [Evidence](#), 6 February 2024, 1730 (Beth Parker).

253 ENVI, [Evidence](#), 13 February 2024, 1705 (Steven Frey).

254 Ibid.

255 Ibid.

256 Ibid.

257 Aquitards are made up of materials with low permeability, such as layers of clay and shale; they prevent any significant movement of water. See: H. Simpson et al., Ontario Ministry of Agriculture, Food and Rural Affairs, [Protecting the Quality of Groundwater Supplies](#), Factsheet, June 2021.



horizontally through the various formations until it reaches and discharges into a surface water body.

The exact path that the water flows along can be complex, but most of the water will take the path of least resistance, flowing through the most permeable formations. Some recharged water can also flow downward through unconfined aquifers to recharge deeper confined aquifers. Eventually it flows to discharge locations that can be several kilometres away.²⁵⁸

As well, the turnover time of water is much slower for groundwater than it is for surface water:

The residence time of groundwater, i.e., the length of time water spends in the groundwater portion of the hydrologic cycle, varies enormously. Water may spend as little as days or weeks underground, or as much as 10 000 or more years. Residence times of tens, hundreds, or even thousands of years are not unusual. By comparison, the average turnover time of river water, or the time it takes the water in rivers to completely replace itself, is about two weeks.²⁵⁹

C. Groundwater: Unknown, Underappreciated, or Ignored

Beth Parker told the Committee that “[d]espite the critical importance of groundwater for the environment and society, it is undervalued, misunderstood, mismanaged and often ignored at the policy level.”²⁶⁰

A number of other witnesses also expressed the view that groundwater is ignored, forgotten, or undervalued. For example, Steven Frey commented that as surface water is increasingly affected by climate change, groundwater has become more and more important to agriculture and to ecosystems; yet, he suggested, current initiatives related to water resources “ignore groundwater.”²⁶¹ Aislin Livingstone (Program Manager, DataStream) pointed out what she saw as an oversight in some Canadian data tracking, noting that “in the 2020 global data drive sustainable development goal 6.3.2—it tracks the health of ambient water quality—Canada reported on the status of rivers but has not reported on groundwater or open water bodies, such as lakes and reservoirs.”²⁶²

258 H. Simpson and J. Myslik, Ontario Ministry of Agriculture, Food and Rural Affairs, [Understanding groundwater](#), Factsheet, June 2021.

259 Government of Canada, [Water sources: groundwater](#).

260 ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker).

261 ENVI, [Evidence](#), 13 February 2024, 1655 (Steven Frey).

262 ENVI, [Evidence](#), 13 February 2024, 1650 (Aislin Livingstone).

Brendan Mulligan (Senior Scientist, Groundwater, Water Resources, Department of Environment, Government of Yukon) told the Committee that while the Yukon government has agreements with the federal government related to surface water quality and quantity monitoring, it has no such agreements concerning groundwater monitoring or aquifer mapping and characterization. He would like to see support for programs “to collect, process and provide data on the quality, quantity, distribution and use of groundwater.”²⁶³

Beth Parker warned that there is insufficient expertise in groundwater in Canada, especially given how important it is likely to become:

Groundwater expertise in Canada is waning due to retirements and a lack of younger generations entering the profession to take over these leadership roles. Geoscience and water resource engineering programs at Canadian universities are underpopulated. We need increased investment in training new Canadian expertise and research. This gap in expertise is happening at a time when climate change, increasing demand for food and energy production, and natural resource extraction are creating a global water crisis. Groundwater is at the very heart of this crisis.²⁶⁴

In its May 2024 brief, the International Association of Hydrogeologists - Canadian National Chapter emphasized the way that groundwater can be left out of communications about water and, as a result, is often left out of funding plans. They explained that “[w]ithout explicit references to groundwater in federal government communications, opportunities are missed to educate non-specialists including the public and decision-makers” and pointed out that this situation can result in “missed opportunities to fund groundwater-related work that could significantly improve management of freshwater resources.” They recommended:

[T]hat the federal government explicitly include “groundwater” as part of “water” and “freshwater” in all written and verbal communications and in re-writing of the ECCC Science Agenda, Canada Water Act, Freshwater Data Strategy, etc. The federal government should use “surface water” instead of “water” and “freshwater” when referring only to rivers, streams, lakes, reservoirs, and/or wetlands and use “watersheds”, which includes groundwater, instead of “water bodies”, which often excludes groundwater.²⁶⁵

The association’s brief goes on to give specific examples of where the federal government could begin, such as on the Canada Water Agency website, in calls for

263 ENVI, [Evidence](#), 11 June 2024, 1730 (Brendan Mulligan).

264 ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker).

265 International Association of Hydrogeologists—Canadian National Chapter, [Brief submitted to ENVI](#), 1 May 2024, pp. 4–5.



applications, in news releases, and elsewhere.²⁶⁶ Several other witnesses also noted that they hoped to see more of a focus on groundwater at the Canada Water Agency.²⁶⁷

The Committee was encouraged to hear from Sumit Gera (Senior Director, Canadian Geospatial Data Infrastructure, Department of Natural Resources) about recent mapping and modelling work related to groundwater:

Work is also under way within NRCan's Geological Survey of Canada. For example, NRCan has conducted a national level groundwater assessment using regional and national-scale groundwater and surface water modelling and remote sensing technologies. The Geological Survey of Canada has also partnered with Canada1Water, which is a fully integrated surface and groundwater model demonstrating water interactions and balances, which can be used to inform adaptation decisions.²⁶⁸

D. Groundwater Under Threat

The Committee heard that groundwater is under threat in Canada and globally in a number of ways—including from contamination with pollutants²⁶⁹ or nutrients,²⁷⁰ from climate change,²⁷¹ and from urban development and population growth,²⁷² among others. James Famiglietti informed the Committee that his research showed that over half of the world's major aquifer systems are “past sustainability tipping points due to over-exploitation.”²⁷³ He explained that this is particularly significant because groundwater provides nearly half of the irrigation water that fuels food production, and

266 International Association of Hydrogeologists—Canadian National Chapter, [Brief submitted to ENVI](#), 1 May 2024, p. 5.

267 E.g., ENVI, [Evidence](#), 13 February 2024, 1710 (Steven Frey); ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker).

268 ENVI, [Evidence](#), 24 October 2023, 1115 (Sumit Gera, Senior Director, Canadian Geospatial Data Infrastructure, Department of Natural Resources).

269 See, for example, ENVI, [Evidence](#), 21 March 2024, 1630 (Mandy Olsgard, Senior Toxicologist and Risk Assessor, As an individual); ENVI, [Evidence](#), 18 April 2024, 1545 (Martin Bureau, Vice-President, Innovation and Head of the PFAS Center of Excellence, ALTRA); ENVI, [Evidence](#), 17 April 2023, 1220 (Melody Lepine, Director, Mikisew Cree First Nation); ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker).

270 E.g., ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker); ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris, Director, Resilient Agriculture Policy Division, Department of Agriculture and Agri-Food).

271 E.g., ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris); ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

272 E.g., ENVI, [Evidence](#), 1 February 2024, 1655 (Maria José Maezo); ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

273 ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

more than that in times of drought.²⁷⁴ He went on to explain, “a profound lack of groundwater management around the world has allowed massive over-pumping to continue unabated.”²⁷⁵

The Committee also heard that groundwater levels in western Canada in early 2023 were at record lows, due to persistent drought,²⁷⁶ causing some municipalities to be unable to withdraw water from reservoirs through their pipes.²⁷⁷ Several witnesses described snowpack levels that were much lower than normal,²⁷⁸ indicating that less meltwater than normal would be available in spring. Marie Larocque (Professor, Université du Québec à Montréal,) described other pressures on groundwater broadly—such as increased pumping, urban sprawl, agricultural intensification, and climate change.²⁷⁹

The Committee heard concerns about contaminated groundwater, which are discussed below. Contaminated groundwater is both technically difficult and costly to clean up.²⁸⁰ The long residence time of groundwater means that a contaminated aquifer could be made unusable as a source of water for decades or longer.²⁸¹ As well, because groundwater may discharge to the surface, contaminated groundwater can also pollute the surface water that it feeds.²⁸² Due to groundwater flows, plumes of contaminants may be carried for many kilometres from their source.²⁸³

Marie Larocque explained that groundwater is vulnerable to contamination:

Groundwater has the particularity of being indirectly exposed to anthropogenic pressures and climatic hazards that occur at the surface. For this reason, impacts are

274 Ibid.

275 Ibid.

276 ENVI, [Evidence](#), 1 February 2024, 1640 (John Pomeroy).

277 Ibid.

278 ENVI, [Evidence](#), 9 April 2024, 1600 (John Pomeroy); ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull); ENVI, [Evidence](#), 18 April 2024, 1530 (Anna Warwick Sears); ENVI, [Evidence](#), 4 June 2024, 1640 (Haseen Khan).

279 ENVI, [Evidence](#), 6 February 2024, 1550 (Marie Larocque).

280 Jacob Kalff, *Limnology: inland water ecosystems*, 2002, Prentice Hall, New Jersey, p. 42.

281 Ibid.

282 Ibid.

283 Ibid.



often delayed in time. They may occur downstream of pressures and are sometimes difficult to measure in the short term. They may also take decades to subside.²⁸⁴

Beth Parker added:

Whether it is the intentional disposal of waste or a result of accidental leaks or spills, groundwater is a common receptor of contaminants. Since groundwater is invisible and moves much more slowly than surface water, it can take decades to discover groundwater contamination, disassociating cause from effect.

We continue to discover new contamination due to human activities occurring decades ago. Recent examples include high nutrient loading from groundwater discharge causing continual algal blooms in Lake Erie and Lake Simcoe, and the discoveries of PFAS and microplastics nearly everywhere.

Since groundwater contamination is slow to remediate, adverse water quality impacts are persistent and cumulative.²⁸⁵

During the Committee's study there was some discussion of private companies that bottle groundwater for sale. Dawn Martin-Hill (Full Professor, Indigenous Studies Department, McMaster University) expressed dismay, telling the Committee that Nestle has been extracting 3.6 million litres of groundwater a day²⁸⁶ in Ontario from an aquifer.²⁸⁷ Some of the questions raised included whether the extraction of groundwater was sustainable, and whether royalties paid to provinces were sufficient; Yenny Vega Cárdenas commented:

It's only normal that people who profit from water should pay something back to the community, because they're exploiting a common, collective resource. So it's only right that this wealth should be redistributed. At present, those who exploit the resource get off lightly, whereas it is normally a common good.²⁸⁸

Ms. Cardenas noted that this is a provincial question.²⁸⁹

284 ENVI, [Evidence](#), 6 February 2024, 1550 (Marie Larocque).

285 ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker).

286 ENVI, [Evidence](#), 19 June 2024, 1820 (Dr. Dawn Martin-Hill).

287 Ibid., 1720.

288 ENVI, [Evidence](#), 30 January 2024, 1710 (Yenny Vega Cárdenas).

289 Ibid.

E. Jurisdiction, Governance, and Trans-Boundary Issues

Like other freshwater, groundwater does not heed political boundaries. The Committee heard from many witnesses that responsibility for water is multi-jurisdictional,²⁹⁰ meaning that federal, provincial/territorial, municipal and Indigenous governments have a role to play. The Committee also heard about concerns and progress related to groundwater governance.

At the federal level, Natural Resources Canada (NRCan) is designated as the lead on groundwater *quantity*, while ECCC is the lead on groundwater *quality*.²⁹¹ In provinces and territories, multiple entities may also share responsibility for the stewardship and management of groundwater.²⁹² Some provinces have legislation to protect groundwater, such as British Columbia's *Groundwater Protection Regulation*²⁹³ under the *Water Sustainability Act*.²⁹⁴

Daniel Wolfish clarified that even with the formation of the Canada Water Agency, NRCan is expected to retain its role as federal government lead on groundwater, as the Canada Water Agency “will not be taking over the responsibilities of others.”²⁹⁵

In a brief, the International Association of Hydrogeologists—Canadian National Chapter stated its view that “[a] cooperative approach is vital for the development of scientific initiatives and policies aimed at safeguarding Canada’s groundwater resources.”²⁹⁶ The group’s brief reiterated conclusions from the 2009 Canada Council of Academies report on groundwater, which emphasized the need for “a unified strategy in managing Canada's groundwater sustainably,” and “highlighted the cross-jurisdictional

290 E.g., ENVI, [Evidence](#), 13 February 2024, 1745 (Kat Hartwig, Executive Director, Living Lakes Canada); ENVI, [Evidence](#), 15 February 2024, 1540 (Merrell-Ann Phare); ENVI, [Evidence](#), 27 February 2024, 1755 (Hon. J. Michael Miltenberger); ENVI, [Evidence](#), 4 June 2024, 1640 (Haseen Khan); ENVI, [Evidence](#), 13 February 2024, 1540 (Claire Malcolmson, Executive Director, Rescue Lake Simcoe Coalition).

291 Natural Resources Canada, Written response to questions from ENVI, 2021, p. 4.

292 Program on Water Governance, [Fact sheet: Groundwater use regulation](#), in Linda Nowlan “Out of Sight, Out of Mind? Taking Canada’s Groundwater for Granted,” Karen Bakker (Ed.), *Eau Canada*, 2007.

293 [Groundwater Protection Regulation](#), B.C. Reg. 39/2016.

294 [Water Sustainability Act](#), SBC 2014, Chapter 15.

295 ENVI, [Evidence](#), 31 October 2023, 1145 (Daniel Wolfish).

296 International Association of Hydrogeologists—Canadian National Chapter, [Brief submitted to ENVI](#), 1 May 2024, p. 1–2.



characteristics of groundwater, underscoring the importance of collaborative efforts among municipal, provincial, and federal government bodies.”²⁹⁷

Nadine Stiller, Chair of the Prairie Provinces Water Board, an organization that focuses on the equitable sharing of transboundary waters in the Prairies through its “master agreement on apportionment,”²⁹⁸ noted that the agreement is was being updated to include interprovincial “co-operation on groundwater and aquifer management.”²⁹⁹ Mike Wei (Professional Engineer, As an individual) explained that British Columbia had begun licencing groundwater in 2016, many decades after other Canadian jurisdictions;³⁰⁰ and noted the urgency of increasing scientific and monitoring infrastructure, suggesting that the federal government could help the province with this, to support decision-making.³⁰¹ He stressed the need for treating groundwater as a sustained priority.³⁰²

James Famiglietti said:

There remains a need, however, for inclusive and just groundwater governance and management. Changing surface water availability means that groundwater, which already supplies about one-third of Canada’s drinking water, will become increasingly called upon to fill emerging gaps in surface water availability. Protection of Canada’s groundwater supply is paramount as a buffer against drought, for climate adaptation and resilience, and for sustainable food production.³⁰³

F. Selected Additional Issues in Groundwater

This section presents information about selected additional issues related to groundwater that the Committee heard about during its study.

1) Groundwater and Agriculture in Canada

Maria José Maezo (Agri-Environmental Consultant from Fédération de l’UPA, Outaouais-Laurentides) told the Committee that in some locations, such as the island of Laval, in Quebec, groundwater is not sufficient in volume for agricultural use. It can be very

297 Ibid.

298 ENVI, [Evidence](#), 18 April 2024, 1535 (Nadine Stiller).

299 Ibid.

300 ENVI, [Evidence](#), 6 February 2024, 1715 (Mike Wei, Professional Engineer, As an individual).

301 Ibid., 1755.

302 Ibid., 1715.

303 ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

expensive for farmers to rely on municipal water supply system for their irrigation needs.³⁰⁴ She also noted that non-agricultural development—for example, urban development, or mining—on or near agricultural land can affect groundwater and cause challenges for local farmers.³⁰⁵ She suggested how the federal government could help:

Of course, ideally the federal government could help producers install irrigation basins; it could better manage the coherence between municipal and agricultural water supplies.

In Laval, some producers are simply connected to the city's aqueduct network. The federal government could play a coordinating role in infrastructure to ensure that water system planning takes into account producers' access to water, or that infrastructure is planned so as not to affect groundwater quality.

This would be particularly necessary in the case of mines or other projects that take place on agricultural land. There are also a host of laws that could protect adjacent producers' access to groundwater.³⁰⁶

The Committee observed that groundwater recharge could be enhanced through land use decisions made by farmers. Bryan Gilvesy (Chief Executive Officer, ALUS), spoke about some of the ways that farmers, through the ALUS program,³⁰⁷ can enhance farm landscapes with natural infrastructure, such as wetlands, thereby supporting groundwater recharge:

Natural infrastructure built by farmers and ranchers on their working landscape ... slows water flow and increases absorption of water to reduce flood risk, and it supports groundwater recharge for increased water security for both upstream and downstream communities.³⁰⁸

2) Need for Better Groundwater Data and Mapping

Estimating the volume of groundwater and mapping it is a challenge, both within Canada and in areas with transboundary waters. The Council of Canadian Academies' 2009 Report of the Expert Panel on Groundwater, *The Sustainable Management of Groundwater in Canada*, noted groundwater data deficiencies as a key priority for

304 ENVI, [Evidence](#), 1 February 2024, 1655 (Maria José Maezo).

305 Ibid.

306 Ibid., 1710.

307 According to Bryan Gilvesy, CEO, ALUS, in a [Brief submitted to ENVI](#), the ALUS program “is designed to deliver value [to landowners] for environmental activity by providing annual payments for the management and maintenance of stewardship projects that produce vital ecosystem services.”

308 ENVI, [Evidence](#), 30 November 2023, 1125 (Bryan Gilvesy).



action. In response to these data needs, NRCan told the Committee that it had taken the following actions:

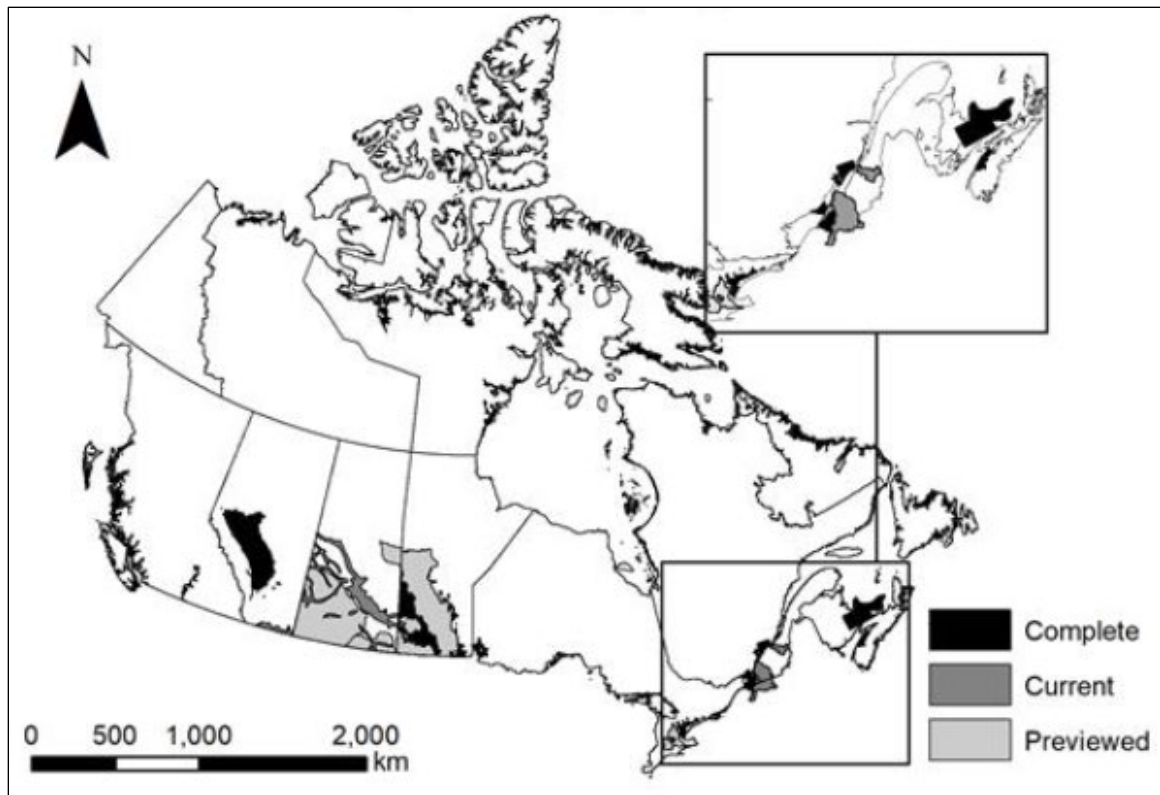
NRCan has followed up on the 2009 report of the Council of Canadian Academies by supporting the Groundwater Information Network data platform ... NRCan also published a synthesis of knowledge on groundwater resources written by a team of scientists from academia, public and private sectors, titled, “[Canada’s Groundwater Resources](#)” (Rivera et al., 2014 edition). NRCan is currently implementing the CCA Expert Panel recommendation to develop a common framework for aquifer classification, characterisation and groundwater flow systems to allow integration of data from local studies into broader regional and national assessments. In 2021, NRCan initiated a large groundwater/surface water interaction model at the national scale (Canada 1 Water), which provides a national framework to integrate data and knowledge in a modelling framework. NRCan also developed a series of standard data layers that will be disseminated via the Groundwater Information Network.³⁰⁹

In its brief, the International Association of Hydrogeologists—Canadian National Chapter, stated that “[m]ost of the aquifers in Canada have not been mapped, classified, or characterized,” emphasizing the difficulty this presents for international reporting on the status of groundwater bodies.³¹⁰ The extent of aquifer mapping in Canada is illustrated in Figure 5.

309 Natural Resources Canada, Written response to questions from ENVI, 2021, p. 10.

310 International Association of Hydrogeologists—Canadian National Chapter, [Brief submitted to ENVI](#), 1 May 2024.

Figure 5—The Status of Aquifer Mapping in Canada



Source: Groundwater Information Network (GIN). (2021). Key aquifers of Canada. [\[Data set\]](#), in [Brief submitted to ENVI](#), International Association of Hydrogeologists—Canadian National Chapter, 1 May 2024.

Beth Parker also noted the need for more information about groundwater in Canada, stating that “[c]urrent monitoring systems in Canada are inadequate in representing the dynamic character and complexity of the hydrologic system, especially the groundwater component.”³¹¹

In its 2021 brief to the Committee, NRCan noted a need for greater understanding of shared Canada–United States groundwater resources:

NRCan has identified 10 international transboundary aquifers of interest and reports on them under the United Nations Sustainable Development Goals (SDG 6.5.2). Hundreds of wells extract groundwater from shared aquifers located on both sides of the Canada-US border, but there are no formal legally-binding agreements in any of the identified transboundary aquifers, and no operational arrangements for water cooperation have

311 ENVI, [Evidence](#), 6 February 2024, 1710 (Beth Parker).



been made in the context of Sustainable Development Goals. A greater understanding of these transboundary aquifers is needed. The necessity for better cross border data harmonization and data sharing has been identified as a recurring issue. In collaboration with ECCC, the USGS, and international partners, NRCan has developed data sharing standards and technologies, but more needs be done to advance this issue.³¹²

G. Conclusion: Groundwater

The International Association of Hydrogeologists—Canadian National Chapter, in its brief, issued a “call to action” to the federal government, asking that it integrate the study of groundwater into its freshwater management:

The federal government can keep our water safe, clean, and well-managed by integrating hydrogeology—the study of groundwater—into freshwater management. Groundwater is critical to Canadian freshwater ecosystems and the largest source of freshwater. Millions of Canadians depend on groundwater as a sole domestic water supply. Groundwater’s strategic value grows as climate change stresses our water resources. First Nations are disproportionately reliant on groundwater so this work will meaningfully advance reconciliation with Indigenous Peoples. If prompt action is not taken, then the looming risks of groundwater depletion and pollution, along with their impacts on humans and ecosystems, will remain unchecked.³¹³

As stated by James Famiglietti:

There remains a need ... for inclusive and just groundwater governance and management. Changing surface water availability means that groundwater, which already supplies about one-third of Canada’s drinking water, will become increasingly called upon to fill emerging gaps in surface water availability. Protection of Canada’s groundwater supply is paramount as a buffer against drought, for climate adaptation and resilience, and for sustainable food production.³¹⁴

Recommendation 17

That, given the important role of groundwater in the hydrological system, the Canada Water Agency, in keeping with respective jurisdictions, dedicate sufficient attention and resources to the role of groundwater in ensuring water security and supporting adaptation to climate change in Canada.

312 Natural Resources Canada, Written response to questions from ENVI, 2021, p. 10.

313 International Association of Hydrologists, [Brief submitted to ENVI](#), 1 May 2024.

314 ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

Recommendation 18

That the Government of Canada recognize the strategic value of groundwater and work with other levels of government and with scientists to take measures to protect groundwater from depletion and pollution, especially where it is a source of drinking water.

Recommendation 19

That the Government of Canada include groundwater issues in the modernization of the *Canada Water Act* and in the activities of the Canada Water Agency, in keeping with respective jurisdictions, and in collaboration with Indigenous communities, recognizing that climate change will cause continued thawing and drying in Canada, and that changing surface water availability will place increasing demands on precious groundwater resources.

6. CLIMATE CHANGE IMPACTS ON FRESHWATER

“The climate crisis is a water crisis, and the health of our watersheds plays a critical role in providing natural defences against climate change impacts including droughts, wildfires and floods.”³¹⁵

Miki Eslake, Program Coordinator,
Rivershed Society of British Columbia

A. Background

John Pomeroy (Distinguished Professor and Canada Research Chair, University of Saskatchewan) provided some context for the Committee regarding the impacts of climate change on freshwater. He told Committee members that he had worked with other scientists at what was then Environment Canada in 1996 to summarize the impacts of climate change on freshwater in Canada. He had recently reviewed that work, and stated:

Everything we mentioned in there had not happened yet, and everything we mentioned in there is now happening: the floods, the droughts being worse, the loss of glaciers, the

315 ENVI, *Evidence*, 1 February 2024, 1550 (Miki Eslake, Program Coordinator, Rivershed Society of British Columbia).



loss of snowpack, lake ice, algae blooms, water contamination, and other problems. We're seeing it all. I guess the lesson from that is that science can be helpful.³¹⁶

There is consensus among climate scientists that the increase in global average temperature by the end of the century must be kept near 1.5°C above pre-industrial levels to avoid the worst impacts of climate change.

According to the World Meteorological Organization's *State of the Global Climate 2025* report, the global average temperature has increased to approximately 1.43°C above pre-industrial levels because of human-caused greenhouse gas (GHG) emissions.³¹⁷ This heating has led to water scarcity, heat waves, forest fires, extreme precipitation, sea-level rise, species loss and ecosystem decline; such effects are expected to worsen with every increment of additional warming.³¹⁸

Climate change impacts are not felt evenly around the world nor by all members of affected communities. Furthermore, populations that have not contributed significantly or at all to climate change, such as young people, future generations and citizens of poor countries, must still live with its consequences.

All elements of the water cycle, which is illustrated in Figure 6, are being affected as the earth's average temperature increases due to climate change.³¹⁹ Climate change affects rainfall, snowfall, snowmelt,³²⁰ and glacial melt, all of which result in changes to established patterns that are essential to water volumes and water quality needed for basic ecosystem function³²¹ as well as for agriculture³²² and other human uses of water, including for drinking water and sanitation. Climate change also makes various extreme weather events more severe and more likely to occur,³²³ which in turn has many consequences, including for infrastructure, public safety, public health and the economy.

316 ENVI, [Evidence](#), 1 February 2024, 1640 (John Pomeroy).

317 World Meteorological Organization, [State of the Global Climate 2025](#), 23 March 2026.

318 United Nations Climate Action, [1.5°C: what it means and why it matters](#).

319 United States Geological Survey, [The Water Cycle](#), 2 October 2022.

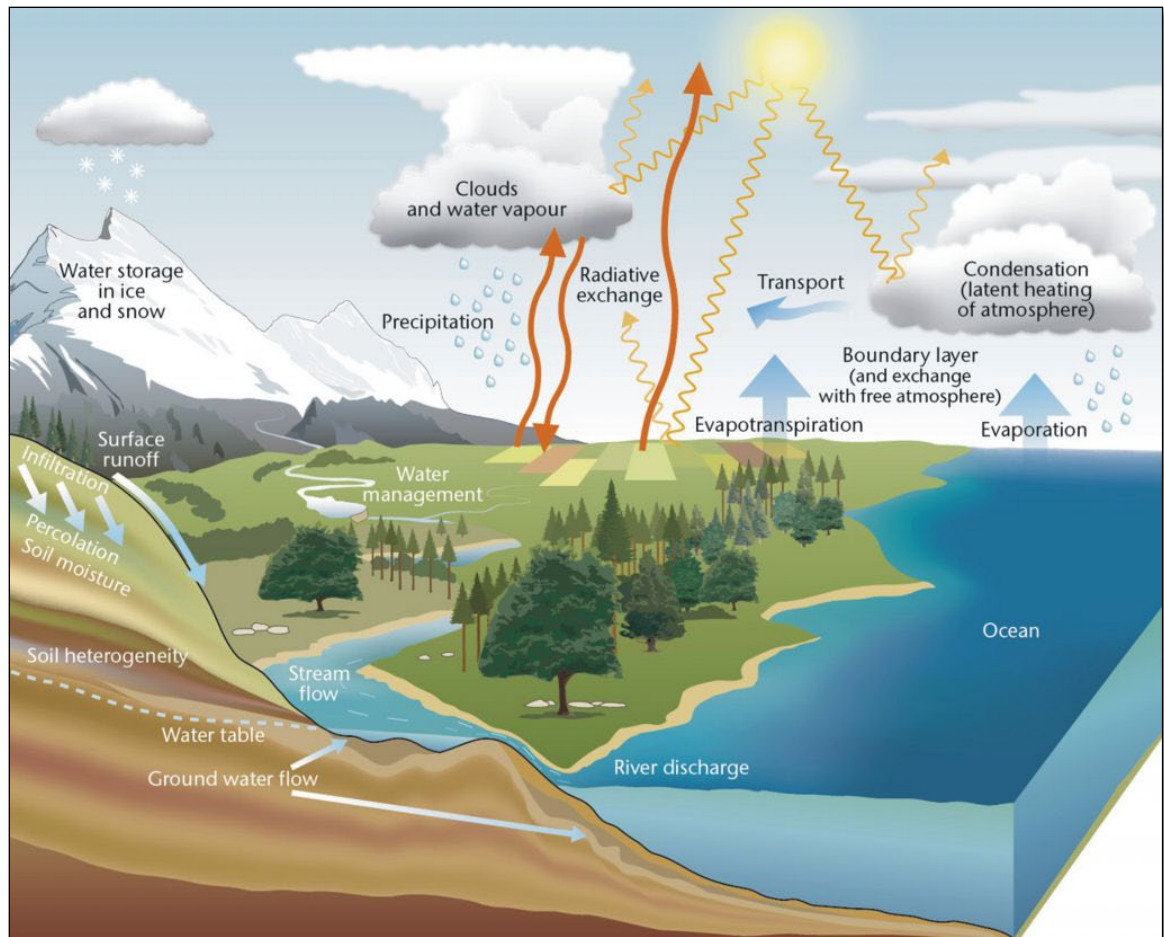
320 For example: Environment and Climate Change Canada, [Snow cover](#).

321 The Nature Conservancy, Conservation Gateway, [Environmental Flows Concepts](#).

322 The World Bank, [Water in Agriculture](#).

323 NASA Global Climate Change: Vital Signs of the Planet, [Extreme Weather and Climate Change](#).

Figure 6— The Water Cycle



Source: United Kingdom (U.K.) Met Office, [Water Cycle](#), 2018; reproduced in Government of Canada, *Canada in a Changing Climate 2019*, “Figure-6.1: The water cycle, its components, relevant processes, and interactions” in [Chapter 6: Changes in Freshwater Availability Across Canada](#).

The impacts of climate change on freshwater relate to other factors, such as land use; for example, efforts to adapt, such as restoring wetlands to reduce flooding, can mitigate negative impacts.³²⁴ Similarly, the effects these impacts may have on people’s physical and mental health may differ according to a number of factors; how well they cope with

324 Government of Canada, [Adapting to climate change in Canada](#).



flooding may relate to such factors as where they live, their age, health, or income, or their community's emergency management plans.³²⁵

Many witnesses who appeared before the Committee during its study spoke with deep concern about climate change and its impacts on freshwater.³²⁶ Robert Sandford, Senior Government Relations Liaison, Global Climate Emergency Response, United Nations University Institute for Water, Environment and Health, divided climate change impacts into two stages: a first stage that consists of impacts such as more frequent and intense extreme weather events and changes in global precipitation patterns; and a second stage that will threaten national security and include an increase in intra- and interstate conflicts and an increase in involuntary human migration.³²⁷ He emphasized the threat of compounding events—that is, situations where a community has not yet recovered from one disaster before another strikes, and cited the examples of “heat wave, wildfires, and floods in 2021 and again in 2023 in British Columbia, and the heat wave, permafrost thaw, hydrological drought, and recurring wildfire evacuations in the Northwest Territories in 2023.”³²⁸

Dr. Pomeroy added:

The year 2023³²⁹ was the hottest year on the planet since instrumented records began—and possibly in 120,000 years, which is most of humanity's history.

In Canada, this melted snow and ice, thawed permafrost, burned our forests and intensified the flow of water through the landscape. Floods were worse and droughts were worse. They were outside of anything in which the species in our country and in our natural environment have ever evolved. This is hurtling us into a dangerous and unfamiliar world where our experience and traditional approaches no longer provide adequate guidance.³³⁰

325 United States Environmental Protection Agency, *[Understanding the Connections Between Climate Change and Human Health](#)*.

326 See, for example, ENVI, *[Evidence](#)*, 1 February 2024, 1640 (John Pomeroy); ENVI, *[Evidence](#)*, 1 February 2024, 1645 (Coree Tull); ENVI, *[Evidence](#)*, 13 February 2024, 1650 (Kat Hartwig); ENVI, *[Evidence](#)*, 27 February 2024, 1600 (Elizabeth Hendriks); ENVI, *[Evidence](#)*, 9 April 2024, 1700 (Robert Sandford, Senior Government Relations Liaison, Global Climate Emergency Response, United Nations University Institute for Water, Environment & Health); ENVI, *[Evidence](#)*, 9 April 2024, 1655 (Cathy Orlando, National Director, Citizens' Climate Lobby).

327 ENVI, *[Evidence](#)*, 9 April 2024, 1700 (Robert Sandford).

328 Ibid.

329 The statement was made in April 2024. In March 2026, the World Meteorological Association described in its *[State of the Global Climate 2025](#)* report that 2015–2025 were the hottest 11 years on record.

330 ENVI, *[Evidence](#)*, 1 February 2024, 1640 (John Pomeroy).

“In the face of biodiversity and climate crises, water management through freshwater restoration and protection strategies is going to be critical to mitigating the risks, threats and impacts of climate change.”³³¹

Elizabeth Hendriks, Vice-President,
Restoration and Regeneration, World Wildlife Fund-Canada

Climate change affects freshwater, and in turn people, communities, and the environment, in numerous ways. Oliver Brandes, Co-Director, POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, told the Committee that “[b]y 2025, climate impacts and disasters will slow down Canada's economic growth by \$25 billion annually, the equivalent of 50% of the projected GDP growth.”³³² Other witnesses also emphasized the costs of dealing with impacts of climate change.³³³

The Assembly of First Nations (AFN) released a climate strategy in October 2023, and sees clear links between freshwater issues and climate change: In its brief to the Committee, AFN stated that “[d]ue to the deep physical, spiritual, and emotional interconnections between our waters, lands, air, and communities, we view [our] climate strategy as a useful framework for addressing the challenges we have with freshwater today.”³³⁴

B. Selected Impacts of Climate Change on Freshwater in Canada

Chapter 4 of the Government of Canada’s 2021 Canada in a Changing Climate: National Issues Report focuses on water resources. The report notes the following impacts of climate change on freshwater in Canada; the first four are observed changes, while the final three are projected future trends:

- Melting ice, thawing permafrost and shorter duration of snow cover;
- Increasing precipitation and a transition from snow to rain;

331 ENVI, [Evidence](#), 27 February 2024, 1600 (Elizabeth Hendriks).

332 ENVI, [Evidence](#), 8 February 2024, 1530 (Oliver Brandes).

333 For example, ENVI, [Evidence](#), 30 November 2023, 1130 (Zita Botelho).

334 Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023.

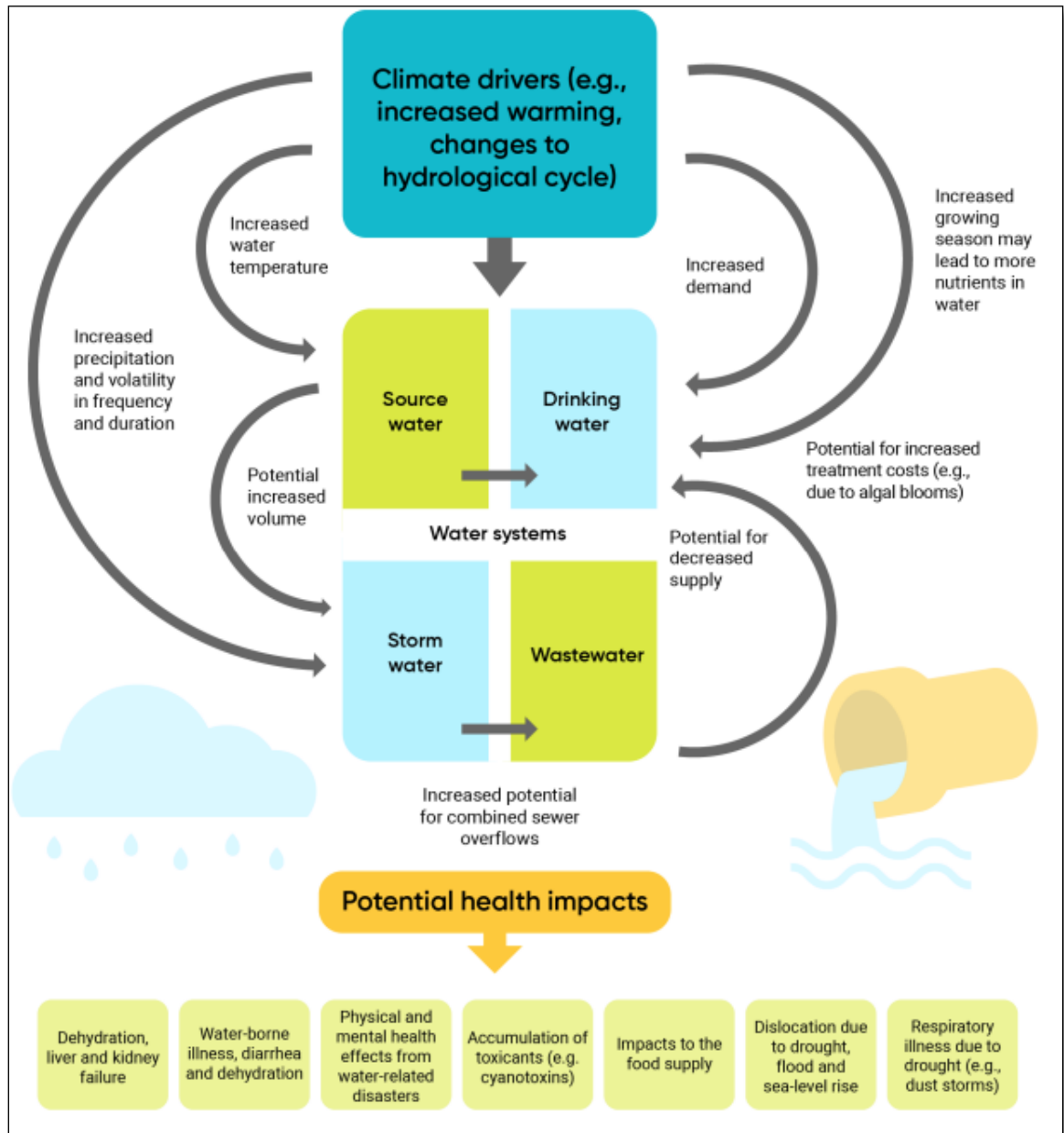


- Changes in the timing of water availability;
- Changes in the nature of extreme events;
- Less water availability in southern basins, particularly in the summer;
- Increased frequency and intensity of water-related extremes; and
- Reduced water quality and more harmful algae blooms.³³⁵

The 2022 report, *Health of Canadians in a Changing Climate*, provides a graphic that illustrates a number of the ways that climate change can affect water quality and quantity, and, in turn, affect health.

335 Government of Canada, *Canada in a Changing Climate: National Issues Report*, [Chapter 4: Water Resources](#), 2021, pp. 192–193, pp. 196–197.

Figure 7—Examples of the Direct and Indirect Ways Climate Change Can Alter Water Quality and Quantity and Affect Health



Source: Tim Takaro et al., *Health of Canadians in a changing climate: Advancing our knowledge for action*, "Chapter 7: Water Quality, Quantity, and Security," 2022, p. 474.



The report notes three areas for federal government action among its suggested “[e]xample adaptations to reduce health risks from climate change impacts on water quality, quantity, and security,”

- Research on threats to drinking water in the context of climate change;
- Development of a recommended set of national guidelines for drinking water safety that integrate information on climate change risks; and
- Nationally integrated approach to monitoring and surveillance for water-borne diseases.³³⁶

The Committee heard from many witnesses about their concerns related to the significant effects of climate change on freshwater. For example, Elizabeth Hendriks (Vice-President, Restoration and Regeneration, World Wildlife Fund-Canada) described climate change as “a real and present threat,”³³⁷ highlighting examples from British Columbia, where “[p]arts of the province are experiencing high levels of drought and there is concern that water levels in the dams will prevent their ability to generate power at the level needed to serve customers,”³³⁸ and Nova Scotia, where “a massive wildfire devastate[d] the Halifax region.”³³⁹ Ms. Hendriks linked these concerns to biodiversity, stating:

There is a slow yet persistent disappearance of nature and the diversity of life on this planet. It is bad for nature and it is bad for us. Specifically, freshwater ecosystems are undervalued and understudied. Fresh water is critical for community and species health.³⁴⁰

A brief submitted to the Committee jointly by several water organizations stated, “[c]limate change is adding to and exacerbating existing threats to our waters caused by pollution, overuse, habitat loss and fragmentation, alteration of flow, and invasive species.”³⁴¹ For its part, the Canadian Environmental Law Association focused on the complexity of water management, telling the Committee: “[c]limate change is

336 Health Canada, *Health of Canadians in a Changing Climate: Advancing our Knowledge for Action*, 2022, p. 516.

337 ENVI, *Evidence*, 27 February 2024, 1600 (Elizabeth Hendriks).

338 Ibid.

339 Ibid.

340 Ibid.

341 The Canadian Freshwater Alliance, Forum for Leadership on Water (FLOW), Our Living Waters, and Rivershed Society of BC, *Brief submitted to ENVI*, 10 June 2021.

exacerbating existing water quality and quantity management challenges in addition to presenting new and deeply complex water management concerns.”³⁴²

Kevin Norris, Director, Resilient Agriculture Policy Division, Department of Agriculture and Agri-Food, outlined how climate change can affect agriculture:

Impacts from climate change are also expected to influence production and increase risks to water quantity and quality. Anticipated seasonal shifts in temperature and precipitation impact water quantity and risk creating insecurity in on-farm water supplies. This could result in greater competition for this resource and increased reliance on costly irrigation and require effective risk management strategies and water resource management.³⁴³

He also explained how climate change can increase the movement of nutrients from agriculture to waterways:

As a result of climate change, wetter than normal winters and springs in combination with hotter, drier summers increase the movement of nutrients, such as those from fertilizers, to surface water and groundwater. This increases the risk of algal blooms and eutrophication of surface waters and has a direct impact on water quality.³⁴⁴

Jerome Marty, Executive Director, International Association for Great Lakes Research, recommended that the government:

[C]onsider climate change as an accelerator for pollutant production and toxicity. Higher temperatures increase metabolic rates of resident organisms, causing oxygen depletion and creating toxic conditions for the biota. Higher water temperatures also favour the growth of harmful algal blooms—HABs—that are able to release cyanotoxins such as microcystin.”³⁴⁵

Climate change also affects the way municipal infrastructure must be designed. As Benoit Barbeau, Full Professor, Polytechnique Montréal, described:

I'll give you a very concrete example. In designing a sewer system, it used to be acceptable for a small suburb to have an overflow once every 10 years. Now, however, these overflows are more frequent. This means that new criteria that factor in heavier

342 Canadian Environmental Law Association, [Brief submitted to ENVI](#), 2 November 2023.

343 ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris).

344 Ibid.

345 ENVI, [Evidence](#), 23 November 2023, 1240 (Jérôme Marty, Executive Director, International Association for Great Lakes Research).



rainfall are required so that the sewers do not overflow any more frequently than before, despite the climate changes.³⁴⁶

Mark Ryckman also underscored how climate change threatens ecosystems.³⁴⁷

C. Adapting to Climate Change

Many witnesses spoke about the importance of adapting to climate change and provided examples about how this can be done.

In terms of agriculture, Tyler McCann (Managing Director, Canadian Agri-Food Policy Institute) said “We talk a lot about mitigation, but I think that adaptation is actually the number one issue for agriculture. That really should be where the focus is—on how we adapt to this new reality.”³⁴⁸

Robert Sopuck emphasized the positive role that has been played by the Winnipeg floodway in preventing damage from flooding: “Built between 1962 and 1968, the floodway cost \$63 million and has saved property from damage to the order of \$30 billion. That's climate change adaptation at its finest.”³⁴⁹

Dr. Pomeroy emphasized a number of areas related to climate change and drought in which he felt the Government of Canada should prioritize actions.:

We need national coordination, new investment, and novel technology—such as the environmental prediction mentioned—to help predict floods, water quality and droughts and to identify properties and infrastructure at risk in the future.

We need to identify the vulnerabilities of communities and focus on mitigating vulnerability, not just flood damages. It's not just money; it's people's lives.

We need to integrate our planning on river basins—something we don't do in this country—to help with disaster mitigation and adaptation, flood and drought recovery, pollution abatement, transboundary allocations, our American water relationships, and the use of natural infrastructure, such as lakes, wetlands and forests.

346 ENVI, [Evidence](#), 2 November 2023, 1240 (Benoit Barbeau, Full Professor, Polytechnique Montréal).

347 ENVI, [Evidence](#), 2 November 2023, 1230 (Mark Ryckman).

348 ENVI, [Evidence](#), 23 November 2023, 1220 (Tyler McCann, Managing Director, Canadian Agri-Food Policy Institute).

349 ENVI, [Evidence](#), 21 November 2023, 1205 (Robert Sopuck).

We need the leading-edge research and science capacity to inform wise water decisions and build state-of-the-art water prediction management systems to support our decision-making so we know in advance what's going to be happening.³⁵⁰

Recommendation 20

That the Government of Canada reflect the science and anticipate changes due to the climate crisis, particularly for biodiversity conservation and climate adaptation.

Recommendation 21

That the Government of Canada address the climate crisis with urgency and priority to avoid the worst impacts of climate change, which includes significant threats to Canada's freshwater systems.

Recommendation 22

That the Government of Canada prioritize climate change and its impacts on freshwater when considering freshwater policies.

Recommendation 23

That the Government of Canada, given that the impacts of climate change vary greatly across Canada, apply regional approaches to freshwater protection in policy creation.

Recommendation 24

That the Government of Canada work collaboratively with provinces and territories to establish freshwater security funds to help with climate mitigation efforts (such as dealing with droughts, flooding, and wildfires).

Recommendation 25

That the Government of Canada establish a Youth Climate Corps to train and employ young Canadians to address labour gaps in the environmental sector, including in freshwater management, data analysis, and research, as set out in Budget 2025, which announced 40 million dollars for the creation of a Youth Climate Corps.

350 ENVI, *Evidence*, 1 February 2024, 1640–1645 (John Pomeroy).



7. AGRICULTURE AND FRESHWATER

“Water is critical for agriculture. Too much or too little has the potential to cause significant harm to food production, but managed and leveraged strategically, it can give Canada a significant competitive advantage in an increasingly hot, thirsty and hungry world.”³⁵¹

Tyler McCann, Managing Director, Canadian Agri-Food Policy Institute

During the study, the Committee heard testimony regarding how essential water is for agriculture, as farmers of all sorts require a consistent and reliable supply of freshwater.³⁵² However, agriculture is a land use activity that can also impact adjacent sources of freshwater, including water quality impacts from the runoff of nutrients (e.g., fertilizers) and pesticides. As expressed by Kevin Norris, Director, Resilient Agriculture Policy Division, Department of Agriculture and Agri-Food:

Canadian farms depend on a clean and reliable source of water. Nevertheless, the sector realizes the impacts it can have on freshwater quality and quantity. Agricultural inputs such as fertilizers and pesticides play an essential role in food security by helping to drive increases in crop yields over time, while also providing social and economic benefits to Canadians. However, when these inputs are used to excess or improperly managed, agricultural production can impact the quality of water through sediment loading, runoff and leaching of excess nutrients, pathogens and pesticides.³⁵³

The Committee explored the following issues related to agriculture: recognizing the importance of water for food security, the benefits of irrigation at Lake Diefenbaker, and watershed management on working landscapes.

A. Water and Food Security

Water is essential for food production. However, climate change is shifting patterns of water availability, and Tyler McCann called for greater investment in understanding how

351 ENVI, [Evidence](#), 23 November 2023, 1110 (Tyler McCann).

352 E.g., ENVI, [Evidence](#), 30 January 2024, 1635 (Ray Orb, President, Saskatchewan Association of Rural Municipalities).

353 ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris).

water availability for agriculture is changing.³⁵⁴ James Famiglietti (Professor, Arizona State University, As an individual) characterized water scarcity in terms of food security:

Because roughly 80% of the world's water that is withdrawn from rivers, lakes, reservoirs and groundwater aquifers is used to produce food, this means that not only is the world's water security at risk, but so too is its food security.³⁵⁵

Dr. Famiglietti encouraged the Committee to consider regional agriculture water supply issues as *national issues*. He provided the example of California, which supplies much of the United States and some of the North American continent with food, and yet its water problems are seen as merely a regional problem:

I want to draw a parallel to what's happening in the United States. Take California, for example. California is running out of groundwater, and the reason is that it grows food for the entire nation. Within the United States, California water security is viewed as a California problem, even though it grows food for the entire nation.

When we look at our food-producing regions in Canada, we need to make sure that if we want to keep those food-producing regions there, they have adequate water supply, and that may require a national level—I don't know if we call it oversight, or policy, or planning.³⁵⁶

Recommendation 26

That the Government of Canada recognize the importance of water to Canada's agriculture industry in increasing food production and addressing global food insecurity.

Recommendation 27

That the Government of Canada consider the potential impacts of future and existing legislation and regulation on agriculture operations to ensure that fresh water and food production are not negatively impacted.

One way to adapt to a water restrained future is to use more drought-tolerant crops. Tyler McCann discussed the development of drought-resilient crop varieties as an adaptation to droughts. Terri Stewart (Executive Director, Chemistry, CropLife Canada) concurred that drought-tolerant crops were a priority:

354 ENVI, [Evidence](#), 23 November 2023, 1205 (Tyler McCann).

355 ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).

356 Ibid., 1645.



With water shortages on the horizon for much of the world, growers continue to actively seek out tools that help them reduce water. Canada's agriculture industry is focused on providing crops that are better able to withstand drought and other extreme weather occurrences...³⁵⁷

Agriculture and Agrifood Canada's research priorities include "improving water use efficiency through the development of more climate-resilient crop varieties and on-farm technologies."³⁵⁸ However, Pierre Petelle (President and Chief Executive Officer, CropLife Canada) warned that the regulatory environment for plant science technologies makes it difficult to bring such innovations to market.³⁵⁹

Recommendation 28

That the Government of Canada improve the federal regulatory approval process for plant science technologies that reduce the amount of water needed to grow food.

B. Irrigation

Greater use of irrigation for food production is another adaptation for a water restrained future. Tyler McCann observed that "Canadian agriculture, compared to its competitors, is a relatively low user of irrigation. We have a lot of untapped potential for sustainable irrigation on Canadian farms."³⁶⁰ Jillian Brown, Executive Director, Saskatchewan Irrigation Projects Association, spoke about the contribution that irrigation can make:

[I]rrigation has been shown to provide producers with greater options to manage their crop rotations, meaning improved soil health and improved soil water use efficiency. In addition, irrigation is a practice that has been shown to increase soil carbon sequestration by 11% to 35% on average in semi-arid regions of Canada.³⁶¹

357 ENVI, [Evidence](#), 27 February 2024, 1730 (Terri Stewart, Executive Director, Chemistry, CropLife Canada).

358 ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris).

359 ENVI, [Evidence](#), 27 February 2024, 1740 (Pierre Petelle, President and Chief Executive Officer, CropLife Canada); *Ibid.*, 1810.

360 ENVI, [Evidence](#), 23 November 2023, 1205 (Tyler McCann).

361 ENVI, [Evidence](#), 6 February 2024, 1715 (Jillian Brown, Executive Director, Saskatchewan Irrigation Projects Association, Irrigation Saskatchewan).

1) Lake Diefenbaker: An Irrigation Case Study

A number of witnesses spoke about Lake Diefenbaker in Saskatchewan, “the largest water reservoir in the Prairies [with] tremendous capacity to support irrigation.”³⁶² Shawn Jaques (President and CEO, Water Security Agency) explained that Lake Diefenbaker is used “to capture and store water in years when there's excess precipitation or excess water flowing on the Saskatchewan River”³⁶³ and that the water is used for irrigation or community use, particularly in years of drought. Mr. Jaques provided the history of Lake Diefenbaker and his view of its future potential:

Creating a large and secure supply of water in the Prairies was discussed for many years in Saskatchewan. Discussions gained momentum following the crushing drought of the 1930s. The decision to proceed with the [Lake Diefenbaker] project was made in 1959, with construction completed in 1967. Lake Diefenbaker was formed by the construction of the Gardiner Dam and the Qu'Appelle River Dam. Lake Diefenbaker was envisioned to provide water for power generation, irrigation, drinking, and urban and industrial development. Today, it provides a significant supply of hydroelectric power, drinking water for nearly two-thirds of the province and water for urban and industrial development in the central area of Saskatchewan.

The irrigation potential of the lake, however, has never been fully realized. Pumphouses and canals were built during the construction of the project. Today, irrigation is operational on the east side of the lake. Unfortunately, in 1973, work was discontinued on the west side by the provincial government of the day when canal construction was already 90% completed. The west side project was never finished. Today, as a result, we see many kilometres of dry canal with concrete structures that have never been used. Lake Diefenbaker has the potential for up to half a million irrigation acres. We are now focused on building out irrigation infrastructure on the west side of Lake Diefenbaker.

The Lake Diefenbaker irrigation projects represent some of the most unique opportunities in Canada to deliver on food security, climate resiliency and economic growth. Irrigation enables producers to grow diverse, high-value crops, which increases on-farm profitability and enables value-added processing, business attraction and employment.³⁶⁴

Shawn Jaques updated the Committee that, early in 2024, “the Province of Saskatchewan announced it's moving forward with the first 90,000 acres of the larger Lake Diefenbaker irrigation projects.”³⁶⁵ Several witnesses expressed their desire that the federal government also provide support to allow Lake Diefenbaker to realize its full

362 ENVI, [Evidence](#), 1 February 2024, 1725 (John Pomeroy).

363 ENVI, [Evidence](#), 4 June 2024, 1545 (Shawn Jaques).

364 Ibid., 1745.

365 ENVI, [Evidence](#), 4 June 2024, 1535 (Shawn Jaques).



irrigation potential.³⁶⁶ Jillian Brown noted that the Lake Diefenbaker development would take “a substantial amount of upfront capital investment... requiring partnership between the province and Canada to support a project that's transformational.”³⁶⁷

Beyond the main potential benefits of the Lake Diefenbaker irrigation project, increased climate resilience to droughts³⁶⁸ and increased food production/security, some witnesses described additional environmental benefits.³⁶⁹ Shawn Jaques discussed the potential to decrease carbon emissions from food production through Lake Diefenbaker irrigation, stating that Saskatchewan’s “irrigated crop acres will be 16% less emissions-intensive than... dryland crops,” concluding: “We're going to be producing more crops on the same land base with fewer emissions per tonne of crop produced.”³⁷⁰

On the other hand, Dr. Pomeroy raised concerns about the unintended downstream consequences of the Lake Diefenbaker project, such as drying out the Saskatchewan River delta, thus impacting Indigenous communities.³⁷¹ Mr. Jaques noted that Saskatchewan’s Water Security Agency is adapting its operations at Lake Diefenbaker in response to changing weather patterns and to lessen impacts on downstream users and communities.³⁷²

Recommendation 29

That the Government of Canada support the Lake Diefenbaker irrigation project, including through funding.

Recommendation 30

That the Government of Canada recognize irrigation for its environmental and climate change adaptation benefits and implement policy that encourages, rather than inhibits, its development and maintenance, in keeping with respective jurisdictions.

366 ENVI, [Evidence](#), 30 January 2024, 1755 (David Cooper, Vice-President, Agriculture Services and Economic Development, Water Security Agency); ENVI, [Evidence](#), 6 February 2024, 1715 (Jillian Brown); ENVI, [Evidence](#), 4 June 2024, 1535 (Shawn Jaques); ENVI, [Evidence](#), 30 January 2024, 1650 (Ray Orb).

367 ENVI, [Evidence](#), 6 February 2024, 1725 (Jillian Brown).

368 E.g., ENVI, [Evidence](#), 30 January 2024, 1755 (David Cooper).

369 ENVI, [Evidence](#), 6 February 2024, 1715 (Jillian Brown); ENVI, [Evidence](#), 4 June 2024, 1535 (Shawn Jaques).

370 ENVI, [Evidence](#), 4 June 2024, 1535 (Shawn Jaques).

371 ENVI, [Evidence](#), 1 February 2024, 1725 (John Pomeroy).

372 ENVI, [Evidence](#), 4 June 2024, 1555 (Shawn Jaques).

C. Beneficial Management Practices and Conservation on Agricultural Landscapes

The Committee heard about the challenges and opportunities of balancing ecological, economic, and social considerations through land and water management practices on agricultural lands.³⁷³ The environmental impacts of agriculture on water sources can be lessened through the use of beneficial management practices on farms.³⁷⁴ Steven Frey (Director of Research, Aquanty, As an Individual) elaborated:

Beneficial management practices that incorporate wetlands, grasslands, cover crops, minimum tillage and controlled drainage all promote surface water and groundwater availability, improve water quality and resiliency to flood, drought and disease stress.³⁷⁵

Another beneficial management practice, “4R nutrient stewardship,” can reduce the amount of nutrient runoff into waterways, as underlined by Frank Annau (Director, Product Stewardship, Fertilizer Canada):

[The] 4R approach has helped farmers apply the right source of fertilizer at the right rate and the right place at the right time. The resulting efficient use of fertilizer and nutrient use efficiency increases both cost savings and crop yields. Applying fertilizer in the right place with the right weather conditions also ensures it stays in the field and out of waterways. For example, in Ontario, 4R corn production practices can reduce phosphorus runoff by up to 60%. In a Saskatchewan cereal-oilseed-pulse rotation, this reduction could be as high as 75%.³⁷⁶

Mr. Annau explained that farms can choose from two tracks of the 4R program: “4R designation” and “4R certification.” 4R certification is the more ambitious track, which requires audits. Its standards were drafted:

[A]s part of a voluntary initiative to improve the [water quality of the] Lake Erie basin. One of the key goals is to create long-term positive impacts on water bodies associated with agriculture, including reducing eutrophication and helping to meet water quality standards. These efforts support the Canada-Ontario Lake Erie action plan, which

373 E.g., ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris); ENVI, [Evidence](#), 2 November 2023, 1225 (Michelle Woodhouse, Program Manager, Freshwater and Great Lakes Protections, Environmental Defence Canada); ENVI, [Evidence](#), 27 February 2024, 1550 (Tim Faveri, Vice President, Sustainability and Stakeholder Relations, Nutrien Ltd.); ENVI, [Evidence](#), 15 February 2024, 1530 (Chandra Madramootoo, Distinguished James McGill Professor, McGill University, As an individual); Canadian Cattle Association, [Brief submitted to ENVI](#), 23 February 2024; ENVI, [Evidence](#), 18 April 2024, 1635 (Frédéric Lasserre, Full Professor, Université Laval, As an individual).

374 ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris).

375 ENVI, [Evidence](#), 13 February 2024, 1655 (Steven Frey).

376 ENVI, [Evidence](#), 23 November 2023, 1235 (Frank Annau, Director, Product Stewardship, Fertilizer Canada).



features 4R in its approach to reduce water phosphorus levels by 40% below 2008 levels.³⁷⁷

Michelle Woodhouse (Program Manager, Freshwater and Great Lakes Protections, Environmental Defence Canada) commented on the contribution of agriculture to nutrient pollution in one of the Great Lakes:

Agricultural activities are the most significant source of nutrient pollution in Lake Erie. Fertilizers, nutrient-rich waste water or animal waste end up on the land and get washed into the lake, where they feed algae instead of crops. While there are farm-level interventions available to reduce nutrient runoff, voluntary uptake is fragmented and inadequate. There is also a conflict of interest whereby privately hired crop advisers, who work for fertilizer companies and have an incentive to sell more fertilizer, are farmers' main source of information on how much fertilizer needs to be applied.

To address the threat posed by algal blooms in Lake Erie and other freshwater bodies across the country, we are recommending that the federal government work with provinces to fund independent, certified agronomists and soil testing experts to reduce overapplication of fertilizers on agricultural lands.³⁷⁸

Ms. Woodhouse further recommended that the federal government conduct or fund research on fertilizer use and disposal, provide support to farmers transitioning to “lower-input growing practices”, and increase support for the implementation of best management practices on farms.³⁷⁹ Tyler McCann also expressed support for additional research investment related to the agricultural sector, its impacts on water, and practices to better protect water.³⁸⁰

Robert Sopuck (Former Member of Parliament) discussed the benefits of natural infrastructure or “nature-based solutions”—the re-creation of lost natural features such as wetlands—to improving water quality and quantity. He explained that restoring wetlands can reduce flood risk, and that “[w]etlands, whether natural or constructed, also improve water quality and sequester carbon.”³⁸¹ Wetland conservation and restoration on privately-owned farmland can bring about multiple environmental benefits enjoyed by the public. “However, farmers are being asked to conserve public resources on their private lands, such as wetlands, that provide only public benefits and

377 Ibid.

378 ENVI, [Evidence](#), 2 November 2023, 1225 (Michelle Woodhouse).

379 Ibid.

380 ENVI, [Evidence](#), 23 November 2023, 1210 (Tyler McCann).

381 ENVI, [Evidence](#), 21 November 2023, 1205 (Robert Sopuck).

only increase the farmer's costs.”³⁸² To encourage wetland conservation, Mr. Sopuck recommended that farmers be provided incentives to ensure that the public benefits of wetlands are maintained on their properties, such as “flood control, water quality improvement, biodiversity, conservation, and carbon sequestration.”³⁸³ He advised that existing programs providing “financial incentives for [agricultural] producers to conserve wetlands... be scaled up significantly.”³⁸⁴ He added that:

Canada has been very late to the game of incentive-based conservation on private lands, and we are behind the U.S. and Europe, where the Farm Bill and the common agricultural policy, respectively, support large-scale private land conservation as a high priority.³⁸⁵

The Committee heard also from Bryan Gilvesy (Chief Executive Officer, ALUS) about the importance of natural infrastructure to reducing the water quality impacts of agriculture:

The decline in Canada's inventory of natural assets such as wetlands and forests has removed critical infrastructure that helps protect water quality from activities that affect freshwater systems. Without sufficient natural infrastructure, we see impacts on water quality. Soil erosion and sedimentation can harm aquatic plants and wildlife and create an environment favourable to the development of algae blooms and pathogens. Runoff of nutrients, pesticides, organic matter and pathogens threatens aquatic life, drinking water systems and our food supply. Natural infrastructure built by farmers and ranchers on their working landscape reduces nutrients from entering freshwater systems, thereby preventing harmful algae blooms. It reduces soil erosion and sedimentation of waterways.³⁸⁶

Recommendation 31

That the Government of Canada establish private land conservation programs on a scale similar to those in the United States and Europe.

Recommendation 32

That the Government of Canada invest in the continued growth and scaling up of the ALUS [Alternative Land Use Services] program with a major funding commitment over five years to continue to engage private landowners in land and water stewardship

382 Ibid.

383 Ibid.

384 Ibid.

385 Ibid.

386 ENVI, [Evidence](#), 30 November 2023, 1125 (Bryan Gilvesy).



practices that help address the triple crises of biodiversity loss, climate change and climate change's impact on freshwater.

D. Agriculture Conclusion

The Committee recognizes the vital role farmers play in society by ensuring food security. The Committee heard that farmers respond more effectively to “carrots than sticks”—in other words, that incentives and voluntary programs are more effective than mandatory measures to encourage new practices that improve environmental outcomes.³⁸⁷ They also heard that farmers should be one of the stakeholders “at the table” to develop water policy.³⁸⁸

Recommendation 33

That the Canada Water Agency play a facilitating role in convening stakeholders from agriculture, Indigenous communities, civil society, and the agricultural value chain to advance water management goals, acting primarily as a convener and enabler in collaboration with the agricultural sector, in keeping with respective jurisdictions.

8. FRESHWATER POLLUTION MANAGEMENT

“Pollutants can travel, and pollution is transboundary. It is a national and international-scale issue that requires management at the national and international scale. Monitoring and research are essential to our understanding of the sources, fate and management of pollution.”³⁸⁹

Julian Aherne, Associate Professor, School of Environment, Trent University

387 ENVI, [Evidence](#), 27 February 2024, 1550 (Tim Faveri); ENVI, [Evidence](#), 23 November 2023, 1235 (Frank Annau); ENVI, [Evidence](#), 21 November 2023, 1205 (Robert Sopuck).

388 ENVI, [Evidence](#), 23 November 2023, 1125 (Tyler McCann).

389 ENVI, [Evidence](#), 23 November 2023, 1105 (Julian Aherne).

A. Introduction

The Committee heard serious concerns from witnesses and authors of briefs about the impacts of multiple types of pollution on freshwater.³⁹⁰ Pollution is the introduction of any substance into the environment – usually as a result of human activities – that has harmful or unpleasant effects.³⁹¹ Pollutants can compromise the water quality of surface water and groundwater. As explained in the *Canadian Environmental Protection Act* glossary, “[a]lthough water pollution often comes from direct sources, such as effluent emitted into lakes and rivers by industries, it may also fall out of the atmosphere or seep in from surrounding land.”³⁹² In addition to industrial effluent, municipal wastewater and agricultural runoff are other common sources of freshwater pollution.³⁹³ Pollutants to freshwater include chemical elements or compounds, microorganisms, radionuclides, nutrients,³⁹⁴ and plastics.³⁹⁵

Several witnesses pointed out that climate change is having a compounding effect on pollution. Increased precipitation leads to greater runoff into combined stormwater and sanitary sewers, leading to more combined sewer overflows or untreated sewage released into waterways. Jérôme Marty (Executive Director, International Association for Great Lakes Research) advised the Committee to “consider climate change as an accelerator for pollutant production and toxicity.”³⁹⁶ Kevin Norris explained how climate change is increasing the movement of nutrients from agriculture to waterways:

As a result of climate change, wetter than normal winters and springs in combination with hotter, drier summers increase the movement of nutrients, such as those from fertilizers, to surface water and groundwater. This increases the risk of algal blooms and eutrophication of surface waters and has a direct impact on water quality.³⁹⁷

390 E.g., ENVI, [Evidence](#), 23 November 2023, 1240 (Jérôme Marty); ENVI, [Evidence](#), 30 November 2023, 1235 (Diane Orihel); ENVI, [Evidence](#), 21 March 2024, 1550 (Cassie Barker, Senior Program Manager, Toxics, Environmental Defence Canada); ENVI, [Evidence](#), 21 November 2023, 1120 (Wyatt Petryshen, Science Policy Advisor, Wildsight); ENVI, [Evidence](#), 23 November 2023, 1105 (Randal Macnair, Conservation Coordinator, Elk Valley, Wildsight).

391 Government of Canada, [Canadian Environmental Protection Act glossary](#).

392 Ibid.

393 Government of Canada, [Water pollution: causes and effects](#).

394 United States, Environmental Protection Agency, [Types of Drinking Water Contaminants](#).

395 Government of Canada, [Plastic pollution – information sheet](#).

396 ENVI, [Evidence](#), 23 November 2023, 1240 (Jérôme Marty).

397 ENVI, [Evidence](#), 26 October 2023, 1110 (Kevin Norris).



This chapter begins by explaining the two main federal statutes that regulate pollution in freshwater, the *Canadian Environmental Protection Act, 1999*³⁹⁸ and the *Fisheries Act*,³⁹⁹ and presents when the pollution prevention provisions of the *Fisheries Act* apply. It then provides a high-level overview of several major types and sources of freshwater pollution: nutrients, plastics, chemicals, and radioactive substances. Finally, the chapter provides detailed analyses of two types of pollutants about which the Committee received substantial information: per- and polyfluoroalkyl substances (PFAS) and seepage from oil sands mining tailings ponds.

B. Pollution Prevention in Federal Law

The two main federal statutes for pollution prevention, the *Canadian Environmental Protection Act, 1999* and the *Fisheries Act*, are discussed below. The discharge of deleterious substances into waters frequented by fish is prohibited under the *Fisheries Act* unless the release occurs in accordance with conditions set out in regulations.⁴⁰⁰ The opposite is true under the *Canadian Environmental Protection Act, 1999* – an activity that results in the release of substances into the environment can be carried out unless regulations limit or prohibit that release.⁴⁰¹

1) *Canadian Environmental Protection Act, 1999*

The *Canadian Environmental Protection Act, 1999* regulates pollution for the dual purpose of protecting both the environment and human health, including through the management and control of toxic substances listed on Schedule 1 of that act. As described by Environment and Climate Change Canada (ECCC), the *Canadian Environmental Protection Act, 1999* (CEPA)⁴⁰²

398 [*Canadian Environmental Protection Act, 1999*](#), S.C. 1999, c. 33.

399 [*Fisheries Act*](#), R.S.C., 1985, c. F-14.

400 Senate of Canada, Standing Committee on Energy, the Environment and Natural Resources, [*Evidence*](#), 28 April 2022 (John Moffet, Assistant Deputy Minister, Environmental Protection Branch, Environment and Climate Change Canada).

401 Ibid.

402 The *Canadian Environmental Protection Act, 1999* was recently amended by [Bill S-5, An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act](#), which received royal assent on 13 June 2023. See: Government of Canada, [Bill S-5, Strengthening Environmental Protection for a Healthier Canada Act – Summary of Amendments](#).

is one of the most important environmental laws in Canada governing the assessment and management of chemical substances, including those that may be released to water.⁴⁰³

Under ... CEPA, ECCC regulates releases of toxics into water, limits nutrients in cleaning products, and requires companies to prepare emergency plans related to their releases.⁴⁰⁴

A variety of mandatory and voluntary risk management instruments can be used to manage risks posed by harmful substances.⁴⁰⁵

To assess the risk of chemical substances that could be regulated under CEPA, the Government of Canada uses its Chemical Management Plan initiative.⁴⁰⁶ Under this initiative, risks to the environment and/or human health are determined through a risk assessment process. Once it has been decided that a chemical substance poses a risk, risk managers assess how best to minimize or eliminate the risk to help protect the public and the environment.

Amendments to CEPA were brought in through Bill S-5, An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act, which ENVI studied and agreed to (with amendments) on 9 March 2023.⁴⁰⁷ Bill S-5 received royal assent on 13 June 2023.⁴⁰⁸ The amendments to CEPA brought through Bill S-5 added the recognition of the right to a healthy environment.⁴⁰⁹ Section 5.1 of CEPA now addresses the implementation of the right to a healthy environment, including developing “an implementation framework to set out how the right to a healthy environment will be considered in the administration of this Act.”⁴¹⁰ Among the

403 Environment and Climate Change Canada, Written response to questions from ENVI, 2021, p. 5.

404 Ibid., p. 7.

405 Ibid., p. 30.

406 Government of Canada, [Chemicals Management Plan](#); Government of Canada, [Risk assessment of chemical substances](#).

407 ENVI, [Report 7 - Bill S-5, An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act](#), 22 March 2023.

408 LEGISinfo, [Bill S-5, An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act](#).

409 ENVI, [Evidence](#), 30 January 2024, 1640 (Deborah Carlson).

410 [Canadian Environmental Protection Act, 1999](#), S.C. 1999, c. 33, s.5.1(1).



administrative duties of the Government of Canada, CEPA now includes the duty to “protect the right of every individual in Canada to a healthy environment as provided under this Act, subject to any reasonable limits.”⁴¹¹ The Committee heard about some of the Government of Canada’s work towards implementing the right to a healthy environment:

With respect to the right to a healthy environment, Health Canada and Environment and Climate Change Canada are collaborating on the development of a framework that will be subject to public consultation and will provide an understanding of how the Minister of Health and the Minister of the Environment and Climate Change Canada can implement those authorities in the administration of the act, as well as intersectionality with other pieces of legislation that may be pertinent to the protection of health and the environment of Canadians.⁴¹²

Two briefs⁴¹³ emphasized the importance of the right to a healthy environment to CEPA, with Environmental Defence stating:

The duty to protect the right of every individual in Canada to a healthy environment compels action without delay where that right is being violated, especially when vulnerable populations are affected.⁴¹⁴

Recommendation 34

That Environment and Climate Change Canada and Health Canada ensure that toxics management demonstrates our right to a healthy environment.

2) Pollution Prevention Provisions of the *Fisheries Act*

Section 36(3) of the *Fisheries Act* prohibits the deposit of a “deleterious substance” into waters frequented by fish, unless the deposit is authorized by regulations.⁴¹⁵

Administration of this prohibition and these regulations allows the federal government to manage some sources of pollution to freshwater. An order in council⁴¹⁶ has

411 Ibid., s.2(1)(a.1).

412 ENVI, [Evidence](#), 26 October 2023, 1240 (Greg Carreau, Director General, Safe Environments Directorate, Department of Health).

413 Observatoire international des droits de la Nature, [Brief submitted to ENVI](#), November 2023; Environmental Defence, [Brief submitted to ENVI](#), 8 February 2024.

414 Environmental Defence, [Brief submitted to ENVI](#), 8 February 2024.

415 [Fisheries Act](#), R.S.C., 1985, c. F-14, s. 36(3).

416 [Order Designating the Minister of the Environment as the Minister Responsible for the Administration and Enforcement of Subsections 36\(3\) to \(6\) of the Fisheries Act](#), SI/2014-21.

designated the Minister of Environment and Climate Change responsible for the administration and enforcement of sections 36(3) to 36(6) of the *Fisheries Act*.

a) Defining “Deleterious Substance” Under the *Fisheries Act*

Section 34(1) of the *Fisheries Act* defines the term “deleterious substance” as

(a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or

(b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water,

and without limiting the generality of the foregoing includes

(c) any substance or class of substances prescribed pursuant to paragraph (2)(a),

(d) any water that contains any substance or class of substances in a quantity or concentration that is equal to or in excess of a quantity or concentration prescribed in respect of that substance or class of substances pursuant to paragraph (2)(b), and

(e) any water that has been subjected to a treatment, process or change prescribed pursuant to paragraph (2)(c); (*substance nocive*) [EMPHASIS IN THE ORIGINAL].⁴¹⁷

Application of Section 36(3)

As explained by the Government of Canada, section 36(3) applies broadly, to:

- “all Canadian waters that are frequented by fish;

417 *Fisheries Act*, R.S.C., 1985, c. F-14, s. 34(1).



- deposits from Crown, private or [I]ndigenous lands into Canadian waters that are frequented by fish;
- all persons including all levels of government (federal, provincial, municipal, [I]ndigenous), as well as private sector operators and members of the public.”⁴¹⁸

Determining if a Substance is Deleterious

To be considered a deleterious substance, the substance need not kill fish, but could cause sublethal effects that impact “growth, respiration, reproduction, larval survival, or normal development.”⁴¹⁹ The Government of Canada explains that it determines whether a deposit contains a deleterious substance using one of the following methods:

Chemical characterization: “Chemical characterizations use lab based testing to identify individual deleterious substances within a sample of the deposit.”

Toxicity tests: “Common toxicity tests used to determine if a discharge is deleterious are the test methods titled ‘*Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout (EPS 1/RM/13)*’ and ‘*Biological Test Method: Acute Lethality Test Using Threespine Stickleback (*Gasterosteus aculeatus*) (EPS1/RM/10)*.’ The tests are designed to determine whether or not the fish will die when subjected to a particular substance, or mixture of substances such as effluent, for a specified time period.”

Sublethal tests: Which “measure whether an effluent affects the growth or reproduction of the test species.”

Evidence-based determination: Whereas “a substance may also be considered to be a deleterious substance based on evidence of fish kills near a deposit or other impacts that can be linked to a deposited substance, enforcement sampling results, and/or expert opinions concerning toxicity of the substance.”⁴²⁰

Regulations and Deleterious Substances

What can be defined as a deleterious substance under section 36 of the *Fisheries Act* is broad. Specific details of deleterious substances that may (or may not) be deposited, under certain circumstances, are defined in regulations made under the *Fisheries Act*.

418 Government of Canada, *Frequently asked questions: Fisheries Act pollution prevention provisions*.

419 Ibid.

420 Government of Canada, *Frequently asked questions: Fisheries Act pollution prevention provisions*.

Section 34(2) of the *Fisheries Act* allows the Governor in Council to make regulations prescribing deleterious substances and section 36(5.2) allows the Minister to make regulations prescribing deleterious substances (in accordance with the *Regulations Establishing Conditions for Making Regulations Under Subsection 36(5.2) of the Fisheries Act*).⁴²¹ Regulations made pursuant to section 34(2) or 36(5.2) of the *Fisheries Act* list specific deleterious substances and specific quantities thereof that are produced by the prescribed industries and are permitted to be deposited. Such regulations include:

- *Aquaculture Activities Regulations*;⁴²²
- *Meat and Poultry Products Plant Liquid Effluent Regulations*;⁴²³
- *Metal and Diamond Mining Effluent Regulations*;⁴²⁴
- *Petroleum Refinery Liquid Effluent Regulations*;⁴²⁵
- *Pulp and Paper Effluent Regulations*;⁴²⁶ and
- *Wastewater Systems Effluent Regulations*.⁴²⁷

Violations and Enforcement of Section 36(3)

The Government of Canada explains that “for a potential violation [of subsection 36(3)], it is not necessary for the deposit to cause deleterious effects in fish that inhabit the receiving waters or for the receiving water to become deleterious itself. The deleterious substance needs only to have been deposited and made its way into water frequented by fish, or be deposited in a place under any conditions where it may enter water frequented by fish.”⁴²⁸

421 [*Regulations Establishing Conditions for Making Regulations Under Subsection 36\(5.2\) of the Fisheries Act*, SOR/2014-91.](#)

422 [*Aquaculture Activities Regulations*](#), SOR/2015-177.

423 [*Meat and Poultry Products Plant Liquid Effluent Regulations*](#), C.R.C., c. 818.

424 [*Metal and Diamond Mining Effluent Regulations*](#), SOR/2002-222.

425 [*Petroleum Refinery Liquid Effluent Regulations*](#), C.R.C., c. 828.

426 [*Pulp and Paper Effluent Regulations*](#), SOR/92-269.

427 [*Wastewater Systems Effluent Regulations*](#), SOR/2012-139.

428 Government of Canada, [*Frequently asked questions: Fisheries Act pollution prevention provisions*](#).



If ECCC enforcement officers discover a violation of the pollution prevention provisions of the *Fisheries Act*, enforcement officers may:

- issue warnings and directions;
- recommend that the Minister [of Environment and Climate Change] consider exercising the authority to issue an order requiring that a person provide plans or other information;
- recommend that the Attorney General seek an injunction from a court to stop an alleged violation; or
- recommend a file for prosecution to the Public Prosecution Service of Canada.⁴²⁹

In addition to a public prosecution, a citizen can file a private prosecution for a violation of the *Fisheries Act*. A private prosecution could be used to protect public resources (e.g., fish and fish habitat) if the Crown fails to enforce the *Fisheries Act* and lay charges.⁴³⁰ A private prosecution is started by a private individual as opposed to a law enforcement agency or prosecution service. As noted by the Public Prosecution Service of Canada, “[the] right of a citizen to institute a prosecution for a breach of the law has been called ‘a valuable constitutional safeguard against inertia or partiality on the part of authority.’”⁴³¹

C. Selected Major Types and Sources of Freshwater Pollution

1) Nutrients

Phosphorus and nitrogen are essential plant nutrients that enter water bodies from point sources (e.g., wastewater treatment plants) and non-point (diffuse) sources (e.g., runoff from agricultural lands and urban areas).⁴³² Increased nutrients entering water

429 Ibid.

430 E.g., MiningWatch Canada, [Background: MiningWatch Canada Charges Against B.C. Government and Mount Polley Mine](#), 18 October 2016.

431 Public Prosecution Service of Canada, [Private Prosecutions](#). Citing: *Gouriet v Union of Post Office Workers*, [1978] AC 435 at 477 (HL) [*Gouriet*].

432 Government of Canada, [Preventing toxic and nuisance algae](#); ENVI, [Evidence](#), 13 February 2024, 1615 (André Bélanger, General Manager, Fondation Rivières); ENVI, [Evidence](#), 2 November 2023, 1225 (Michelle Woodhouse).

can result in harmful algal blooms⁴³³: the rapid growth of certain algae or cyanobacteria (also known as blue-green algae) that naturally contain substances toxic to humans or animals.⁴³⁴

Jérôme Marty elaborated on the connection between managing nutrient inputs to waterways, climate change, and harmful algal blooms in the Great Lakes:

Although the Great Lakes water quality has improved in several lakes, Lake Erie continues to remain a priority area with regard to nutrient management, both for point sources—for example, urban areas—and for non-point sources, such as agriculture. The [Great Lakes Water Quality Agreement]⁴³⁵ includes reduction targets for phosphorus loading, with a 40% reduction from 2008 levels by 2025. The reduction of point source discharges of nutrients has been achieved through improved wastewater treatment technologies, but the reduction of non-point source nutrients through adaptive management and best practices poses more challenges.

....

Higher temperatures increase metabolic rates of resident organisms, causing oxygen depletion and creating toxic conditions for the biota. Higher water temperatures also favour the growth of harmful algal blooms—HABs—that are able to release cyanotoxins such as microcystin. As stated by the editor of [the International Association for Great Lakes Research] journal, Dr. Robert Hecky, Lake Erie is “the canary in the Great Lakes climate mine”. In this context, the urgency of reducing nutrient inputs from the land becomes even more critical.⁴³⁶

2) Plastics

Microplastics are synthetic polymers that are commonly defined by their size of 5 mm or smaller in all dimensions.⁴³⁷ They can contain chemical additives, and persistent pollutants, such as PFAS,⁴³⁸ can stick (adsorb) to them. As a result, microplastics can

433 ENVI, [Evidence](#), 30 November 2023, 1125 (Bryan Gilvesy).

434 Government of Canada, [Preventing toxic and nuisance algae](#); R. Smith, Our Living Waters, [Monitoring Water Bodies with Harmful Algal Blooms: A Canadian Landscape Scan](#), 2019.

435 Government of Canada, [2012 Great Lakes Water Quality Agreement](#).

436 ENVI, [Evidence](#), 23 November 2023, 1240 (Jérôme Marty).

437 Madeleine Smith et al., “[Microplastics in Seafood and the Implications for Human Health](#),” *Current Environmental Health Reports*, Vol. 5, No. 3, 2018, pp. 375–386.

438 “Microplastics can often transport PFAS through the environment... consuming a serving of freshwater fish can expose you to as much PFAS as you would consume drinking a month's worth of contaminated drinking water.” ENVI, [Evidence](#), 21 March 2024, 1550 (Cassie Barker).



accumulate persistent pollutants while circulating in the environment.⁴³⁹ If a person or animal consumes these microplastics, they also consume the pollutants stuck to them. For example, Cassie Barker (Senior Program Manager, Toxics, Environmental Defence Canada) noted that microplastics can accumulate PFAS, so that “consuming a serving of freshwater fish can expose you to as much PFAS as you would consume drinking a month's worth of contaminated drinking water.”⁴⁴⁰ Nanoplastics are microscopic plastic particles – even smaller than microplastics – that come from the breakdown of larger plastics.⁴⁴¹ Nanoplastics are small enough to penetrate cells and interfere with a body's internal processes.⁴⁴² Both micro- and nanoplastics may also come from tire wear, personal care products, and laundry wastewater.⁴⁴³

In its written brief to the Committee, the Surfrider Foundation Canada described another concerning source of plastic pollution to water: expanded and extruded polystyrene used in floating infrastructure such as docks. They added that:

[A]quatic ecosystems are being devastated by plastic pollution, and a majority of this pollution is from expanded and extruded polystyrene (EPS & XPS). This is because EPS and XPS are used in docks, marinas and other aquaculture infrastructure. In British Columbia, polystyrene is used in 80% of aquatic infrastructure, which is a similar scenario across Canada on the coasts, lakes and rivers.⁴⁴⁴

The polystyrene breaks down over time into smaller and smaller pieces and it:

[D]oes not biodegrade, it accumulates and persists in the environment, including in marine and freshwater ecosystems. Polystyrene poses a risk to terrestrial and aquatic fauna who mistake it for food, which also introduces chemicals into the food chain.⁴⁴⁵

As explored in ENVI's 2022 report, *The Impacts of a Ban on Certain Single-Use Plastic Items on Industry, Human Health and the Environment in Canada*, CEPA has been used

439 Sarah Yakobowski, *Global Marine Plastic Pollution: Sources, Solutions and Canada's Role*, Library of Parliament publication, 22 November 2019.

440 ENVI, *Evidence*, 21 March 2024, 1550 (Cassie Barker).

441 Canadian Plastics, *Ontario researchers use 3D imaging to study microplastic waste*.

442 St. Lawrence Action Plan 2011–2026, *Nanoplastics: small particles with big impact*, 22 June 2023.

443 Hanpeng Lai, Xing Liu and Man Qu, *Nanomaterials*, “*Nanoplastics and Human Health: Hazard Identification and Biointerface*,” 11 April 2022.

444 Surfrider Foundation Canada, *Brief submitted to ENVI*, 13 November 2024.

445 Ibid.

to regulate harmful single use plastics.⁴⁴⁶ A scientific risk assessment of expanded and extruded polystyrene could be undertaken to determine if it is toxic to the environment and/or human health according to CEPA, and if regulation under CEPA is warranted.

3) Chemicals and Compounds

Chemicals and mixtures of chemicals are among the pollution threats to surface waters and groundwater, and may affect sources of drinking water, as well as the aquatic environment. They may be synthetic, naturally occurring, or both. Some chemicals are regulated and monitored; for examples, pesticides through the Pesticides Regulatory Directorate,⁴⁴⁷ and petroleum substances and metals such as lead through the Government of Canada's Chemicals Management Plan.⁴⁴⁸ Others may not be regulated or monitored to an extent that is protective of the environment and human health. Contaminants of emerging concern are not yet well understood and therefore their risks may not be sufficiently managed under existing Canadian environmental laws.⁴⁴⁹ These include pharmaceuticals, personal care product residues⁴⁵⁰ and PFAS (discussed in detail below).

The chemical characteristics of pollutants impact their effects on the environment and human health. For instance, many synthetic chemicals “cannot be broken down at all by natural processes,”⁴⁵¹ making them “persistent” in the environment. Such chemicals may be toxic and/or “bioaccumulative,” i.e., they collect in living organisms and end up in the food chain.⁴⁵² Once taken up by humans or animals, certain chemicals have endocrine-disrupting effects, affecting growth, reproduction or blood biochemistry, and may be carcinogenic or neurotoxic.⁴⁵³ As explained by Jérôme Marty, “[u]nderstanding the human and ecological impacts of exposure to persistent [contaminants of emerging

446 ENVI, *The Impacts of a Ban on Certain Single-Use Plastic Items on Industry, Human Health and the Environment in Canada*, 2022.

447 Health Canada's [Pesticides Regulatory Directorate](#) (formerly the Pest Management Regulatory Agency) is responsible for pesticide regulation in Canada.

448 The [Chemicals Management Plan](#) implements some responsibilities of the Minister of Environment and Climate Change and the Minister of Health under the [Canadian Environmental Protection Act, 1999](#).

449 Michael Doran, Water Canada, [Contaminants of emerging concern](#), 17 February 2022.

450 Ibid.

451 Government of Canada, [Water pollution: causes and effects](#).

452 Government of Canada, [Canadian Environmental Protection Act glossary](#).

453 Government of Canada, [Consideration of endocrine-related effects in risk assessment](#).



concern] is critical both for specific compounds and for mixtures.”⁴⁵⁴ Mixtures of chemicals sometimes have synergistic effects, where “exposure to two or more chemicals at one time results in health effects that are greater than the sum of the effects of the individual chemicals.”⁴⁵⁵

4) Radioactive Waste

The Committee studied Canada’s radioactive waste management and produced a 2022 report, *Canada and Radioactive Waste Management: Important Decisions for the Future*.⁴⁵⁶ Among the topics discussed in detail in the report was the planned near surface disposal facility for low level radioactive waste in Chalk River, Ontario, along the Ottawa River. Concern about this near surface disposal facility and the potential risk of radioactive contamination of the Ottawa River should it leak, was raised by a few witnesses during the study of freshwater.⁴⁵⁷ When Maja Vodanovic (Mayor of the Borough of Lachine, Executive Committee Member, Responsible for Consultation with the Boroughs and for Waterworks, City of Montréal) was asked about detecting and treating radioactive material in Montreal’s water treatment facilities, in light of the proposed Chalk River near surface disposal site, she cautioned:

If the water were to become radioactive, we could do nothing to change it, because we do not have the necessary equipment. That is one of the reasons why we were against [the Chalk River near surface disposal facility] plan. We do not know exactly what is going to be on the site over the next 50 years. In addition, the site will have to be monitored for 500 years, but no one can monitor a site for 500 years. We are very concerned, because the site is located right beside the water, alongside the groundwater. We are afraid that climate change and floods will mean that it gets to the Ottawa River and affects everybody downstream, right to Montreal.⁴⁵⁸

Larissa Holman (Director, Science and Policy, Ottawa Riverkeeper) expressed concerns about oversight and transparency related to the storage and monitoring of radioactive waste at Chalk River:

What matters most to us is really the oversight. What will happen, and will the waste be properly recovered when it's removed from the site? We also ask that monitoring be

454 ENVI, [Evidence](#), 23 November 2023, 1240 (Jérôme Marty).

455 Government of Canada, Canadian Centre for Occupational Health and Safety, [Synergism and related terms](#).

456 ENVI, [Canada and Radioactive Waste Management: Important Decisions for the Future](#), September 2022.

457 ENVI, [Evidence](#), 13 February 2024, 1710 (Larissa Holman); ENVI, [Evidence](#), 8 February 2024, 1715 (Maja Vodanovic, Mayor of the Borough of Lachine, Executive Committee Member, Responsible for Consultation with the Boroughs and for Waterworks, City of Montréal).

458 ENVI, [Evidence](#), 8 February 2024, 1715 (Maja Vodanovic).

done in a more proactive and robust way. There's a lot of data available about radioactive waste at Chalk River. Unfortunately, it is only available in the environmental reports or through the independent monitoring project that the Canadian Nuclear Safety Commission, CNSC, puts out. That data is not very robust. It doesn't capture what is happening.⁴⁵⁹

Recommendation 35

That the Government of Canada and industry be open and transparent in the management of radioactive waste and its transportation; Indigenous Peoples and Canadians have a right to access information, to engage in decision-making, and to know the risks.

Recommendation 36

That the Government of Canada put in place an independent agency, arms-length from government and industry, to oversee radioactive waste management and decommissioning.

D. Per- and Polyfluoroalkyl Substances (PFAS)

1) Background on Use and Health Impacts

Per- and polyfluoroalkyl substances – or PFAS – are contaminants of emerging concern about which the Committee heard much discussion. PFAS substances comprise thousands⁴⁶⁰ of synthetic chemicals colloquially referred to as “forever chemicals” because they do not readily degrade.⁴⁶¹ “These chemicals persist because PFAS have a strong fluorine-carbon bond, the strongest bond in organic chemistry. Because of this, once PFAS are formed they don't break down. Instead, they persist forever and accumulate in the environment and in our bodies.”⁴⁶² The properties of PFAS substances, including their durability and resistance to heat, water, grease, and chemicals,⁴⁶³ has led

459 ENVI, [Evidence](#), 13 February 2024, 1710 (Larissa Holman).

460 Environmental Defence Canada notes that estimates of the number of individual PFAS substances range from 4,700 to 14,000 (Environmental Defence Canada, [Brief submitted to ENVI](#), 8 February 2024). The Committee heard a similar range of estimates in testimony and briefs. The Government of Canada uses the estimate of 4,700 PFAS substances (Government of Canada, [DRAFT State of Per- and Polyfluoroalkyl Substances \(PFAS\) Report](#), May 2023, p. 4).

461 Luxmy Begum, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 May 2023.

462 ENVI, [Evidence](#), 21 March 2024, 1525 (Cassie Barker).

463 Chemistry Industry Association of Canada, [Brief submitted to ENVI](#), 7 June 2024; Environmental Defence Canada, [Brief submitted to ENVI](#), 8 February 2024.



to them being used in the manufacture of numerous product categories since the 1950s, including firefighting foams; cosmetics; textiles; non-stick, stain-resistant, and water repellent coatings; food packaging; paper and metal coatings; electronics; telecommunications infrastructure; aerospace applications; medical devices; electric cars and semiconductors.⁴⁶⁴ Research associates PFAS with a variety of health impacts, including cancer, reproductive harms, kidney disease, and impacts on the immune, endocrine, and nervous systems.⁴⁶⁵

2) PFAS in Drinking Water and Wastewater

PFAS “enter the environment via many different pathways in air, water and land,”⁴⁶⁶ with their widespread use resulting in “water contamination across Canada.”⁴⁶⁷ For instance, of 500 Quebec tap water samples that the Université de Montréal laboratory of Sébastien Sauvé (Full Professor) tested, only 2 had no PFAS detected.⁴⁶⁸ Sources of drinking water – both groundwater and surface water – may receive inputs of PFAS from contaminated sites such as military bases, landfills, industrial sites, or fire fighting training areas.⁴⁶⁹ Since PFAS substances are “commonly used in many different consumer products, they end up in trace amounts (parts per billion or less) in wastewater and biosolids.”⁴⁷⁰ This creates a potential burden for wastewater treatment plants to deal with PFAS, particularly because conventional treatment methods do not effectively remove them, and makes wastewater treatment plant effluent a source of PFAS to the receiving environment.⁴⁷¹

464 Chemistry Industry Association of Canada, [Brief submitted to ENVI](#), 7 June 2024; Dr. Kim Gilbride, Dr. Rania Hamza; and Dr. Patricia Hania, [Brief submitted to ENVI](#), 7 June 2021; Sanexen Environmental Services Inc., [Brief submitted to ENVI](#), 1 August 2023; ENVI, [Evidence](#), 21 March 2024, 1520 (Sébastien Sauvé, Full Professor); ENVI, [Evidence](#), 21 March 2024, 1525 (Cassie Barker).

465 Government of Canada, [DRAFT State of Per- and Polyfluoroalkyl Substances \(PFAS\) Report](#), May 2023, pp. 81–96; ENVI, [Evidence](#), 21 March 2024, 1525 (Cassie Barker).

466 ENVI, [Evidence](#), 21 November 2023, 1115 (Luxmy Begum, Founder, The EcoAmbassador).

467 ENVI, [Evidence](#), 21 March 2024, 1520 (Sébastien Sauvé).

468 Ibid.

469 Ibid.

470 Luxmy Begum, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 May 2023.

471 Ibid.; Dr. Kim Gilbride, Dr. Rania Hamza, and Dr. Patricia Hania, [Brief submitted to ENVI](#), 7 June 2021.

The Committee heard that treating PFAS in wastewater and drinking water is costly and technically challenging.⁴⁷² Cassie Barker noted that certain U.S. municipalities were bringing legal action against the chemical companies that produced PFAS for the high costs required to decontaminate their drinking water sources.⁴⁷³ After outlining the thermal treatment options for PFAS, Luxmy Begum (Founder, The EcoAmbassador) conceded that, at this point, the most efficient means of reducing risks and concerns related to PFAS in wastewater and biosolids is reducing PFAS compounds at their source and “phasing out their usage.”⁴⁷⁴

3) Assessing and Regulating PFAS Under the *Canadian Environmental Protection Act, 1999*

Two PFAS compounds, perfluorooctanoic acid and its salts (PFOA) and perfluorooctane sulfonate and its salts (PFOS) have been listed in Schedule 1 of the Canadian Environmental Protection Act, 1999.⁴⁷⁵ These two PFAS substances are the most commonly manufactured as well as the most well-studied.⁴⁷⁶ However, PFOA or PFOS can be readily substituted with one of the other thousands of PFAS substances available with similar properties – including being “environmentally persistent, bio-accumulative, and long-lasting in the human body, fish and the environment.”⁴⁷⁷ Concern for such “regrettable substitutions” has been expressed by the Organisation for Economic Co-operation and Development (OECD) and the United Nation’s *Stockholm Convention on Persistent Organic Pollutants*,⁴⁷⁸ and has led jurisdictions such as the European Union to manage PFAS as a class (as opposed to substance by substance).⁴⁷⁹ Scientifically assessing and regulating each of the thousands of PFAS substances individually, or as

472 ENVI, [Evidence](#), 8 February 2024, 1645 (Maja Vodanovic); ENVI, [Evidence](#), 18 April 2024, 1545 (Martin Bureau); Canadian Environmental Law Association, [Brief submitted to ENVI](#), 2 November 2023; Luxmy Begum, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 May 2023; ENVI, [Evidence](#), 21 March 2024, 1525 (Cassie Barker); ENVI, [Evidence](#), 9 February 2024, 1615 (Shelley Peters, Executive Director, Canadian Water Quality Association).

473 ENVI, [Evidence](#), 21 March 2024, 1525 (Cassie Barker).

474 ENVI, [Evidence](#), 21 November 2023, 1115 (Luxmy Begum).

475 Perfluorooctanoic acid and its salts (PFOA) is listed in Part 2 of Schedule 1 of the *Canadian Environmental Protection Act, 1999* (CEPA) and perfluorooctane sulfonate and its salts (PFOS) is listed in Part 1 of Schedule 1 of CEPA ([Canadian Environmental Protection Act, 1999](#), S.C. 1999, c. 33).

476 Luxmy Begum, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 May 2023.

477 Dr. Kim Gilbride, Dr. Rania Hamza; and Dr. Patricia Hania, [Brief submitted to ENVI](#), 7 June 2021.

478 Government of Canada, [Draft state of per- and polyfluoroalkyl substances \(PFAS\) report](#), May 2023, p. 10; Government of Canada, [Persistent organic pollutants: Stockholm Convention](#).

479 Government of Canada, [Draft state of per- and polyfluoroalkyl substances \(PFAS\) report](#), May 2023, p. 10.



subgroups, is costly, inefficient and would take considerable time while PFAS substances continue to enter the environment and pose health risks to people.⁴⁸⁰ Favour for the “proactive and precautionary approach” of addressing PFAS as a class was expressed by multiple authors of briefs and witnesses.⁴⁸¹ As stated by Cassie Barker:

Scientists with expertise in PFAS state that all well-studied PFAS show human health harms and that the health and environmental risks of PFAS, coupled with their extreme environmental persistence, require a class-based approach.⁴⁸²

In contrast, the Chemistry Industry Association of Canada recommended that PFAS substances not be managed as a single class but rather be “grouped appropriately based on scientifically justifiable categorization,” such as the following groups: 1) polymer PFASs, 2) non-polymer perfluoroalkyl substances and 3) non-polymer polyfluoroalkyl substances.⁴⁸³

In May 2023, Environment and Climate Change Canada and Health Canada published, *Draft State of Per- and Polyfluoroalkyl Substances (PFAS) Report*,⁴⁸⁴ and *Risk management scope for per- and polyfluoroalkyl substances (PFAS)*,⁴⁸⁵ in the *Canada Gazette, Part I*. These documents proposed to assess and manage PFAS as a class, and concluded that the class of PFAS meets one or more criteria under section 64 of the CEPA to be considered a toxic substance.

In March 2025, the Government of Canada published its most recent State of per- and polyfluoroalkyl substances (PFAS) report.⁴⁸⁶ Also in March 2025, the Government of Canada’s Risk Management Approach for Per- and Polyfluoroalkyl Substances (PFAS),

480 Dr. Kim Gilbride, Dr. Rania Hamza; and Dr. Patricia Hania, [Brief submitted to ENVI](#), 7 June 2021.

481 ENVI, [Evidence](#), 18 April 2024, 1550 (Martin Bureau); Ottawa Riverkeeper, [Brief submitted to ENVI](#), undated, published on the ENVI website 25 October 2023; ENVI, [Evidence](#), 21 March 2024, 1610 (Sébastien Sauvé); ENVI, [Evidence](#), 21 March 2024, 1610 (Cassie Barker); ENVI, [Evidence](#), 2 November 2023, 1110 (Laura Tanguay, Water Policy Coordinator, Canadian Environmental Law Association).

482 ENVI, [Evidence](#), 21 March 2024, 1525 (Cassie Barker).

483 Chemistry Industry Association of Canada, [Brief submitted to ENVI](#), 7 June 2024.

484 Government of Canada, [Draft state of per- and polyfluoroalkyl substances \(PFAS\) report](#), May 2023.

485 Government of Canada, [Risk management scope for per- and polyfluoroalkyl substances \(PFAS\)](#), May 2023.

486 Government of Canada, [State of per- and polyfluoroalkyl substances \(PFAS\) report](#), March 2025.

Excluding Fluoropolymers was published.⁴⁸⁷ The Government of Canada has indicated that fluoropolymers will be further assessed separately in the future.⁴⁸⁸

Significantly, on 8 March 2025, a proposed order adding PFAS as a class (excluding fluoropolymers) to Part 2 of Schedule 1 to CEPA was published in *Canada Gazette*, Part I.⁴⁸⁹ A public comment period was open for 60 days following the publication of the proposed order. If PFAS is placed on Schedule 1, regulations can be made under CEPA to restrict the use and sale of the class of PFAS and to apply measures to prevent pollution from these substances.

In March 2025, the Government of Canada published its most recent *State of per- and polyfluoroalkyl substances (PFAS) report*.⁴⁹⁰ Representatives from Environmental Defence Canada and the Canadian Environmental Law Association expressed a desire for Canada to move more quickly in regulating PFAS, citing comparisons to regulatory requirements in the United States, and the European Union's roadmap for phasing out PFAS.⁴⁹¹ Benoit Barbeau clarified that Canada's PFAS water contamination situation is less serious than that of the United States because PFAS has not been manufactured in Canada as it has been in the United States,⁴⁹² therefore Canada has not had PFAS manufacturing industrial outputs. The Chemistry Industry Association of Canada also noted that, as an importer of PFAS substances, the risk in Canada is different than it is in places where PFAS is produced, such as the U.S. and Europe.⁴⁹³

4) PFAS Drinking Water Quality Guidelines

The *Guidelines for Canadian Drinking Water Quality*⁴⁹⁴ are established by the Federal-Provincial-Territorial Committee on Drinking Water, which Health Canada coordinates

487 Government of Canada, *Risk management approach for per- and polyfluoroalkyl substances (PFAS), excluding fluoropolymers*, March 2025.

488 Ibid.

489 *Order Adding a Toxic Substance to Part 2 of Schedule 1 to the Canadian Environmental Protection Act, 1999* in *Canada Gazette*, Part I, 8 March 2025.

490 Government of Canada, *State of per- and polyfluoroalkyl substances (PFAS) report*, March 2025.

491 ENVI, *Evidence*, 21 March 2024, 1525, 1600, 1605 (Cassie Barker); Canadian Environmental Law Association, *Brief submitted to ENVI*, 11 June 2021.

492 ENVI, *Evidence*, 2 November 2023, 1245 (Benoit Barbeau).

493 Chemistry Industry Association of Canada, *Brief submitted to ENVI*, 7 June 2024.

494 Government of Canada, *Guidelines for Canadian Drinking Water Quality - Summary Tables*.



and provides with scientific expertise.⁴⁹⁵ The guidelines “set out the basic parameters that every water system should strive to achieve in order to provide the cleanest, safest and most reliable drinking water possible. They are used by every jurisdiction in Canada as the basis for establishing their own requirements for drinking water quality, thereby ensuring national consistency.”⁴⁹⁶

Greg Carreau (Director General, Safe Environments Directorate, Department of Health) explained the federal drinking water quality guidelines in place for PFOA and PFOS, and the class-based PFAS drinking water quality guideline under consideration:⁴⁹⁷

With regard to drinking water, Health Canada has ... put in place drinking water quality guidelines for two classes of these [PFAS] chemicals. Then, more recently, it published a draft objective that is a broad approach to mitigating potential health risks from the broad class of these chemicals in drinking water. ... In the drinking water context, that broad class is being considered through the drinking water objective, which sets a guideline or a number for which treatment can be achieved for that broad class of chemicals.⁴⁹⁸

In their 2023 brief to the Committee, the Canadian Environmental Law Association urged Health Canada to choose a PFAS drinking water quality objective that is health-based and protective of developing fetuses, babies and children.⁴⁹⁹ The Canadian Environmental Law Association also argued that Health Canada should follow the United States Environmental Protection Agency (US EPA) approach to PFOA and PFOS drinking water quality objectives.⁵⁰⁰ On 10 April 2024, the US EPA announced the final *National Primary Drinking Water Regulation* under the *Safe Drinking Water Act* for six PFAS, which “established legally enforceable levels for six PFAS in drinking water.”⁵⁰¹ The US EPA now requires public water systems to monitor for these PFAS, to notify the public about the levels of these PFAS and to reduce their levels in the water.⁵⁰² Sanexen Environmental Services Inc.’s brief acknowledged that the draft drinking water

495 Government of Canada, [Federal-Provincial-Territorial Committee on Drinking Water \(CDW\) – Health Canada](#).

496 Health Canada, [Guidance for Providing Safe Drinking Water in Areas of Federal Jurisdiction](#), 2021.

497 Public comments on the draft PFAS drinking water quality guideline were accepted until 12 April 2023 (Government of Canada, [Water talk: Per-and polyfluoroalkyl substances \(PFAS\) in drinking water](#)).

498 ENVI, [Evidence](#), 26 October 2023, 1135 (Greg Carreau).

499 Canadian Environmental Law Association, [Brief submitted to ENVI](#), 2 November 2023.

500 Ibid.

501 United States Environmental Protection Agency, *Safe Drinking Water Act: Per-and Polyfluoroalkyl Substances (PFAS)*, [“Final PFAS National Primary Drinking Water Regulations.”](#)

502 Ibid.

quality objectives for PFAS in Canadian drinking water follow a different approach to that of the US EPA, but concluded that the “resulting maximum contamination limits” were similar in the two countries’ approaches, “therefore reinforcing the validity of these [Canadian] drinking water objectives.” Sanexen strongly advised that Canada’s draft PFAS drinking water quality objectives be implemented as soon as possible.⁵⁰³

Subsequent to the testimony heard, Health Canada published the *Objective for Canadian drinking water quality- per- and polyfluoroalkyl substances* on 9 August 2024. This “precautionary group-based approach” established an objective value of 30 ng/L (for the sum total of 25 specific PFAS chemicals), “to reduce exposure to PFAS in drinking water.”⁵⁰⁴ The Committee was pleased to observe this development to help protect the health of Canadians from PFAS. The Committee notes that water utilities may require support to comply with these standards.

5) Alternatives to PFAS

The Committee discussed whether there were alternatives to PFAS that would enable these substances to be phased out. When asked about the existence of feasible alternatives, Martin Bureau (Vice-President, Innovation and Head of the PFAS Center of Excellence, ALTRA) responded:

The simple answer is, yes, there are alternatives, and they work. The thing is that this is a family of products that have proven performance. As a result, and because our regulations are done in a certain way, this molecule is being banned or this other molecule is being banned. However, we chemists are very clever at adding new branches to the molecules. That changes the name and then it's a whole new molecule. We need to ban the whole family of fluorine-based compounds for all those non-essential uses. There are a few exceptions. If there were only exceptions, we wouldn't be in the position we are in now. Yes, alternatives exist.⁵⁰⁵

Sébastien Sauvé concurred that alternatives to PFAS firefighting foams exist and are in use by some firefighters in Quebec.⁵⁰⁶ Defined and permitted “essential uses” of PFAS could be in electric car batteries⁵⁰⁷ or certain firefighting foams, even if other uses of

503 Sanexen Environmental Services Inc., [Brief submitted to ENVI](#), 1 August 2023.

504 Health Canada, [Objective for Canadian drinking water quality- per- and polyfluoroalkyl substances](#).

505 ENVI, [Evidence](#), 18 April 2024, 1550 (Martin Bureau).

506 ENVI, [Evidence](#), 21 March 2024, 1605 (Sébastien Sauvé).

507 Ibid., 1520.



PFAS are phased out. To help reduce PFAS entering the environment, consumers could be supported to choose PFAS-free alternatives with clear labelling standards.

6) Research Needs

The Committee heard that research is underway on detecting and quantifying PFAS substances as well as on exposures and health risks of these substances,⁵⁰⁸ but that more remains to be done. Ottawa Riverkeeper noted that “the presence of PFAS is known but poorly understood” and recommended that Canada “provide the necessary investment to test for, identify areas of concern, and develop action plans to mitigate PFAS contamination,” particularly where humans may ingest PFAS through drinking water or food sources that where PFAS levels have built up (bioaccumulated) in their systems.⁵⁰⁹ Scott Higgins (Senior Research Scientist, Experimental Lakes Area, International Institute for Sustainable Development) pointed out national-scale research, monitoring and analysis gaps in Canada in comparison to the United States regarding PFAS contamination of freshwater.⁵¹⁰ The Canada Water Agency was framed as having a potential role in improving coordination of federal government research and management related to freshwater contaminants,⁵¹¹ such as PFAS.

Recommendation 37

That Environment and Climate Change Canada and Health Canada proceed without delay with the final assessment of per- and polyfluoroalkyl (PFAS) substances as a class under the *Canadian Environmental Protection Act, 1999*, and that they implement appropriate regulatory actions to protect human health and the environment, such as PFAS phaseouts with defined essential uses.

Recommendation 38

That Environment and Climate Change Canada and Health Canada ensure all per- and polyfluoroalkyl (PFAS) substances are included in a single class and regulated under the *Canadian Environmental Protection Act, 1999*.

508 Luxmy Begum, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 May 2023.

509 Ottawa Riverkeeper, [Brief submitted to ENVI](#), undated, published on ENVI website 25 October 2023.

510 ENVI, [Evidence](#), 13 February 2024, 1605 (Scott Higgins, Senior Research Scientist, Experimental Lakes Area, International Institute for Sustainable Development).

511 ENVI, [Evidence](#), 26 October 2023, 1140 (Greg Carreau).

Recommendation 39

That Environment and Climate Change Canada and Health Canada define essential uses of per- and polyfluoroalkyl substances (PFAS), as well as the priorities for their phaseout.

Recommendation 40

That the Government of Canada promote per- and polyfluoroalkyl (PFAS)-free solutions.

E. Seepage from Oil Sands Mining Tailings Ponds

It has been established that contaminants from oil sands mining can travel through the air and be deposited in surface waters, whether nearby or over 50 km away,⁵¹² but less appears to be known about the movement of such contaminants through water. During its study of the seepage and overflow from Imperial Oil's Kearl oil sands mine site, and during its study of freshwater, the Committee received information about seepage occurring from tailings ponds at oil sands mines. Accordingly, while this section addresses seepage broadly, it uses detailed information related to the Kearl site whenever possible.

This section addresses the question of how contaminants from oil sands mining can seep from tailings ponds into groundwater, and additionally, whether they can in turn reach surface waters, such as rivers and lakes. It begins by providing information about groundwater, oil sands tailings and oil sands process-affected water (OSPW). Next, it presents information about the structure of tailings ponds, also known as external tailings areas (ETAs), and the seepage that comes from them. It then describes interception approaches for this seepage and the ways that seepage can reach groundwater, followed by some ways in which contaminants in groundwater can reach surface water. Finally, the section presents selected issues related to oil sands tailings pond seepage.

1) Groundwater and Oil Sands Tailings

The chapter on groundwater in this report, and the Government of Canada website "Water sources: groundwater," provide background and context for understanding

512 For example, Jane Kirk et al., *Atmospheric Deposition to the Athabasca Oil Sands Region Using Snowpack Measurements and Dated Lake Sediment Cores*, Oil Sands Monitoring Program Technical Report Series No. 1.2, June 2018.



groundwater.⁵¹³ Another Government of Canada website, “Oil sands mining effluent,” includes information about the oil sands.⁵¹⁴ It explains, among other things, that the byproduct of the process of separating bitumen from sand is called tailings, and explains, as follows, what tailings are and how they could be harmful:

Oil sands tailings are a mixture of sand, silt, clay, residual bitumen, and contaminated process-affected water. Process-affected water contains many compounds that may be harmful to the environment if released without treatment. These include:

- Metals
- Salts (inorganic ions)
- Naphthenic acids
- Petroleum [h]ydrocarbons
- Polycyclic aromatic hydrocarbons (PAHs)
- Other organic compounds.⁵¹⁵

Oil sands tailings are typically stored in an external tailings area (ETA) – which is often referred to as a tailings pond. The liquid substance that may seep from an ETA is often referred to as OSPW, oil sands process-affected tailings water, or process-affected water. In the case of the seepage at the Kearl mine, the liquid was described as process-affected water, stored in tailings ponds, but was also referred to as industrial wastewater in some documentation.⁵¹⁶

2) Tailings Pond Design and Seepage of Process-Affected Water

The Committee heard that there are approximately 1.4 trillion litres of process-affected water held in oil sands tailings ponds.⁵¹⁷ This volume is equivalent to about 560,000 Olympic size swimming pools. In testimony to the Committee, Diane Orihel (Associate

513 Government of Canada, [Water sources: groundwater](#).

514 Government of Canada, [Oil sands mining effluent](#).

515 Ibid.

516 Alberta Energy Regulator, [Administrative Penalty Director’s Decision re: Imperial Oil Resources Limited Kearl Oil Sands Processing Plant and Mine shallow seepage incident](#), p. 4 of 11.

517 ENVI, [Evidence](#), 30 November 2023, 1235 (Diane Orihel); Environmental Defence Canada, [Brief submitted to ENVI](#), January 2024, p. 3.

Professor in Aquatic Ecotoxicology, Queen's University) described the water in tailings ponds, and the ponds themselves, as follows:

This water has been taken from the Athabasca River and then used numerous times for industrial processes to extract bitumen from oil sands. While reusing water multiple times for bitumen extraction has reduced the volume of water extracted from the river, it has also created a serious problem. It has concentrated salts, metals and naphthenic acids in these waters, making them toxic to fish, amphibians, birds and mammals.

...

This highly toxic water is then stored in rudimentary earthen pits that were never constructed to be anything more than temporary settling ponds. As a result, the tailings ponds are a massive liability.⁵¹⁸

In a 2020 report prepared by the Secretariat of the Commission for Environmental Cooperation (CEC),⁵¹⁹ *Alberta Tailings Ponds II: Factual Record regarding Submission SEM-17-001* (the CEC report), a response from the Government of Canada noted that “[t]ailings ponds are engineered to seep, as seepage provides critical structural stability.”⁵²⁰ Tailings pond design is explained as follows in the same report:

[Oil sands process-affected water (OSPW)] is an acutely toxic substance containing, among other things, naphthenic acids and heavy metals. The outer walls of oil sands tailings ponds are constructed from excavated permeable materials from the oil sands mining process. Due in part to the unavailability and prohibitive expense of impermeable linings, and the requirement to maintain the structural integrity of the tailings pond walls, OSPW slowly seeps through the walls of the tailings ponds. Seepage collection ditches, designed to reverse migration of groundwater away from tailings ponds, intercept OSPW that seeps through the permeable walls of the tailings pond. This water is collected, usually in a seepage pond, which may or may not be lined, then pumped back into the tailings pond.⁵²¹

The report explains that seepage may differ according to local geology:

The geological setting for tailings ponds varies significantly. Impermeable geological strata under some ponds results in minimal seepage, while more permeable underlying sediments may result in higher rates of seepage. For the latter, seepage will mix with

518 ENVI, [Evidence](#), 30 November 2023, 1235 (Diane Orihel).

519 The Commission for Environmental Cooperation (CEC) was funded by the three North American governments as part of their [Agreement on Environmental Cooperation](#). A [7 January 2026 presidential memorandum](#) indicates that the United States intended to withdraw from the CEC.

520 Commission for Environmental Cooperation, [Alberta Tailings Ponds II: Factual Record regarding Submission SEM-17-001](#), 2020, p. 44.

521 Ibid., p. 3.



natural groundwater beneath the pond. The natural groundwater flow is often greater than the seepage rate, resulting in dilution. Interception trenches are built down gradient from tailings ponds to collect seepage before it can reach any surface water bodies.⁵²²

In a brief submitted to the Committee, Mandy Olsgard (Senior Toxicologist and Risk Assessor, As an individual) explained that the Alberta Energy Regulator (AER) approves designs for oil sands tailings ponds from which seepage will take place; she comments that “industry designs unlined ponds and then requests [permission for] seepage from these tailings ponds to groundwater, which the AER approves.”⁵²³

Laurie Pushor, President and Chief Executive Officer, Alberta Energy Regulator, confirmed, in his testimony on 28 November 2023, that tailings dams “across Canada”⁵²⁴ allow for seepage, stating “the earthen structures are expected to allow some movement of seepage through the dam structure.”⁵²⁵ He explained that every dam also has a “containment system,”⁵²⁶ and that it is important that monitoring take place so that “as seepage moves through, there’s an interception system, a series of wells or other interception devices, that can collect that seepage and move it back into the containment pond.”⁵²⁷

Documentation for the approval of Imperial Oil’s Kearl Oil Sands Mine Project shows that seepage from Kearl was anticipated in the site’s design:

Imperial Oil indicated that ETA seepage would need to be captured in order to maintain acceptable water quality levels in surrounding water bodies to the north, including the Firebag River and its three main tributaries. Imperial Oil predicted that seepage rates as much [as] 1,000 litres per second could occur when the pond was at the design elevation and the proposed seepage mitigation was in operation.⁵²⁸

522 Ibid., p. 120.

523 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 6; ENVI, [Evidence](#), 21 March 2024, 1625 (Mandy Olsgard).

524 ENVI, [Evidence](#), 28 November 2023, 1130 (Laurie Pushor, President and Chief Executive Officer, Alberta Energy Regulator).

525 Ibid.

526 Ibid.

527 Ibid.

528 Alberta Energy and Utilities Board and Canadian Environmental Assessment Agency, [Report of the Joint Review Panel Established by the Alberta Energy and Utilities Board and the Government of Canada](#) (EUB Decision 2007-013), 27 February 2007, p. 37.

A joint panel⁵²⁹ established to investigate the environmental impact of Imperial Oil's operation felt that the location of the ETA at Kearl entailed a risk of spreading contamination to surface water:

The Joint Panel notes that the proposed location of the ETA overlies permeable surficial deposits that will likely be the primary pathway for transmission of process-affected tailings water from the ETA. The Joint Panel also notes that if unmitigated, this seepage will likely impact surface water bodies to the north, specifically the Firebag River and its three tributaries, and that groundwater and surface water quality could degrade.⁵³⁰

3) Seepage Interception Systems and Movement of Contaminants to Groundwater

As outlined above, because seepage is anticipated, interception systems are designed and built around tailings ponds.⁵³¹ Mandy Olsgard provides an example from the Kearl oil sands mine, in which the seepage interception system was in place, though not initially turned on, although there was evidence in Imperial Oil's monitoring reports, of "increasing trends and exceedances of control objectives for key indicators of tailings seepage in the tailings groundwater monitoring network."⁵³² Ms. Olsgard noted:

[M]y review of the Imperial Kearl groundwater monitoring data led me to conclude in November 2022 what we all learned in February 2023: the tailings-contaminated groundwater from the Kearl mine was seeping off lease. It was also evident that at least three years prior to the issuance of the EPO,^[533] Imperial was reporting groundwater

529 A [Joint Review Panel](#) was established in 2006 by the Alberta Energy Utilities Board and the Government of Canada to fulfill environmental assessment requirements of both Alberta and the Government of Canada regarding Imperial Oil Resources Ventures' Limited's application for an Oil Sands Mine and Bitumen Processing Facility (Kearl Oil Sands Project). The Joint Review Panel's decision (EUB Decision 2007-013) was issued 27 February 2007, permitting the project to proceed to the regulatory phase.

530 Alberta Energy and Utilities Board and Canadian Environmental Assessment Agency, [Report of the Joint Review Panel Established by the Alberta Energy and Utilities Board and the Government of Canada](#) (EUB Decision 2007-013), 27 February 2007, pp. 36–38.

531 As noted by Laurie Pushor: "as seepage moves through, there's an interception system, a series of wells or other interception devices, that can collect that seepage and move it back into the containment pond," ENVI, [Evidence](#), 28 November 2023, 1130 (Laurie Pushor).

532 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, pp. 5–6.

533 The "EPO" refers to the [Environmental Protection Order](#) issued by the Alberta Energy Regulator to Imperial Oil Resources Limited in relation to two "releases" of a "Substance," including "discoloured surface water" that was initially found on 19 May 2022, and later found to be consistent with the chemistry of industrial wastewater and to exceed "Alberta Environment and Protected Areas (AEPA) and Canadian Council of Ministers of the Environment (CCME) guidelines for constituents including but not limited to dissolved iron, total arsenic, F2 hydrocarbons, sulphate, total sulphide."



contamination and seepage to the AER, but delayed turning the seepage interception system on.⁵³⁴

Ms. Olsgard suggested that the release at Imperial's Kearl mine was a symptom of a larger regulatory oversight problem related to the approval of unlined tailings storage areas.⁵³⁵

In the online book *Hydrogeology and Mineral Resource Development*, Leslie Smith explains how seepage interception measures may be needed for any ETA, and how only a percentage of seepage is likely to be captured, that is, some seepage is likely to move off a mine site despite interception systems:

If unrecovered seepage is moving down valley beyond the seepage collection pond with concentrations of one or more solutes above natural background values, then additional groundwater interception measures might be required. This will commonly involve the installation of one or more groundwater wells to capture the process-affected water. Beyond the normal design considerations for the interception wells and associated monitoring wells, a key point of discussion becomes what the capture efficiency of the interception well system will need to be in order to meet environmental standards. For example, is it necessary to capture 90% of the impacted groundwater in the well system, or will the efficiency need to be greater than, say 98%?⁵³⁶

Ms. Olsgard informed ENVI members in her brief that she has reviewed annual groundwater monitoring submissions by oil sands operators,⁵³⁷ and that these submissions indicate that “contamination of groundwater in proximity to tailings ponds is occurring at each oilsands mine.”⁵³⁸

Furthermore, the CEC found, in its 2020 report, that “based on the scientific tools used today, the current literature shows that there is strong scientifically valid evidence of OSPW [oil sands process water] seepage into near-field groundwater around tailings ponds.”⁵³⁹

534 ENVI, [Evidence](#), 21 March 2024, 1625 (Mandy Olsgard).

535 Ibid.; Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 6.

536 Leslie Smith, “[7 Seepage Management During Operation of a Tailings Facility](#),” in *Hydrogeology and Mineral Resource Development*, The Groundwater Project, 2021.

537 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 6.

538 Ibid.

539 Commission for Environmental Co-operation, [Alberta Tailings Ponds II: Factual Record regarding Submission SEM-17-001](#), 2020, p. 60.

4) Movement of Contaminants From Groundwater to Surface Water

Groundwater and surface water are intricately connected, as the Committee heard from experts.⁵⁴⁰ For example, Beth Parker explained, “it’s important to think of groundwater and surface water as one resource. ... [G]roundwater discharges to surface water and sustains those flows throughout the seasons. Surface water can discharge back to groundwater. They’re inextricably linked.”⁵⁴¹

Groundwater in the Athabasca region has been studied extensively.⁵⁴² According to a recent peer-reviewed study, the groundwater and surface water systems in the Athabasca River Basin have a high degree of interaction, with groundwater’s contribution to the surface water system along the Athabasca River ranging from 34% in the high flow season to 63% in the low flow season, with an overall average annual groundwater contribution of 45%.⁵⁴³

Each tailings pond interacts with specific local geology, which affects the way groundwater and surface water are likely to interact. Several examples exist of tailings pond liquid seeping into groundwater and then into surface water. For example, at the Kearl mine, seepage was found to have moved through shallow groundwater that was above, not at, the elevation of the seepage interception system, before reaching the surface.⁵⁴⁴

In another example, highlighted in the 2020 CEC report, data from Syncrude monitoring reports showed evidence of seepage of process-affected water from tailings ponds into groundwater in locations close to surface water:

The Canadian Association of Petroleum Producers (CAPP) submitted groundwater monitoring reports to the Secretariat from two oil sands facilities operated by Syncrude and Suncor. A review of the data presented in the Syncrude monitoring reports by the Secretariat’s expert shows consistent evidence of seepage of OSPW from tailings ponds

540 ENVI, [Evidence](#), 6 February 2024, 1710 and 1730 (Beth Parker); ENVI, [Evidence](#), 30 November 2023, 1230 (Beatrix Beisner).

541 ENVI, [Evidence](#), 6 February 2024, 1730 (Beth Parker).

542 See, for example, Alberta Environment and Sustainable Resource Development, Lower Athabasca Region Groundwater Management Framework, [Supporting Document for the North Athabasca Oil Sands \(NAOS\) Area](#), June 2013.

543 Hyoun-Tae Hwang et al., “[Estimation of groundwater contributions to Athabasca River, Alberta, Canada](#),” *Journal of Hydrology: Regional Studies*, Vol. 45, February 2023.

544 Imperial Oil, [Kearl Seepage – Investigation Results](#), 5 May 2023.



into groundwater at certain monitoring wells that are close in proximity to surface water, including tributaries to the Athabasca River.⁵⁴⁵

The CEC noted in its report that it had hired an independent expert to assess, among other things, the movement of contaminants from groundwater to surface water, and that that expert had found that evidence of process-affected water reaching “natural surface waters” was not widely available in peer-reviewed journals:

The expert concluded that there is scientifically valid evidence of OSPW seepage into near-field groundwater around tailings ponds, especially when compared with the first peer-reviewed evidence published in 2009. However, there is generally less publicly available peer-reviewed science that OSPW is reaching natural surface waters.⁵⁴⁶

The CEC report explains why the Government of Canada has not undertaken any *Fisheries Act* prosecutions against tailings ponds operators. The government states, in its response to the report:

For all of the inspections conducted, enforcement officers, after consulting in depth with ECCC [Environment and Climate Change Canada] scientists, determined that they did not have reasonable grounds to believe that there was a violation of the pollution prevention provisions of the Act. The primary reason for these determinations was an inability to differentiate whether the source of deleterious substances in bitumen influenced groundwater samples was anthropogenic or naturally occurring.^{[547], 548}

This last passage means that because it is currently not easy to identify the original source of chemicals in the water, ECCC scientists could not conclusively say that a chemical found in surface water outside a mine site was coming from tailings ponds and not just naturally present. The Government of Canada response indicated that the lack of reliable methods for differentiating between anthropogenic and naturally occurring deleterious substances in water means it is difficult or impossible to state definitively whether the pollution prevention provisions of the *Fisheries Act* have been violated.

545 Commission for Environmental Cooperation, [*Alberta Tailings Ponds II: Factual Record regarding Submission SEM-17-001*](#), 2020, p. 3.

546 Ibid., p. 1.

547 J. V. Headley et al., “[Preliminary fingerprinting of Athabasca oil sands polar organics in environmental samples using electrospray ionization Fourier transform ion cyclotron resonance mass spectrometry](#),” *Rapid Communications in Mass Spectrometry*, Vol. 25, No. 13, 2011.

548 Commission for Environmental Cooperation, [*Alberta Tailings Ponds II: Factual Record regarding Submission SEM-17-001*](#), 2020, p. 9.

5) Selected Issues Related to Oil Sands Tailings Ponds

Evidence heard by the Committee indicated several important issues related to oil sands tailings water and the assessment of its impacts on the environment and human health. This section first discusses public access to analyses of monitoring data. A lack of access to such analyses may contribute to a gap in mine site operators or regulators taking action to respond to monitoring results. Then it touches on the discharge of substances from oil sands mines to surface waters other than the seepage of process-affected water. Finally, it addresses the reclamation of oil sands mine sites as well as the risk of ongoing or future seepage of tailings into groundwater.

a) Access to Monitoring Information to Assess the Need for Additional Mitigation Measures

The Government of Canada and Government of Alberta's joint Oil Sands Monitoring Program states that it "funds and undertakes ambient environmental monitoring within the oil sands region of Alberta to enhance the understanding of the effects of oil sands development and core outcomes."⁵⁴⁹ The Committee heard that oilsands companies do a lot of monitoring and the region is heavily monitored.⁵⁵⁰ However, it does not appear that the monitoring data or related information submitted to the AER by oil sands operators are readily available to the public, nor that any compilation or cumulative analysis of them exists.

Ms. Olsgard noted that one challenge for understanding the extent of health risks that may be related to oil sands monitoring data is that "oilsands operators control access to all information related to tailings; [... including] monitoring data characterizing the chemical properties and movement of chemicals from tailings deposits, as well as access to physical samples for academic and government research."⁵⁵¹ Ms. Olsgard noted to the Committee that in order to see the groundwater reports submitted to the AER by oil sands operators, it is necessary to make a request and pay a fee.⁵⁵²

Professor Frederick Wrona (Professor, Svare Research Chair, Integrated Watershed Processes, As an individual) explained to the Committee that current oil sands

549 Government of Alberta, "[Oil Sands Monitoring Program annual report](#)," *All Resources*.

550 ENVI, [Evidence](#), 21 March 2024, 1630 (Frederick Wrona, Professor, Svare Research Chair, Integrated Watershed Processes, As an Individual).

551 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 5.

552 ENVI, [Evidence](#), 21 March 2024, 1625 (Mandy Olsgard).



monitoring does not meaningfully communicate findings and/or trigger action when data reveal an environmental issue:

Previous government-led and independent expert reviews of regional oil sands monitoring in the Athabasca basin found that despite long-term and long-standing commitments to implement integrated monitoring and related cumulative effects assessment, there was little tangible progress in advancing the assessment and related regulatory policies. After decades and hundreds of millions of dollars spent on environmental monitoring and research in the Athabasca basin, significant challenges remain in providing open, transparent and accessible data, which are used to only a fraction of their potential to inform “state/condition of environment” reporting and relevant environmental management decision-making and actions.

There are currently at least 10 different types of monitoring programs conducted in the basin. Open access to the data collected under many of these programs remains difficult to obtain, if not impossible. Moreover, these data have different assurance quality control practices, including analytical standards and inconsistent forms of public recording. We simply don’t need another website collating fragmented data. We need systemic change in how we design and implement an effective monitoring, evaluation and reporting system.

Finally, for many monitoring programs, there are no clearly defined decision criteria and there is no on–off switch for ratcheting up or down or increasing the intensity and frequency of monitoring, which is a core principle of adaptive monitoring.

In closing, with the right commitment and expertise, it is possible to develop an adaptive framework with defined criteria for changing monitoring intensity and related reporting, thereby ensuring the best cost-effective use of scientific and technical resources.⁵⁵³

For the Kearl Oil Sands Mine, the Joint Review Panel’s assessment that the ETA would not result in significant adverse environmental effects from seepage relied heavily on its belief that Imperial Oil’s adaptive monitoring program, with the involvement of the provincial environment department, would effectively result in action, should impacts be detected:

The Joint Panel is confident that Imperial Oil’s commitment to monitor the effectiveness of the proposed seepage interception system will provide the means to assess whether alternative or additional mitigation will be required. The Joint Panel expects that Imperial Oil will work closely with Alberta in developing its detailed groundwater monitoring plan for the [Kearl Oil Sands (KOS)] Project. The Joint Panel notes Imperial Oil’s commitment to work with [Alberta Environment (AENV)] to determine the

553 ENVI, *Evidence*, 21 March 2024, 1630 (Frederick Wrona).

appropriate threshold values that must be met by the seepage control management system.

The Joint Panel believes that the ETA will not have any significant adverse environmental effects if the Joint Panel recommendations and the mitigation measures proposed by Imperial Oil are implemented.⁵⁵⁴

Furthermore, during the environmental assessment, Imperial Oil noted the importance of surface water quality monitoring to confirm its modelling of future impacts:

Imperial Oil predicted the KOS Project would have a negligible to small change on the water quality of water bodies and watercourses in the area. Imperial Oil stated that the water quality in the Muskeg River, the Firebag River downstream of the external tailings area, Wapasu Creek, and Kearsy Lake would be monitored downstream of the project development area and that it would work with AENV to define the specific surface water monitoring and reporting requirements for the KOS Project. Imperial Oil stated that this monitoring was important for confirming its impact predictions and validating its modelling.⁵⁵⁵

If the adaptive monitoring programs at oil sands mine sites are not effective at triggering action by the mine operators or the regulator to address seepage extending beyond a mine site and/or resulting in environmental impacts, then impacts of seepage could be occurring throughout the oil sands region even if mine operators are fulfilling their regulatory monitoring requirements.

b) Discharges of Other Substances from Oil Sands Mines to Surface Waters

Contaminants from oil sands mining can travel through water into surface waters, including the Athabasca River, by other pathways – not solely through seepage of process-affected water from ETAs into groundwater that later reaches surface water. Contaminants are also present in other liquids, such as industrial wastewater, which is sometimes discharged by oil sands operators with permission from the AER.

Ms. Olsford notes:

My review of publicly available industrial wastewater reports submitted by oil sands mine operators identified over 35 active releases of oilsands industrial water directly to the Athabasca, Muskeg and Firebag Rivers and to tributaries and the land which carries surface water to these Rivers.

554 Alberta Energy and Utilities Board and Canadian Environmental Assessment Agency, *Report of the Joint Review Panel Established by the Alberta Energy and Utilities Board and the Government of Canada* (EUB Decision 2007-013), 27 February 2007, p. 38.

555 Ibid., p. 78.



Year over year operators report to the AER that the quality of industrial wastewater released from oilsands mines to the local rivers and tributaries are exceeding surface water quality guidelines for salts, metals, nutrients and is at times chronically toxic.⁵⁵⁶

c) Reclamation of Oil Sands Tailings Ponds

Ms. Olsgard noted in her brief that her greatest concern in the long term is the fact that seepage from tailings deposits into groundwater will continue forever under current closure plans for oil sands mines; she explained that operators are not required to reconstruct tailings ponds to prevent seepage from tailings deposits to groundwater, so the seepage will continue in perpetuity:

In AER-approved life of mine closure plans, operators are not required to remediate, that is remove chemicals, from fine tailings before using these tailings as soils and sediments to create lakes, wetlands, and forests during reclamation.

There are no provincial requirements for operators to remediate tailings deposits to meet contaminated sites policy and remediation guidelines.^[557] The sole focus of current regulations for oil sands fine tailings is on dewatering the tailings to create geotechnically stable and trafficable surfaces.

In the currently approved Life of Mine Closure Plans[,] Suncor, Syncrude, Imperial and CNRL have proposed using tailings as soil substrates that will create 80% of the reclaimed landscape as forests and wetlands. The other 20% will be pit lakes, many of which will be constructed with fine tailings filling much of the mine pits and serving as the sediments at the bottom of these lakes.^[558]

Because there are no requirements for remediation or removal of chemicals from these tailings when used as sediments and soils, tailings substrates will continuously release salts, metals, polycyclic aromatic hydrocarbons, and other chemicals to soil porewater, surface water, and groundwater. Tailings will act as a continuous source of chemicals in the hydrological cycle of the reclaimed landscape, none of which has been accounted for in closure planning by oilsands operators.

[...] If approved and relied on for reclamation, this practice will likely result in long term contamination of reclaimed areas and land use restrictions to protect human and environmental health from chemical exposures. Research on tailings substrates and

556 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 4.

557 Alberta Energy Regulator, [Direction for Conservation and Reclamation Submissions Under an Environmental Protection and Enhancement Act Approval for Mineable Oil Sands Sites](#), December 2018.

558 Approved Life of Mine Closure Plans are available by request to informationrequest@aer.ca; individual products can be found at the Alberta Energy Regulator's website: "[Products and Services Catalogue](#)."

effects on plant health also identify the potential for long term contamination effects.^[559]

The focus on dewatering tailings has resulted in tailings treatment technologies that use large-scale chemical amendments such as polyacrylamide (PAM) to consolidate fine tailings and introduce a chemical not naturally present in the oilsands region.^[560] Acrylamide, a human neurotoxicant, has been identified in treated tailings release water (OSPW) and tailings porewater, yet it is not considered in the regulation or approval of tailings treatment technologies. Recent research has indicated there could be toxicity from acrylamide to mammalian species.^[561]

This is the approved plan for how oilsands mine sites will be returned to Indigenous people, Albertans, and Canadians and is likely a reflection of the cost of removing chemicals to safe levels.⁵⁶²

As outlined above, seepage after mine closure and reclamation could have long-term environmental and human health effects.

6) Conclusion: Seepage From Tailings Ponds

In its study of freshwater, the Committee heard that contaminants from oil sands mining can seep out of tailings ponds and reach groundwater. Committee members also heard that groundwater and surface waters are intricately connected, and should be considered as a single freshwater resource, and that groundwater contamination may affect surface waters.⁵⁶³ Information to this effect is also contained in the CEC report.⁵⁶⁴

To confirm the frequency and volume at which oil sands process-affected water is seeping into groundwater and then reaching surface water, it would be helpful to have

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- 559 See, for example, Canadian Oilsands Innovation Alliance (COSIA), [*COSIA Tailings EPA: 2021 Tailings Research Report*](#), November 2022; and other publications cited in Mandy Olsgard, [*Brief submitted to ENVI*](#), 23 March 2024, pp. 6–7.
- 560 Vahid Vajihinejad, Rina Guillermo and João B. P. Soares, “[Dewatering Oil Sands Mature Fine Tailings \(MFTs\) with Poly\(acrylamide-co-diallyldimethylammonium chloride\): Effect of Average Molecular Weight and Copolymer Composition](#),” *Industrial and Engineering Chemistry Research*, Vol. 56, No. 5, 2017.
- 561 Jia Li, Zuo Tong How and Mohamed Gamal El-Din, “[Aerobic degradation of anionic polyacrylamide in oil sands tailings: Impact factor, degradation effect, and mechanism](#),” *Science of The Total Environment*, 27 September 2022.
- 562 Mandy Olsgard, [*Brief submitted to ENVI*](#), 23 March 2024, pp. 6–7.
- 563 ENVI, [*Evidence*](#), 6 February 2024, 1710 and 1730 (Beth Parker); ENVI, [*Evidence*](#), 30 November 2023, 1230 (Beatrix Beisner).
- 564 Commission for Environmental Cooperation, [*Alberta Tailings Ponds II: Factual Record regarding Submission SEM-17-001*](#), 2020.



access to robust and standardized scientific methods for determining with certainty whether contaminants found in surface water have come from tailings ponds or from other sources, such as surface water runoff or air deposition of contaminants. Mass spectrometry can be used for such “chemical fingerprinting,”⁵⁶⁵ of contaminants found only in tailings ponds, and to identify those compounds in environmental samples. Researchers, including from ECCC,⁵⁶⁶ are working on methods and standards to facilitate research that could lead to more definitive results showing precisely where seepage from oil sands tailings ponds travels.

9. DRINKING WATER AND WASTEWATER

“Freshwater is simultaneously Canada’s most important natural resource, and the one we take most for granted.”⁵⁶⁷

Shelley Peters, Executive Director, Canadian Water Quality Association

This chapter synthesizes evidence heard by the Committee regarding drinking water and wastewater in Canada. It starts with background information before considering the unique governance challenges related to drinking water and wastewater treatment on First Nations lands. It explores issues raised to the Committee, namely: infrastructure needs and funding needs for municipalities to adapt to emerging concerns. Finally, it offers the Committee’s recommendations related to improved drinking water and wastewater management.

565 For example, J. V. Headley et al., [“Chemical fingerprinting of naphthenic acids and oil sands process waters – A review of analytical methods for environmental samples,”](#) *Journal of Environmental Science and Health, Part A, Toxic/Hazardous Substances and Environmental Engineering*, Vol. 48, No. 10, 6 May 2013; and Lucie M. J. Lévesque et al., [“Dissolved polycyclic aromatic compounds in Canada’s Athabasca River in relation to Oil Sands from 2013 through 2019,”](#) *Environmental Monitoring and Assessment*, Vol. 195, Art. no. 1354, 21 October 2023.

566 Richard A. Frank, [“Preparative isolation, fractionation and chemical characterization of dissolved organics from natural and industrially derived bitumen-influenced groundwaters from the Athabasca River watershed,”](#) *Science of The Total Environment*, Vol. 777, July 2021.

Environment and Climate Change Canada’s ongoing scientific research as part of the Canada–Alberta oil sands environmental monitoring program is compiled on its website: [“Oil sands monitoring: scientific papers and presentations.”](#)

567 ENVI, [Evidence](#), 8 February 2024, 1540 (Shelley Peters).

A. Drinking Water

As described in *Guidance for Safe Drinking Water in Canada: From Intake to Tap*, a 2001 report of the Federal-Provincial-Territorial [Committee] on Drinking Water:

In Canada, drinking water has historically been considered a natural resource. As such, the legislative responsibility for providing safe drinking water to the public has long been considered a provincial/territorial responsibility. Most provinces and territories have adopted enforceable regulations to protect their source waters and to establish requirements for providing drinking water, including the certification of operators.⁵⁶⁸

The federal, provincial, and territorial governments collaborate on drinking water guidelines, as described below. Provinces and territories are responsible for implementing the guidelines in their respective jurisdictions.⁵⁶⁹ They may do this in part by setting out, in legislation and regulations, the drinking water quality standards that must be met by owners and operators of drinking water systems and the standards that must be met in the construction and maintenance of wells.⁵⁷⁰

According to Statistics Canada data, in 2019, approximately 86% of people in Canada were served by drinking water plants—32,465,000 people out of a total population of approximately 37,589,000 in July of 2019.⁵⁷¹

1) Guidelines for Canadian Drinking Water Quality

The Guidelines for Canadian Drinking Water Quality are established by the Federal-Provincial-Territorial Committee on Drinking Water (CDW).⁵⁷² Health Canada coordinates the CDW and provides it with scientific expertise. Membership of the CDW includes one voting member representing the authority responsible for drinking water quality for each of the 10 provinces, the three territories, and the federal government. Non-voting members on the CDW include the Federal-Provincial-Territorial Committee on Health

568 Federal-Provincial-Territorial Subcommittee on Drinking Water of the Federal-Provincial-Territorial Committee on Environmental and Occupational Health, *Guidance for Safe Drinking Water in Canada: From Intake to Tap*, 2001.

569 Ibid.

570 See, for example, Government of Ontario, *Ontario Water Resources Act*, R.R.O. 1990, Regulation 903, "Wells."

571 Statistics Canada, *Canada's population estimates: Age and sex, July 1, 2019*.

572 Government of Canada, *Federal-Provincial-Territorial Committee on Drinking Water (CDW) – Health Canada*.



and the Environment, the Canadian Advisory Council on Plumbing, and Environment and Climate Change Canada.

The *Guidelines for Canadian Drinking Water Quality* set out the parameters that all water systems “should strive to achieve in order to provide the cleanest, safest and most reliable drinking water supply possible.”⁵⁷³ The guidelines include criteria for microbiological, chemical, and radiological contaminants, as well as for taste and odour. As explained by Health Canada,

[t]he most significant risks to people’s health from drinking water come from microscopic organisms such as disease-causing bacteria, protozoa and viruses. The guidelines that relate to these microorganisms are stringent because the associated health effects can be quite severe.⁵⁷⁴

To address microbiological contaminants, drinking water may be disinfected with, for example, chlorine, chloramine, ozone, and/or ultraviolet light.

2) Multi-Barrier Approach to Safe Drinking Water

The CDW collaborates with the Canadian Council of Ministers of the Environment, specifically to develop a multi-barrier approach to safe drinking water. The multi-barrier approach “recognizes that the key to ensuring clean, safe and reliable drinking water is to implement multiple barriers which control microbiological pathogens and contaminants that may enter the water supply system.”⁵⁷⁵ The approach focuses on considering threats to water quality and ensuring barriers are in place to eliminate or minimize them, through the following:

- source water protection (i.e., protecting lakes, rivers and groundwater from contamination);
- effective drinking water treatment; and

573 Health Canada, *Canadian Drinking Water Guidelines*.

574 Ibid.

575 Federal-Provincial-Territorial Subcommittee on Drinking Water of the Federal-Provincial-Territorial Committee on Environmental and Occupational Health, *Guidance for Safe Drinking Water in Canada: From Intake to Tap*, 2001.

- preventing water quality deterioration in drinking water distribution systems (including aging infrastructure).⁵⁷⁶

A compliance monitoring approach “relies on sampling small amounts of water in a drinking water system and testing those samples for the presence of known and quantifiable organisms or substances.”⁵⁷⁷

In its 2021 brief sent to the Committee, the Canadian Water and Wastewater Association expressed interest in more detailed data on water and wastewater from the federal government, such as a database covering all provinces and territories and providing data on all water systems and wastewater treatment plants, including:

- water volumes treated and distributed to consumers;
- wastewater volumes collected, treated, and released; and
- water quality and effluent testing results.⁵⁷⁸

B. Wastewater

Wastewater is one of the largest sources of pollution by volume in Canada.⁵⁷⁹ Managing it requires coordination and cooperation because “all levels of government share responsibility for managing the collection, treatment and release of wastewater.”⁵⁸⁰

1) Wastewater Systems Effluent Regulations

The Wastewater Systems Effluent Regulations (WSER) were established under the Fisheries Act in 2012 and came into effect in January 2015.⁵⁸¹ They include “mandatory

576 Health Canada, *The Multi-Barrier Approach to Safe Drinking Water*.

577 Federal-Provincial-Territorial Subcommittee on Drinking Water of the Federal-Provincial-Territorial Committee on Environmental and Occupational Health, *Guidance for Safe Drinking Water in Canada: From Intake to Tap*, 2001.

578 Canadian Water and Wastewater Association, *Brief submitted to ENVI*, 6 May 2021.

579 Environment and Climate Change Canada, Written Response to Questions from ENVI, 2021.

580 Ibid.

581 Government of Canada, *Municipal wastewater treatment*, “*Quality*.”



minimum effluent quality standards that can be achieved through secondary wastewater treatment.”⁵⁸²

The WSER allow for equivalency agreements with provinces or territories where the “regulatory regime is considered equivalent in effect to the federal Regulations.”⁵⁸³ Quebec and the Yukon have equivalency agreements in place and Orders in Council have declared that the WSER do not apply in those jurisdictions.

In the case of New Brunswick and Saskatchewan, administrative agreements are in place whereby those provinces administer some activities for the WSER on behalf of Environment and Climate Change Canada. Both provincial and federal regimes are in place; however, a single window for regulatory reporting is achieved in those provinces as a result of the administrative agreements.⁵⁸⁴

2) Wastewater Treatment

As explained in the Canadian Council of Ministers of the Environment’s 2020 Municipal Wastewater Effluent Strategy:

Municipal wastewater consists of sanitary sewage from homes, businesses, industries and institutions as well as the rain and melted snow that drain into sanitary sewers. Municipal wastewater typically contains human and other organic waste, nutrients, pathogens, microorganisms, suspended solids and household and industrial chemicals. Treating wastewater before it is released into lakes and rivers reduces the risks posed to human health and the environment.⁵⁸⁵

A higher level of wastewater treatment results in “cleaner effluent and a smaller impact on the environment.”⁵⁸⁶ The levels of wastewater treatment may be summarized as follows:

- No treatment: No treatment process or only screening and/or grit removal;
- Primary treatment: Removing a portion of suspended solids and organic matter by physical processes (e.g., allowing suspended solids to settle to

582 Government of Canada, *Municipal wastewater treatment*, “[Data Sources and Methods](#).”

583 Government of Canada, *Wastewater*, [Bilateral agreements](#).

584 Ibid.

585 Canadian Council of Ministers of the Environment, [Municipal Wastewater Effluent Strategy](#).

586 Government of Canada, *Municipal wastewater treatment*, “[Population served](#).”

the bottom due to gravity) and/or chemical processes (e.g., adding a chemical to cause particles to clump together so that they settle out more quickly);

- Secondary treatment: Removing organic matter and suspended solids using biological treatment processes (e.g., using microorganisms to break down organic compounds) and secondary settlement;
- Tertiary treatment: Removing specific substances of concern (solids, nutrients and/or contaminants) after secondary treatment using a number of physical processes (e.g., filtration), chemical processes (e.g., coagulation and flocculation) or biological processes (e.g., using microorganisms to remove nutrients like nitrogen and phosphorus from the effluent).⁵⁸⁷

3) Combined Sewer Overflows

Surface runoff from urban areas is typically transported through either a separate storm sewer system (i.e., separated from sewage) or a combined sewer system.⁵⁸⁸ Stormwater from a separate sewer system may be discharged directly into a water body or first processed to improve water quality. With combined sewer systems, stormwater and household wastewater merge into one pipe. As these were commonly constructed before the 1940s, many older municipalities in North America have some of them.⁵⁸⁹ When combined sewer systems experience an overwhelming volume of water, such as following extreme rainfall or rapid snowmelt, the capacity of the wastewater treatment facility may be exceeded. Combined sewer overflows are intentional releases of combined stormwater and sewage without treatment in order to prevent sewer overloads and flooding of properties (including the wastewater treatment facility itself).⁵⁹⁰

Figure 8 shows the proportion of municipal wastewater, by volume, discharged following primary treatment, secondary treatment, tertiary treatment, no treatment, or as a result of combined sewer overflow. As can be seen in Figure 8, the vast majority of municipal wastewater has some form of treatment, but the release of untreated wastewater persists.

587 Ibid.

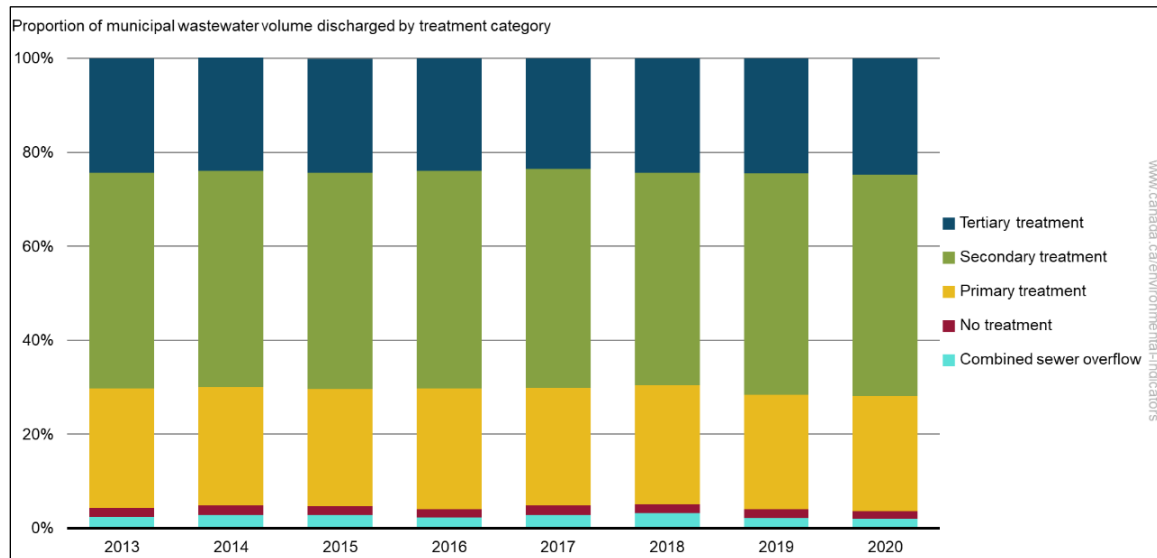
588 Government of Canada, [*Municipal wastewater treatment*](#).

589 Ibid.; and City of Toronto, [*Combined Sewer Overflows*](#).

590 Government of Canada, [*Municipal wastewater treatment*](#).



Figure 8—Proportion of Municipal Wastewater Volume Discharged by Treatment Category in Canada, 2013 to 2020



Note: Data on combined sewer overflows were unavailable for the sewer systems located in the Northwest Territories, Nunavut and north of the 54th parallel in the provinces of Quebec and Newfoundland and Labrador. Data on Quebec's combined sewer overflow volume is not available for the years 2018, 2019 and 2020.

Sources: Government of Canada, Municipal wastewater treatment, "[Volume](#)" using data from Statistics Canada (2023), [Table 38-10-0124-01: Wastewater volumes discharged from municipal sewage systems by treatment category \(x 1,000,000\)](#) and [Table 38-10-0100-01: Combined sewer overflow discharge volumes \(x 1,000,000\)](#).

In 2020, 3.7% or 219 million cubic metres of municipal wastewater was discharged with no treatment, including 116.9 cubic metres of combined sewer overflows.⁵⁹¹

As climate change is resulting in increasingly frequent extreme weather events,⁵⁹² and as urban growth has resulted in increased runoff⁵⁹³ from impervious surfaces,⁵⁹⁴ the

591 Government of Canada, *Municipal wastewater treatment*, "[Volume](#)."

592 Intergovernmental Panel on Climate Change, IPCC Sixth Assessment Report, [Chapter 11: Weather and Climate Extreme Events in a Changing Climate](#), Executive Summary, 2023.

593 Water Canada, [Sustainable Stormwater Management](#).

594 Impervious surfaces (e.g., concrete, asphalt) do not permit rainwater or meltwater to permeate into groundwater. Instead, water runs off into stormwater sewers.

likelihood of high volumes of stormwater being sent to wastewater treatment systems also increases.

4) Untreated Wastewater

Untreated wastewater, sometimes referred to as raw sewage, may be released during storms from outdated infrastructure, such as combined stormwater and sanitary sewers. It may also be released where there is no wastewater treatment infrastructure in place or during wastewater infrastructure maintenance, repair or construction.⁵⁹⁵ The Committee heard about the consequences of releasing untreated wastewater into freshwater, including compromised water quality with potential public health and ecosystem health consequences.⁵⁹⁶ Mark Fisher (President and Chief Executive Officer, Council of the Great Lakes Region) pointed out that, in large cities such as Montreal and Toronto, “when there are heavy rain events, you still see to this day combined sewer overflows that are dumping raw sewage”⁵⁹⁷ into receiving water bodies. He noted that massive infrastructure investments are required to solve combined sewer overflows and the water quality issues that result from them. He noted that cities do not have the resources themselves for these infrastructure upgrades, therefore funding mechanisms such as the Canada Infrastructure Bank are needed. George Peslari (Reeve, Rural Municipality of South Qu'Appelle No. 157) agreed that untreated wastewater release was occurring and that municipalities did not have the funds themselves to solve it:

During flood events, the City of Regina has come under scrutiny for being allowed, on an emergency basis, to release untreated water. We all know this is happening all over Canada. As the reeve of a rural municipality, I know the tax base cannot support a solution for this problem.⁵⁹⁸

Recommendation 41

That the Government of Canada work with provinces, territories, municipalities and Indigenous communities to prohibit the dumping of raw sewage into freshwater bodies.

595 Environment and Climate Change Canada, Written response to questions from ENVI, 2021, p. 26.

596 Environment and Climate Change Canada, Written response to questions from ENVI, 2021; Réseau Environnement, [Brief submitted to ENVI](#), undated, published on ENVI website 14 February 2024.

597 ENVI, [Evidence](#), 27 February 2024, 1735 (Mark Fisher, President and Chief Executive Officer, Council of the Great Lakes Region).

598 ENVI, [Evidence](#), 2 November 2023, 1120 (George Peslari, Reeve, Rural Municipality of South Qu'Appelle No. 157).



5) Wastewater Monitoring for Public Health

The Committee heard about Canadian innovation and leadership related to wastewater: surveillance for viruses, such the SARS-CoV-2 virus that causes COVID-19.⁵⁹⁹ Early in the COVID-19 pandemic, the Canadian Water Network created a COVID-19 Wastewater Coalition to foster collaboration between “municipalities, utilities, researchers, public health agencies and governments to accelerate sharing of knowledge on the application of wastewater-based epidemiology for SARS-CoV-2 in Canada.”⁶⁰⁰

Global Affairs Canada wrote to the Committee that Canada is “a world leader in the development of advanced water, wastewater and sanitation technologies.”⁶⁰¹ To illustrate this, it described how Canada developed “the world’s first rapid, on-site testing solution for the detection of SARS-CoV-2 in wastewater,”⁶⁰² which was then also deployed in the United States in 2022.⁶⁰³ Frederick Wrona agreed that Canada was a global leader in terms of early detection of COVID-19 in water.⁶⁰⁴

In order to take full advantage of Canada’s expertise in this area, while providing the public health benefits of early detection of outbreaks in communities across Canada, the Committee recommends:

Recommendation 42

That Health Canada, working with the Public Health Agency of Canada, incorporate wastewater monitoring as a permanent vehicle for better understanding the public health profiles of Canadian communities and more accurately predicting public health outbreaks; that the Public Health Agency of Canada enter into joint funding agreements, in keeping with respective jurisdictions, with provinces, territories and Indigenous communities to support wastewater monitoring at the local level, focusing especially on smaller urban centres and rural areas where federal and provincial wastewater monitoring may not exist.

599 Global Affairs Canada, Written response to questions from ENVI, 2024; Canadian Water Network, [Brief submitted to ENVI](#), 11 June 2021; Global Water Futures, [Brief submitted to ENVI](#), 11 May 2021; Dr. Kim Gilbride, Dr. Rania Hamza, and Dr. Patricia Hania, [Brief submitted to ENVI](#), 7 June 2021 brief; ENVI, [Evidence](#), 21 March 2024, 1700 (Frederick Wrona).

600 Canadian Water Network, [Brief submitted to ENVI](#), 11 June 2021.

601 Global Affairs Canada, Written response to questions from ENVI, 2024.

602 Ibid.

603 Ibid.

604 ENVI, [Evidence](#), 21 March 2024, 1700 (Frederick Wrona).

C. First Nations Drinking Water and Wastewater

1) Responsibility for First Nations Drinking Water

Many First Nations communities face unique challenges regarding drinking water, particularly those that are in remote areas. Responsibility for drinking water in First Nations communities in Canada differs according to a community's location:

- territorial governments are responsible for providing safe drinking water in all communities in their jurisdictions, including First Nations and Inuit communities;
- in British Columbia (B.C.), the First Nations Health Authority supports programs for drinking water quality; and
- on reserves south of the 60th parallel (that is, in all provinces except B.C.) First Nations communities and the Government of Canada share responsibility for drinking water quality management.⁶⁰⁵

According to Indigenous Services Canada, the federal government and First Nations are working together on, among other things:

- improving infrastructure on reserves;
- keeping water systems running and properly staffed;
- ending long-term drinking water advisories;
- supporting First Nations control of water delivery; and
- preventing short-term drinking water advisories from becoming long-term.⁶⁰⁶

Infrastructure needs in many Indigenous communities are well known, and there have been numerous calls to close the “infrastructure gap”—the difference between infrastructure servicing Indigenous communities and infrastructure readily available to

605 Government of Canada, Water in First Nations communities, *Roles and responsibilities*.

606 Government of Canada, *Achieving clean drinking water in First Nations communities*.



non-Indigenous Canadians.⁶⁰⁷ This infrastructure gap includes drinking water and wastewater infrastructure.

The federal government maintains a website to share current and historical information about long-term drinking water advisories, including details of the number of homes and buildings affected by each advisory.⁶⁰⁸

George McGraw (Founder and Chief Executive Officer, DIGDEEP), pointed out the following statistics regarding water and First Nations people in Canada:

In Canada, the best available data shows that members of [F]irst [N]ations are 90 times more likely to live without running water than other Canadians. Many of those communities have faced water advisories for decades, causing significant concern for health risks and long-term prosperity, and the number of waterborne diseases in [F]irst [N]ations communities is 26 times higher than the national average.⁶⁰⁹

When asked about why she thinks there remain long term boil water advisories in First Nations communities, Teresa McClenaghan (Executive Director, Canadian Environmental Law Association) offered this perspective on the complexities of some situations:

In one case, it's because of the issue concerning the intersection between disinfecting drinking water and organic material in the source of the fresh water. It's very difficult to find a different source. I can think of a couple of communities, in particular. You can't just boil it in those cases. The issue is that you must disinfect the water if it's from surface water. You must have some system of disinfection. Then it becomes a question of whether we find a different method for disinfection instead of, for example, chlorination. Perhaps there can be different technologies. Perhaps it's time to think about a filtration system. I can't speak to the specifics because I'm not an engineer, and I'm not acting for communities. I'll just say that, in principle, when you find you have a long-standing, intractable problem, you need to start to look for other solutions. If I may, I'll quickly add that it's also a question of where the first nations' own infrastructure is. It may be that they need senior governments to think about helping them relocate. For example, the location of their lagoon, waste-water system outflow, intake or landfill site.... Some of those source-water plans we did with [F]irst [N]ations, with grant funding, noted those issues. For example, in some communities in northern Ontario, it costs big capital dollars to change that around so you don't have the outflow from the wastewater plant ahead of the intake or a landfill site.⁶¹⁰

607 E.g., Government of Canada, [Investing in Indigenous community infrastructure](#).

608 Government of Canada, [Active long-term drinking water advisories](#).

609 ENVI, [Evidence](#), 15 February 2024, 1545 (George McGraw, Founder and Chief Executive Officer, DIGDEEP).

610 ENVI, [Evidence](#), 2 November 2023, 1145 (Teresa McClenaghan, Executive Director, Canadian Environmental Law Association).

In its brief on freshwater to the Committee, the Congress of Aboriginal Peoples commented on the lack of clarity regarding the federal government's responsibility for Indigenous peoples' water for those living off First Nations reserves:

For Indigenous Peoples residing on *Indian Act* reserve lands, the federal government has a much clearer constitutional authority and has established mechanisms for water management regulations which involve on-reserve First Nations. In contrast, Indigenous Peoples living off-reserve face the challenge of determining which federal or provincial department, agency, or myriad of other decision-making and supporting bodies to turn to in order to secure their rights to water and involvement in water governance and management. The federal government's duty to consult and fiduciary responsibilities towards off-reserve Indigenous Peoples requires clarity on how to address water governance when provincial governments hold much of the decision-making authority.⁶¹¹

In 2022, the federal government repealed the 2013 Safe Drinking Water for First Nations Act,⁶¹² and stated that it is “committed to developing and introducing new First Nations drinking water and wastewater legislation, in consultation with First Nations.”⁶¹³ The federal government shared an “updated consultation draft of a legislative proposal” with First Nations rights-holders and First Nation organizations in July 2023, for further feedback by early September 2023.⁶¹⁴ In a summary of what it had heard during consultations, the federal government noted four priorities that First Nations have consistently highlighted:

- recognition of rights;
- sustainable funding for drinking water and wastewater services;
- protection of source water; and
- ongoing engagement on water issues that affect First Nations.

Safe drinking water on First Nations reserves was the subject of a class action lawsuit that was settled in 2021. A settlement agreement⁶¹⁵ with the Attorney General of

611 Congress of Aboriginal Peoples, [Brief submitted to ENVI](#), November 2023.

612 [Safe Drinking Water for First Nations Act](#), S.C. 2013, c. 21 (repealed 2022).

613 Government of Canada, [Developing laws and regulations for First Nations drinking water and wastewater: engagement 2022 to 2023](#).

614 Ibid.

615 Settlement Agreement, [Manitoba Court of Queen's Bench File No.: CI-19-01-24661, Federal Court File No.: T-1673-19](#), 15 September 2021.



Canada was approved by the Federal Court⁶¹⁶ and the Court of Queen's Bench of Manitoba.⁶¹⁷ The terms of the settlement included the establishment of a First Nations Advisory Committee on Safe Drinking Water, including \$20 million in federal funding through 2025.⁶¹⁸ At the time of the settlement in 2021, the federal government indicated that its efforts to develop and introduce new proposed First Nations drinking water and wastewater legislation (the future Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands), in consultation with First Nations, would be aligned with the settlement agreement.⁶¹⁹

Bill C-61, An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands (First Nations Clean Water Act)⁶²⁰ received first reading in the House of Commons on 11 December 2023. Bill C-61 completed second reading on 5 June 2024 and was referred to the House of Commons Standing Committee on Indigenous and Northern Affairs. Because of the relevance of the subject matter of that bill to the freshwater study, on 18 June 2024, the Committee agreed to incorporate evidence heard to date by that committee so far into its study of freshwater. Although Bill C-61 died on the *Order Paper* as a result of Parliament's prorogation in January 2025 and has not been re-introduced, the following sections detail evidence heard during the study of Bill C-61 by that committee.

The Committee feels strongly that First Nations voices should be listened to regarding Bill C-61 and any water solutions for their communities. A representative from Indigenous Services Canada informed INAN that all First Nations in Canada had been provided with consultation drafts of Bill C-61.⁶²¹ First Nations witnesses were part of INAN's study of Bill C-61 and provided a variety of viewpoints.

Chief Billy-Joe Tuccaro expressed his dismay over Bill C-61 and the apparent existence of a two-tiered drinking water system in Canada:

616 Federal Court, [Manitoba Court of Queen's Bench File No.: CI-19-01-24661](#), [Federal Court File No.: T-1673-19](#), [Citation: 2021 FC 1415](#), 22 December 2021.

617 Court of Queen's Bench of Manitoba, [Dockets CI 19-01-24661](#) and T-1673-19, 22 December 2021.

618 First Nations Drinking Water Settlement, [The Journey to the Settlement](#).

619 Ibid.

620 LEGISinfo, [C-61: An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands](#); Library of Parliament, Brittany Collier and Marlisa Tiedemann, [Legislative Summary of Bill C-61: An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands](#), 16 May 2025.

621 INAN, [Evidence](#), 12 June 2024, 1705 (Joanne Wilkinson).

It blows my mind, as the [C]hief of the Mikisew Cree First Nation, that the federal government would even consider Bill C-61, an act respecting water, source water, drinking water, waste water and related infrastructure on first nation lands. Why do we have to be a second tier in this country when we were the first peoples of this land? That tells me that there are two tiers. Why can't we have the same access to clean drinking water that you guys get in Ottawa?⁶²²

Chief Lance Haymond (Assembly of First Nations Quebec-Labrador) felt that Bill C-61 represented “significant progress,” although “the lack of real co-development was undoubtedly a major concern for chiefs across this country regarding the development of Bill C-61.” However, Chief Lance Haymond (Assembly of First Nations Quebec-Labrador) was pleased to see the evolution of Bill C-61 and the inclusion of some of his input in key areas:

As for the bill itself, although it was not co-developed as planned, the text still evolved compared to previous versions. This is the first time I've seen our input included in its entirety in some areas, and the government going farther than expected in other areas. Despite an inadequate process, we have still made progress on the main gaps, which are inherent rights, funding, governance, standards, transboundary water sources and immunity. For example, there is now a reference to the existence of the inherent right of first nations to self-government. The concept of free, prior and informed consent has been added to the principles section. There are some substantial additions to the government's obligations, such as doing its best to provide funding that is “adequate, predictable, stable, sustainable” and “needs-based”. On the issue of transboundary waters, there is a mechanism for off-reserve collaboration regarding provincial, federal and [F]irst [N]ations territorial jurisdiction. There are also added provisions related to the immunity of [F]irst [N]ations employees.⁶²³

In contrast, Chief Sheldon Sunshine (Sturgeon Lake Cree Nation) saw Bill C-61 as “the latest attempt to encroach on our inherent authority over water” and had the following message for INAN:

I want to be crystal clear today that we do not need legislation to recognize and affirm our treaty. We need the space and the capacity to develop our own laws. This requires positive action by the federal government, given the effects of decades of neglect. However, Bill C-61 does not just infringe on our jurisdiction. It also creates a two-tier water system where the [F]irst [N]ations will continue to be denied the human right to water, and it downloads federal liability to the nations.⁶²⁴

622 ENVI, [Evidence](#), 27 February 2024, 1625 (Chief Billy-Joe Tuccaro).

623 INAN, [Evidence](#), 17 June 2024, 1110 (Chief Lance Haymond Assembly of First Nations Quebec-Labrador).

624 INAN, [Evidence](#), 17 June 2024, 1115 (Chief Sheldon Sunshine, Sturgeon Lake Cree Nation).



Carl Yates, Interim Chief Executive Officer of the Atlantic First Nations Water Authority Inc., a full-service water and wastewater utility owned and operated by its participating First Nations (discussed further below), commented on the standards for drinking water quality for First Nations. He expressed that his organization is keen to see “the Canadian drinking water quality guideline standards adopted as the minimum for service to [F]irst [N]ations, be that either central systems or individual wells.”⁶²⁵

Carl Yates also expressed that he would like to see wastewater effluent quality requirements tied to environmental risk “to ensure that the receiving waters are well protected.”⁶²⁶ James MacKinnon, also from the Atlantic First Nations Water Authority, explained that Indigenous Services Canada would currently approve wastewater infrastructure funding that would meet the requirements in the *Wastewater Systems Effluent Regulations*⁶²⁷ under the *Fisheries Act*.⁶²⁸ However, if the receiving water body for the wastewater effluent is ecologically sensitive, the Canadian Council of Ministers of the Environment⁶²⁹ might recommend a higher level of treatment, but funding would not be provided to meet this higher standard.⁶³⁰ The Atlantic First Nations Water Authority would like to see flexibility in how the federal government provides funding to First Nations for water and wastewater. Such flexibility could assist First Nations groups that would like to achieve a higher level of wastewater treatment than what is required by the *Wastewater Systems Effluent Regulations*.⁶³¹

2) Atlantic First Nation Water Authority

The Committee heard that the Atlantic First Nations Water Authority, which was described as follows, may be a collaborative model to emulate throughout Canada:

The AFNWA is a first-of-its-kind, full-service water and wastewater utility that is owned and operated by its participating [F]irst [N]ations. Currently, we provide service to 13

625 ENVI, *Evidence*, 2 November 2023, 1135 (Carl Yates, Interim Chief Executive Officer, Atlantic First Nations Water Authority Inc.).

626 Ibid.

627 *Wastewater Systems Effluent Regulations* SOR/2012-139.

628 *Fisheries Act*, R.S.C. 1985, C. F-14.

629 The Canadian Council of Ministers of the Environment is an intergovernmental forum led by federal, provincial and territorial ministers of the environment, who work together on environmental issues of national and international concern.

630 INAN, *Evidence*, 19 June 2024, 1825 (James MacKinnon, Director, Engagement and Government Relations, Atlantic First Nations Water Authority Inc.).

631 Ibid.

nations in Atlantic Canada. The AFNWA is a not-for-profit organization led by its participating [F]irst [N]ations, with the board comprising primarily [F]irst [N]ation chiefs, who have carefully developed incorporation documents, governance manuals and bylaws to guide their decision-making. The AFNWA board of directors is supported and informed by our elders advisory lodge. The elders provide guidance on [F]irst [N]ation values, cultures and knowledge, and offer advice to the board to ensure that the AFNWA is not solely a copy of a western utility model. The foundation of AFNWA's success to date is, in large part, due to its alignment and connection of funding to treatment, monitoring and operation standards through an [I]ndigenous-informed governance framework.⁶³²

Indigenous Services Canada discussed the Atlantic First Nation Water Authority in its written submission to the Committee and noted that similar models may be followed elsewhere in Canada as water and wastewater services are transferred to First Nations:

As services continue to transfer across the country, First Nation partners are developing models that fit their needs and priorities. This may take the form of utility models, like the [Atlantic First Nations Water Authority], or other models resulting from engagements with communities, technicians and Chiefs and Councils.⁶³³

In recognition of the importance of ensuring all First Nations communities in Canada are served with clean drinking water, the Committee recommends:

Recommendation 43

That the Government of Canada work with provinces, territories, municipalities, and First Nations communities to ensure all Canadians have access to safe, clean, and affordable drinking water, especially in small, rural, remote, and First Nations communities.

632 Ibid.

633 Indigenous Services Canada, Written response to questions from ENVI, 2021.



D. Water Infrastructure Investment Needs

“The federal government has a key role to play in ensuring that funding is sufficient to have a chance of resolving the [water infrastructure asset maintenance deficit] situation within an acceptable time frame. It must recognize the importance of local municipalities in building resilience to climate change and addressing water issues in cities. If it wishes to be taken seriously in its intention to put in place an effective strategy to protect freshwater, it seems clear to me that priority must be given to the rehabilitation, maintenance and improvement of municipal stormwater, groundwater, surface water and waste water catchment, filtration and treatment works.⁶³⁴”

Jimmy Bouchard, Support Representative, Conseil régional de l'environnement et du développement durable du Saguenay-Lac-St-Jean

The Committee heard concerning information about the state of Canada’s aging water infrastructure across many municipalities.⁶³⁵ Besides requiring funding to maintain or upgrade infrastructure, municipalities and regions must receive adequate support to implement responses to emerging contaminants and extreme weather events.⁶³⁶ This includes funding to implement new regulatory standards.⁶³⁷ Some aspects of Canada’s water infrastructure requiring further attention are addressed below, namely: leaks, undertreatment of wastewater, cybersecurity, and funding deficiencies.

634 ENVI, [Evidence](#), 27 February 2024, 1720 (Jimmy Bouchard).

635 E.g., ENVI, [Evidence](#), 4 June 2024, 1640 (Haseen Khan); ENVI, [Evidence](#), 4 June 2024, 1705 (Sean Ledgerwood).

636 ENVI, [Evidence](#), 27 February 2024, 1735 (Mark Fisher); ENVI, [Evidence](#), 18 April 2024, 1530 (Anna Warwick Sears); ENVI, [Evidence](#), 18 April 2024, 1640 (Roy Brouwer, Professor and Executive Director, Water Institute, University of Waterloo, As an individual).

637 ENVI, [Evidence](#), 8 February 2024, 1705 (Maja Vodanovic).

1) Leaks

Several witnesses mentioned that leaks in water infrastructure are a challenging problem that wastes drinking water. Roy Brouwer (Professor and Executive Director, Water Institute, University of Waterloo) informed the Committee that:

In 2021, losses from the water distribution systems due to leaking accounted for 17% of all water produced in Canada. This is 828 million cubic metres of potable water, enough to meet the needs of 10 million Canadians for a whole year.⁶³⁸

Maja Vodanovic (Mayor of the Borough of Lachine, Executive Committee Member, Responsible for Consultation with the Boroughs and for Waterworks, City of Montréal) added that Montreal appears to be a high consumer of water because “the leaks in our infrastructure are up to 24% right now.”⁶³⁹ This magnitude of loss of drinking water through leaks is unconscionable, particularly when some Indigenous communities in Canada do not have access to clean drinking water. However, the Committee recognizes that municipalities themselves often do not have the funds to detect and solve leaks in their infrastructure. To address these problems, the Committee recommends:

Recommendation 44

That the Government of Canada establish a fund through the Federation of Canadian Municipalities for water system diagnostics to assist municipalities in better detecting system leaks and other system weaknesses in advance.

2) Cybersecurity of Canada's Water and Wastewater Infrastructure

In addition to the need to upgrade and maintain Canada's water infrastructure, several briefs highlighted the importance of cyber security.⁶⁴⁰ When computer systems used to automate industrial processes and operations are connected to networks, they can be accessed and compromised by what the Government of Canada has referred to as “threat actors.”⁶⁴¹ Cyber threats to crucial infrastructure include ransomware and denial of service.⁶⁴² The Committee notes that water infrastructure is one of the ten critical

638 ENVI, [Evidence](#), 18 April 2024, 1640 (Roy Brouwer).

639 ENVI, [Evidence](#), 8 February 2024, 1730 (Maja Vodanovic).

640 Dr. Carolyn Johns, [Brief submitted to ENVI](#), 10 June 2021; Canadian Water and Wastewater Association, [Brief submitted to ENVI](#), 6 May 2021.

641 Government of Canada, [Security Considerations for Critical Infrastructure](#), 2022.

642 Ibid.



infrastructure sectors mentioned in the *National Strategy for Critical Infrastructure*⁶⁴³ and the Canadian Centre for Cyber Security's *Security Considerations for Critical Infrastructure*.⁶⁴⁴

The Committee heard from the Canadian Water and Wastewater Association, an advocacy group for the municipal water sector, that it collaborates with Public Safety Canada in its National Critical Infrastructure Sectors Forum and in cyber security research.⁶⁴⁵ The Canadian Public Works Association informed the Committee that “public works agencies, as owners and operators of critical water infrastructure,”⁶⁴⁶ rely on “Public Safety Canada’s critical infrastructure⁶⁴⁷ and cyber security⁶⁴⁸ programs and resources.”⁶⁴⁹ In her brief to the Committee, Carolyn Johns (Professor, Toronto Metropolitan University) identified water security, including “security from cyber threats and attacks on water systems” as an area of critical need for Canada.⁶⁵⁰ Because of the seriousness of the potential threats, the Committee urges the Government of Canada to do more to ensure water infrastructure managers have the support they need to keep Canada’s water supply safe from cyber attacks.

Recommendation 45

That the Government of Canada provide greater support to ensure the cybersecurity of Canada’s water and wastewater infrastructure, which are strategic assets.

3) Undertreated Wastewater

Mathieu Laneuville (President and Chief Executive Officer, Réseau Environnement) commented on the level of wastewater treatment—primary versus more extensive secondary or tertiary wastewater treatment—occurring in Canada. Although primary wastewater treatment is better than simply releasing untreated wastewater, it still

643 Public Safety Canada, *National Strategy for Critical Infrastructure*, 2009.

644 Government of Canada, *Security Considerations for Critical Infrastructure* 2022.

645 Canadian Water and Wastewater Association, *Brief submitted to ENVI*, 6 May 2021.

646 Canadian Public Works Association, *Brief submitted to ENVI*, undated, published on ENVI website 21 June 2021.

647 Government of Canada, *Critical Infrastructure*.

648 Government of Canada, *Cyber Security*.

649 Canadian Public Works Association, *Brief submitted to ENVI*, undated, published on ENVI website 21 June 2021.

650 Dr. Carolyn Johns, *Brief submitted to ENVI*, 10 June 2021, p. 4.

leaves contaminants—particularly emerging contaminants like endocrine disrupters—in the wastewater:

At present, a lot of primary treatment is done in Canada. These wastewater treatment facilities were built 40 years ago. I would point out that 40 years ago, [a lot of] wastewater was not being treated. It was being dumped directly into watercourses. Then primary treatment of this water was started. That is fine, but today, given new technologies, ... and given emerging new contaminants, we have to [do better by] public health and the health of our ecosystems... That is why, at Réseau Environnement, we advocate treatment 2.0. Let's not keep using 40-year old technology. We have to adopt new standards. We could follow the example of Switzerland, for example, which has succeeded in treating 80% of emerging contaminants, unlike Canada, where we do a lot of primary water treatment.⁶⁵¹

Benoit Barbeau (Full Professor, Polytechnique Montréal) also cautioned the Committee that Canada's water treatment infrastructure is not equipped to deal with emerging contaminants, such as PFAS, and that Canada is lagging behind in wastewater treatment of other substances, such as nutrients.⁶⁵²

4) Importance of Flushability Standards to Protect Infrastructure

Some items flushed into municipal wastewater systems can be problematic for maintaining the wastewater infrastructure, even when these may be labelled as “flushable” by manufacturers. Robert Haller, Executive Director of the Canadian Water and Wastewater Association, explained that his organization, along with Friends of the Earth, had complained to the Competition Bureau about improper labelling and false advertising of products that industry labels as “flushable.” He expressed concern over the stress placed on public wastewater infrastructure by these products. He strongly recommended that Canada adopt a standard created by wastewater professionals and supported by his organization: the international water services flushability standard.⁶⁵³

651 ENVI, [Evidence](#), 8 February 2024, 1655 (Mathieu Laneuville).

652 ENVI, [Evidence](#), 2 November 2023, 1210 (Benoit Barbeau).

653 ENVI, [Evidence](#), 2 November 2023, 1250 (Robert Haller, Executive Director, Canadian Water and Wastewater Association). See: Canadian Water and Wastewater Association, [Support and Funding for a Canadian Standard for Flushable Consumer Products](#).



5) Funding of Water Infrastructure

Jimmy Bouchard (Support Representative, Conseil régional de l'environnement et du développement durable du Saguenay-Lac-St-Jean) discussed what he saw as insufficient funding of water infrastructure in Canada.

In Quebec alone, the water infrastructure asset maintenance deficit is nearly \$35 billion. This amount goes up with every year that passes due to infrastructure underfunding at the various levels of government. The federal government has a key role to play in ensuring that funding is sufficient to have a chance of resolving the situation within an acceptable time frame. It must recognize the importance of local municipalities in building resilience to climate change and addressing water issues in cities. If it wishes to be taken seriously in its intention to put in place an effective strategy to protect freshwater, it seems clear to me that priority must be given to the rehabilitation, maintenance and improvement of municipal stormwater, groundwater, surface water and waste water catchment, filtration and treatment works.⁶⁵⁴

Robert Haller also described a lack of funding, and explained how the Canadian Water and Wastewater Association advocates for Canada's municipal water sector:

One of our strongest jobs is advocating to Infrastructure Canada to tell them how critical our need for financial support is to address aging infrastructure and to implement what all the other federal departments need of us. Our major point of concern is the massive cost of maintaining and replacing our infrastructure. You all know that we [municipal water utilities] own most of the infrastructure in Canada, but we get less than 10% of the access to the tax revenues we need. We're told to be self-sufficient through our rates, but then we're told that access to safe water is a human right. What does that mean?

We're called upon to replace our infrastructure, expand for population growth and plan for climate change, but then we have to keep everything affordable to the consumer. We need sustainable and reliable funding to do what we need to do. We're looking forward to a renewed Canada infrastructure plan. We support new regulations, but they always come at a huge cost to us. We need Environment Canada talking to Infrastructure Canada when they introduce costly new regulations to us.⁶⁵⁵

The Committee heard that the formula for allocating funding for water infrastructure may disadvantage small (those with a population of 6,500 or less), rural and northern communities. Infrastructure funding programs that apply a per capita benefit test, or that look at the overall expenditure in relation to the system, could disadvantage

654 ENVI, [Evidence](#), 27 February 2024, 1720 (Jimmy Bouchard).

655 ENVI, [Evidence](#), 2 November 2023, 1220 (Robert Haller).

communities with small populations or where projects are more expensive because equipment and people must be flown in.⁶⁵⁶

The Committee was encouraged to hear about effective cooperation between water stakeholders, such as the Canadian Water Network, leveraging their knowledge of the municipal water sector by working with the Federation of Canadian Municipalities to help “improve the effectiveness of federal funding programming and support to the water sector.”⁶⁵⁷ Having heard testimony from communities, water infrastructure operators, researchers and other stakeholders, the Committee observed that existing federal funding opportunities for water infrastructure may inadvertently disadvantage some communities—such as those that are small and remote—making them less likely to be awarded funding. The Committee suggests that water infrastructure funding criteria be more flexible and accommodate the specific needs of smaller, rural, northern, and Indigenous communities.

Recommendation 46

That the Government of Canada create a dedicated, sustainable long-term fund for upgrades to municipal water infrastructure.

Recommendation 47

That the Government of Canada renew funding to the Federation of Canadian Municipalities for municipalities to develop water asset management plans to better predict their future water system upgrade needs.

Recommendation 48

That the Government of Canada establish a fund through the Federation of Canadian Municipalities to help municipalities prepare engineering plans for water system upgrades well in advance of funding opportunities becoming available, so that municipalities can be ready to take advantage of them when they arrive; and, that the application timelines for water infrastructure funding be increased to allow municipalities enough time to prepare the engineering plans required to support successful applications.

656 ENVI, [Evidence](#), 2 November 2023, 1150 (Theresa McClenaghan); ENVI, [Evidence](#), 2 November 2023, 1115, 1120 (George Peslari); ENVI, [Evidence](#), 27 February 2024, 1720 (Jimmy Bouchard).

657 Canadian Water Network, [Brief submitted to ENVI](#), 11 June 2021.



10. INDIGENOUS PEOPLES AND CONSIDERATIONS RELATED TO WATER

Much of what the Committee heard in relation to freshwater and Indigenous people in Canada is integrated throughout this report. This has been done intentionally to reflect what the Committee heard regarding the need to consider Indigenous traditional knowledge and worldviews alongside western ways of understanding water, rather than having Indigenous perspectives marginalized.⁶⁵⁸ This chapter starts by pointing the reader to other sections of the report that explore perspectives of Indigenous peoples. It then highlights some of the main messages heard regarding Indigenous peoples and water.

A. Issues Related to Indigenous Communities that are Explored in Other Chapters of this Report

The following describes some of the content related to Indigenous people, their perspectives, and their rights in other chapters of the report:

- the “Shared Jurisdiction for Freshwater” chapter includes a description of Indigenous peoples’ inherent right to self-government, including its constitutional basis. Views on Indigenous co-management and water governance are also presented;
- the “Seepage and Overflow at Imperial Oil’s Kearl Oil Sands Mine” chapter presents what the Committee heard about some of the impacts experienced by Indigenous people downstream from the Kearl oil sands mine site, including health and mental health impacts. It explains Indigenous views on the extent to which the federal government is upholding the constitutional rights of Indigenous peoples in the area, the desire for greater Indigenous involvement in decision-making related to activities that affect their traditional territories, and concerns about environmental racism;
- the “Drinking Water and Wastewater” chapter includes a section on First Nations drinking water that describes the federal responsibility for First Nations water, the lack of access to clean drinking water in some First Nations communities, and some reactions to proposed legislation on First

658 E.g., Canadian Environmental Law Association, [Brief submitted to ENVI](#), 11 June 2021.

Nations water, Bill C-61: An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands;⁶⁵⁹

- the “Rights” chapter includes the importance of recognizing Indigenous rights to water;
- the “Research, Monitoring and Data” chapter discusses the opportunity to expand the geographical reach of national monitoring programs while engaging Indigenous communities through Indigenous water monitoring initiatives; and
- the “Watersheds” chapter includes the importance of co-developing an updated *Canada Water Act* with Indigenous peoples.

B. Themes of Indigenous Reconciliation and Co-Management

The Committee heard about the opportunity for advancing reconciliation with Indigenous peoples through federal water policy and governance, as well as the importance of Indigenous people having authority over their waters. In recommending a renewal of the *Canada Water Act* (discussed in greater detail in the “Watersheds” chapter), Global Water Futures asserted the need for an updated approach to Indigenous water rights in Canada, noting that “[t]he 1987 Federal Water Policy ... advances an extremely outdated approach to Indigenous water rights, responsibilities, and governance roles.”⁶⁶⁰

Likewise, the POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, suggested that the federal government fulfill “the federal government’s stated commitment to advancing government-to-government, nation-to-nation relationships by developing pathways and providing resources for the co-governance of shared waters with Indigenous peoples” and “[d]etermine, in partnership with Indigenous peoples, how they will participate in advancing water-related legislative, institutional, and policy initiatives that affect or interest them.”⁶⁶¹

659 LEGISinfo, [C-61: An Act respecting water, source water, drinking water, wastewater and related infrastructure on First Nation lands](#). Bill C-61 died on the order paper when the 44th Parliament was dissolved on 6 January 2025.

660 Global Water Futures, [Brief submitted to ENVI](#), 11 May 2021, p. 9.

661 POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria, [Brief submitted to ENVI](#), 10 June 2021, p. 2.



The Assembly of First Nations (AFN) stated in its brief that First Nations have historically been excluded from participating in water governance, or have been less involved and less informed about water-related projects than non-First Nations participants.⁶⁶² It also stated that enforcement capacity is a challenge for First Nations that work on water protection and conservation, because, while they can develop bylaws, “First Nations have challenges with enforcing these bylaws on industry actors in their territories due to the lack of recognition in crown laws and regulations.”⁶⁶³

The AFN also remarked on the jurisdictional complexity of authority over water:

The current multi-jurisdictional freshwater authority between First Nations, and the federal, provincial, and territorial governments is complex. While water flows through many First Nations’ territorial boundaries, there exist multiple challenges for First Nations that consist of jurisdictional fragmentation, lack of recognized authority, decision-maker status, and a lack of state governmental or industry accountability on freshwater protection. These challenges result in water protection gaps, poor sharing of information, a disconnect between diverse policies and programs, and difficulties in water monitoring and regulations. Overall, there remain challenges to ensuring the full and meaningful participation of First Nations in decision-making processes related to water.⁶⁶⁴

C. Water From an Indigenous Worldview

The Committee heard about how water may be seen in Indigenous worldviews—of which there are a diversity.⁶⁶⁵ Such views typically contrast with a resource management-centric view of water.

Caleb Behn (As an Individual) stated, “we have a very different relationality to the non-human because we view and interface with these non-human entities as having agency, as having breath, as having spirit, as having profundity.”⁶⁶⁶

662 Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023, p. 3.

663 Ibid.

664 Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023, p. 2. (This brief contains references for statements made in this quote.)

665 See, for example, Dr. Claire Oswald (Interim Academic Director) et al., Ryerson Urban Water, [Brief submitted to ENVI](#), 7 May 2021, p. 4.

666 ENVI, [Evidence](#), 30 January 2024, 1705 (Caleb Behn, As an individual).

Chief Billy-Joe Tuccaro (Mikisew Cree First Nation) offered the following perspective:

Our way of life and who we are as Mikisew people depend on water for all aspects of our traditional cultural inherent rights. It connects us to our ancestors. It is what connects us as human beings. For us, water is boss. Our elders remind us that, before we are born into this world, we have lived our first nine months in water. It sustains and gives us life. We are dependent on water. Without water, we will die. Water holds memory that is transferred to us. That is our relationality. As Mikisew people, we rely on our local water sources on a daily basis as we hunt, harvest and fish as intended in our promised treaty.⁶⁶⁷

The Assembly of First Nations (AFN) described a First Nations view of water in its brief:

Water is fundamental for life. For First Nations, the significance of water deepens through our eternal connection to water. Many First Nations consider water to be a *relative*—rather than a resource that can be bought or sold—in which there exists a reciprocal relationship that must be continuously nurtured and respected.⁶⁶⁸

...

We operate under the basic principle that if you take care of the water, it will take care of you. We understand that a healthy ecosystem is necessary in order to exercise our Indigenous rights and laws, which enable us to fish, hunt, gather and practice our traditional customs and ceremonies. While some of these concepts likely resonate with non-Indigenous Peoples as well, the reality is that Western ways of knowing have largely precluded such characterizations and have, thereby, led to the pollution and desecration of Mother Earth.⁶⁶⁹

AFN went on to outline the role of First Nations women with respect to water, and how it has changed as a result of colonialization:

For First Nations women, this connection to water deepens through their roles as child bearers. Just as water from Mother Earth carries life to us, women carry life and water in their wombs during pregnancy. It is in this way that we recognize that all aspects of creation are interrelated. When settlers arrived on Turtle Island (i.e., North America), Indigenous natural law was largely replaced by colonial law and this changed the ways that water was respected. Colonialism has had negative ramifications for Indigenous Knowledge relating to water, and the intergenerational transfer of this knowledge has thereby been diminished. Our traditional ways of being were not passed on from grandmothers to mothers who, in turn, have been unable to teach our youth. As a result, First Nations have suffered a loss of traditional roles, responsibilities, practices, and stewardship. It has been difficult to reclaim these roles since, to this day, the vast

667 ENVI, [Evidence](#), 27 February 2024, 1555 (Chief Billy-Joe Tuccaro).

668 Assembly of First Nations, [Brief submitted to ENVI](#), 11 June 2021.

669 Ibid.



majority of policies in Canada that involve water fail to embody the critical roles of First Nations' women with respect to water.⁶⁷⁰

Dawn Martin-Hill (Full Professor, Indigenous Studies Department, McMaster University) described her role as an Indigenous woman and scientist and shared examples of the significance of water in her culture:

As a Kanienkehaka—Mohawk—woman and a scientist living in my community, it is important to acknowledge the laws that our people upheld long before colonial laws of the Crown.

The research [project on water Dr. Martin-Hill is describing] centres on the Haudenosaunee Great Law and responsibility to care for the water. This is embedded in our creation stories and the thanksgiving—or *Ohenton kariwatehkwen*—address. The constitution of the Haudenosaunee states that whenever the confederacy leaders “shall assemble for the purpose of holding a council, the [leaders] shall open it by expressing their gratitude to...and offer thanks to the earth where men dwell, to the streams of water, the pools and the lakes.”

Secretary to the Haudenosaunee Confederacy and sub-chief Leroy Hill tells us how the Great Lakes were formed, and the fresh water that the Creator gave us to live on earth. The landscape of this region is literally tied to our creation story.⁶⁷¹

Keepers of the Water, which is an “Indigenous-led water-protecting organization based in Treaty 8 Territory comprised of First Nations, Métis, Inuit, environmental groups, concerned citizens, and communities working collaboratively for the preservation of the environment”⁶⁷² shared the Keepers of the Water Declaration:

Water is a Sacred gift, an essential element that sustains and connects all life. It is not a commodity to be bought or sold. All people share an obligation to cooperate in ensuring that Water, in all its forms, is protected and conserved with regard to the needs of all living things today and for the generations yet to come.⁶⁷³

The Committee was privileged to hear so many views of Indigenous witnesses related to water, and takes seriously its responsibility to reflect these views.

670 Ibid.

671 INAN, [Evidence](#), 19 June 2024, 1720 (Dr. Dawn Martin-Hill).

672 Keepers of the Water, [Brief submitted to ENVI](#), 9 January 2024, p. 7.

673 Ibid., p. 8.

11. RESEARCH, MONITORING AND DATA RELATED TO FRESHWATER IN CANADA

Freshwater research in Canada happens in many places: It may be conducted within government institutions and departments at the federal, provincial/territorial and municipal levels, at public and private academic institutions, and by citizens' groups, conservation authorities, corporations, and non-governmental organizations, among others.

Over the course of its study, the Committee heard about research related to freshwater; in particular about the importance of monitoring, and of making data accessible for analysis and use in evidence-based policy making. This chapter presents highlights of what the Committee heard on these topics. It begins with a description of federal research and supports for research on freshwater. It then describes evidence heard about the current state of freshwater research in Canada and the need for additional research and training. Next, it discusses the importance of monitoring freshwater quality and quantity, including Indigenous-led initiatives. Finally, the chapter concludes by exploring the need for systemic change in water data management in Canada.

A. Federal Support for Freshwater Research

Federal employees from a variety of departments and organizations conduct research related to freshwater. The federal government also provides funding for freshwater research conducted outside the government.

1) Freshwater Research Conducted by the Federal Government

Federal scientists conduct research related to freshwater at a number of federal research facilities.⁶⁷⁴ Research conducted by parts of the Government of Canada on freshwater covers a wide range of topics, including water quality monitoring, ecology, hydrology, the study of aquatic contaminants and their remediation, and others. It can also include chemical and toxicological analyses related to legal obligations under the *Canada Water Act*, the *Canadian Environmental Protection Act, 1999*, the *Fisheries Act* and the *Migratory Bird Convention Act*, among other laws.⁶⁷⁵ For example, as noted by Environment and Climate Change Canada (ECCC):

674 Environment and Climate Change Canada, [Environmental science centres across Canada](#); and Fisheries and Oceans Canada, [Science facilities](#).

675 Environment and Climate Change Canada, [Environmental science centres across Canada](#).



Part 3, Section 44 of the *Canadian Environmental Protection Act, 1999* authorizes the Minister of the Environment to establish environmental monitoring stations, collect and publish data on environmental quality in Canada, conduct research and studies on pollution control and environmental contamination, formulate pollution prevention plans, and publish information on pollution prevention plans, and on the quality and state of the Canadian Environment.⁶⁷⁶

2) Federal Funding for Freshwater Research

Federal support for research is made available mainly through three federal granting councils, which provide scholarships to graduate students and research grants to researchers, through peer-reviewed competitions.⁶⁷⁷ Additionally, the Canada Foundation for Innovation is a non-profit corporation supported by the Government of Canada that funds research equipment and facilities and could support research on freshwater.⁶⁷⁸

The Committee heard from members of the research community; some from academia, some engaged in citizen science, and others from non-governmental organizations and industry. Witnesses discussed areas in which Canada demonstrates strength in water research, as well as where targeted investment could help Canada realize greater research leadership potential. Witnesses also discussed the importance of increasing data sharing from freshwater monitoring programs in order to inform evidence-based decisions.

B. Perspectives on Freshwater Research and Training

1) Current State of Research

Several witnesses discussed Canada's leadership position in freshwater research.⁶⁷⁹ In its brief, the United Nations University Institute for Water, Environment and Health observed that Canada ranks "among global leaders in the water research field"⁶⁸⁰ with "a range of

676 Government of Canada, [*Canadian Environmental Protection Act: monitoring, reporting and research*](#).

677 Government of Canada, [*Selecting the Appropriate Federal Granting Agency*](#).

678 Government of Canada, [*"Infographic for Canada Foundation for Innovation"*](#), GC InfoBase, Database, accessed 9 February 2024.

679 ENVI, [*Evidence*](#), 13 February 2024, 1535 (Scott Higgins); United Nations University – Institute for Water, Environment and Health, [*Brief submitted to ENVI*](#), undated, published on ENVI website 15 February 2024, p. 2; ENVI, [*Evidence*](#), 23 November 2023, 1100 (Julian Aherne).

680 United Nations University – Institute for Water, Environment and Health, [*Brief submitted to ENVI*](#), undated, published on the ENVI website 15 February 2024, p. 2.

university research centers, institutes and national research networks..., supported by funding from three dedicated thematic research councils, and by provincial and territorial governments, private foundations, corporations and non-government organizations.”⁶⁸¹ Julian Aherne (Associate Professor, School of Environment, Trent University) highlighted that research “conducted at the [International Institute for Sustainable Development] Experimental Lakes Area in northern Ontario has contributed to environmental policy around the world, from mitigating algal blooms to reducing how much mercury gets into our waterways, and more recently to advancing our understanding of the fate of microplastics in fresh waters.”⁶⁸² Scott Higgins (Senior Research Scientist, Experimental Lakes Area, International Institute for Sustainable Development) described the highly collaborative nature of the Experimental Lakes Area’s research as leading to “strong management and policy outcomes.”⁶⁸³ He also noted that collaborating with academic and government researchers, Indigenous peoples, industry, NGOs and other stakeholders on their research helps break down silos and is “highly cost effective.”⁶⁸⁴

In its brief, the United Nations University Institute for Water, Environment and Health discussed the potential of Canada’s Global Water Futures program to share research advances with the world:

The Global Water Futures Program (GWF)—a seven-year (2016–2023) research initiative at the University of Saskatchewan with a mission to improve disaster warning, predict water futures, and inform adaptation to change and risk management—was the largest university-led water research program of its kind in the world, and one of the largest water science collaborations in history. It covered much of Canada’s national water resources research agenda with the aim of ultimately providing global leadership in water science for cold regions and addressing the strategic needs of the Canadian economy in the face of an uncertain water future. The maturing research outcomes of this network have the potential to powerfully inform, not just domestic water policy by way of the recently created Canada Water Agency, but also what Canada can offer the rest of the world in terms of breakthroughs in both water science and governance.⁶⁸⁵

681 Ibid.

682 ENVI, [Evidence](#), 23 November 2023, 1100 (Julian Aherne).

683 ENVI, [Evidence](#), 13 February 2024, 1535 (Scott Higgins).

684 Ibid.

685 United Nations University – Institute for Water, Environment and Health, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 February 2024, p. 3.



2) Research and Training Needs

Witnesses highlighted areas of priority for future freshwater research and funding. Adam Weir called for national-scale research related to recreational fisheries, given their economic significance.⁶⁸⁶ As mentioned in the per- and polyfluoroalkyl substances (PFAS) section of this report, some witnesses identified research into PFAS contamination of freshwater and its impacts and mitigation as a research need for Canada.⁶⁸⁷ The Association for Great Lakes Research recommended federal support for research on emerging contaminants, a group that includes PFAS, and emphasized the importance of research into cumulative effects:

Invest in research to better understand the fate, behavior, and toxicity of emerging contaminants to support informed regulations. Such studies may be needed for specific chemicals which are poorly studied and should consider cumulative effects. Consumers are exposed to several contaminants at once and understanding the cumulative effects of multiple exposures deserves further research.⁶⁸⁸

Steven Frey (Director of Research, Aquanty) noted that most research and modelling efforts have focused on surface water, and he identified “one of the big missing links in Canada: data sets that characterize water below the surface.”⁶⁸⁹ He explained that his organization’s model, Aquanty, starts “from the bottom up,”⁶⁹⁰ mapping aquifers and groundwater flow, and then layering the land surface on top, which “takes tremendous amounts of data.”⁶⁹¹ Use of the Aquanty model was recommended by Duncan Morrison (Executive Director, Manitoba Forage and Grassland Association), including to input data resulting from on-farm research.⁶⁹²

Scott Higgins suggested that it would be in the national interest for Canada to develop a national water strategy that includes “facilitating priority areas of research,”⁶⁹³ and “routine national water assessments” as part of a national monitoring program to “help

686 ENVI, [Evidence](#), 1 February 2024, 1545 (Adam Weir).

687 Ottawa Riverkeeper, [Brief submitted to ENVI](#), undated, published on ENVI website 25 October 2023; ENVI, [Evidence](#), 13 February 2024, 1605 (Scott Higgins).

688 International Association for Great Lakes Research, [Brief submitted to ENVI](#), 23 November 2023.

689 ENVI, [Evidence](#), 13 February 2024, 1705 (Steven Frey).

690 Ibid.

691 Ibid.

692 ENVI, [Evidence](#), 13 February 2024, 1705 (Duncan Morrison, Executive Director, Manitoba Forage and Grassland Association).

693 ENVI, [Evidence](#), 13 February 2024, 1535 (Scott Higgins).

identify emerging issues of regional and national importance where management and policy interventions, or further research, are needed.”⁶⁹⁴ Such a national strategy could help balance competing priorities and help align funding with strategic research needs.

The Committee heard that there is a need for more Canadians to enter water-related post-secondary education and careers. Beth Parker explained that hydrogeology graduate programs had trouble finding Canadian graduate students to take advantage of research funding opportunities available.⁶⁹⁵ Likewise, Shelley Peters and Jason Jackson of the Canadian Water Quality Association, as well as Mathieu Laneuville of Réseau Environnement, informed the Committee that there are not enough certified water specialists and technicians to meet residential consumer demand in Canada.⁶⁹⁶

Recommendation 49

That the Government of Canada actively support Canadian academic institutions that wish to consolidate and increase Canada's scientific knowledge and professional expertise in water management, including in partnership with the United Nations University Institute for Water, Environment and Health.

C. Importance of Monitoring

“We simply don't need another website collating fragmented data. We need systemic change in how we design and implement an effective monitoring, evaluation, and reporting system.”⁶⁹⁷

Frederick Wrona, Professor, Svare Research Chair,
Integrated Watershed Processes, As an individual

The Committee heard throughout the study the importance of, and need for, long-term monitoring of environmental variables, such as water quality monitoring in the oilsands,

694 Ibid.

695 ENVI, [Evidence](#), 6 February 2024, 1800 (Beth Parker).

696 ENVI, [Evidence](#), 8 February 2024, 1540 (Shelley Peters); ENVI, [Evidence](#), 8 February 2024, 1625 (Jason Jackson, Professor and Education Consultant, Canadian Water Quality Association); [Evidence](#), 8 February 2024, 1720 (Mathieu Laneuville).

697 ENVI, [Evidence](#), 21 March 2024, 1630 (Frederick Wrona).



and flood and drought-related monitoring.⁶⁹⁸ In their brief to the Committee, Professor Frederick Wrona and Professor Kelly Munkittrick explained that quality monitoring programs must not stop at monitoring—they must also involve evaluation/analysis of data and reporting of results in a way that is meaningful and understandable to all stakeholders, including the public.⁶⁹⁹ Professors Wrona and Munkittrick laid out the importance, structure, and challenge of such programs:

Quantifying, understanding, and predicting the changes in water quantity, quality, and aquatic biota in response to ... multiple environmental stressors requires coordinated, integrated, and credible monitoring, evaluation, and reporting (MER) systems to inform communities, the public, and decision-makers at all levels of government on what actions are necessary to ensure the conservation, protection, security, and sustainability of our water resources.

Effective design and implementation of an integrated [monitoring, evaluation and reporting] system requires the acquisition and timely reporting of relevant environmental information. Integrated watershed management requires the ability to define appropriate baseline conditions against which to assess change, as well as identify and track any environmental impacts, and the capacity to assess and predict any cumulative effects.

While such an approach to inform integrated basin management decision-making sounds logical and straightforward to do, all levels of government, communities, industry, and NGOs continue to struggle with structuring and implementing an effective, adaptive, and cost-efficient [monitoring, evaluation and reporting] framework for freshwater systems.⁷⁰⁰

Julian Aherne emphasized that monitoring of freshwater is essential and “that coordinated national-scale monitoring is required for effective detection and management of pollution.”⁷⁰¹ He advised that “[s]uch monitoring programs must be long-term programs to allow for the detection of trends, and they must be coordinated to allow for comparison across regions.”⁷⁰² Dr. Aherne explained how a lack of coordination hinders our collective understanding of the severity of freshwater issues:

For example, to date, observations of microplastics in fresh waters have been carried out by individual researchers, each using different sampling and analytical protocols. As

698 E.g. ENVI, [Evidence](#), 21 March 2024, 1535 (Paul West-Sells, President and Chief Executive Officer, Western Copper and Gold).

699 Frederick Wrona and Kelly Munkittrick, [Brief submitted to ENVI](#), 17 March 2024.

700 Ibid.

701 ENVI, [Evidence](#), 23 November 2023, 1100 (Julian Aherne).

702 Ibid.

a result, we have no capacity to compare across studies, and a limited understanding of the scale of the issue.

Scott Higgins also advocated for a national freshwater monitoring program in Canada that makes use of work already underway, thereby avoiding duplication.⁷⁰³ Canada could work to emulate the outcomes of national monitoring programs in the United States, which have been effective at identifying risks to freshwater from various sectors so that they can be responded to appropriately.⁷⁰⁴

The potential benefits of a national water monitoring program for the agriculture industry and the chemicals industry were highlighted by Terri Stewart (Executive Director, Chemistry, CropLife Canada):

Currently, Canada does not have a consistent national water monitoring program. In the absence of this information, the [Pest Management Regulatory Agency] defaults to overly conservative assumptions, often resulting in the cancellation of uses that would otherwise not be a regulatory concern. This reduces the competitiveness of Canadian growers and compromises their ability to combat both existing and future pests. In terms of a national, government-run program, having such a framework really would ensure quality and consistency in terms of methods of detection and sampling collection, use of thresholds that are in line with what is used by Health Canada, sampling done across Canada—including different agricultural areas—and being able to do it at a consistent frequency so that they can conduct trend analysis to understand the levels over time.⁷⁰⁵

1) Indigenous-Led Freshwater Research and Monitoring, Community-Based Water Quality Monitoring and Citizen Science

The Committee heard about the opportunity to involve interested citizens in monitoring their local freshwater. Engaging local citizens typically allows for much more and broader data collection—in terms of geographical reach and number of sampling trips—than if researchers travel to sample water themselves. It allows freshwater monitoring programs to benefit from local knowledge of the landscape, including Indigenous traditional knowledge. It also provides a method to engage and educate community members and help inspire them about water stewardship.

703 ENVI, [Evidence](#), 13 February 2024, 1610 (Scott Higgins).

704 Ibid.

705 ENVI, [Evidence](#), 27 February 2024, 1800 (Terri Stewart).



ECCC discussed the importance of working across sectors and jurisdictions, including Indigenous government and community groups, to bring together freshwater data:

Federal sources of data are not on their own sufficient to protect and manage fresh water. To accomplish this, datasets from various sources (federal, other orders of government, including Indigenous governments, and non-governmental organizations/community groups) need to be interoperable to provide a more comprehensive picture of the state of water at any given location, area or watershed. Further work is required to create a full inventory of data in Canada, to establish standards and tools to improve discoverability and accessibility, and to ensure that existing data or data generated in the future are usable for further research, decision-making, and action.⁷⁰⁶

Ottawa Riverkeeper recognized the potential of citizen and community science, noting: “There is so much potential for data gaps to be filled using creative and collaborative approaches to data collection and sharing.”⁷⁰⁷ In its brief, Datastream recommended that the federal government use “community-based monitoring data to increase Canada’s capacity for water quality assessment, informed decision making, and climate change adaptation” and that it “provide long-term funding support (5+ years) for community-based watershed monitoring and restoration programming.”⁷⁰⁸

The Canadian Aquatic Biomonitoring Network (CABIN)⁷⁰⁹ program was mentioned by a number of stakeholders as an example of national-scale standardization of water data with training for those interested in local freshwater data collection.⁷¹⁰ The Institut National de la recherche scientifique also suggested in its brief that more federal funding for citizen research is needed, particularly in northern regions of Canada, where monitoring is difficult without the involvement of local community members, and where traditional knowledge could contribute to participatory water management.⁷¹¹

706 Environment and Climate Change Canada, Written response to questions from ENVI, 9 July 2021.

707 Ottawa Riverkeeper, [Brief submitted to ENVI](#), undated, published on ENVI website 25 October 2023.

708 DataStream, [Brief submitted to ENVI](#), 24 January 2024.

709 Environment and Climate Change Canada, Written response to questions from ENVI, 9 July 2021.

See: Government of Canada, [Canadian Aquatic Biomonitoring Network](#).

710 World Wildlife Fund-Canada, [Brief submitted to ENVI](#), undated, published on the ENVI website 13 May 2021; Bow River Basin Council, Lesser Slave Watershed Council, LICA-Environmental Stewards (Beaver River Watershed), Mighty Peace Watershed Alliance, North Saskatchewan Watershed Alliance, Oldman Watershed Council, Red Deer River Watershed Alliance, and South East Alberta Watershed Alliance, [Brief submitted to ENVI](#), 11 June 2021; Ottawa Riverkeeper, [Brief submitted to ENVI](#), 11 June 2021; Environment and Climate Change Canada, Written response to questions from ENVI, 9 July 2021.

711 Institut National de la recherche scientifique, [Brief submitted to ENVI](#), 7 May 2021.

The Committee heard about Indigenous Guardians Programs and several other Indigenous freshwater monitoring and stewardship initiatives, and also heard that there are some barriers to the realization of their full potential. As described by the Assembly of First Nations:

There are currently many First Nations across Turtle Island that are leading and involved in work to protect the freshwater within their territories. These initiatives can range from water monitoring and data gathering programs to establishing Indigenous Protected and Conserved Areas (IPCAs), Indigenous guardian programs, and restoration initiatives for aquatic environments. These initiatives are often overly prescribed proposal-based programs through the Government of Canada that are short term and deliverable-bound. A lack of permanent funding and human resource capacity is a barrier to already established co-governance agreements on water to carryout essential stewardship and conservation work such as water quality research and assessments, monitoring, Indigenous knowledge programs, and guardian programs.⁷¹²

Kat Hartwig (Executive Director, Living Lakes Canada) saw the potential of Indigenous involvement in water stewardship, including through monitoring, to “advance Indigenous knowledge and data sovereignty.”⁷¹³ When discussing the lack of safe drinking water on some First Nations lands, the Safe Drinking Water Foundation expressed its support for greater involvement of First Nations groups in the monitoring of freshwater.⁷¹⁴ Carl Yates (Interim Chief Executive Officer, Atlantic First Nations Water Authority Inc.) emphasized that the Atlantic First Nations Water Authority “embraces two-eyed seeing, which is a process that recognizes traditional indigenous knowledge and western science as complementary.”⁷¹⁵ He identified a critical gap in recognizing “multiple knowledge systems and ways of knowing in monitoring, evaluation, and reporting program design and in integrating [I]ndigenous knowledge holders in the co-design and implementation of such programs.”⁷¹⁶ He encouraged “the federal government to support programs that promote two-eyed seeing with dedicated funding for [I]ndigenous communities.”⁷¹⁷

Indigenous monitoring and other community-based monitoring can fill gaps in freshwater data. Without enough data for analysis, meaningful identification of trends, on which policy decisions can be based, cannot be made. For instance, Kat Kavanagh

712 Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023, pp. 3–4.

713 ENVI, [Evidence](#), 13 February 2024, 1650 (Kat Hartwig).

714 Safe Drinking Water Foundation, [Brief submitted to ENVI](#), undated, published on ENVI website 2 June 2021.

715 ENVI, [Evidence](#), 2 November 2023, 1110 (Carl Yates).

716 Ibid.

717 Ibid.



(Executive Director, Water Rangers) noted that World Wildlife Fund Canada’s 2020 watershed reports listed over 60% of subwatersheds as data-deficient, meaning the health of those subwatersheds could not be assessed.⁷¹⁸

Recommendation 50

That the Government of Canada increase its long-term support for Indigenous freshwater monitoring and research, thereby engaging more Indigenous people in water stewardship, utilizing Indigenous traditional knowledge, and ensuring more complete coverage of freshwater monitoring across Canada.

Recommendation 51

That the Government of Canada assist local communities in freshwater data-monitoring and governance and financially assist local organizations with their concerns.

D. Need for Systemic Change in Water Data Management

“Currently, water quality data in Canada is widely dispersed across different levels of government and sectors. It's very challenging to access. Millions and millions of dollars are spent on collecting data, and yet it often sits on shelves gathering dust. Canada needs a national database that is open and accessible to everyone.”⁷¹⁹

Scott Higgins, Senior Research Scientist, Experimental Lakes Area,
International Institute for Sustainable Development

Research and monitoring can generate large quantities of data. Making data available to others, such as by providing it to a shared database, allows other researchers to conduct comprehensive analyses and identify trends. In order to enable analyses of data from multiple researchers, the type of data collected should be standardized and in a common format.

718 ENVI, [Evidence](#), 15 February 2024, 1655 (Kat Kavanagh).

719 ENVI, [Evidence](#), 13 February 2024, 1535 (Scott Higgins).

Many authors of briefs and witnesses called for improved access to water data in Canada. They also identified a need to facilitate the sharing of water data, which would require standardization of the format of those data.⁷²⁰ As noted in the Canada Water Agency chapter of this report, some saw that Agency as well-placed to provide leadership and technical support for water data sharing.

Specifically, DataStream, “a charity dedicated to advancing freshwater protection through open data and the inclusion of public voices in decision-making,”⁷²¹ emphasized the need for consistency in “data across departments, programs, and jurisdictions.”⁷²² They argued “that all data collected using public funds [should be] publicly available.”⁷²³ Aislin Livingstone (Program Manager, DataStream) also saw an opportunity for data that is collected by developers, in order to fulfill regulatory requirements, to be made usable and accessible. According to Ms. Livingstone:

Water data needs to be open by default so that policies and decisions are based on the best available evidence. Progress has been made to improve access to federally collected data, but more work is needed. From 2019 to 2020 alone, the Government of Canada invested over \$73 million in water-related research. However, the data from this kind of research isn't always shared publicly. Ensuring that this data is openly accessible would maximize these investments by facilitating broader data reuse.⁷²⁴

Andre Bélanger (General Manager, Rivers Foundation) provided his perspective on the importance of open data in a usable format:

Data is collected in Canada and we don't know what to do with it. Why is the data being collected? What are the datasets used for? What kind of picture do they paint? Are there any comparisons to be made? The [Canada Water Agency] can and should support the sharing of as much data as possible, develop interoperability mechanisms for open

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- 720 Gordon Foundation, [Brief submitted to ENVI](#), undated, published on the ENVI website 2 June 2021; World Wildlife Fund-Canada, [Brief submitted to ENVI](#), undated, published on the ENVI website 13 May 2021; Canadian Environmental Law Association, [Brief submitted to ENVI](#), 2 November 2023; Coalition Navigation, [Brief submitted to ENVI](#), 20 March 2024; Ducks Unlimited Canada, [Brief submitted to ENVI](#), 22 June 2023; International Association for Great Lakes Research, [Brief submitted to ENVI](#), 23 November 2023; Living Lakes Canada, [Brief submitted to ENVI](#), 22 February 2024; ENVI, [Evidence](#), 30 January 2024, 1720 (Yenny Vega Cárdenas).
- 721 ENVI, [Evidence](#), 13 February 2024, 1645 (Aislin Livingstone).
- 722 DataStream, [Brief submitted to ENVI](#), 24 January 2024. DataStream recommends the use of WQX standard for the Exchange of Water Quality data, a “well-established” data standard that is required to be used for all federal water quality data collected in the United States.
- 723 DataStream, [Brief submitted to ENVI](#), 24 January 2024.
- 724 ENVI, [Evidence](#), 13 February 2024, 1645 (Aislin Livingstone).



data, and support citizen data mining efforts that might seem to provide different results at first glance.⁷²⁵

Kat Kavanagh described how the open data platform of her organization, Water Rangers, was facilitating the monitoring of freshwater by community groups:

Water Rangers set about to respond to community needs for [tools to share and understand data] that lower barriers and help them participate in specifically community-based water monitoring. We've designed test kits and built an open data platform curated for the public, which is being used by 300 groups across Canada, the U.S., the U.K. and even Mexico. In Canada those groups can automatically share their dataset with DataStream ... a national database for water quality data.⁷²⁶

In written responses to questions from the Committee, several federal entities suggested that making more standardized data and information available between levels of government could be valuable for all researchers and other stakeholders. In its submission, Crown-Indigenous Relations and Northern Affairs Canada noted a lack of sufficient data, particularly for the North, related to quality and quantity of freshwater, contaminants in freshwater fish and ecosystems and the impacts of climate change on the freshwater environment.⁷²⁷ ECCC noted that an extensive consultation process had identified a “[n]eed for enhanced coordination mechanisms to leverage academic and private sector science and innovation on fresh water.”⁷²⁸

Recommendation 52

That the Government of Canada work with all levels of government to develop a coordinated model for standardized data collecting and reporting.

Recommendation 53

That the Government of Canada take immediate action, including to establish a coordinated model for standardized data collection and reporting, leveraging watersheds for research and innovation, and investing in mission-driven research to conserve and strategically leverage water as a vital asset.

725 ENVI, [Evidence](#), 13 February 2024, 1545 (André Bélanger).

726 ENVI, [Evidence](#), 15 February 2024, 1655 (Kat Kavanagh).

727 Crown-Indigenous Relations and Northern Affairs Canada, Written response to questions from ENVI, 2021.

728 Environment and Climate Change Canada, Written response to questions from ENVI, 9 July 2021, p. 13.

Recommendation 54

That the Canada Water Agency establish, in collaboration with provinces and territories, standards for the collection, evaluation and dissemination of good quality water data, knowledge, including Indigenous knowledge, as well as for community-based water-monitoring and -management tools.

Recommendation 55

That the Government of Canada analyze human health impacts in freshwater data collection and analysis (surface level and groundwater).

Recommendation 56

That the Government of Canada, in collaboration with provinces, territories, and First Nations communities, provide funding and support for data collection, management, and analysis which includes:

- **supporting partnerships with First Nations communities that respect existing rights and advance collaboration, including through community-led initiatives, on freshwater monitoring and stewardship;**
- **funding and supporting collaboration with other levels of government and non-governmental agencies and organizations that are best positioned to establish key partnerships and relationships, while leveraging existing systems and avoiding duplication; and**
- **investing in grey (traditional) and green (natural) infrastructure projects that protect freshwater environments, including nature-based solutions and the restoration and rebuilding of the National Long-term Water Quality Monitoring Program, where such investments improve water quality and support evidence-based decision-making.**

1) Conclusion: Translating Research and Monitoring Data into Evidence-Based Policy Decisions

Research and monitoring data in and of itself will not result in positive changes to freshwater unless it influences policy decisions around freshwater management. The results of research and the analysis of monitoring data must be effectively communicated to decision makers and used as the basis of freshwater policy decisions. However, the link between research and policy decisions is often a missing one. For a



that connect researchers with policy makers are, therefore, important. One such example is the United Nations University Institute for Water, Environment and Health's recently-created "hubs" at "leading water research institutions," including Canadian universities, which are helping to connect government departments with research information and expertise.⁷²⁹ There may also be a role for the Canada Water Agency in enhancing the connection between those generating and analyzing data and those making policy decisions about Canada's freshwater.

12. SEEPAGE AND OVERFLOW AT IMPERIAL OIL'S KEARL OIL SANDS MINE

A. Introduction

In early February 2023, 5.3 million litres of liquid overflowed from Imperial Oil's Kearl oil sands mine (the Kearl site) into the surrounding landscape.⁷³⁰ Days later, the Alberta Energy Regulator (AER) responded to this overflow with an environmental protection order⁷³¹ that addressed the overflow as well as ongoing seepage that Imperial Oil had first reported to the AER about 9 months previously, in May 2022. Indigenous communities living downstream the Athabasca River from the Kearl site were not aware that this seepage had been happening,⁷³² despite at least some communities having agreements in place with Imperial Oil that required disclosure of such events.⁷³³

At its 20 March 2023 meeting, the Committee agreed to hold several meetings in relation to leaks at the Kearl oil sands mine in Alberta. The Committee agreed to invite members of nearby Indigenous communities, the CEO of Imperial Oil Resources Limited (Imperial Oil), representatives of the Alberta Energy Regulator (AER or the regulator), Environment and Climate Change Canada (ECCC), the Regional Municipality of Wood Buffalo, and the Government of Northwest Territories to testify. The Committee agreed to include the evidence gathered during these meetings in this report.

Following its initial meetings in April 2023, the Committee agreed to re-invite both the AER and Imperial Oil in October 2023 to provide an update. In total, there were five

729 United Nations University – Institute for Water, Environment and Health, [Brief submitted to ENVI](#), undated, published on the ENVI website 15 February 2024, p. 6.

730 Alberta Energy Regulator, [Order](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

731 Ibid.

732 ENVI, [Evidence](#), 27 February 2024, 1150 (Chief Billy-Joe Tuccaro).

733 Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023, p. 3.

meetings and 29 witness appearances focused on the study of the events at the Kearl oil sands mine, and the Committee received 3 briefs and 12 pieces of correspondence and reference documents. Of note, some testimony and written materials received as part of the study of freshwater more broadly also referred to the events at the Kearl oil sands mine.

This section begins with a brief description of the Athabasca River basin and some of the communities located there. It then presents background information on tailings ponds, and an overview of information about the Kearl oil sands mine and the seepage and overflow that were reported in 2022 and 2023, including maps and a timeline of selected events. It then includes a section focused on the main points the Committee heard from witnesses.

B. The Athabasca River Basin

The Athabasca River basin, where the oil sands are located, is a vast, wetland-filled region. The Committee heard about the region from eight Indigenous groups who live in the vicinity of the oil sands developments in Alberta (for further information, Appendix B includes a map that identifies Indigenous communities across that province.

These groups included:

- Athabasca Chipewyan First Nation;
- Fort Chipewyan Métis Nation;
- Fort McKay First Nation;
- Fort McKay Métis Nation;
- Fort McMurray First Nation 468;
- McMurray Métis 1935;
- Mikisew Cree First Nation; and
- Willow Lake Métis Nation.



These groups emphasized that the exercise of their treaty rights requires access to and use of their traditional territories⁷³⁴ in the Athabasca River basin. Their members have kinship ties across the region and travel and harvest across the region.⁷³⁵

The Committee also heard about the incidents at the Kearl site from a representative of the Dene Nation in the Northwest Territories, further downstream, from representatives of the Regional Municipality of Wood Buffalo and of the Government of the Northwest Territories, and from staff of Environment and Climate Change Canada.

Fort Chipewyan is the oldest consecutively inhabited settlement in Alberta, and is a historic and a contemporary Métis community.⁷³⁶ As explained in its brief to the Committee, the Fort Chipewyan Métis Nation (FCMN) has relied—and continues to rely—on hunting, fishing, trapping and gathering throughout its traditional territory for survival and for medicinal, spiritual, recreational, cultural and economic purposes.⁷³⁷ As explained in the brief from the FCMN Association:

FCMN are also culturally connected to the lands and waters where harvesting of resources and practice of other cultural activities have taken place. Cultural knowledge, related language, and importance of their territory, and access to areas, is passed generationally. Since the late 18th century, FCMN have used the rivers and lakes within its traditional territory and throughout the region to travel for activities such as trading, hauling wood, commercial barging, commercial fishing, and for seasonal subsistence hunting and fishing. These navigable waters throughout the territory, including but not limited to the environs of Muskeg and Firebag rivers, were and continue to be, a key transportation route, enabling the FCMN to maintain unique Métis traditional and commercial economic activities. These practices continue to be an integral and vital part of a distinct Métis culture and way of life.⁷³⁸

Timothy Clark (Principal, Willow Springs Strategic Solutions, Fort McMurray Métis Local 1935), described the scale and the visual impact of oil sands development in the region:

734 For example, ENVI, [Evidence](#), 17 April 2023, 1240 (Russell Noseworthy, Manager, Government and Industry Relations, Fort McMurray Métis Local 1935).

735 ENVI, [Evidence](#), 17 April 2024, 1300 (Timothy Clark, Principal, Willow Springs Strategic Solutions, Fort McMurray Métis Local 1935).

736 Fort Chipewyan Métis Nation Association, [Brief submitted to ENVI](#), 17 April 2023, p. 1.

737 Ibid.

738 Ibid., p. 1–2.

Between the approved and applied for oil sands mines, the Athabasca River north of Fort McMurray will be lined [with such mines] on both sides for nearly 100 kilometres.⁷³⁹

Frederick Wrona indicated that so much industrial activity has led to extensive monitoring:

The Athabasca River basin and associated larger Mackenzie River basin have become one of the most monitored and studied freshwater systems in Canada. However, there are substantial knowledge gaps and uncertainties in how the basin and downstream ecosystems are changing in relation to increasing environmental stressors associated with regional development and population growth.⁷⁴⁰

C. Background: Oil Sands Tailings Ponds

Tailings ponds are engineered dam and dike facilities for storing tailings materials and process-affected water,⁷⁴¹ where suspended solid particles settle out and water is separated out for re-use.⁷⁴² The process-affected water is used repeatedly for bitumen extraction, which causes it to become concentrated with salts, metals, residual bitumen, and numerous dissolved organic chemical compounds derived from natural bitumen.⁷⁴³

As described by Simon Younger during his 20 April 2023 appearance before the Committee:

Seepage was anticipated in the design of our Kearl tailing system. That's an industry standard. We have a seepage interception system. That's exactly why it's there and what it is installed to do. That concept is proven, and that's conventional technology that we have employed.⁷⁴⁴

In a report prepared by the Secretariat of the Commission for Environmental Cooperation, the Government of Canada affirmed that "[t]ailings ponds are engineered

739 ENVI, [Evidence](#), 17 April 2024, 1300 (Timothy Clark).

740 ENVI, [Evidence](#), 21 March 2024, 1630 (Frederick Wrona).

741 Process-affected water is also described in Chapter 8, Freshwater Pollution Management, along with other information related to tailings ponds.

742 Canadian Association of Petroleum Producers, [Oil Sands Tailings](#).

743 Jessie S. Reynolds et al., Environmental Toxicology and Chemistry Volume 41, Issue 5, [Fathead Minnows Exposed to Organic Compounds from Oil Sands Tailings as Embryos Have Reduced Survival, Impaired Development, at and Altered Behaviors That Persist into Larval Stages](#), pp. 1319–1332, 21 February 2022.

744 ENVI, [Evidence](#), 20 April 2023, 1715 (Simon Younger, Senior Vice-President, Upstream, Imperial Oil Limited).

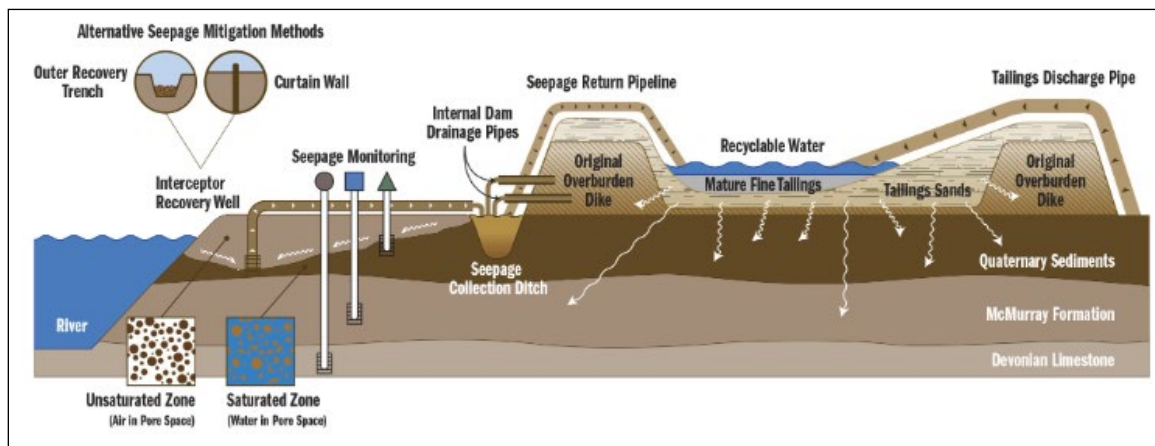


to seep, as seepage provides critical structural stability.”⁷⁴⁵ The report explains that seepage may differ according to local geology:

The geological setting for tailings ponds varies significantly. Impermeable geological strata under some ponds results in minimal seepage, while more permeable underlying sediments may result in higher rates of seepage. For the latter, seepage will mix with natural groundwater beneath the pond. The natural groundwater flow is often greater than the seepage rate, resulting in dilution. Interception trenches are built down gradient from tailings ponds to collect seepage before it can reach any surface water bodies.⁷⁴⁶

Figure 9 shows a cross-sectional diagram of a sample tailings pond and related infrastructure.

Figure 9—Tailings Seepage Recapturing and Monitoring Systems



Source: Government of Canada, [Oil Sands: Tailings Management](#); originally from Ministry of Environment and Sustainable Resource Development, Government of Alberta.

Scientists have been demonstrating for approximately 40 years that tailings ponds (both the water and the bottom sediment) contain substances that are acutely toxic to fish, frogs, and other aquatic life.⁷⁴⁷ Diane Orihel explained that the naphthenic acid component of oil sands process water has to date been shown to be the most toxic component of that liquid, with animals showing a greater number and severity of abnormalities (such as heart edemas in fish and malformed limbs in amphibians) with

⁷⁴⁵ Secretariat of the Commission for Environmental Cooperation, [Alberta Tailings Ponds II: Factual Record regarding Submissions SEM-17-001](#), 2020, p. 44.

⁷⁴⁶ Ibid., p. 120.

⁷⁴⁷ Diane Orihel, [Brief submitted to ENVI](#), undated, published on ENVI website 11 July 2024, p. 4.

increasing exposure.⁷⁴⁸ In a brief, Diane Orihel outlined five pathways by which aquatic wildlife can be exposed to the toxic substances from tailings ponds: by direct contact with the tailings ponds; when there is seepage out of them; when they are accidentally breached; when end-pit lakes and reclamation wetlands are created; and when treated wastewater is intentionally discharged.⁷⁴⁹

D. Overview: Kearl Oil Sands Project

Owned by Imperial Oil (71%) and ExxonMobil Canada (29%), the Kearl oil sands mine is located about 70 km north of Fort McMurray, Alberta, and covers an area of about 200 km².⁷⁵⁰ The Kearl mine began production in 2013. Natural Resources Canada states that the mine produced 281,000 barrels per day in 2021.⁷⁵¹ It has an estimated 4.6 billion barrels of “recoverable bitumen resource.”⁷⁵²

The following maps (Figures 11 and 12) show the Kearl mine site and provide information about watersheds, communities, waterways and water bodies in the vicinity.

748 Ibid.

749 Ibid., p. 6.

750 Imperial Oil, [Kearl](#).

751 Natural Resources Canada, [Energy Fact Book 2022–2023](#), 2022, p. 108.

752 Newswire.ca, [Imperial Oil Announces First Production From Kearl Oil Sands Project](#), 27 April 2013.

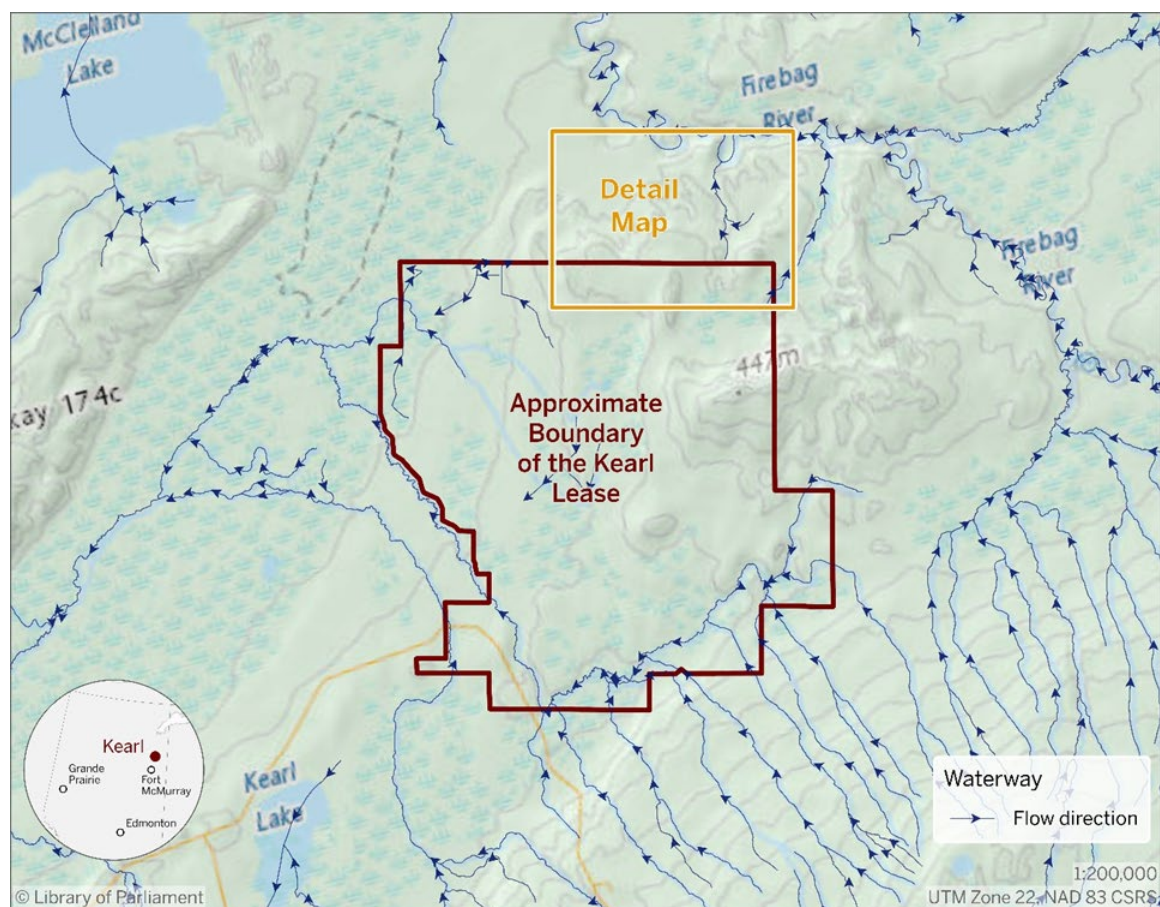


**Figure 10—Watersheds in the Region Around
Kearl Mine and Selected Indigenous Communities**



Sources: Map prepared by the Library of Parliament, 2023, using data obtained from Government of Alberta, [Alberta Watersheds](#), 2022; Natural Resources Canada, [Administrative Boundaries in Canada—CanVec Series—Administrative Features](#), 1M, 2019. Map contains information licensed under [Open Government Licence—Canada](#). The [World Topographic Canadian Style](#) and [World Terrain Base](#) layers are the intellectual property of Esri and are used under licence, © 2022 Esri and its licensors. All rights reserved. The following software was used: Esri, ArcGIS Pro, version 3.1.0.

Figure 11— Waterways and Water Flow Direction Near Kearl Mine



Note: See Figure 12 for Detail Map.

Sources: Map prepared by the Library of Parliament, 2023, using data obtained from Imperial Oil, [Kearl impact external map](#), 2023; Natural Resources Canada, [Administrative Boundaries in Canada—CanVec Series—Administrative Features](#), 1M, 2019, [Lakes, Rivers and Glaciers in Canada—CanVec Series—Hydrographic Features](#), 50K, 2019, and [Canada Base Map Transportation \(CBMT\)](#). Map contains information licensed under [Open Government Licence—Canada](#). The [Terrain](#) layer is the intellectual property of Esri and is used under licence, © 2022 Esri and its licensors. All rights reserved. The following software was used: Esri, ArcGIS Pro, version 3.1.0.



E. Seepage and Overflow at the Kearl Oil Sands Mine

Reports of leaks of industrial wastewater from tailings ponds at the Kearl oil sands mine first appeared in the media after the AER published an order on its website, dated 6 February 2023, stating that there had been two incidents of release of industrial wastewater from tailings containment areas at the Kearl Oil Sands Processing Plant and Mine (the Kearl site).⁷⁵³ The order explains that the Kearl site produces “industrial wastewater” as a by-product of crude oil production, and notes that this substance “is known to cause an adverse effect to the environment.”⁷⁵⁴

The first incident, referred to as “Release 1” in the order, was initially reported to the AER by Imperial Oil on 19 May 2022, when Imperial Oil informed the regulator that it had found “discoloured surface water” on and off the Kearl site. The AER subsequently inspected the site on two separate occasions (20 May 2022 and 6 June 2022) and stated that the discoloured surface water contained released industrial wastewater. It was determined that the substance in Release 1 contained process-affected water, also known as “tailings;” however, Imperial Oil requested that the AER refer to Release 1 as containing industrial wastewater because, they argued, process-affected water “is included in the definition of ‘industrial wastewater’.”⁷⁵⁵ Both terms have been used in this report, depending on their sources.

The second incident, “due to an overflow of an industrial wastewater storage pond,” was reported to the AER on 4 February 2023 and referred to by the regulator as “Release 2.”

Both releases may also be referred to as “leaks” in this report. Release 1 is referred to as “seepage,” while Release 2 is referred to as “overflow.”

Imperial Oil provides information and its perspective on the incidents, along with a map of the site and the location of the leaks on its website, “Environmental protection order: Updates on Imperial’s actions.”⁷⁵⁶ As of 8 January 2026, there was an update dated “Winter 2025/26.”⁷⁵⁷

753 Alberta Energy Regulator, [Order](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

754 Ibid.

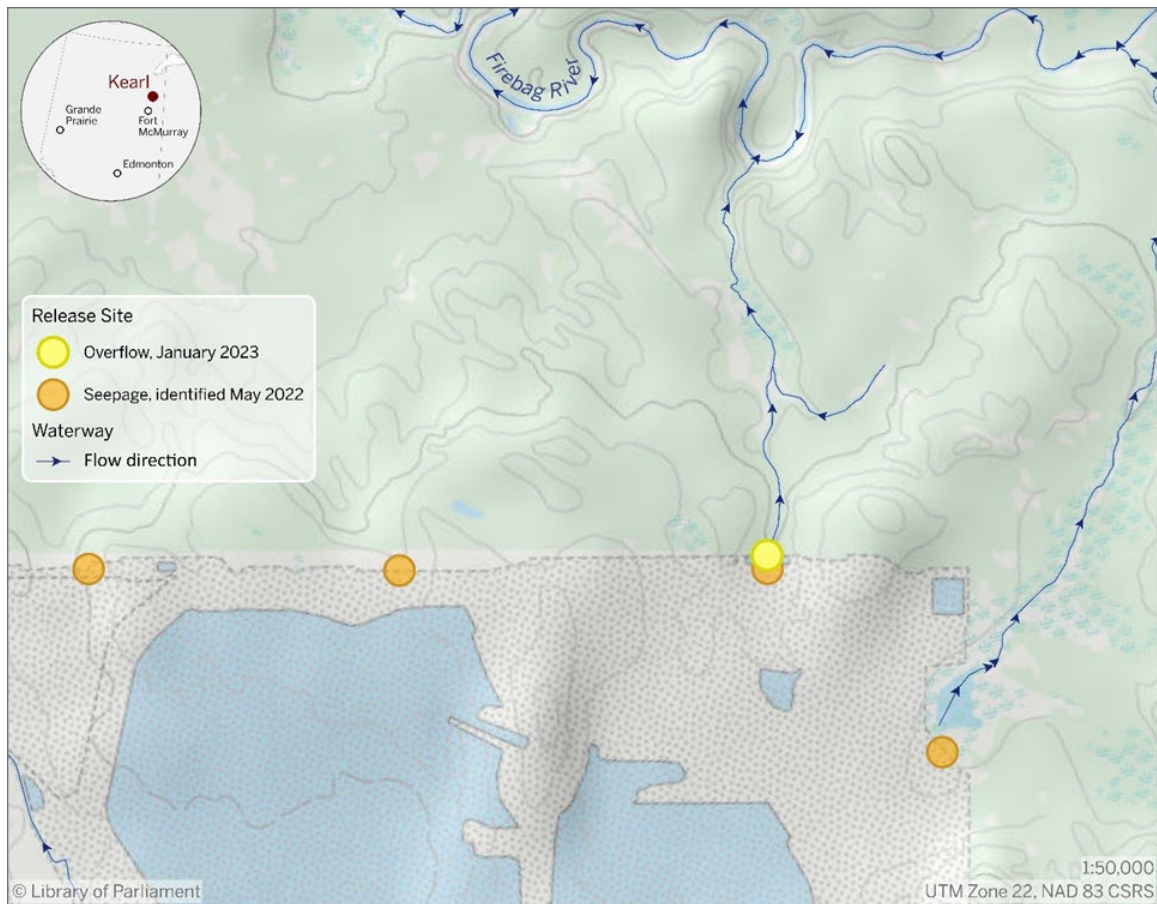
755 Alberta Energy Regulator, [Administrative Penalty Director’s Decision re: Kearl Oil Sands Processing Plant and Mine Shallow Seepage Incident](#), p. 4 of 11.

756 Imperial Oil, [Environmental protection order: Updates on Imperial’s actions](#).

757 Ibid.

Figure 12 shows the locations of the seepage and overflow as identified by Imperial Oil.

Figure 12—Detail Map of Identified Seepage and Overflow Locations at Kearl Mine



Sources: Map prepared by the Library of Parliament, 2023, using data obtained from Imperial Oil, [Kearl impact external map](#), 2023; Natural Resources Canada, [Administrative Boundaries in Canada—CanVec Series—Administrative Features](#), 1M, 2019, [Lakes, Rivers and Glaciers in Canada—CanVec Series—Hydrographic Features](#), 50K, 2019, and [Canada Base Map Transportation \(CBMT\)](#). It contains information licensed under [Open Government Licence—Canada](#). The [Terrain](#) layer is the intellectual property of Esri and is used under licence, © 2022 Esri and its licensors. All rights reserved. The following software was used: Esri, ArcGIS Pro, version 3.1.0.



1) Environmental Impacts of the Releases

The area affected by the releases “includes muskeg and forested public lands inhabited by various species of wildlife.”⁷⁵⁸ The area impacted by Release 1 “is in proximity to a fish-bearing waterbody known as Waterbody 3 and tributaries that feed the Firebag and Muskeg Rivers.”⁷⁵⁹ As communicated in its 6 February 2023 order, “the AER has determined that additional work is required to ensure that source control of the Substance is in place prior to spring freshet to prevent further environmental impact.”⁷⁶⁰

Chemical analyses submitted to the AER on 16 August 2022 showed that samples from the area affected by Release 1 exceeded Alberta Environment and Protected Areas and Canadian Council of Ministers of the Environment guidelines for the following:

- dissolved iron;
- total arsenic;
- fraction 2 hydrocarbons;⁷⁶¹
- sulphate; and
- total sulphide.⁷⁶²

As of 8 January 2026, the Kearl website describes the current status of the seepage as follows:

With help from third-party assessments, we have mapped locations of potential seepage north of the lease boundary using extensive groundwater and surface water quality monitoring. The furthest we have detected shallow groundwater above screening guidelines is up to 150 metres from the lease boundary, in one localized area. In the deeper groundwater (more than 12 metres below surface near the Kearl lease), groundwater above screening guidelines has been detected within approximately one kilometre of the site. That remains two kilometres away from the Firebag River. We

758 Ibid.

759 Alberta Energy Regulator, [Order](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

760 Ibid.

761 According to the [Alberta government](#), fraction 2 (F2) hydrocarbons contain molecules with 10–16 carbon atoms, and include kerosene, creosote and some types of diesel.

762 Alberta Energy Regulator, [Order](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

have been sharing this information with communities and continue to monitor both groundwater and surface water quality in these areas.⁷⁶³

Recommendation 57

That the Government of Canada, in keeping with respective jurisdictions, conduct a health study of the health impacts of tailings ponds on populations living near tailings ponds and the oil sands.

Recommendation 58

That the Government of Canada, with provincial governments, reassess its regulations related to tailings pond management due to the negative impacts of tailing ponds on nearby communities.

Recommendation 59

That the Government of Canada, in keeping with respective jurisdictions, conduct or provide support for a study of the cumulative impacts of tailings ponds on human health, and that it ensure that this study is designed with local Indigenous communities.

2) Timeline of Selected Events Related to the Kearl Oil Sands Project and Leaks

The following list shows information about the leaks and other selected events related to the Kearl Oil Sands Mine Project from 2005 to 2023.

- 14 October 2005:
 - It is determined that a federal environmental assessment under the Canadian Environmental Assessment Act (1992) is required for the proposed Kearl Oil Sands Project.⁷⁶⁴
 - A Joint Review Panel is established to conduct an in-depth assessment that will fulfill both the provincial and federal environmental assessment requirements.⁷⁶⁵

763 Imperial Oil, [Environmental protection order: Updates on Imperial's actions](#).

764 Government of Canada, [Kearl Oil Sands Project—Mine Development \(Archived\)](#).

765 Ibid.



- 27 February 2007:
 - The Joint Review Panel concludes that the project is not likely to cause significant adverse environmental effects if appropriate mitigation measures are implemented.⁷⁶⁶
- 5 June 2008:
 - A final decision is made, with approval of the Governor in Council, that the project is not likely to cause significant adverse environmental effects and can proceed to the regulatory approvals phase. Fisheries and Oceans Canada can then issue the Fisheries Act authorization that is required for the project to proceed to construction.⁷⁶⁷
 - A follow-up program “to verify the accuracy of the environmental assessment and/or determine the effectiveness of any measures taken to mitigate the adverse environmental effects” is required and administered by Fisheries and Oceans Canada.⁷⁶⁸
- 2013:
 - Oil production at the Kearl site begins.⁷⁶⁹
- 2015:
 - Production at the Kearl site reaches 220,000 barrels per day.⁷⁷⁰
- 2019:
 - According to a statement from the Mikisew Cree First Nation, groundwater reporting from the Kearl site that was submitted to the

766 Ibid.

767 Ibid.

768 Ibid.

769 Imperial Oil, [Kearl](#).

770 Ibid.

AER by Imperial Oil already indicates that seepage was happening by this year.⁷⁷¹

- 19 May 2022—Release 1:
 - Imperial Oil reports “an initial leak”⁷⁷² of industrial wastewater to the Alberta Energy Regulator (AER) with “discoloured surface water” found at location on the Kearl Site and “to the north and northeast of the Site boundary.”⁷⁷³ The AER refers to this as “Release 1.”⁷⁷⁴
 - One email is sent to a single point of contact for Indigenous communities in May 2022, with no additional follow-up until the AER issues its environmental protection order (order) on 6 February 2023.⁷⁷⁵
- 20 May 2022 and 6 June 2022:
 - The AER inspects the Kearl site and confirms the presence of industrial wastewater from Release 1.⁷⁷⁶
- 16 August 2022:
 - Imperial Oil’s chemistry submission to the AER for “Impacted Area 1 is found to be consistent with that of industrial wastewater” and exceeds Alberta Environment and Protected Areas and Canadian Council of Ministers of the Environment guidelines for constituents including but not limited to dissolved iron, total arsenic, F2 hydrocarbons, sulphate, total sulphide.⁷⁷⁷

771 Mikisew Cree First Nation, [*Mikisew Cree First Nation calling for systemic overhaul of the AER*](#) (statement), 28 September 2023.

772 Environment and Climate Change Canada, [*Ministers provide a status update on federal action to address ongoing situation at Kearl Oil Sands Mine*](#), Statement, 20 March 2023.

773 Alberta Energy Regulator, [*Order*](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

774 Ibid.

775 Deloitte, [*Alberta Energy Regulator \(AER\) Third-Party Review 23RFP-CS016*](#), 11 September 2023, p. 9.

776 Alberta Energy Regulator, [*Order*](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

777 Ibid.



- 2 September 2022:
 - A Notice of Noncompliance is issued by the AER to Imperial Oil “in respect of Release 1 for releasing a substance from the site to the surrounding watershed and for failing to manage and contain the industrial wastewater as per their [Environmental Protection and Enhancement Act] approval.”⁷⁷⁸
- 29 November 2022:
 - Imperial Oil confirms to the AER that Release 1 consisted of industrial wastewater seeping from the External Tailings Area “through a common fill layer placed during construction, mixing with shallow groundwater, and coming to surface at locations on the Site and Off-site.”⁷⁷⁹
- December 2022:
 - Imperial Oil submits action plans to the AER for “source control, delineation, and remediation”⁷⁸⁰ of the seepage, and to prevent further release, but the AER determines that the plans would take too long and requires that the work be completed sooner, so that the release can be controlled “before Spring runoff,” to prevent further environmental impacts.⁷⁸¹
- 27 January 2023:
 - Imperial Oil submits further action plans to the AER for “source control, delineation, and remediation” of the seepage.⁷⁸²

778 Ibid.

779 Ibid.

780 Alberta Energy Regulator, [*Ongoing Investigations*](#).

781 Ibid.

782 Ibid.

- 4 February 2023—Release 2:
 - Imperial Oil reports an “overflow of an industrial wastewater storage pond”⁷⁸³ to the AER.⁷⁸⁴ The AER refers to this as Release 2 and notes that it was located near Release 1.⁷⁸⁵
- 5 February 2023:
 - The AER inspects Release 2 and “observe[s] that the area affected includes the Site and areas outside the Site including muskeg and forested area.”⁷⁸⁶
 - Imperial Oil estimates that 5.3 million litres (L) of industrial wastewater were released as part of Release 2.
- 6 February 2023:
 - The AER issues an order⁷⁸⁷ to Imperial Oil under sections 113 and 241 of the Environmental Protection and Enhancement Act (EPEA).⁷⁸⁸
 - The order requires “delineation and remediation work” related to Release 2. The order notes that “source control measures for Release 2” have been completed.
 - The order notes that Release 1 is continuing to actively release industrial wastewater.⁷⁸⁹
 - The order requires Imperial Oil to provide “an updated Source Control and Containment Plan detailing the actions required in the short-term

783 A report prepared for Imperial Oil by Deloitte, *Alberta Energy Regulator (AER) Third-Party Review 23RFP-CS016*, 11 September 2023, p. 8, identifies the substance in the overflow as “process-affected water.”

784 Alberta Energy Regulator, *Order*, Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

785 Ibid.

786 Ibid.

787 Ibid.

788 *Environmental Protection and Enhancement Act*, RSA 2000, c E-12.

789 Alberta Energy Regulator, *Order*, Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta, p. 3.



to effectively intercept and contain the Substance from the Releases prior to spring freshet,”⁷⁹⁰ and to implement these actions.

- 7 February 2023:
 - The AER makes public the environmental protection order it issues to Imperial Oil, dated 6 February 2023.⁷⁹¹
- 28 February 2023:
 - This is the deadline for Imperial Oil to have submitted a plan for source control and containment, as well as a sampling and monitoring plan for the releases, including details on ongoing soil, surface water and groundwater monitoring.⁷⁹²
- 2 March 2023:
 - Chief Allan Adam (ACFN) holds a press conference and states that the AER failed to notify his community and others about the dangers, and that Imperial Oil failed in its duty to report the issue to them, despite having held face-to-face meetings with them subsequent to the findings of the leak.⁷⁹³
- 10 March 2023:
 - ECCC enforcement officers issue a Fisheries Act direction to Imperial Oil requiring “immediate action to prevent any seepage from entering fish-bearing waters,” as the seepage was believed to be harmful to fish.⁷⁹⁴

790 Ibid.

791 Alberta Energy Regulator, [Order](#), Issued to Imperial Oil Resources Limited, 6 February 2023, Fort McMurray, Alberta.

792 Ibid.

793 Global News, [“Alberta band chief angry over silence from Imperial Oil after Kearl oilsands tailings spill,”](#) 2 March 2023.

794 Environment and Climate Change Canada, [“Ministers provide a status update on federal action to address ongoing situation at Kearl Oil Sands Mine,”](#) *Statement*, 20 March 2023.

- 20 March 2023:
 - ECCC issues a statement from the Minister of Environment and Climate Change and the Minister of Indigenous Services expressing “serious concern” about the “slow notification of the federal government and Indigenous communities” of the leak and seepage at the Kearl site.⁷⁹⁵
- 17 April 2023:
 - In a statement, Steven Guilbeault, Minister of Environment and Climate Change states that a “Notification and Monitoring Working Group” will be created, and will include “the federal and provincial governments, Indigenous Nations from Fort Chipewyan, and the Government of Northwest Territories, with participation from oil sands company representatives.”⁷⁹⁶
- 4 May 2023:
 - Imperial Oil publishes its “summary reports on root cause findings” in two documents dated 4 May 2023: one on the “seepage”⁷⁹⁷ and one on the “drainage pond overflow.”⁷⁹⁸
 - Environment and Climate Change Canada announces in a news release that it has begun an investigation under the Fisheries Act based on its mandate to enforce federal environmental legislation that aims to prevent pollution and protect Canada’s wildlife and biodiversity.⁷⁹⁹

795 Ibid.

796 Environment and Climate Change Canada, “[Minister Guilbeault provides an update on federal action to address the ongoing spill situation at the Kearl Oil Sands Mine](#),” *Statement*, 17 April 2023.

797 Imperial Oil, [Kearl Seepage—Investigation Results](#), 4 May 2023.

798 Imperial Oil, [Kearl Drainage Pond 4 \(DP4\) Overflow—Investigation Results](#), 4 May 2023.

799 Environment and Climate Change Canada, “[Environment and Climate Change Canada Enforcement opens a formal investigation into Imperial Oil Ltd.’s Kearl Oil Sands Site](#),” *News Release*, 4 May 2023.



- 11 May 2023:
 - The Alberta Energy Regulator (AER) engages Deloitte LLP to conduct an independent review of the AER's actions in handling the Imperial Oil Kearl seepage and spill incidents.⁸⁰⁰
- 11 September 2023:
 - The AER publishes the third-party review report prepared by Deloitte, Alberta Energy Regulator (AER) Third-Party Review 23RFP-CS016,⁸⁰¹ which identifies some opportunities for improvement in communications processes and for distinguishing between incidents and emergencies. The AER also publishes a supplemental report by Deloitte.⁸⁰²
- 28 September 2023:
 - Mikisew Cree First Nation publishes a statement on social media in response to the AER's 11 September 2023 report, calling for a systemic overhaul of the AER and criticizing it for its "failure to regulate."⁸⁰³

On 22 March 2023, the Alberta Information and Privacy Commissioner launched an investigation to assess whether the AER had had an obligation to disclose information to the public or others about the tailings pond leak from Imperial's Kearl Oil Sands Project.⁸⁰⁴

Of note, on 22 August, 2024, after the Committee's study had concluded, the Alberta Energy Regulator announced that it had imposed an administrative penalty of \$50,000 on Imperial; the AER described this penalty as "representing the maximum base penalty table amount permissible under the regulation and including a representative daily amount."⁸⁰⁵ The Notice of Administrative Penalty states that the penalty is for the "Kearl

800 Alberta Energy Regulator, [Announcement—March 28, 2023 updated](#) (web page).

801 Deloitte, [Alberta Energy Regulator \(AER\) Third-Party Review 23RFP-CS016](#), 11 September 2023.

802 Deloitte, [Alberta Energy Regulator \(AER\) Third-Party Review 23RFP-CS016: Third-Party Review Supplemental Report](#), 11 September 2023.

803 Mikisew Cree First Nation, [Statement on Facebook](#), 28 September 2023.

804 Office of the Information and Privacy Commissioner of Alberta, [Announcement: Commissioner Launches FOIP Investigation into the Alberta Energy Regulator](#), 22 March 2023.

805 Alberta Energy Regulator, [Alberta Energy Regulator penalizes Imperial Oil, releases first finding from ongoing Kearl investigation](#), 22 August 2024.

Oil Sands Processing Plant and Mine shallow seepage incident,” and that two portions of the AER’s investigation remain open:

- 1) the investigation into the February 4, 2023, overflow of an industrial wastewater storage pond, and
- 2) the investigation of seepage at the Kearl site through deep pathways that is unrelated to the [shallow seepage] incident.⁸⁰⁶

Recommendation 60

That the Government of Canada, in collaboration with provincial, territorial, municipal and Indigenous governments, consider whether, in the case of an industrial accident that could affect the health of people in nearby or downstream communities, not just the company responsible, but also relevant government regulators, should take responsibility for ensuring that appropriate notification is given and received.

F. What the Committee Heard

This section presents witness perspectives the Committee heard in relation to the seepage and overflow at the Kearl site. It touches on communication about the incidents at the Kearl site, and witness views on the health impacts—including mental health impacts—for people who live near or have their traditional territory near oil sands operations. The section discusses Indigenous rights and witness views on the regulatory framework for oil sands mines in Canada. It then presents witness suggestions related to conducting a study of tailings pond safety and risk management, and their opinions related to a possible planned release of treated tailings water. Finally, it talks about Indigenous witnesses’ wish to be part of decisions relating to their traditional territories, and closes with discussion of environmental racism.

1) Communication About the Seepage and Overflow at the Kearl Site

Indigenous representatives spoke about the type of communication between their communities and Imperial Oil or the Alberta Energy Regulator in relation to the leaks at the Kearl site. Many witnesses said that they had not heard directly from Imperial Oil or

806 Alberta Energy Regulator, [Notice of Administrative Penalty](#), p. 2.



the AER,⁸⁰⁷ but Fort McKay Métis Nation and Willow Lake Métis Nation noted that they had received an email from the Alberta Energy Regulator on February 7, 2023.⁸⁰⁸

Chief Adam said that no one from Imperial Oil officially told him of the leaks—he was told by another chief (Chief Mel Grandjamb of Fort MacKay) in the evening of 24 February 2023, about tailings ponds leaking into the Firebag River.⁸⁰⁹ As for Chief Billie-Joe Tuccaro of the Mikisew Cree First Nation, he became chief in October 2022, after the first “release,” and first heard about the incidents in February 2023 by word of mouth.⁸¹⁰

Russel Noseworthy, Manager, Government and Industry Relations, Fort McMurray Métis Local 1935, said that while communications processes for incidents such as leaks might exist on paper, Indigenous communities such as his did not have confidence that they would be followed. He added that he was very concerned because “we are constantly at risk of being exposed to contaminants and other dangerous substances that would have drastic effects on human health for the people who live in and around the area.”⁸¹¹

The Honourable Shane Thompson, Minister of Environment and Climate Change, Government of the Northwest Territories, spoke to the Committee about the 2015 comprehensive water agreement his territory signed with Alberta in 2015, noting that his territory had not been informed about the Kearl incidents, or the previous week’s spill at Suncor. However, he had recently received assurances that communication would happen in the future.⁸¹²

Mr. Thompson told the Committee that “People are increasingly concerned and scared about the effects of oil sands development on the water, land and air in the Northwest

807 E.g., ENVI, [Evidence](#), 17 April 2023, 1150 (Chief Allan Adam, Athabasca Chipewyan First Nation); ENVI, [Evidence](#), 17 April 2023, 1150 (Chief Billy-Joe Tuccaro).

808 ENVI, [Evidence](#), 17 April 2023, 1250 (Margaret Luker, Director, Sustainability, Fort McKay Métis Nation); ENVI, [Evidence](#), 17 April 2023, 1245 (Destiny Martin, Sustainability Manager, Willow Lake Métis Nation).

809 ENVI, [Evidence](#), 17 April 2023, 1145 (Chief Allan Adam).

810 ENVI, [Evidence](#), 17 April 2023, 1150 (Chief Billy-Joe Tuccaro).

811 ENVI, [Evidence](#), 17 April 2023, 1240 (Russell Noseworthy).

812 ENVI, [Evidence](#), 24 April 2023, 1210 (Hon. Shane Thompson, Minister, Environment and Climate Change, Government of the Northwest Territories).

Territories,”⁸¹³ adding that “trust in government's ability to keep their waters safe has been lost. This trust needs to be rebuilt.”⁸¹⁴

In their brief to the Committee, the Fort Chipewyan Métis Nation provided several examples of their efforts to communicate with Imperial Oil about water quality, which they said were dismissed with statements that data were not available yet or with referrals to the AER.⁸¹⁵

However, several witnesses had received communications about the leaks. Margaret Luker (Director, Sustainability, Fort McKay Métis Nation) noted that Fort McKay Métis Nation had received informal notification from Imperial Oil when discoloured water was first sighted at the Kearl Site, and noted that her Nation has an excellent working relationship with Imperial Oil; however, she pointed out that “this is a 45-year-old legacy issue and not solely an Imperial issue.”⁸¹⁶

The Willow Lake Métis Nation was first notified about the tailings ponds leaks at Imperial Oil's Kearl Lake site via an email from the Alberta Energy Regulator on 7 February 2023.⁸¹⁷ They received an email from Imperial Oil on 8 March 2023, with links to the company's website updated, but never received a response to their letter to Imperial Oil. Destiny Martin (Sustainability Manager, Willow Lake Métis Nation) indicated her view that this lack of direct communication “does not align with statements on Imperial's website that indicate the company is engaging with affected [I]ndigenous communities.”⁸¹⁸

Sandy Bowman, who is Mayor of the Regional Municipality of Wood Buffalo, stated that the municipality had “continued to provide safe drinking water to Fort Chipewyan and elsewhere, even since learning of the Imperial Oil release.”⁸¹⁹ He added: “Since we've been made aware of the incident, AER has communicated very well with the municipality by phone, by text and by calls.”⁸²⁰

813 Ibid.

814 Ibid.

815 Fort Chipewyan Métis Nation, [Brief submitted to ENVI](#), 17 April 2023.

816 ENVI, [Evidence](#), 17 April 2023, 1250 (Margaret Luker).

817 ENVI, [Evidence](#), 17 April 2023, 1245 (Destiny Martin).

818 Ibid.

819 ENVI, [Evidence](#), 24 April 2023, 1215 (Sandy Bowman).

820 Ibid.



When asked to explain why the AER had not told the Government of Alberta, the Government of the Northwest Territories, or the Government of Canada, of the leaks, Laurie Pushor (President and Chief Executive Officer, Alberta Energy Regulator) expressed openness to “learning whatever lessons and changes need to be made in order to make this a more effective and deliberate process,”⁸²¹ and identified existing communications protocols used by regulators and governments, including the [Alberta EDGE](#) system. He stated: “I understand that the province and the federal government have agreed that those procedures and protocols need to be reviewed to determine what happens.”⁸²² Mr. Pushor also explained his view that the situation was complicated, significant analysis was needed, and that there had been “no evidence presented that this reached a waterway.”⁸²³

Brad Corson, of Imperial Oil, began by apologizing for what happened at the Kearl site. He accepted responsibility for Imperial Oil’s failure to communicate satisfactorily with neighbouring Indigenous communities:

[A]t the very beginning of the incidents, we did make a notification, but we failed in escalating that notification within those communities. Then we also failed in providing regular updates as time went on as we gathered more information about the incident. We provided that information to the AER, but we should have, in parallel, provided it to the [I]ndigenous communities. We will do that in the future. We're doing that on a regular basis now.⁸²⁴

Laurie Pushor, President and Chief Executive Officer of the Alberta Energy Regulator, began his appearance at Committee in April 2023 by apologizing for not having met community expectations:

Before I begin, I want to acknowledge the [First [N]ations, Métis and stakeholders I am meeting with and who testified at this committee. These are lands where they have told us they practise traditional ways and exercise treaty rights, all downstream from oil sands operations, and they need to be confident in the safe, effective operation of the industry.

821 ENVI, [Evidence](#), 24 April 2023, 1225 (Laurie Pushor).

822 Ibid., 1230.

823 Ibid.

824 ENVI, [Evidence](#), 20 April 2023, 1555 (Brad Corson, Chairman, President and Chief Executive Officer, Imperial Oil Limited).

It is clear that neither Imperial nor the AER met community expectations to ensure that they are fully aware of what is and what was happening. For that, I am truly sorry.⁸²⁵

Mr. Pushor noted that the AER's Board of Directors had started a third-party review of "the AER's actions, processes and communications surrounding the incidents,"⁸²⁶ and stated:

We are committed to working alongside communities to strengthen our processes and engagement and to build relationships, enhance transparency and broaden communication around our work.⁸²⁷

He then outlined all the events that had taken place. When asked about deep groundwater monitoring, Mr. Pushor stated that the AER had compelled Imperial Oil to do deep groundwater monitoring, and affirmed that there had been "evidence of toxins associated with process-affected water in that deep groundwater monitoring."⁸²⁸

Mr. Corson stated that there had been no impact on drinking water quality as a result of the events at the Kearl site.⁸²⁹ When asked about contaminants found in a waterbody outside the Kearl site, and whether they could adversely affect human health, Mr. Pushor stated:

I'm telling you that the monitoring results we've seen around the entire Kearl tailings pond and in waterbody 3 are stable or declining, which is what we want to see as we examine the effectiveness of the enhancements to the containment system.

We will be diligent for a long period of time and monitoring this to ensure that we can be confident the enhancements to the containment system that were installed are working effectively.⁸³⁰

Ms. Olsgard, on the other hand, pointed out that the information available on AER and Imperial Oil websites indicated that "surface water quality guidelines were relied on to assess data at impacted wetlands and surface water bodies and as such would not have considered human health."⁸³¹ As the brief explains:

825 ENVI, [Evidence](#), 24 April 2023, 1205 (Laurie Pushor).

826 Ibid.

827 Ibid.

828 Ibid., 1240.

829 ENVI, [Evidence](#), 20 April 2023, 1705 (Brad Corson).

830 ENVI, [Evidence](#), 28 November 2023, 1145 (Laurie Pushor).

831 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 2.



Surface water quality guidelines do not consider human health endpoints and there are no human health monitoring programs in the Athabasca Oil Sands region.

Provincial and federal surface water quality guidelines focus on the protection of aquatic life and were established using data for fish and other aquatic species^[832]. Therefore, the use of these guidelines to assess surface water quality and risks does not consider human health endpoints, such as the potential for chemicals to cause cancer.⁸³³

Ms. Olsgard also informed the Committee that information about the seepage from the Kearl site had been available and reported to the AER several years earlier; it was just not shared broadly:

First, my review of the Imperial Kearl groundwater monitoring data (reported to AER in 2020 and 2021) led me to conclude in November 2022 what we all learned in February 2023, that tailings contaminated groundwater from the Kearl mine was seeping off lease.

It was evident that at least 3 years prior to the issuance of the [Environmental Protection Order], Imperial was reporting increasing trends and exceedances of control objectives for key indicators of tailings seepage in the tailings groundwater monitoring network to the AER.⁸³⁴

Some Indigenous witnesses were asked whether their communities had impact benefit agreements in place with Imperial Oil that included an agreement about how communication should happen. According to Chief Adam, AFCN's agreement says that Imperial and other operators are supposed to notify the communities of anything that goes on at their site.

Chief Adam highlighted what he felt was an injustice when communities have an impact benefit agreement that commits them, among other things, to speaking positively about the company with which they have an agreement:

Imperial was supposed to notify us of everything that happens on their site, and that goes for every oil sands operator out there as well.

For some reason ... [t]hey breached their own agreement. We, as the Athabasca Chipewyan First Nation, always uphold our side of the agreement and do not talk badly about the oil sands operators. We gave you guys the trust that was required for them to operate in our region. To withhold information for 10 months and for how many years is

832 Alberta Government, [Environmental Quality Guidelines for Alberta Surface Waters](#), 28 March 2018.

833 Mandy Olsgard, [Brief submitted to ENVI](#), 23 March 2024, p. 2.

834 Ibid., p. 5.

absurd and appalling. Why do you continue to lie to us? What have we done in regard to Canada...that we lied to everybody? We never did anything to anybody.⁸³⁵

The Committee heard that once they knew about the seepage, some communities were given access to the Kearl site to see for themselves what was happening. Chief Adam reported that he and several other staff saw that a tailings pond was leaking in several different areas.⁸³⁶

2) Perspectives on the Third-Party Review of the Alberta Energy Regulator's Actions

In September 2023, the AER released a third-party review of its response to the Kearl incidents, Alberta Energy Regulator (AER) Third-Party Review 23RFP-CS016. The review was prepared by the firm Deloitte LLP.

The review noted, in a section on perspectives from Indigenous peoples, that those consulted felt that “[t]he AER should differentiate between a rights holder, and a stakeholder in their policies and procedures to better address the unique needs, rights, and perspectives of each group.”⁸³⁷ However, overall, the review focused on events after the environmental protection order was made, and found that the AER had followed internal policies, standards, procedures, and/or processes; it identified “opportunities for improvement that will clarify and mature processes, and procedures as well as streamline the AER's governance system for incident and emergency management.”⁸³⁸

Following the review's publication, a number of Indigenous leaders expressed their dissatisfaction; among their concerns was the review's narrow focus on communications, especially in light of the fact that Imperial Oil and the AER appeared to have data from 2020 and 2021 that acknowledged that tailings had been seeping from the ponds, but had done nothing to contain the tailings at that time.⁸³⁹

835 ENVI, [Evidence](#), 17 April 2023, 1145 (Chief Allan Adam).

836 Ibid., 1150.

837 Deloitte, [Alberta Energy Regulator \(AER\) Third-Party Review 23RFP-CS016](#), Third-Party Review Report, 11 September 2023, p. 9.

838 Ibid., p. 3.

839 See for example, *Fort McMurray Today*, “[Chief tells AER to ‘lawyer up’ as report finds rules followed in Kearl leaks](#),” 27 September 2023; and *NNSL Media*, “[Indigenous environmentalists blast Alberta regulator and federal inaction over Kearl mine leakage](#),” 11 October 2023.



Mikisew Cree First Nation published a statement on social media in response to the AER's 11 September 2023 report, calling for a systemic overhaul of the AER and criticizing it for its "failure to regulate."⁸⁴⁰

In March 2024, the Athabasca Chipewyan First Nation (ACFN) filed a lawsuit against the Alberta Energy Regulator in relation to the leaks, alleging negligence and a failure to live up to Treaty obligations.⁸⁴¹

3) Health Impacts

Many representatives of Indigenous communities expressed concern that contamination from tailings pond leakage could be in the lands frequented by community members, and noted that their members' rights include such activities as using water, and harvesting plants and animals across their traditional territories.⁸⁴² Chief Tuccaro said in 2024 that many of his community members had not used the community's beach area for swimming since learning of the Kearl incidents because of concerns about what could be in the water.⁸⁴³ Timothy Clark (Principal, Willow Springs Strategic Solutions, Fort McMurray Métis Local 1935) explained:

In our community, over the years we have seen a decline in traditional-use practices and the exercise of these rights, in part because of the loss of confidence in the safety and quality of the resources. Are they healthy? Is the water safe? People used to drink water regularly from the rivers. Almost no one does now.⁸⁴⁴

Alienor Rougeot (Program Manager, Climate and Energy, Environmental Defence Canada) pointed out that it is not just the two incidents at the Kearl site that pose health threats:

It is especially concerning that local communities are exposed to these heavy metals and toxic substances from tailings ponds through multiple pathways: through the water they drink, through the game and food that they harvest off the territory, and through the

840 Mikisew Cree First Nations, "[Statement](#)," Facebook, 28 September 2023.

841 Aaron Sousa, CBC News, [First Nation sues Alberta Energy Regulator over tailings leaks from oilsands mine](#), 6 March 2024.

842 E.g., ENVI, [Evidence](#), 17 April 2023, 1240 (Russell Noseworthy); ENVI, [Evidence](#), 27 February 2024, 1615 (Chief Billy-Joe Tuccaro); ENVI, [Evidence](#), 17 April 2023, 1245 (Destiny Martin); ENVI, [Evidence](#), 17 April 2023, 1300 (Timothy Clark); ENVI, [Evidence](#), 17 April 2023, 1120 (Martin Grygar, Professional Engineer, Fort McMurray 468 First Nation).

843 ENVI, [Evidence](#), 27 February 2024, 1615 (Chief Billy-Joe Tuccaro).

844 ENVI, [Evidence](#), 17 April 2023, 1300 (Timothy Clark).

air. As a reminder, two weeks ago, a study found that air pollutants from the oil sands could be 20 to 64 times higher than previously reported.⁸⁴⁵

Chief Tuccaro also mentioned very high cancer rates experienced by members of the Mikisew Cree:

We have seen a huge escalation in cancer in the last two years. I know that for a fact. As a chief, I know between 40 and 50 people who have been diagnosed or whose cancers were in remission and have now resurfaced. We also have the rarest form of cancer: bile duct cancer. When my people are diagnosed with that, they perish within a couple of months. I've seen it first-hand.⁸⁴⁶

4) Mental Health Impacts

Witnesses also talked about the mental health impacts of the Kearl incidents. Chief Adam described the feeling of doubting whether your water is safe:

When it comes to the issues in regard to safe consumption of food and water, after being notified about the spill from Kearl Lake and finding out that it was all true, I went back home to Fort Chip. I had to turn that tap on to cook my food. I drink two cups of coffee every morning. Where does that water come from?

Knowing that turning that tap on could be detrimental to my health [...]. When I went home, knowing this information, I felt so alone. I did not know how to tell the people what was going on [...]⁸⁴⁷

Callie Davies-Flett spoke about how not knowing if you are harming yourself or your children during everyday activities on your traditional territory that people who live elsewhere do not have to think twice about:

The chief asked me to say something from the youth perspective when you asked about mental health. I think it's very important that we communicate that way, through the youth. I'm speaking as someone who grew up with industry. I was born and raised in the Fort McMurray region, and Fort Chip has a special place in my heart. My family is from Fort Chip. I go there every second week, or every week sometimes now with work.

As somebody who is just starting on my journey and starting in life, I question whether it's a safe place to bring up a family and to bring children to swim, as Chief Tuccaro said.

845 ENVI, [Evidence](#), 6 February 2024, 1555 (Aliénor Rougeot, Program Manager, Climate and Energy, Environmental Defence Canada).

846 ENVI, [Evidence](#), 27 February 2024, 1615 (Chief Billy-Joe Tuccaro).

847 ENVI, [Evidence](#), 17 April 2023, 1155 (Chief Allan Adam).



I swam at the lakefront. Is something going to happen to me because I grew up with industry? These are mental health things and the questions we're asking ourselves.⁸⁴⁸

Carmen Wells, representing the Fort Chipewyan Métis Nation, told Committee members that “people aren't sleeping at night for fear of what news will arrive the next day.”⁸⁴⁹ Chief Tuccaro expressed the extreme urgency of addressing mental health issues in his community, and a sense that others felt Indigenous people’s lives did not matter:

[S]ince the start of the year, we have probably had 18 deaths in the community. There is a crisis in the community. People are committing suicide. Is it tied to what's going on with the water and with what people are thinking is going on? It's something that needs to be addressed sooner rather than later.

As a parent of two young daughters in this community, it's stressful. What Chief Adam said about turning on that tap was the same thing I thought about a week ago when I was taking a shower: Am I okay?

Imagine that, the undue mental stress just because we want to do something. You guys have every right to do whatever you want in your healthy communities, where you guys drink the water. If this were in Ottawa right now, I guarantee that there would be a crisis.

When will [I]ndigenous lives matter?⁸⁵⁰

Chief Adam added:

Feeling the effects of what goes on and not knowing the future if we continue going down this path is a crisis on its own. The health issue that I talked about in the past—and I don't speak about it too much anymore—is still there. It never went away. It only increased.⁸⁵¹

Daniel Stuckless explained that the fear of a rupture or other problems with tailings ponds is constantly on the minds of people in Fort McKay Métis Nation: “It is a constant. When you add that constant stressor on top of other social issues like residential school

848 ENVI, [Evidence](#), 17 April 2023, 1200 (Callie Davies-Flett, Regulatory Advisor, Athabasca Chipewyan First Nation).

849 ENVI, [Evidence](#), 24 April 2023, 1115 (Carmen Wells, Lands and Regulatory Management, Fort Chipewyan Métis Nation Association).

850 ENVI, [Evidence](#), 17 April 2023, 1200 (Chief Billy-Joe Tuccaro).

851 ENVI, [Evidence](#), 17 April 2023, 1210 (Chief Allan Adam).

survival and the sixties scoop, you have a stressed community that continues to be stressed about lands they've used for centuries or millennia.”⁸⁵²

The Committee heard from representatives of the Mikisew Cree First Nation that, due to elevated cancer rates, for years they had been requesting a comprehensive community-based health study of the Indigenous communities near oil sands developments.⁸⁵³

Melody Lepine, of the Mikisew Cree First Nation, noted that communities had been asking for, and not seeing, health studies since 2003. They have been asking and pushing, in various regulatory contexts, including with the federal government and at joint review panels, but no regulatory body has yet supported such a study.⁸⁵⁴

We started requesting a health study in 2003 at the joint review panel hearing for the CNRL Horizon mine and the Shell Jackpine mine hearings. We've been advocating for and requesting health studies for over a decade. Just recently, at the Teck Frontier hearing in 2019, we presented the federal government with a health study proposal. Health Canada and the federal government have that proposal and have sat on it since 2019.⁸⁵⁵

Mr. Noseworthy noted the need for a cumulative study to address the lack of understanding of the cumulative effects of Athabasca oil sands development on Indigenous people's rights:

We have no cumulative measure of how we've been impacted in the region. We don't know, from the various operators, how all that accumulation of pollution has been counted and how that impacts the right to hunt, fish, trap and live healthy lives in that region. We don't understand.

We need a cumulative effects impact assessment. We need to understand that. That's the first thing we need in the region. To go along with that cumulative effects assessment, we need to understand how our rights have been impacted.⁸⁵⁶

852 ENVI, [Evidence](#), 17 April 2023, 1255 (Daniel Stuckless, Director, Fort McKay Métis Nation).

853 ENVI, [Evidence](#), 17 April 2023, 1135 (Chief Billy-Joe Tuccaro); ENVI, [Evidence](#), 17 April 2023, 1210 (Melody Lepine).

854 ENVI, [Evidence](#), 17 April 2023, 1210 (Melody Lepine).

855 Ibid.

856 ENVI, [Evidence](#), 17 April 2023, 1240 (Russell Noseworthy).



Witnesses generally communicated a sense that their concerns about tailings ponds were about more than just recent incidents;⁸⁵⁷ as Timothy Clark put it, these incidents took place “within a much wider and interconnected system that is constantly undermining the rights, health and interests of the people who reside in this region, particularly [I]ndigenous people.”⁸⁵⁸ Overall, there was significant interest among Indigenous witnesses in a study of the cumulative effects of the oil sands.⁸⁵⁹

5) Constitutional Rights of Indigenous Peoples

Some witnesses explained that Indigenous peoples have a constitutional right to a healthy ecosystem in which to live, harvest, and engage in cultural activities. For example, The Fort Chipewyan Metis Nation (FCMN) stated, in a brief:

FCMN land stewardship, predicated on the ethic of natural law, is a fundamental cultural and traditional knowledge land use practice for the FCMN, and as such is an inherent and inextricable Aboriginal right under the *Constitution Act*. The ability to transfer knowledge of a harvesting area to young rights holders is also an inextricable right that is crucial to the viability of future rights of practice. Any plans or activities that reduce, marginalize, or alienate the opportunity and ability to conduct these practices, or alter[...] the ecological health and viability of harvesting areas that support cultural practices and pursuits, now or in the future, directly and adversely affect[...]s our rights. At a minimum, Articles 18, 20, 26, 32 of the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP) also support this [...]⁸⁶⁰

Chief Adam reminded the federal government of its responsibilities to Indigenous people under Section 35 of the *Constitution Act, 1982*,⁸⁶¹ and he argued that if the federal government has approved an industrial project, implying that the project is safe for neighbouring communities, then it should take responsibility if that turns out not to be the case:

Your responsibility is to uphold our constitutional, guaranteed treaty rights under section 35. Your responsibility is to deliver the basic health, social, education and infrastructure services that your settler communities take for granted. Your

857 E.g., ENVI, [Evidence](#), 17 April 2023, 1300 (Timothy Clark); ENVI, [Evidence](#), 17 April 2023, 1250 (Margaret Luker); ENVI, [Evidence](#), 17 April 2023, 1125 (Martin Grygar); ENVI, [Evidence](#), 24 April 2023, 1105 (Gerald Antoine, Dene National Chief, Regional Chief, Assembly of First Nations, Northwest Territories, Dene Nation).

858 ENVI, [Evidence](#), 17 April 2023, 1300 (Timothy Clark).

859 E.g., ENVI, [Evidence](#), 17 April 2023, 1245 (Destiny Martin); ENVI, [Evidence](#), 17 April 2023, 1240 (Russell Noseworthy).

860 Fort Chipewyan Métis Nation, [Brief submitted to ENVI](#), 17 April 2023, p. 2.

861 [Constitution Act, 1982](#).

responsibility is to properly regulate massive industrial projects that potentially threaten the health and safety of Fort Chipewyan and other downstream communities. Your responsibility is to warn human beings when their water might have been poisoned as a result of a failed tailings dam that was declared to be safe when it was approved and licensed by Canada. Make me understand that. It was done by Canada. You have a responsibility, regardless of what you think.⁸⁶²

Martyn Grygar explained the significance of Canada having passed UNDRIP legislation:⁸⁶³

In 2021, Canada's United Nations Declaration on the Rights of Indigenous Peoples Act received royal assent and came into force. This is very important to the communities in this area because it allows them the ability to practise their treaty rights on this land when the oil sand operators wrap up their operations. This legislation provides a road map for the Government of Canada and [I]ndigenous peoples to work together to implement the UN declaration based on lasting reconciliation, healing and co-operative relations.⁸⁶⁴

In its brief, the FCMN brief pointed out that the Province of Alberta has not recognized UNDRIP.⁸⁶⁵ Timothy Clark opined that the difference between provinces' approaches means that:

[T]he substance and quality of your constitutional rights as an [I]ndigenous person vary depending on the province in which you live, and I don't think that is either the spirit or the letter of our Constitution. I can't imagine many of the rights we all enjoy as Canadians varying so greatly depending on where we live or on our ethnic background.⁸⁶⁶

6) Views on the Regulatory Framework for Oil Sands Mines in Alberta

The Committee heard from many Indigenous witnesses that oil sands regulatory oversight by the Alberta government is insufficient, with systemic problems, and it heard from some that they feel federal government involvement is necessary to protect the environment and human health.⁸⁶⁷

862 ENVI, [Evidence](#), 17 April 2023, 1105 (Chief Allan Adam).

863 ENVI, [Evidence](#), 17 April 2023, 1120 (Martin Grygar).

864 Ibid.

865 Fort Chipewyan Métis Nation, [Brief submitted to ENVI](#), 17 April 2023, p. 2.

866 ENVI, [Evidence](#), 17 April 2023, 1310 (Timothy Clark).

867 ENVI, [Evidence](#), 17 April 2023, 1200 (Chief Billy-Joe Tuccaro); ENVI, [Evidence](#), 17 April 2023, 1235 (Daniel Stuckless).



Chief Tuccaro raised concerns about Alberta and Canada's regulatory oversight of oil sands development.⁸⁶⁸ He and several other witnesses described the Alberta Energy Regulator (AER) as a "captured regulator."⁸⁶⁹ Daniel Stuckless said the AER "actively dismisses and downplay[s] impacts of oil sands on communities and their aboriginal and treaty rights."⁸⁷⁰

Timothy Clark stated that "the environmental impact assessment process in Alberta is extraordinarily weak."⁸⁷¹ Martyn Grygar, speaking on behalf of Chief Neil Cheecham of Fort McMurray 468 First Nation, who was unable to attend, stated that the incident at the Kearl site had shown that "oil sands operators, regulatory bodies, and governments continue to behave inappropriately," and stated "[t]herefore, today we seek to express the growing request that regulations and policies in remediation, environmental protection and restoration need to be grounded in the protection and continuance of inherent aboriginal and treaty rights in the area."⁸⁷²

Chief Adam also argued that the oil sands industry is not properly regulated. He suggested that the federal government already has tools available that should allow it to intervene and to better regulate industrial activities:

Canadians expect this industry to be properly regulated. I'm here to tell you that it's not true. It's not regulated. While Alberta bears much of the blame, Canada must also shoulder the responsibility for what is happening. CEPA, the Fisheries Act and the Mackenzie River Basin Transboundary Waters Master Agreement, which you have with your own counterparts.... You guys can't even fulfill that. I would have told them that 20 years ago. That agreement contains legal tools and frameworks that would enable the federal government to protect the health and safety of the residents downstream of the oil sands.

We can point to a lack of enforcement, funding and political will, but these are excuses, not solutions. We need solutions. This incident has downstream [I]ndigenous communities in Alberta and residents of the north questioning whether this is an isolated problem or a systemic issue throughout the oil sands. When I say a "systemic issue", I'm talking about systemic racism in regard to [F]irst [N]ations communities

868 ENVI, [Evidence](#), 17 April 2023, 1135 (Chief Billy-Joe Tuccaro).

869 Ibid.; ENVI, [Evidence](#), 17 April 2023, 1235, 1255 (Daniel Stuckless); ENVI, [Evidence](#), 17 April 2023, 1315 (Margaret Luker); ENVI, [Evidence](#), 17 April 2023, 1310 (Timothy Clark).

870 ENVI, [Evidence](#), 17 April 2023, 1235 (Daniel Stuckless).

871 ENVI, [Evidence](#), 17 April 2023, 1335 (Timothy Clark).

872 ENVI, [Evidence](#), 17 April 2023, 1120 (Martin Grygar).

downstream. If this were in Calgary, I guarantee you guys would be crying and yelling from the bottom of your lungs, not me here today.⁸⁷³

Daniel Stuckless described the Government of Alberta as being absent and its processes⁸⁷⁴ as “broken.”⁸⁷⁵ He said:

It is imperative that we have federal oversight on these issues, which impact people, their human rights and their access to clean water, and which, of course, have cumulative impacts on treaty and aboriginal rights.

To date we have not heard from Alberta on this issue. [...]

There is still no case in Alberta in which there's been an accommodation for any impacted right, or even recognition of those impacts.⁸⁷⁶

His main point, he said, was that there is a bigger problem than just the seepage from Imperial Oil's Kearl site; like Chief Allan, he identified a systemic problem, commenting: “[T]his is a systemic issue. It's an issue of racial discrimination and government ineptitude, from politics and policy right down to directives, regulations and the lack of enforceability.”⁸⁷⁷

Fort Chipewyan Métis Nation suggested that the federal government should be more involved in regulation of the oil sands:

These decades of poor regulation require a change and an overhaul of Alberta's Energy [Regulator] [...]. Canada needs to be a larger presence in the mismanaged oilsands, as it has only been to the detriment of the Indigenous communities, the constitutionally protected rights holders of these lands and waters. More oversight, perhaps co-management, is required of this resource rich area.⁸⁷⁸

Keepers of the Water, an organization that “advocate[s] for the unheard voices, including the rivers, creeks, watersheds, and all living beings dependent on them,” wrote in its

873 ENVI, [Evidence](#), 17 April 2023, 1105 (Chief Allan Adam).

874 As summarized by the Government of Alberta on its website, [Indigenous consultations in Alberta](#), “Alberta's management and development of provincial Crown lands and natural resources is subject to its legal and constitutional duty to consult First Nations and, where appropriate, accommodate their interests when Crown decisions may adversely impact their continued exercise of constitutionally protected Treaty rights and traditional uses.”

875 ENVI, [Evidence](#), 17 April 2023, 1235 (Daniel Stuckless).

876 Ibid.

877 Ibid.

878 Fort Chipewyan Métis Nation, [Brief submitted to ENVI](#), 17 April 2023, p. 6.



brief to the Committee that the leak at the Kearl site is “part of an ongoing pattern of the violation of Aboriginal and Treaty rights of Indigenous Nations in proximity to and downstream from Alberta’s tar sands developments.”⁸⁷⁹ It adds:

The pattern of rights violations is so egregious and systemic that it would be misleading to characterize Alberta’s mismanagement of tar [sands’] environmental impacts as a failure. KOW [Keepers of the Water] shares the view of many Indigenous peoples around and downstream from tar sands extraction that Alberta’s regulatory system is corrupt, scientifically impoverished and entirely designed to benefit fossil fuel corporations while destroying the land and steamrolling the rights of Indigenous peoples. In this regard, Alberta’s regulatory regime is working entirely as intended.⁸⁸⁰

Keepers of the Water asked that the federal government leverage whatever jurisdiction it has over regulation of the oil sands industry to ensure that Indigenous rights are respected.⁸⁸¹

Recommendation 61

That the Government of Canada prioritize finding ways to use its existing areas of jurisdiction to better protect Indigenous rights in areas affected by oil sands projects.

Recommendation 62

That Fisheries and Oceans Canada and Environment and Climate Change Canada support the development of surface water quality guidelines that include chronic toxicity testing on fish, in addition to acute toxicity testing.

The Committee also heard that the AER has inadequate guidelines for levels of naphthenic acids,⁸⁸² which were found in what Imperial Oil calls “Waterbody 3,” and which are known to be lethal to—or to cause deformities in—fish, depending on the extent to which tailings have been treated.⁸⁸³

879 Keepers of the Water, [Brief submitted to ENVI](#), 9 January 2024, p. 2.

880 Ibid.

881 Ibid., p. 3.

882 ENVI, [Evidence](#), 17 April 2023, 1220 (Chief Billy-Joe Tuccaro).

883 Diane Orihel, [Brief submitted to ENVI](#), undated, published on ENVI website 11 July 2024, p. 4.

Recommendation 63

That the Government of Canada consider setting model guidelines for naphthenic acids in water, with a view to providing information about safe levels of not just acute, but also chronic, exposure.

Recommendation 64

That the Government of Canada support complete water quality monitoring in the Athabasca region, including testing for naphthenic acids, PAHs and substances known to be endocrine disruptors.

Chief Tuccaro called for an independent review of the approval of the leaking tailings pond and suggested that “Canada and Alberta need to establish a commission to look at solutions for tailings accumulation.”⁸⁸⁴

The Province of Alberta and the federal government both have responsibilities in relation to the approval and regulation of oil sands mining, and these two levels of government work together to regulate oil sands mining sites (as in the Joint Review Panel environmental assessment mentioned earlier in this chapter). Earlier in this report, the key legislative and regulatory powers of the federal government related to pollution—under the *Canadian Environmental Protection Act, 1999* and the *Fisheries Act*—were explored. The Committee heard a number of calls for the federal government to step in and do more to administer and enforce these pieces of legislation in the oil sands.⁸⁸⁵ Alienor Rougeot called for a scientific risk assessment of naphthenic acids under the authority of CEPA.⁸⁸⁶

Recommendation 65

That the Government of Canada explore all options of administration and enforcement of the *Canadian Environmental Protection Act, 1999* and the *Fisheries Act* (e.g., making regulations under these acts) in order to protect environmental and human health from substances found in oil sands process-affected water.

884 Vincent McDermott, “[Chief Allan Adam accuses Premier Danielle Smith of minimizing spill at Kearl Lake site](#),” *Fort McMurray Today*, 9 March 2023.

885 E.g., Alienor Rougeot, Environmental Defence Canada, [Brief submitted to ENVI](#), January 2024, p. 6.

886 Ibid.



7) Calls for Broad Study of Tailings Ponds Safety and Risk Management

A number of witnesses emphasized the need, from their perspective, for a broader study of the safety of tailings ponds: Chief Gerald Antoine suggested an investigation into the Kearl incidents to understand the implications, and inspections and analysis of existing tailings ponds, so they can be maintained, restored, and repaired.⁸⁸⁷

Carmen Wells explained:

UNESCO asked for an independent, systematic risk assessment of the tailings ponds, which should still happen. I'm looking for a comprehensive tailings ponds audit. That would be a review of their status, where they are now and whether they're following through with their approvals as they exist now. We want to know how structurally sound they are, if they will continue to be structurally sound, and if they will continue to be structurally sound for a life-of-mine closure plan. There is also the question of reclamation on the land as well.⁸⁸⁸

Melody Lepine noted that the government of Alberta guides the actions of the AER, which regulates the companies that operate in the oil sands.

I think you need to ask the AER what they are going to do to change. What are they going to do to stop these tailings ponds from leaking?

We also can't ignore the fact that the AER regulates based on Alberta policies. What is the Alberta government doing in the update of their lower [Athabasca] regional plan? What are they doing regarding a tailings risk assessment and tailings management framework to limit growth and these tailings ponds from seeping?⁸⁸⁹

Oil sands operators contribute financial security deposits to the Government of Alberta as outlined in the AER's Guide to the Mine Financial Security Program, but the Committee heard from Chief Allan Adam that the true estimated cost to clean up the oil sands is far higher than what has been contributed by the operators.⁸⁹⁰

8) Possible Planned Release of Treated Tailings Water

As outlined below, several witnesses mentioned the fact that the federal government is considering the possibility of permitting the release of water from tailings ponds into the

887 ENVI, [Evidence](#), 24 April 2023, 1130 (Gerald Antoine).

888 ENVI, [Evidence](#), 24 April 2023, 1135 (Carmen Wells).

889 ENVI, [Evidence](#), 17 April 2023, 1220 (Melody Lepine).

890 ENVI, [Evidence](#), 17 April 2023, 1115 (Chief Allan Adam).

Athabasca River.”⁸⁹¹ According to the federal government, “[d]espite heavy water re-use by operators, additional fresh water is still required on an ongoing basis. In the decades since oil sands mining began, this added freshwater use, together with captured precipitation in the tailings ponds has led to the accumulation of substantial process-affected water volumes.”⁸⁹²

Approximately 1.4 trillion litres of tailings from oil sands mining are held in earthen tailings ponds along the Athabasca River.⁸⁹³ Chief Tuccaro pointed out to the Committee that the Kearl site seepage and overflow must be seen in context, which he said is

the constant lack of necessary federal protection of our environment, rights and health in the face of what is now 1.4 trillion litres of liquid waste located near rivers, wetlands, lakes and groundwater that flows downstream to our community and ultimately to the Arctic.⁸⁹⁴

Diane Orihel further clarified:

Currently, 1.4 trillion litres of Canada's water are held by the oil sands industry in tailings ponds. This water has been taken from the Athabasca River and then used numerous times for industrial processes to extract bitumen from oil sands. While reusing water multiple times for bitumen extraction has reduced the volume of water extracted from the river, it has also created a serious problem. It has concentrated salts, metals and naphthenic acids in these waters, making them toxic to fish, amphibians, birds and mammals. [...]

This highly toxic water is then stored in rudimentary earthen pits that were never constructed to be anything more than temporary settling ponds. As a result, the tailings ponds are a massive liability. I hope the Kearl incident wakes us to this ticking time bomb.⁸⁹⁵

When asked about whether he also saw the ponds as a time bomb, Laurie Pushor emphasized the tailings management plans:

The management of the tailings ponds across all of the mines in the oil sands area starts with the approval in the joint [review] panels. All of these mines were approved by joint panels. In that program, an extensive amount of attention is paid to what the tailings

891 Government of Canada, [Oil sands mining effluent](#).

892 Ibid.

893 ENVI, [Evidence](#), 17 April 2023, 1130 (Chief Billy-Joe Tuccaro); ENVI, [Evidence](#), 30 November 2023, 1235 (Diane Orihel).

894 ENVI, [Evidence](#), 17 April 2023, 1130 (Chief Billy-Joe Tuccaro).

895 ENVI, [Evidence](#), 30 November 2023, 1235 (Diane Orihel).



management plans are. There were very open and broad-based communications and hearings that they came through around those approvals.

In addition, each company is required to file an annual report on their tailings management and on what's happening with their tailings program. Included in that is a community notification of those results.⁸⁹⁶

ECCC has stated that it is “exploring options to manage the accumulation of oil sands process-affected water in existing tailings ponds located in the Athabasca Oil Sands Region,”⁸⁹⁷ and that [o]ne of the options under consideration is the potential development of regulations under the *Fisheries Act*.⁸⁹⁸ ECCC notes that, “[i]f developed, regulations would allow releases of treated effluent into the Athabasca River⁸⁹⁹ and its tributaries under certain conditions.”⁹⁰⁰

A Crown-Indigenous working group⁹⁰¹ was established in 2021 to “lead[...] the work to explore options to manage the accumulation of oil sands process-affected water in

896 ENVI, [Evidence](#), 24 April 2023, 1240 (Laurie Pushor).

897 Government of Canada, [Oil sands mining effluent](#).

898 Ibid.

899 The possibility of developing regulations for existing oil sands tailing ponds was also discussed by ECCC officials at the Standing Senate Committee on Energy, the Environment and Natural Resources during that committee’s study of [Bill S-5](#), An Act to amend the Canadian Environmental Protection Act, 1999, to make related amendments to the Food and Drugs Act and to repeal the Perfluorooctane Sulfonate Virtual Elimination Act in 2022. On 28 April 2022, John Moffet (Assistant Deputy Minister, Environmental Protection Branch, Environment and Climate Change Canada) said:

First of all, it has been our advice to successive ministers, including to Minister Guilbeault, that the most significant legislative authority to be used to address potential risks to the Athabasca Watershed from the tailings ponds and to the rights and activities of the Indigenous people who live in that area is the Fisheries Act. The reason for that is that under CEPA — in a very simple sense — an activity can be carried out unless it is regulated. It’s the opposite under the Fisheries Act. Under the Fisheries Act, the discharge of deleterious substances, including substances from tailings ponds, is prohibited unless regulated. In other words, if we don’t have a regulation — and we don’t have one — any discharge of deleterious substances from the tailings ponds is illegal, and that is the case at the moment. If we find there are discharges from tailings ponds — and we are actively looking into this matter now — then that would constitute a violation of the Fisheries Act. That’s the first point — that we intend to rely on the Fisheries Act.

(Standing Senate Committee on Energy, the Environment and Natural Resources, [Evidence](#), 28 April 2022, John Moffet, Assistant Deputy Minister, Environmental Protection Branch, Environment and Climate Change Canada).

900 Government of Canada, [Oil sands mining effluent](#).

901 In May 2024, the working group produced a What we Heard report: [Public Engagement on the Introduction to the Crown-Indigenous Working Group for the Potential Oil Sands Mining Effluent Regulations](#). In March 2025, it produced a [discussion paper](#), for which a comment period lasted until 9 July 2025.

tailings ponds located in the [Athabasca Oil Sands Region].”⁹⁰² Witnesses from the Fort McMurray 468 First Nation and the Fort McMurray Métis Local No. 1935 expressed concern to the Committee over the impacts of this potential regulation and the release of treated effluent on both their rights and the environment.⁹⁰³ Mr. Noseworthy noted:

The Crown-[I]ndigenous working group was proposed as a mechanism for collaboration on the development of potential regulations for the release of water, and would be complemented by some sort of discussion about how that might impact our rights as a community and as [I]ndigenous people living there on the river. However, we're extremely concerned. We had requested from that group a process to identify how our rights would be impacted by what's happening and by the changes to the Fisheries Act that are being proposed.⁹⁰⁴

Timothy Clark felt that the working group had tried to move too fast, and that a key message is that to be done properly, work in the oil sands needs to be based on a regional assessment of the region:

[W]ork needs to be done properly. It needs to be backed by a regional assessment under the Impact Assessment Act of this region. That we have 60 years of open-pit oil sands mining and we know almost nothing about the cumulative effects is appalling. It's absolutely appalling. That alone is reason for the minister to authorize a regional assessment in this region, because how can we assess our rights moving forward when we're talking about cities' worth of tailings ponds that are going to be released if we have no baseline for where we are starting from?⁹⁰⁵

Diane Orihel characterized the existence of such a volume of tailings ponds as a “failure in water management and policy”⁹⁰⁶ and explained the view that clean-up of tailings ponds should happen while the industry can pay for it:

The industry must be required to treat and release its waste water—not at the end of the mine's life and not after the industry goes bankrupt and taxpayers are on the hook, but by the industry, in real time, during mine operation.⁹⁰⁷

902 Government of Canada, *Oil sands mining effluent*, Crown-Indigenous Working Group.

903 ENVI, *Evidence*, 17 April 2023, 1125 (Martin Grygar); ENVI, *Evidence*, 17 April 2023, 1240 (Daniel Stuckless).

904 ENVI, *Evidence*, 17 April 2023, 1240 (Russell Noseworthy).

905 ENVI, *Evidence*, 17 April 2023, 1340 (Timothy Clark).

906 ENVI, *Evidence*, 30 November 2023, 1235 (Diane Orihel).

907 Ibid.



Dr. Orihel noted in a brief that the greatest costs of tailings ponds are yet to come, and echoed Chief Adam's concern that "only a small fraction of the anticipated cost has been posted by oil sands companies under Alberta's Mine Financial Security Program."⁹⁰⁸

[...] decommissioning of physical structures, detoxification of contaminated waters and sediments, and reclamation of the landscape. There is a great deal of uncertainty as to what are the true costs of this clean-up, with some estimates exceeding \$100 billion.⁹⁰⁹

Dr. Orihel spoke about some of the ways to detoxify oil sands process affected water, such as with microbes and advanced oxidation technologies that break down organic compounds. She described a titanium dioxide microparticle that can use energy from sun to break down naphthenic acids, which are highly toxic to aquatic organisms. While partial break-down of the compounds can create more toxic products, a complete breakdown can "remove the acute lethality of the water."⁹¹⁰

Recommendation 66

That the Government of Canada, through its research funding mechanisms, support research related to the removal of toxins from oil sands process-affected water.

Martin Grygar said that communities are asking for the water in tailings ponds to be treated effectively "so it does not continue to contaminate the environment," emphasizing that leaving it ponds is not a treatment.⁹¹¹ Carmen Wells was concerned that water would be released into the river only partially treated, and called on the federal government to "undertake a full audit of the many tailings ponds in our backyard."⁹¹² Several witnesses noted that they were not supportive of the release of treated tailings water,⁹¹³ while Mr. Noseworthy emphasized that a cumulative effects impact assessment would be needed first, along with an understanding of how Indigenous rights to hunt, fish, trap, and live healthy lives in the region have been affected by the accumulation of pollution to date.⁹¹⁴

908 Diane Orihel, [Brief submitted to ENVI](#), undated, published on ENVI website 11 July 2024, p. 3.

909 Ibid.

910 ENVI, [Evidence](#), 30 November 2023, 1255 (Diane Orihel).

911 ENVI, [Evidence](#), 17 April 2023, 1220 (Martin Grygar).

912 ENVI, [Evidence](#), 24 April 2023, 1115 (Carmen Wells).

913 E.g., Keepers of the Water, [Brief submitted to ENVI](#), 9 January 2024, p. 3; ENVI, [Evidence](#), 17 April 2023, 1115 (Chief Allan Adam); ENVI, [Evidence](#), 27 February 2024, 1625 (Chief Billy-Joe Tuccaro).

914 ENVI, [Evidence](#), 17 April 2023, 1240 (Russell Noseworthy).

Mandy Olsgard told the Committee about another, not well documented, source of contamination in the Athabasca watershed; she said that her review of reports submitted by oil sands operators to the AER showed that there had been “over 40 approved releases of industrial waste water from oil sands mines, even though federal effluent regulations for oil sands mines are not yet available under the *Fisheries Act*.”⁹¹⁵ She added:

Year over year, operators report to the AER that the quality of these releases to local rivers and tributaries exceeds surface water quality guidelines for salts, metals and nutrients, and is at times chronically toxic. The most recent surface water monitoring report by the Government of Alberta, the backstop for assessing change in this region, reported that concentrations of lithium, uranium and sulfate were significantly different than historical conditions and exceeded compliance triggers.

Based on this information, the AER is aware that waste water released from oil sands mines is exceeding provincial and federal surface water quality guidelines and that the provincial government has identified changing conditions in the lower Athabasca River downstream from oil sands development, yet there is no evidence the AER has identified regulatory actions for oil sands operators. It is unclear whether these releases are in contravention of the federal *Fisheries Act* through deposition of deleterious substances to surface waters in the lower Athabasca region.⁹¹⁶

a) Regulation of Deleterious Substances

Section 36(3) of the *Fisheries Act* prohibits the deposit of a deleterious substance in water frequented by fish, unless that deposit is authorized through regulations. There are currently no regulations under the *Fisheries Act* permitting the release of oil sands tailings fluids into waters frequented by fish.

Ms. Rougeot suggested that the federal government could request more information from companies to assist with compliance with the *Fisheries Act*, noting in a brief that both the Office of the Auditor General, in 2019, and the Commission for Environmental Cooperation, in 2020, had identified the lack of federal information on mining effluent releases as a barrier to enforcing the section 36(3) prohibition against depositing deleterious substances in the *Fisheries Act*.⁹¹⁷ The Minister should, she argued, exercise ministerial authority under the *Fisheries Act* and CEPA to obtain more information from operators, such as information about environmental effects monitoring, sampling,

915 ENVI, [Evidence](#), 21 March 2024, 1625 (Mandy Olsgard).

916 Ibid.

917 Alienor Rougeot, Environmental Defence Canada, [Brief submitted to ENVI](#), January 2024, p. 4.



evaluation, and other documentation, if necessary to ensure the protection of fish or fish habitat.⁹¹⁸

9) A Seat at the Table

Several witnesses stated the importance of Indigenous involvement in decision-making related to activities that affect their traditional territories. Gerald Antoine emphasized the need for Indigenous involvement in the governance of oil sands:

Processes for things such as the tar sands have never involved the Dene and Métis people. Because of the way the system has been set up, we've never been part of it, and there is no consideration of our being involved. From now on, moving forward, we need to be involved.

There are different ways to build trust. The question I have is, why are these companies allowed to investigate themselves? It's like asking the Indian residential schools abusers to investigate themselves. That is not acceptable.⁹¹⁹

Chief Adam described the AER in Alberta as “a complete joke” that has been rubber-stamping oil sands applications without regard for the health of his people.⁹²⁰ He stated his view that “Canada has a responsibility to address the larger tailings and reclamation crisis unfolding in our region.”⁹²¹ He suggested that there should be a “federally mandated, [I]ndigenous-led, co-management body with effective oversight and enforcement powers” to fix the problems:⁹²²

What we're asking, Mr. Chair, is for the [F]irst [N]ations communities that are going to be affected by major industrial components to be the AER, to be the regulators. We should be sitting behind the table, not giving evidence about the damaging effects the industry has on our communities and why they continue today.⁹²³

Callie Davies-Flett asked for support for the inclusion of Indigenous communities in the Tailings Management Framework:

[T]he AER and the Alberta government have established a tailings management framework [TMF]. That is essentially the root cause of some of the issues coming up

918 Ibid.

919 ENVI, [Evidence](#), 24 April 2023, 1130 (Gerald Antoine).

920 ENVI, [Evidence](#), 17 April 2023, 1115 (Chief Allan Adam).

921 Ibid., 1120.

922 Ibid.

923 Ibid.

right now. He described how the TMF currently has no duty to consult. Eliminating our presence within the room when these decisions are being made is the first wrongdoing [...] here. That's just the tip of the iceberg.

If there is a push to, in some way, include us in this management framework, that would be the major solution we can come up with.⁹²⁴

Chief Adam outlined his vision of Indigenous involvement in decision-making related to projects on traditional territories:

Further to the question on what Canada could do, Canada could recommend to the Alberta government, when it comes to major developments, that [F]irst [N]ations not give testimony at a hearing but sit on the panel and listen to the questions that industry puts before them on why they want to have their projects on our traditional territories. That's what I'm asking for. I'm asking for a seat at the table to make the decisions. Either we give the green light or we give nothing. Right now, everybody has been given the green light, and the only result we have been getting back is, "We will tell you what kind of country you will have."⁹²⁵

Recommendation 67

That the Impact Assessment Agency of Canada work collaboratively with Indigenous communities to identify any potential impacts on Indigenous people, and develop appropriate mitigation or other accommodation proposals that, if implemented, could address potential impacts; and that the Agency explore opportunities to work in partnership with communities in the conduct of impact assessments, as well as contributing to the result of the assessments conducted under their own Indigenous laws, processes or cultural protocols, into the impact assessment process.

10) Environmental Racism

A number of witnesses raised concerns about environmental racism.⁹²⁶ Keepers of the Water noted that the "harm goes beyond physical health degradation. The rapid and incessant sprawl of the tailings ponds has resulted in the takeover of thousands of hectares of Indigenous lands, affecting their ability to access and pass on their traditional practices."⁹²⁷ Chief Gerald Antoine (Dene National Chief, Regional Chief,

924 ENVI, [Evidence](#), 17 April 2023, 1215 (Callie Davies-Flett).

925 ENVI, [Evidence](#), 17 April 2023, 1215 (Chief Allan Adam).

926 Ibid., 1105; ENVI, [Evidence](#), 24 April 2023, 1115 (Carmen Wells); ENVI, [Evidence](#), 24 April 2023, 1105 (Gerald Antoine).

927 Keepers of the Water, [Brief submitted to ENVI](#), 9 January 2024, p. 7.



Assembly of First Nations, Northwest Territories, Dene Nation) stated that he felt the seepage and leak, and the fact that downstream Indigenous nations had not been informed, was a crime and constituted environmental racism.⁹²⁸

Keepers of the Water added, in their brief:

[O]ur relatives' testimony and expert testimony, they will mean nothing if Canada continues to uphold, protect and fund—often with taxpayers' dollars—an industry that knowingly perpetuates environmental racism.”⁹²⁹

13. FLOODS AND DROUGHTS AND THEIR FORECASTING

A. Bill C-317, An Act to Establish a National Strategy Respecting Flood and Drought Forecasting

During the freshwater study, the Committee studied a bill on a related topic, Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting (short title: National Strategy on Flood and Drought Forecasting Act). Bill C-317 received first reading in the House of Commons on 8 March 2023 and was considered by the ENVI Committee on 9 April 2024 and 30 April 2024. On 30 April 2024, the Committee agreed to report the bill, with minor amendments, back to the House.⁹³⁰ Bill C-317 passed through the House of Commons and then completed first reading in the Senate on 6 June 2024. The Committee agreed to incorporate evidence regarding Bill C-317 into its freshwater study, because it complemented and augmented the freshwater study. The bill died on the order paper when parliament was prorogued on 6 January 2025. A similar bill, C-241, An Act to establish a national strategy respecting flood and drought forecasting, was introduced in the 45th Parliament.⁹³¹

This chapter provides an overview of flood and drought forecasting in Canada and how a national strategy might improve collaboration and result in improved forecasts.

Bill C-241, like its predecessor Bill C-317, would require the Minister of the Environment, in collaboration with the Minister of Agriculture and Agri-Food, the Minister of Natural Resources and the Minister of Public Safety and Emergency Preparedness, to “develop a

928 ENVI, [Evidence](#), 24 April 2023, 1105 (Gerald Antoine).

929 Keepers of the Water, [Brief submitted to ENVI](#), 9 January 2024, p. 7.

930 ENVI, Eleventh Report, [Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting](#), 30 April 2024.

931 LEGISinfo, [Bill C-241, An Act to establish a national strategy respecting flood and drought forecasting](#).

national strategy respecting flood and drought forecasting to help provide key stakeholders with the information they need to forecast floods and droughts.”⁹³² It would require that the Minister of the Environment “consult with representatives of provincial and municipal governments, Indigenous governing bodies and other relevant stakeholders, including representatives from Canadian universities, civil society organizations and industry”⁹³³ on the national strategy on flood and drought forecasting.

B. Background on Flood and Droughts

As described by the Government of Canada, a flood results from an increase in streamflow beyond the point where the normal stream channel can contain the water.⁹³⁴ When water overspills a river’s banks, it spreads onto the adjoining floodplain.⁹³⁵ A flash flood may last for just hours, whereas seasonal flooding after spring snowmelt runoff may last for a month or two.⁹³⁶ Drought is “a shortage of precipitation over an extended period, usually a season or more, resulting in insufficient water availability that adversely impacts vegetation, animals and people.”⁹³⁷

Witnesses and authors of briefs spoke about the increasing frequency and magnitude of floods and droughts in Canada,⁹³⁸ as well as globally.⁹³⁹ Climate change impacts, such as greater rain intensity and frequency and snow and glacier melting, increase flood risk. Flood risks have also increased due to development on floodplains, land that is denuded by wildfires, and land that is paved, thereby becoming impermeable to water and resulting in increased runoff.⁹⁴⁰ Chandra Madramootoo (Distinguished James McGill

932 LEGISinfo, [Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting](#), s. 3(1).

933 Ibid., s. 3(2).

934 Government of Canada, [Floods](#).

935 Ibid.

936 Ibid.

937 Natural Resources Canada, [Drought](#).

938 ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull); ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti); ENVI, [Evidence](#), 1 February 2024, 1640 (John Pomeroy); ENVI, [Evidence](#), 1 February 2024, 1630 (Alain Pietroniro, Professor, Department of Civil Engineering, University of Calgary, As an individual); ENVI, [Evidence](#), 6 February 2024, 1600 (Alex Ostrop, Chair, Alberta Irrigation Districts Association); ENVI, [Evidence](#), 11 June 2024, 1730 (Heather Jirousek); ENVI, [Evidence](#), 8 February 2024, 1530 (Oliver Brandes); ENVI, [Evidence](#), 1 February 2024, 1600 (Rébecca Pétrin, Chief Executive Officer, Eau Secours); ENVI, [Evidence](#), 30 November 2023, 1130 (Zita Botelho).

939 ENVI, [Evidence](#), 1 February 2024, 1555 (John Pomeroy); ENVI, [Evidence](#), 15 February 2024, 1530 (Chandra Madramootoo).

940 ENVI, [Evidence](#), 1 February 2024, 1600 (John Pomeroy).



Professor, McGill University) informed the Committee that, globally, the “effects of climatic change are already seen through a higher frequency of hydro-climatic disasters, notably floods, droughts and land degradation.”⁹⁴¹

Witnesses and authors of briefs described serious national and regional impacts of flooding and drought events in terms of economic losses (property damage, insurance costs, and lost economic activity) as well as health and social effects.

Impacts at the national level included the following:

- Canadian damages from flood, drought and storm events were estimated to exceed \$40 billion from the years 2000 to 2023 (in comparison to an estimated \$1 billion in damages from 1867 to 2000);⁹⁴²
- Canada exceeded \$3 billion in insured damaged from natural disasters in 2022 and in 2023;⁹⁴³ and
- Flooding from intense storms and atmospheric rivers can overwhelm municipal water treatment facilities “leaving residents with unsafe, untreated water.”⁹⁴⁴

Impacts at a regional level included:

- Four deaths and over \$5 billion in damages in the 2013 Alberta flood;⁹⁴⁵
- Economic losses estimated for the province of British Columbia at \$1 billion annually from long-term water shortages;⁹⁴⁶
- Multi-year droughts in multiple watersheds in British Columbia, “where farmers had to stop irrigating at a time when they’d already planted and fertilized;”⁹⁴⁷

941 ENVI, [Evidence](#), 15 February 2024, 1530 (Chandra Madramootoo).

942 ENVI, [Evidence](#), 9 April 2024, 1540 (John Pomeroy).

943 ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull).

944 ENVI, [Evidence](#), 8 February 2024, 1540 (Shelley Peters).

945 ENVI, [Evidence](#), 9 April 2024, 1540 (John Pomeroy).

946 ENVI, [Evidence](#), 1 February 2024, 1645 (Coree Tull).

947 ENVI, [Evidence](#), 6 February 2024, 1740 (Mike Wei).

- The 2011 flood in the Assiniboine River basin displaced thousands of people and impacted “thousands of homes, businesses and acres of agricultural land;”⁹⁴⁸ and
- In the Nechako region, “ongoing drought and devastating wildfires have dried out critically important salmon streams across the region that are crucial to salmon recovery efforts.”⁹⁴⁹

Accurate and timely flood and drought forecasting has the potential to prevent loss of life and decrease damage caused by floods and droughts. The Committee noted that improved flood and drought forecasting in Canada could enable Canadians to take actions to prevent damage from flooding (which could in turn decrease insurance claims) and to evacuate. As explained by John Pomeroy:

Accurate flood predictions can reduce the damages. Obviously, they can't stop the rain and they can't stop the snowmelt, but they allow time for reservoirs to be operated differently, for sandbagging and other measures to be put into place, and for individuals to take action, including getting out of town. ... The expenses are dramatically reduced when adequate flood warning is provided.⁹⁵⁰

Drought is a contributing factor to wildfires. Improved drought forecasting could help Canadians better prepare for – and respond to – wildfire threats.⁹⁵¹ It could also aid farmers in selecting crops with the appropriate drought tolerance and could better inform water allocation, potentially increasing farmers’ yields. As John Pomeroy added:

With prediction, if farmers knew reliably in January what the drought situation would be, then they could plan their seeding and what they are going to do with their fields. The irrigation district could better manage what it's doing. We could reap a tremendous economic benefit and a food security benefit from this as well.⁹⁵²

C. Existing Flood and Drought Forecasting in Canada

Federal-provincial-territorial cooperation is essential to effective flood and drought forecasting. The Committee heard that flood and drought forecasting relies on two main

948 ENVI, [Evidence](#), 30 November 2023, 1240 (Wanda McFadyen).

949 ENVI, [Evidence](#), 1 February 2024, 1550 (Miki Eslake).

950 ENVI, [Evidence](#), 9 April 2024, 1640 (John Pomeroy).

951 Insurance Bureau of Canada, Correspondence to ENVI, Re: House of Commons Standing Committee on Environment and Sustainable Development Study of Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting, 8 April 2024.

952 ENVI, [Evidence](#), 9 April 2024, 1640 (John Pomeroy).



inputs: 1) weather forecasts and 2) water level and flow data. Satellite images form the basis of weather forecasting, which is a responsibility of ECCC's Meteorological Service of Canada. Water level and flow data are collected at gauges and hydrometric⁹⁵³ stations located in water bodies across Canada.⁹⁵⁴ Alain Pietroniro (Professor, Forum for Leadership on Water) explained that, "through a cost-sharing agreement that dates back to 1975,"⁹⁵⁵ the national network of hydrometric stations is co-managed by the federal, provincial and territorial governments. In his view, this successful collaborative approach "ensures consistent and standardized data collection across Canada, data that are quality-assured and readily available in real time as well as maintained in a historical archive."⁹⁵⁶ Data from provinces, territories, and the federal government need to be combined for accurate flood and drought forecasting across the Canadian landscape.

Currently, provincial and territorial capabilities in flood forecasting vary significantly, with some having advanced systems while others are lagging, particularly where resources are scarcer.⁹⁵⁷ As Dr. Pomeroy put it, "Some big, rich provinces have excellent computer models that do this. The Americans run everything on supercomputers; we don't. Some provinces are using Excel spreadsheets for their flood predictions."⁹⁵⁸ In a 2019 paper cited by a witness and in several written submissions provided to the Committee,⁹⁵⁹ *Water Security for Canadians: Solutions for Canada's Emerging Water Crisis*, Canadian water leaders warned that "managing and responding to changing water regimes, particularly extreme floods and droughts, is undermined by lack of national forecasting and prediction capabilities to support all levels of government decision-making."⁹⁶⁰

953 Hydrometric stations provide hydrometric data, that is water level and flow data (Government of Canada, [Water Level and Flow](#)).

954 ENVI, [Evidence](#), 9 April 2024, 1535 (Francis Scarpaleggia, Lac-Saint-Louis).

955 ENVI, [Evidence](#), 27 February 2024, 1545 (Alain Pietroniro, Professor, Forum for Leadership on Water).

956 Ibid.

957 ENVI, [Evidence](#), 1 February 2024, 1740 (John Pomeroy).

958 Ibid.

959 Forum for Leadership in Water, [Brief submitted to ENVI](#), 25 May 2021; Water Security for Canadians, *Renewing the Canada Water Act*, [Brief submitted to ENVI](#), 14 May 2021; AquaAction, [Brief submitted to ENVI](#), June 2021; Oliver Brandes, Written response to questions from ENVI, 26 February 2024.

960 Global Water Futures; Centre for Indigenous Environmental Resources; Forum for Leadership on Water; POLIS Water Sustainability Project, Centre for Global Studies, University of Victoria; United Nations University Institute for Water, Environment and Health; [Water Security for Canadians: Solutions for Canada's Emerging Water Crisis](#), 2019, p. 8.

The Committee acknowledges the vital flood prediction and warning work already done by the provinces and territories, and at the federal level by Agriculture and Agrifood Canada (drought monitoring), ECCC (weather forecasting and stream-flow prediction), Natural Resources Canada (floodplain mapping), and Public Safety Canada (flood warnings). The Committee is also encouraged by opportunities for improved flood and drought forecasting through increased collaboration and cooperation between these federal government departments and the provinces and territories.

1) Opportunities for Improvement in Flood and Drought Forecasting

a) Expansion of Network of Hydrometric Monitoring Stations

To provide more accurate flood and drought predictions, Canada's network of hydrometric monitoring stations may need to be expanded. Alain Pietroniro informed the Committee that the number of hydrometric monitoring stations in Canada was cut in the early 1990s and that the network of stations has not since recovered, adding:

[It's] well recognized that more [hydrometric monitoring] stations are required to effectively address Canada's current and evolving water information needs, particularly as we know that the impacts of climate change are being realized through accelerations in the water cycle, affecting floods, droughts and ecosystems. Although provincial investments in expanding the network have increased substantially—largely as a response to floods and water management challenges at the local level—overall, the number of stations has slightly decreased. This has been largely due to federally funded stations within the network being reduced substantially in the mid-1990s. ... More funding needs to be allocated for targeted network expansion.⁹⁶¹

Improved Forecasting Services to Underserved Communities

John Pomeroy noted that water flow and level gauges were initially put in big cities, therefore there are almost no flood prediction gauges currently on Indigenous lands. Expansion of the network of these monitoring systems to provide coverage of Indigenous lands could, therefore, improve flood and drought forecasting services to Indigenous communities. Rural and remote areas in general have poorer coverage with hydrometric monitoring stations, so there is opportunity to improve flood and drought prediction for these areas by expanding the network of stations. He added:

961 ENVI, *Evidence*, 27 February 2024, 1545 (Alain Pietroniro).



We need to identify the vulnerabilities of communities and focus on mitigating vulnerability, not just flood damages. It's not just money; it's people's lives.⁹⁶²

b) Greater National Coordination for Sharing of Advancements in Flood and Drought Forecasting Models

John Pomeroy identified an opportunity for Canada to adopt the sophisticated forecasting models developed by the Global Waters Futures program, which was winding down. The Global Waters Futures program was a \$78-million pan-Canadian Research program which ran from 2016 to 2025 and was funded through the Canada First Research Excellence Fund.⁹⁶³ Adopting these forecasting models would leverage investments already made in the Global Water Futures research program, while also improving Canada's flood and drought forecasting.⁹⁶⁴ Advances in forecasting allow for more sophisticated models that can cover larger areas, however this also requires data from multiple jurisdictions to be inputted and significant computational power to run the models. The need for technical and computational support in order for smaller jurisdictions to take advantage of such models was illustrated by Dr. Pomeroy:

[Global Water Futures] developed a state-of-the-art prediction system for the Yukon River basin and transferred this to the Yukon government for its operational forecasts. Technical challenges in running such a complex hydrological computer system meant that we have been running the system for the Yukon government since 2018. Remember, the Yukon territory has 40,000 people. It doesn't have the technical expertise, so far, to run a system like this without assistance. A federal-provincial-territorial co-operative system could far better ensure that resources and technologies are available to support operational forecasting and prediction from these co-developed systems.⁹⁶⁵

If the federal government provided greater federal computational support to provinces and territories, and integrated data over multiple jurisdictions, more advanced flood and drought forecasting models could be used in all provinces and territories, including those currently without sophisticated forecasting capabilities.⁹⁶⁶ The accuracy of national

962 ENVI, [Evidence](#), 1 February 2024, 1640 (John Pomeroy).

963 Global Water Futures, [Global Water Futures](#).

964 ENVI, [Evidence](#), 9 April 2024, 1635 (John Pomeroy).

965 Ibid., 1540.

966 Ibid., ENVI, [Evidence](#), 1 February 2024, 1740 (John Pomeroy).

models for flood and drought forecasting could be improved by integrated local data, hence another benefit of coordinated data-sharing across levels of government.⁹⁶⁷

Dr. Pomeroy noted that the need for and value of improved communication and collaboration was evident when the Global Water Futures program convened a meeting in 2019 with the help of Environment and Climate Change Canada and the 13 territorial and provincial forecasting groups, which had never met before.⁹⁶⁸

2) Support for Improved Environmental Risk Prediction, Including Flood and Drought Forecasting

Witnesses expressed support for a national strategy on forecasting of floods, droughts, and other natural disasters.⁹⁶⁹ Martyn Clark (Professor, Hydrology, University of Calgary, As an individual) stated that “Canada is the only G7 country without coordinated capabilities for predicting environmental risks.”⁹⁷⁰ He proposed “the creation of a Canadian co-operative institute for environmental prediction, inspired by successful models such as the cooperative institute program in the United States”⁹⁷¹ to predict floods, droughts, wildfires, severe water quality issues, and ecosystem health changes.⁹⁷² Other groups that spoke about Bill C-317 emphasized the value of including local flood and drought prediction expertise and existing initiatives in a national strategy, as well as the importance of interjurisdictional cooperation, transparency, and the sharing of standardized data.⁹⁷³

Professor James Famiglietti expressed support for continued dialogue about “national-scale flood, groundwater and water availability forecasting.”⁹⁷⁴ Merrel-Ann Phare (Commissioner, International Joint Commission, Canadian Section) agreed that there is a need for improved flood forecasting, particularly in a cross-border manner, for resilience

967 ENVI, [Evidence](#), 9 April 2024, 1535 (Francis Scarpaleggia).

968 ENVI, [Evidence](#), 9 April 2024, 1550 (John Pomeroy).

969 ENVI, [Evidence](#), 9 April 2024, 1700 (Robert Sandford); ENVI, [Evidence](#), 9 April 2024, 1655 (Cathy Orlando); ENVI, [Evidence](#), 1 February 2024, 1535 (Martyn Clark, Professor, Hydrology, University of Calgary, As an individual).

970 ENVI, [Evidence](#), 1 February 2024, 1535 (Martyn Clark).

971 Ibid.

972 Ibid.

973 Alberta Irrigation Districts Association, [Brief submitted to ENVI](#), 25 April 2024; ENVI, [Evidence](#), 9 April 2024, 1650 (Wanda McFadyen); ENVI, [Evidence](#), 9 April 2024, 1715 (Larissa Holman).

974 ENVI, [Evidence](#), 6 February 2024, 1545 (James Famiglietti).



against climate change impacts.⁹⁷⁵ Haseen Khan (Director, Water Resources Management Division, Department of Environment and Climate Change, Government of the Province of Newfoundland and Labrador) emphasized the value of technical guidance from the Government of Canada to provinces such as Newfoundland and Labrador regarding flood forecasting models.⁹⁷⁶ Heather Jirousek (Director, Water Resources, Department of Environment, Government of Yukon) advised that a national strategy on flood and drought should consider “the realities of a northern and small jurisdiction and understands the importance of supporting network expansion to meet data requirements for forecasting.”⁹⁷⁷ In agreeing to report Bill C-317 back to the House with only minor amendments,⁹⁷⁸ the Committee expressed its support for a national strategy respecting flood and drought forecasting.

14. CANADA'S WATER TECHNOLOGY SECTOR (OR WATER TECH AND INNOVATION IN CANADA)

Witnesses highlighted that innovative clean technologies related to water and wastewater could help Canada address a range of freshwater challenges. A theme that emerged from the evidence was that the potential of such “water technology” to provide environmental, economic and social benefits was underrealized in Canada.⁹⁷⁹ For example, Heather Crochetiere (Director, Industry Innovation, Foresight Canada) commented on the potential of water tech in relation to climate change and sustainable investments:

The importance of water tech is rising as an effective solution and a method of reducing the emissions intensity of water and waste-water treatment processes, as we increasingly feel the effects of climate change. Water tech is critical in the practical sense, but also has the potential to be positioned as a lucrative opportunity as climate change rises in priority among investment and impact portfolios.⁹⁸⁰

975 ENVI, [Evidence](#), 15 February 2024, 1540 (Merrell-Ann Phare).

976 ENVI, [Evidence](#), 4 June 2024, 1730 (Haseen Khan).

977 ENVI, [Evidence](#), 11 June 2024, 1735 (Heather Jirousek).

978 ENVI, Eleventh Report, [Bill C-317, An Act to establish a national strategy respecting flood and drought forecasting](#), 30 April 2024.

979 E.g., ENVI, [Evidence](#), 8 February 2024, 1535 (Alan Shapiro, Strategic Advisor, Foresight Cleantech Accelerator, BC Net Zero Innovation Network, As an individual); ENVI, [Evidence](#), 8 February 2024, 1545 (Patricia Gomez, Scientific Coordinator, Co-Founder of Clean Nature, Centre des technologies de l'eau).

980 ENVI, [Evidence](#), 8 February 2024, 1650 (Heather Crochetiere, Director, Industry Innovation, Foresight Canada).

This section explains water technology, identifies barriers to water technology development, commercialization, and adoption in Canada, and offers recommendations to address those barriers. Some of the issues and opportunities heard about water technology were similar to those heard during the Committee's study of clean technologies, for which it tabled a report in the House of Commons in 2023, *Support for Clean Technologies in Canada to Reduce Domestic and International Greenhouse Gas Emissions*.⁹⁸¹

A. Defining Water Technology

Water technology or “water tech” is clean technology related to water and wastewater. Clean technology is defined by the Government of Canada as:

- Any good or service designed with the primary purpose of contributing to remediating or preventing any type of environmental damage.
- Any good or service that is less polluting or more resource efficient than equivalent normal products that furnish a similar utility.⁹⁸²

Alan Shapiro (Strategic Advisor, BC Net Zero Innovation Network, As an individual) provided the following definition and examples of water technology:

Water technology refers to products and services that support water quality, quantity, supply and stewardship across the water cycle. This includes water treatment technologies, such as ultraviolet disinfection and sensors to detect emerging contaminants in the environment; irrigation systems to reduce agricultural water usage; and platforms to help water facilities reduce energy and chemical consumption. All of these are examples of successful water solutions developed in Canada today.⁹⁸³

Statistics Canada's Survey of Environmental Goods and Services, which measures Canada's “revenues, employment and exports from the provision of environmental and clean technology goods and services”⁹⁸⁴ includes the following as clean technologies related to water and wastewater:

981 ENVI, Report 10: [*Support for Clean Technologies in Canada to Reduce Domestic and International Greenhouse Gas Emissions*](#), October 2023.

982 Government of Canada, [*Clean Technology Data Strategy*](#).

983 ENVI, [*Evidence*](#), 8 February 2024, 1535 (Alan Shapiro).

984 Statistics Canada, [*Clean technologies and the Survey of Environmental Goods and Services: A technical reference guide*](#), 18 October 2021.



- Physical/chemical treatment of industrial wastewater;
- Centralized physical/chemical and biological treatment of sewage;
- Wastewater management system/services;
- Biological or physical/chemical treatment of groundwater, surface water, and leachate;
- Control, containment and monitoring services for water;
- Treatment of drinking water / filtration systems;
- Water efficiency (e.g., equipment to reduce water consumption, processes for desalinated water, rainwater collection);
- Measurement and control of water use; and
- Water recycling (e.g., gray water reuse; water recycling technologies).⁹⁸⁵

1) Technology Development Cycle

For any technology, including clean technology and water technology, the Government of Canada identifies the following broad technology development stages:

- Fundamental Research;
- Research and Development;
- Pilot and Demonstration; and
- Early Adoption.⁹⁸⁶

Following the completion of technology development, technology may move to the stage of being commercially available.⁹⁸⁷

985 Ibid.

986 Government of Canada, [Technology Readiness Level \(TRL\) Assessment Tool](#).

987 Ibid.

Among the stakeholders from whom the Committee heard were water technology “accelerators,” such as AquaAction, Centre des technologies de l’eau, and Foresight.⁹⁸⁸ Such groups bring together stakeholders and facilitate connections in order to accelerate the adoption of innovative water technologies.⁹⁸⁹ Foresight, “Canada’s largest cleantech innovation and adoption accelerator,”⁹⁹⁰ has a branch dedicated to water technology, WaterNEXT. This branch works “across multiple water sectors, from resources to utilities, [to] bring together stakeholders ... to accelerate the commercialization and adoption of innovative technologies to serve the world's most pressing water challenges.”⁹⁹¹

B. Addressing Barriers to Water Technology Development and Adoption in Canada

Witnesses noted that the landscape for water technology development, adoption and commercialization in Canada presents some barriers to be addressed. Some witnesses identified that Canada has gaps to fill in terms of government support for water tech innovation, be it through funding programs, procurement opportunities, appropriate regulatory frameworks, or environmental or economic incentives.⁹⁹² Others highlighted the challenges that entrepreneurs face in securing financing to bring water tech innovations to market in Canada.⁹⁹³

Alan Shapiro characterized Canada’s water tech landscape and challenges as follows:

While Canada has strong foundations in water research and innovation, domestic technology adoption continues to be a major challenge. Studies identify risk aversion, conservative procurement processes, and poor environmental and economic incentives as barriers. Under current conditions, Canadian technology frequently needs to find an export market in order to be tested and deployed. A lack of local adoption opportunities limits the environmental and economic potential of these solutions. Local governments in particular are significantly under-resourced for making water-related investments.⁹⁹⁴

988 ENVI, [Evidence](#), 8 February 2024.

989 Foresight Canada, [Brief submitted to ENVI](#), 20 February 2024.

990 Ibid.

991 ENVI, [Evidence](#), 8 February 2024, 1650 (Heather Crochetiere).

992 ENVI, [Evidence](#), 8 February 2024, 1650 and 1720 (Heather Crochetiere); ENVI, [Evidence](#), 8 February 2024, 1535 (Alan Shapiro); ENVI, [Evidence](#), 8 February 2024, 1545 (Patricia Gomez); ENVI, [Evidence](#), 8 February 2024, 1640 (Soula Chronopoulos, President, AquaAction).

993 ENVI, [Evidence](#), 8 February 2024, 1545 (Patricia Gomez); ENVI, [Evidence](#), 8 February 2024, 1640 (Soula Chronopoulos).

994 ENVI, [Evidence](#), 8 February 2024, 1535 (Alan Shapiro).



1) Support for Research and Development in Water Technology

The Committee heard that, generally, Canada provides better support for the earlier stages of technology development (e.g., research and development) than it does for the later stages (e.g., adoption and commercialization).⁹⁹⁵ According to Alan Shapiro, “[f]ederal funding is being put into research and innovation, but not enough federal funding is being put into technology adoption.”⁹⁹⁶ Patricia Gomez (Scientific Coordinator, Co-Founder of Clean Nature, Centre des technologies de l'eau) described a “severe shortage of support for promising and innovative ideas” and the need to support “technology acceleration and transfer.”⁹⁹⁷

In his brief to the Committee, Chandra Madramootoo (Distinguished James McGill Professor, McGill University) noted that there were numerous ways for the federal government to better support freshwater-related research and development, including through the National Research Council. However, he cautioned that “the development of only one centre of excellence or expertise to service the entire country” is “unrealistic,”⁹⁹⁸ advising that regional problems require research and development solutions to be developed regionally.⁹⁹⁹ Soula Chronopoulos (President, AquaAction) suggested that the National Research Council provide a research and development facility “specifically for water technology” to “enable innovators to conduct testing and validation of their technologies.”¹⁰⁰⁰

Recommendation 68

That the National Research Council explore establishing research and development facilities specifically focused on the development and testing of water technology products and services.

995 ENVI, [Evidence](#), 8 February 2024, 1545 (Patricia Gomez).

996 ENVI, [Evidence](#), 8 February 2024, 1600 (Alan Shapiro).

997 ENVI, [Evidence](#), 8 February 2024, 1545 (Patricia Gomez).

998 Chandra Madramootoo, [Brief submitted to ENVI](#), 11 June 2021.

999 Ibid.

1000 ENVI, [Evidence](#), 8 February 2024, 1640 (Soula Chronopoulos).

2) Support for Adoption and Commercialization of Water Technology

Heather Crochetiere noted that the Canadian market tends to be slow to adopt “novel solutions.”¹⁰⁰¹ Some witnesses lamented that Canadian water tech should not need to be proven successful abroad in order to be embraced domestically.¹⁰⁰² The Committee heard about opportunities for the Government of Canada to better support the later stages of water technology development, and the adoption and commercialization of that technology.

Heather Crochetiere suggested that the Government of Canada could “de-risk novel technologies” by supporting Canadian pilot and demonstration projects for water technology.¹⁰⁰³ Municipal, provincial, territorial and the federal governments need to adopt less prescriptive and more risk tolerant procurement policies that favour innovation and high environmental performance.¹⁰⁰⁴ Ms. Crochetiere also suggested that “developing water standards in environmental regulations ... would push Canadian industries to adopt those cleaner technologies here at home and give our Canadian entrepreneurs an opportunity.”¹⁰⁰⁵

Witnesses also noted how supporting water tech commercialization will create other economic benefits. For example, in its brief, AquaAction discussed the “significant” benefits resulting from AquaEntrepreneur, a water tech commercialization pilot program in Quebec. This pilot program directly engages with municipal water managers to implement water tech solutions to solve local problems.¹⁰⁰⁶ According to AquaAction, the economic benefits of this program include reduced infrastructure and maintenance costs, among others.¹⁰⁰⁷ It emphasized the importance of working across levels of government and industry to further water tech demonstration and commercialization:

The importance of local initiatives and the crucial role of provinces and municipalities, such as the Federation of Canadian Municipalities, cannot be understated. The federal government must also find ways to incentivize watertech projects with municipalities

1001 ENVI, [Evidence](#), 8 February 2024, 1650 (Heather Crochetiere).

1002 E.g., ENVI, [Evidence](#), 8 February 2024, 1535 (Alan Shapiro).

1003 ENVI, [Evidence](#), 8 February 2024, 1650 (Heather Crochetiere).

1004 Ibid.

1005 Ibid.

1006 AquaAction, [Brief submitted to ENVI](#), October 2023.

1007 Ibid.



and industry stakeholders to facilitate young innovators' access to real-world water-related test sites in our towns and cities.¹⁰⁰⁸

In order to facilitate connecting innovators and markets, Soula Chronopoulos recommended increasing support for water tech accelerators at both the federal and provincial levels, through “targeted performance-based grant programs for enablers like AquaAction, Cteau and Foresight across Canada.”¹⁰⁰⁹ Patrica Gomez agreed, stating that

there aren't enough technology acceleration resources for Canada to become a leader in the water sector and use the best technologies to protect this resource. The risk is that Canada will lose out on promising ideas and technologies.¹⁰¹⁰

Recommendation 69

That the Government of Canada better support the commercialization of clean technology to monitor and improve water quality.

Recommendation 70

That the Government of Canada provide more direct support to water technology accelerators, including matching funds for provincial investments in water start-ups, and in the form of grants and low-interest repayable loans, to water technology enablers and accelerators such as AquaAction, McGill's Dobson Center for Entrepreneurship, Ontario's MaRS Discovery District, and ForeSight.

Recommendation 71

That the Government of Canada work with the Federation of Canadian Municipalities to expand the scope of the Green Municipal Fund to include funding for water technology pilot projects at the municipal level.

1008 Ibid.

1009 ENVI, [Evidence](#), 8 February 2024, 1640 (Soula Chronopoulos).

1010 ENVI, [Evidence](#), 8 February 2024, 1545 (Patricia Gomez).

3) Ensuring Canada Retains Water Technology Entrepreneurs and Remains Competitive with the United States

“Due to a lack of focused and specific federal support for watertech innovation, Canada’s water innovators are at risk of draining south into more enticing jurisdictions outside of Canada, along with their start-ups, [intellectual property], and jobs.”¹⁰¹¹

AquaAction

Witnesses expressed concern that a lack of domestic support can hamper the Canadian water tech sector and force entrepreneurs to look to other countries, in particular, the United States. Soula Chronopoulos (President, AquaAction) encouraged greater fiscal incentives, such as tax credits, to improve Canada’s attractiveness to water tech innovators.¹⁰¹² Ms. Chronopoulos suggested that federal funding programs for water tech be designed in such a way as to encourage recipients to stay in Canada:

I think what we have to do is that if we fund accelerators and entrepreneurs, we should be signing agreements with them and saying, “Hey, if you're receiving federal funding, you should be staying in Canada for five years—otherwise, you pay that back.” What we're doing right now is that we're giving them money, they're getting greater job offers and incentives from everywhere else and they're leaving. That's why we're losing them.¹⁰¹³

In order to better align Canada’s support for water tech with that of the United States, the Committee recommends:

Recommendation 72

That the Government of Canada extend the new Clean Technology Manufacturing Investment Tax Credit to encourage water technology investment, as was done by the United States Department of Commerce.

1011 AquaAction, [Brief submitted to ENVI](#), 8 February 2024.

1012 ENVI, [Evidence](#), 8 February 2024, 1640 (Soula Chronopoulos).

1013 Ibid., 1740.



Recommendation 73

That Innovation, Science and Economic Development Canada compile a comprehensive inventory of United States federal and state government programs available to support that country’s water technology sector, including grants, low-cost repayable loans, tax credits, and “buy American” policies, in order to assess Canada’s relative competitiveness.

4) Inclusion of Technology in Freshwater Policy

Some witnesses and authors of briefs raised concerns that water tech appeared to be absent from the Government of Canada’s freshwater policies and priorities.¹⁰¹⁴ Others saw the Canada Water Agency as an opportunity for better integration of water tech in federal freshwater policy.¹⁰¹⁵ The Committee supports coordinating water tech programs and freshwater policy to more fully harness the potential of water tech to address freshwater issues, while offering economic opportunities for Canadian innovators.

Recommendation 74

That the Government of Canada ensure coordination between Innovation, Science and Economic Development Canada’s clean technology programs and the Canada Water Agency’s efforts in freshwater protection.

C. Conclusion: Canada’s Water Technology Sector

The Committee was impressed by the potential of Canadian entrepreneurs to innovate water technology solutions to a range of freshwater challenges. However, the Committee acknowledges that many water technology innovators may not be receiving the support they need within Canada to fully develop and commercialize their ideas. Deploying water technology where it is needed presents an economic opportunity for innovators while providing society with environmental benefits. It is in our collective best interests to better support and commercialize Canadian water technology innovations, so that they can improve freshwater outcomes within Canada and, when they are exported, abroad.

1014 E.g., ENVI, [Evidence](#), 8 February 2024, 1535 (Alan Shapiro); AquaAction, [Brief submitted to ENVI](#), 8 February 2024.

1015 ENVI, [Evidence](#), 8 February 2024, 1600 (Patricia Gomez); ENVI, [Evidence](#), 8 February 2024, 1640 (Soula Chronopoulos).

15. CANADA'S FRESHWATER ON THE INTERNATIONAL STAGE

The Committee heard from a number of witnesses about the threats to water globally, and about the potential for Canada to contribute internationally. Areas where witnesses suggested that Canada's role could be strengthened include management of transboundary freshwater, development of water-related technology, and international development.

A. Global Threats to Freshwater

Safe and clean drinking water is essential to human life and health, but for over two billion people globally, it is not readily available.¹⁰¹⁶ Climate change adds additional threats to drinking water access, particularly for the world's most vulnerable populations.¹⁰¹⁷ Chandra Madramootoo, Distinguished James McGill Professor, McGill University, told the Committee:

First, water security is at the nexus of climate change and national security. The effects of climatic change are already seen through a higher frequency of hydro-climatic disasters, notably floods, droughts and land degradation. The World Bank estimates that roughly 1.6 billion people live in countries with water scarcity, and that number could double in two decades.¹⁰¹⁸

Beth Parker stated that "climate change, increasing demand for food and energy production, and natural resource extraction are creating a global water crisis."¹⁰¹⁹ James Famiglietti told the Committee that freshwater availability globally "is literally shrinking in the face of climate change and a growing population."¹⁰²⁰ A number of other witnesses expressed the view that the climate crisis is a water crisis.¹⁰²¹

1016 Office of the United Nations (UN) High Commissioner for Human Rights, *OHCHR and the rights to water and sanitation*.

1017 UN Educational, Scientific and Cultural Organization, *Water and Climate Change*, 2020, pp. 11 and 179.

1018 ENVI, *Evidence*, 15 February 2024, 1530 (Chandra Madramootoo).

1019 ENVI, *Evidence*, 6 February 2024, 1710 (Beth Parker).

1020 ENVI, *Evidence*, 6 February 2024, 1545 (James Famiglietti).

1021 ENVI, *Evidence*, 1 February 2024, 1550 (Miki Eslake); ENVI, *Evidence*, 1 February 2024, 1645 (Coree Tull); ENVI, *Evidence*, 8 February 2024, 1530 (Oliver Brandes); ENVI, *Evidence*, 8 February 2024, 1640 (Soula Chronopoulos); The Canadian Coalition for Healthy Waters, *Brief submitted to ENVI*, undated, published on ENVI website 4 April 2024.



In its 2021 brief, UNU-INWEH outlined the United States' response to that perceived crisis, noting that the US had a global water strategy for 2022-2027.¹⁰²²

A recently released US Global Water Strategy explicitly recognizes that a growing global water crisis may undermine economic growth, foster insecurity and state failure, and have adverse impact on US national interests. To address this global challenge, the US will aim to increase sustainable access to safe drinking water and sanitation services; encourage the sound management and protection of freshwater resources; promote cooperation on shared waters, and strengthen water-sector governance, financing, and institutions. The US will provide technical assistance; make targeted investments in sustainable infrastructure and services; promote science, technology and information; mobilize financial resources; engage diplomatically; and strengthen partnerships and intergovernmental organizations. Implementation of this Strategy will be coordinated through an Interagency Water Working Group comprised of representatives from 17 different US federal agencies.¹⁰²³

Global Affairs Canada told the Committee in its 2024 written submission that:

Global Affairs Canada is aware of the U.S. Global Water Strategy and is not working on a similar strategy. However, water figures prominently in the Government of Canada's approach to international assistance. Our development and humanitarian programs support access to water sanitation and hygiene (WASH), access to water for agriculture, disaster risk reduction, and climate change resilience, including nature-based solutions and biodiversity. ... Since 2000, the Government of Canada has invested more than \$1.5 billion in support of water and sanitation initiatives in developing countries.¹⁰²⁴

1) Sustainable Development Goals Related to Freshwater

Through the United Nations Sustainable Development Goals (SDGs), nations have committed to efforts that would protect water for all, including for non-human life, on earth.

Canada, along with 192 other United Nations member states, adopted the 2030 Agenda for Sustainable Development in 2015.¹⁰²⁵ Two of the SDGs relate directly to freshwater:

1022 Government of the United States, [U.S. Government Global Water Strategy 2022–2027](#).

1023 United Nations University Institute for Water, Environment and Health (UNU-INWEH), [Brief submitted to ENVI](#), April 2021, p. 2.

1024 Global Affairs Canada, Written response to questions from ENVI, 2024, p. 18.

1025 Government of Canada, [The 2030 Agenda Sustainable Development](#).

- SDG 6, Clean Water and Sanitation, aims to: Ensure availability and sustainable management of water and sanitation for all;¹⁰²⁶ and
- SDG 15, Life on Land, aims to: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.¹⁰²⁷

In Canada's Federal Sustainable Development Strategy for 2022–2026, *Achieving a Sustainable Future*, the federal government outlines its efforts to achieve the goals in Canada, including via Goal 6: Ensure clean and safe water for all Canadians and Goal 15: Protect and recover species, conserve Canadian biodiversity.¹⁰²⁸

The web page *Canada and the Sustainable Development Goals* outlines federal actions that are intended to help achieve these goals both in Canada and internationally.¹⁰²⁹

Robert Sandford, Kaveh Madani (Director, United Nations University Institute for Water, Environment and Health), and Chandra Madramootoo, suggested that Canada has potential to achieve these goals and also to help others meet the water-related SDGs.¹⁰³⁰

B. Freshwater Solutions: Canadian Leadership Opportunities Internationally

In their 2024 brief, Robert Sandford and Kaveh Madani of the United Nations University Institute for Water, Environment and Health (UNU-INWEH) wrote about what they see as a global water crisis, and Canada's potential role in responding accordingly:

The huge geography of Canada and the wide range of water issues it has had [to deal with] and will continue to deal with in a warming world uniquely positions Canada to lead a new narrative on the global water crisis. Because of its wide-ranging experience with industrialized agriculture, protecting wetlands, managing some of the world's largest forests, dealing with snow and ice, optimizing hydropower generation, while at

1026 UN, Sustainable Development Goals, [*Goal 6: Ensure access to water and sanitation for all.*](#)

1027 UN, Sustainable Development Goals, [*Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.*](#)

1028 Government of Canada, [*Federal sustainable development strategy.*](#)

1029 Government of Canada, [*Canada and the Sustainable Development Goals.*](#)

1030 Robert Sandford and Kaveh Madani, United Nations University Institute for Water, Environment and Health (UNU-INWEH), [*Brief submitted to ENVI*](#), undated, published on the ENVI website 15 February 2024, p. 1; Professor Chandra A. Madramootoo, [*Brief submitted to ENVI*](#), 11 June 2021, p. 8.



the same time working to improve the lives and advancing reconciliation with more than 600 differing Indigenous peoples, the potential exists, in fact, for Canada to become a leader in helping the world [come] together by advancing integrating solutions through dialogue that will help nations around the world deal with their own water challenges.¹⁰³¹

They went on: “Canada definitely should and can play a greater role internationally in helping find solutions to the challenge of global freshwater security—through both government and the private-sector involvement.”¹⁰³²

1) Managing Transboundary Waters: Canadian Expertise

Global Affairs Canada is responsible for the management of transboundary water resources with the United States (also discussed in chapter on shared jurisdiction).

Robert Sandford noted, “water is already a pillar of Canada’s foreign policy and has been so for more than a century. Since the signing of the boundary waters treaty in 1909, Canada and the United States have shown the entire world how water can be peaceably shared through co-operation.”¹⁰³³

2) Canada’s International Assistance Related to Freshwater

Internationally, Canada spent approximately \$100 million between 2015 and 2020 on international assistance for water infrastructure, and has also provided funding through the International Development Research Centre to support research on water-related issues.¹⁰³⁴

As described by Global Affairs Canada, water is a focus of Canada’s international development assistance:

[Water] figures prominently in the Government of Canada’s approach to international assistance. Our development and humanitarian programs support access to water sanitation and hygiene (WASH), access to water for agriculture, disaster risk reduction, and climate change resilience, including nature-based solutions and biodiversity. Canada supports the United Nations General Assembly Resolution 64/292, which recognizes the

1031 Robert Sandford and Kaveh Madani, United Nations University Institute for Water, Environment and Health (UNU-INWEH), [Brief submitted to ENVI](#), undated, published on the ENVI website 15 February 2024, p. 1.

1032 United Nations University Institute for Water, Environment and Health (UNU-INWEH), [Brief submitted to ENVI](#), April 2021, p. 2.

1033 ENVI, [Evidence](#), 15 February 2024, 1535 (Robert Sandford).

1034 Government of Canada, [Sustainable Development Goal 6: Clean water and sanitation](#).

human right to water and sanitation, and that clean drinking water and sanitation are essential to the realization of all human rights. Since 2000, the Government of Canada has invested more than \$1.5 billion in support of water and sanitation initiatives in developing countries.¹⁰³⁵

An example of a water and sanitation initiative supported by the Government of Canada is “Women-Led WASH for Healthy Homes,” implemented by Centre for Affordable Water and Sanitation Technology in Ethiopia. Canada provided \$1,911,441 for this from 2021 to 2025.¹⁰³⁶

In its written response to questions from the Committee, Environment and Climate Change Canada (ECCC) added the following regarding Canada’s engagement on international:

- “G20 Dialogue on Water;
- World Meteorological Organization (WMO), the primary United Nations agency for hydrological services in support of the Global Water Agenda;
- Organization for Economic Co-operation and Development (OECD) through the Working Party on Biodiversity, Water and Ecosystems (WPBWE);
- Convention on Biological Diversity;
- United Nations Environment Program (UNEP);
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention);
- UNESCO’s Intergovernmental Hydrological Programme.”¹⁰³⁷

Chandra Madramootoo (Distinguished James McGill Professor, McGill University) spoke to the Committee about water and food security, and what he felt Canada’s role should be:

1035 Global Affairs Canada, Written response to questions from ENVI, 2024, p. 18.

1036 Government of Canada, *2019 Call for Concept Notes—Development Impact Window—Canadian Small and Medium Organizations for Impact and Innovation—Selected Projects*.

1037 Environment and Climate Change Canada, Written response to questions from ENVI, 2021, p. 17.



Agriculture uses about 70% of global water withdrawals. In water- stressed basins, such as the Aral Sea and the Nile, agriculture consumes as much as 90% of water supplies to meet irrigation demands. Canada, at one time, was a significant donor to agricultural water projects in developing regions. Sadly, this is no longer the case, and Canada has lost its voice in major water fora dedicated to agricultural water use.¹⁰³⁸

He continued to underscore the contributions Canada can make:

Canada's innovations in irrigation water management and modern technologies for the drainage of agricultural lands are world-renowned. Canada is well positioned to disseminate knowledge and provide expertise in climate-smart agriculture for food-insecure regions of sub-Saharan Africa, central Asia, Latin America, the Middle East and north Africa. Interventions that build resilience to drought, water scarcity, land degradation and floods—with women at the core—ought to be promoted with our development partners. It is essential to strengthen existing platforms, such as the global framework on water scarcity in agriculture, WASAG, hosted by the Food and Agriculture Organization of the United Nations. Technical leadership from Canada is urgently sought in the WASAG, aimed at the world's arid and semi-arid regions where the poorest of the poor reside.¹⁰³⁹

3) Private Sector Activities Related to Freshwater

The Committee heard many examples of ways in which water-related technology could be beneficial. For example, Mathieu Laneuville, (President and Chief Executive Officer, Réseau Environnement) described research results that showed that each dollar invested in municipal water processing infrastructure resulted in a return on investment of \$1.72, taking into account the benefits of clean drinking water to human health.¹⁰⁴⁰

In its brief, GAC explained some of the work Canada is already doing:

The [Trade Commissioner Service (TCS)] has more than 1,000 trade commissioners in over 160 cities around the world. Over 100 directly support Canadian environmental and clean technology (ECT) businesses (including those in the water, wastewater and sanitation subsectors) to enter, or scale up in international markets. TCS services to these firms help them prepare for international markets, assess market potential, find qualified contacts and resolve business problems.¹⁰⁴¹

It then provided further details about Canada's contributions to global solutions:

1038 ENVI, [Evidence](#), 15 February 2024, 1530 (Chandra Madramootoo).

1039 Ibid.

1040 ENVI, [Evidence](#), 8 February 2024, 1655 (Mathieu Laneuville).

1041 Global Affairs Canada, Written response to questions from ENVI, 2024, p. 14.

Canada is a world leader in the development of advanced water, wastewater and sanitation technologies ... Canada has a strong global niche in disinfection technologies, wastewater reuse with membrane filtration, and wastewater treatment solutions for oil and gas and mining. ... Canadian exporters of these internationally recognized water management solutions are well positioned to address global challenges and assist like-minded countries' efforts to achieve international sustainability targets.¹⁰⁴²

The Committee heard from AquaAction, an organization that aims to enable “emerging water tech enterprises across Canada,”¹⁰⁴³ that the Government of Canada programs have helped clean tech exports grow,¹⁰⁴⁴ that employment in the water sector in Canada is growing rapidly, and that “the Canadian water industry is currently benefitting from a spur in the development and application of innovative technological tools, applications, and approaches.” AquaAction argued that “[f]ederal government investment in enabler organizations such as AquaAction that support the emergence, growth, and development of water tech enterprises is key for this nascent sector in Canada to thrive.”¹⁰⁴⁵

Alan Shapiro, Strategic Advisor, BC Net Zero Innovation Network, emphasized the importance of including freshwater, and not just oceans, in all thinking about the “blue economy:”

“Blue economy” refers to the sustainable use and conservation of ocean and freshwater resources to support jobs and economic growth. Despite Canada's established brand as a global water leader, Fisheries and Oceans Canada's blue economy strategy has been framed as “an opportunity to harness [Canada's] ocean growth potential”. This oceans-only blue economy definition sidelines fresh water, a massive omission given that the Great Lakes alone generate more than 1.5 million jobs and \$60 billion in annual wages across Canada and the U.S.¹⁰⁴⁶

Coalition Navigation suggested in its brief that freshwater solutions developed in Canada are easily transferable outside the Canadian context, and suggested that “financial institutions could set up programs to finance expertise export initiatives that promote international cooperation.”¹⁰⁴⁷

1042 Ibid.

1043 AquaAction, [Brief submitted to ENVI](#), June 2021, p. 3.

1044 Ibid., p. 5.

1045 Ibid., p. 2.

1046 ENVI, [Evidence](#), 8 February 2024, 1535 (Alan Shapiro).

1047 Coalition Navigation, [Brief submitted to ENVI](#), 11 June 2021, p. 6.



C. Conclusion: Canadian Leadership Potential in International Freshwater Issues

The Forum for Leadership on Water (FLOW) recommended in its brief that the federal government consider “global water leadership”¹⁰⁴⁸ as one of its main priorities in relation to water, suggesting that “addressing water issues on a global scale may well become a lynchpin to an equitable, prosperous, and sustainable future.”¹⁰⁴⁹

Gregory McClinchey suggested that water could be seen as a foreign policy priority,¹⁰⁵⁰ as did Kaveh Madani, who suggested that it could be used “for peacebuilding and to establish Canada as a leader in the water space.”¹⁰⁵¹ He explained: “[t]he experience of dealing with the most diverse range of water management problems has equipped Canada with the expertise and reputation needed to guide and set an effective solution path for the world.”¹⁰⁵²

Canada, as a freshwater nation,¹⁰⁵³ has opportunities for international leadership based on the country’s reality and experience.¹⁰⁵⁴

Recommendation 75

That the Government of Canada make addressing the global water crisis a foreign policy objective with a view to helping the world strengthen food security and gender equality and promote conflict resolution between countries that share water resources; that in pursuing a water-related foreign policy, the government collaborate with the Canada-based United Nations University Institute for Water, Environment and Health, the International Development Research Centre, and the International Institute for Sustainable Development.

1048 Forum for Leadership on Water (FLOW), [Brief submitted to ENVI](#), 25 May 2021, p. 5.

1049 Ibid.

1050 ENVI, [Evidence](#), 15 February 2024, 1705 (Gregory McClinchey).

1051 ENVI, [Evidence](#), 15 February 2024, 1645 (Kaveh Madani, Director, United Nations University Institute for Water, Environment and Health).

1052 Ibid.

1053 E.g., Conservation Ontario, [Brief submitted to ENVI](#), 25 May 2021, p. 5.

1054 See, for example, Forum for Leadership on Water (FLOW), [Brief submitted to ENVI](#), 25 May 2021; ENVI, [Evidence](#), 15 February 2024, 1705 (Gregory McClinchey, Director, Policy and Legislative Affairs, Great Lakes Fishery Commission); ENVI, [Evidence](#), 15 February 2024, 1645 (Kaveh Madani, Director, United Nations University Institute for Water, Environment and Health).

Recommendation 76

That the Government of Canada follow up on commitments made at the G7 Climate, Energy and Environment Ministers' Meeting (Torino, April 29–30, 2024) to identify common goals and strategies among G7 nations for helping to address the global water crisis.

Recommendation 77

That the Government of Canada collaborate with the United Nations University Institute for Water, Environment and Health and other Canada-based entities to establish a global water innovation hub to promote Canadian companies and academic institutions and the solutions they offer to the global water crisis; that this hub also assist with the transfer of knowledge and expertise from the Canadian water sector to those involved in water management and protection in other countries, especially developing countries.

Recommendation 78

That the Government of Canada take an active role in the next United Nations Water Conference in 2026 co-hosted by Senegal and the United Arab Emirates in 2026 and take steps to host or co-host the next UN Water Conference in 2028 or 2029.

Recommendation 79

That the Government of Canada, as part of efforts to promote Canada as a global water leader, create an international twinning program for Canadian water utilities, including those operating in or on behalf of First Nations, to assist utilities in developing countries with adopting best practices and technologies.

Recommendation 80

That the Government of Canada place a priority on promoting Canada's status as a global water nation and leader by engaging systematically, on an ongoing basis, with all international agencies involved in advancing the international water agenda.

Recommendation 81

That, in future, the Government of Canada actively participate in all international freshwater conferences and relevant fora.



Recommendation 82

That the Government of Canada, through Global Affairs Canada, develop and publish a global water strategy, on the model of the U.S. Global Water Strategy, that seeks to outline and promote Canada's foreign policy interests related to freshwater; that this strategy be tied in part to the export interests of Canada's watertech sector and to Canada's reputation for promoting global peace and security, in this case water security.

16. THE CANADA WATER AGENCY

“Water-related problems have never been as frequent, intense and complex. This is a fact. While water governance tools have not yet been adapted to grasp the implications of these problems, we are living in a time of political and legal transformation that has not been seen in Canada for almost 50 years. The creation of the Canada Water Agency, the implementation of the freshwater action plan, and the modernization of the *Canada Water Act* are all initiatives that may make it possible to remodel the legal and political water governance landscape.”¹⁰⁵⁵

Alexandre Lillo, Law Professor,
Université du Québec à Montréal, As an individual

While the Committee was engaged with its study on freshwater, the Government of Canada was working to develop the Canada Water Agency and Parliament studied its enabling legislation. The Committee heard much commentary on the Canada Water Agency's mandate, structure, operations, and responsibilities.

A. Background on the Creation of the Canada Water Agency

In his [2019 mandate letter](#), the Prime Minister mandated the Minister of Environment and Climate Change to create a new Canada Water Agency. The Global Water Futures

¹⁰⁵⁵ ENVI, [Evidence](#), 21 November 2023, 1105 (Alexandre Lillo).

program, in collaboration with other water stakeholder groups,¹⁰⁵⁶ convened national discussions and webinars starting in May 2020 to inform the development of the Canada Water Agency.¹⁰⁵⁷ Environment and Climate Change Canada released [*Toward the Creation of a Canada Water Agency: Discussion Paper*](#) in December 2020 to support public consultation on the development of the Canada Water Agency. A report summarizing the input received, [*Toward the creation of a Canada water Agency: stakeholder and public engagement – What we heard*](#), was published in 2021.

Legislation to establish the Canada Water Agency as a stand-alone entity, reporting to the Minister of Environment and Climate Change Canada, was contained within [*Bill C-59, An Act to implement certain provisions of the fall economic statement tabled in Parliament on November 21, 2023 and certain provisions of the budget tabled in Parliament on March 28, 2023*](#). Bill C-59 was tabled in the House of Commons on 30 November 2023, completed third reading in the House of Commons on 28 May 2024, completed third reading in the Senate of Canada on 19 June 2024, and received Royal assent on 20 June 2024.

The Canada Water Agency is headquartered in Winnipeg, with regional offices across Canada. Daniel Wolfish described how:

The Canada [W]ater [A]gency has a mandate to improve freshwater management in Canada by providing leadership, effective collaboration federally, and improved coordination and collaboration with provinces, territories and [I]ndigenous peoples to proactively address national and regional transboundary water challenges and opportunities.¹⁰⁵⁸

In addition to delivering the Freshwater Action Plan, a program to improve freshwater outcomes in waterbodies of national significance, and leading the modernization of the [*Canada Water Act*](#), the Canada Water Agency:

- provides policy leadership and develops whole-of-government approaches to freshwater challenges and opportunities;

1056 Other groups which organized the national discussions included Massey College, Forum for Leadership on Water, Centre for Indigenous Environmental Resources, POLIS Project on Ecological Governance at University of Victoria, United Nations University Institute for Water, Environment and Health, de Gaspé Beaubien Foundation, and AquaForum. (Global Water Futures, [*Designing the Canada Water Agency: What we Heard*](#).)

1057 Global Water Futures, [*Designing the Canada Water Agency: What we Heard*](#).

1058 ENVI, [*Evidence*](#), 24 October 2023, 1105 (Daniel Wolfish).



- makes it easier for Canadians and decision-makers to find federal freshwater resources;
- promotes federal-provincial-territorial collaboration;
- supports Canada–U.S. collaboration on transboundary waters;
- provides opportunities and funding to support Indigenous inclusion and participation in freshwater activities;
- leverages freshwater science and data to improve policy and program outcomes;
- reports regularly on the state of freshwater quality, quantity, availability and use in Canada; and
- supports the development of the National Freshwater Data Strategy in collaboration with key partners and stakeholders, which will provide guidance for the management of freshwater data and ultimately enable decision-makers to better use data for timely and effective decision making.¹⁰⁵⁹

B. Commentary on the Role and Mandate of Canada Water Agency

Witnesses and authors of briefs explained how the implementation of a Canada Water Agency could help address some of the systemic issues in water governance in Canada, and that the following could be achieved:

- Facilitating federal departments working together, rather than in isolation or “silos”,¹⁰⁶⁰
- Improving coordination and collaboration between federal, provincial, municipal/ regional, and Indigenous levels of government;¹⁰⁶¹

1059 Government of Canada, [Canada Water Agency](#).

1060 ENVI, [Evidence](#), 2 November 2023, 1220 (Robert Haller); Coalition Navigation, [Brief submitted to ENVI](#), 20 March 2024.

1061 ENVI, [Evidence](#), 21 November 2023, 1105 (Alexandre Lillo); ENVI, [Evidence](#), 21 November 2023, 1210 (Andrew Stegemann); ENVI, [Evidence](#), 23 November 2023, 1210 (Tyler McCann); Ducks Unlimited Canada, [Brief submitted to ENVI](#), 22 June 2023.

- Facilitating water management across borders (e.g., enabling Ontario's conservation authorities to work with Quebec's regional governance model on transboundary waters);¹⁰⁶²
- Increasing coordination of federal and other government funding programs to more effectively achieve improved freshwater outcomes and meet specific goals (e.g., increased watertech).¹⁰⁶³
- Leverage existing work, including that undertaken by grassroots organizations and academics.

Daniel Wolfish explained that a key function of the Canada Water Agency could be to provide a single point of entry for the numerous federal departments and agencies with responsibilities for freshwater:

We provide an opportunity, a single window, for the provinces or territories to engage with us on questions so that we can then navigate the federal system with them. We won't have all the tools all the time. We won't have all the solutions, but our job is to help figure that out for Canadians, creating a portal site—what we would call a “one window on water” or WOW—to help Canadians navigate the system, to get information and to connect with where the appropriate information and responsibilities lie.¹⁰⁶⁴

Mr. Wolfish noted that the Canada Water Agency aims to leverage existing mechanisms for interjurisdictional cooperation, such as the Canadian Council of Ministers of the Environment,¹⁰⁶⁵ Canada's “minister-led intergovernmental forum for collective action on environmental issues of national and international concern.”¹⁰⁶⁶

The full implementation of the Canada Water Agency could fill gaps in monitoring, research, and policy from a national perspective.¹⁰⁶⁷ Witnesses recommended that the Canada Water Agency leverage and engage with existing groups that study and manage freshwater, including grassroots organizations, in order to avoid duplication of effort

1062 ENVI, [Evidence](#), 12 December 2023, 1305 (Mathieu Madison).

1063 ENVI, [Evidence](#), 2 November 2023, 1235 (Robert Haller); AquaAction, [Brief submitted to ENVI](#), 8 February 2024; de Gaspé Beaubien Foundation, [Brief submitted to ENVI](#), December 2023; Foresight Canada, [Brief submitted to ENVI](#), 20 February 2024.

1064 ENVI, [Evidence](#), 11 June 2024, 1710 (Daniel Wolfish).

1065 Ibid., 1155.

1066 Canadian Council of Ministers of the Environment, [CCME](#).

1067 ENVI, [Evidence](#), 30 January 2024, 1715 (Amélie Delage).



while also ensuring better, more coordinated results.¹⁰⁶⁸ As expressed by Scott Higgins, Senior Research Scientist, Experimental Lakes Area, International Institute for Sustainable Development:

Between climate change, increased rainfall and flooding in parts of the country, and increased risks of droughts in other parts of the country, water quantity is going to be a critical aspect of what the Canada [W]ater [A]gency should do. I really think its role needs to be to bring together these disparate groups in order to target issues that are of national importance. There are already many groups working on water across Canada: This work doesn't need to be duplicated, but it needs to be strengthened, and we need a national picture.¹⁰⁶⁹

Many authors of briefs and witnesses identified an opportunity for the Canada Water Agency to improve access to water data in Canada and to facilitate the sharing of high-quality community-based monitoring data to inform decision makers.¹⁰⁷⁰ Specifically, DataStream emphasized the need for consistency in “data across departments, programs, and jurisdictions”¹⁰⁷¹ and argued “that all data collected using public funds [should be] publicly available.”¹⁰⁷² The Committee was encouraged to see the Canada Water Agency leading the development of a National Freshwater Data Strategy to “establish guidelines and principles for how freshwater information should be organized, stored, and shared in Canada.”¹⁰⁷³

A number of witnesses and authors of briefs suggested that the Canada Water Agency was well-placed to advance reconciliation with Indigenous peoples, such as through applying the *United Nations Declaration on the Rights of Indigenous Peoples Act* to Canadian water policies and by co-developing freshwater policy and legislation with

1068 ENVI, [Evidence](#), 30 November 2023, 1255 (Wanda McFadyen); ENVI, [Evidence](#), 30 November 2023, 1300 (Marc Hudon); ENVI, [Evidence](#), 1 February 2024, 1540 (Rébecca Pétrin).

1069 ENVI, [Evidence](#), 13 February 2024, 1610 (Scott Higgins).

1070 Gordon Foundation, [Brief submitted to ENVI](#), undated, published on the ENVI website 2 June 2021; World Wildlife Fund-Canada, [Brief submitted to ENVI](#), undated, published on the ENVI website 13 May 2021; Canadian Environmental Law Association, [Brief submitted to ENVI](#), 2 November 2023; Coalition Navigation, [Brief submitted to ENVI](#), 20 March 2024; Ducks Unlimited Canada, [Brief submitted to ENVI](#), 22 June 2023; International Association for Great Lakes Research, [Brief submitted to ENVI](#), 23 November 2023; Living Lakes Canada, [Brief submitted to ENVI](#), 22 February 2024; ENVI, [Evidence](#), 30 January 2024, 1720 (Yenny Vega Cárdenas).

1071 DataStream, [Brief submitted to ENVI](#), 24 January 2024. DataStream recommends the use of WQX standard for the Exchange of Water Quality data, a “well-established” data standard that is required to be used for all federal water quality data collected in the United States.

1072 DataStream, [Brief submitted to ENVI](#), 24 January 2024.

1073 Environment and Climate Change Canada, [National Freshwater Data Strategy](#). A public comment period regarding the National Freshwater Data Strategy closed 15 September 2024.

Indigenous peoples.¹⁰⁷⁴ However, concern was raised about inadequate consultation about the Canada Water Agency with First Nations. As described by the Assembly of First Nations (AFN):

In July 2023, the First Nations-in-Assembly passed AFN Resolution 53/2023, *First Nations-led Process for National Water Stewardship and the Canada Water Agency (CWA)*, which calls upon Canada to halt the creation of the CWA until First Nations concerns have been addressed. The resolution also directs the AFN to call on Canada to fund the creation of a national First Nations-led stewardship task force under the guidance and participation of relevant Chiefs Committees, to inform the implementation of the CWA and related legislation, policies, and initiatives. Since passing this resolution, the AFN has been working with CWA senior officials to address the concerns of First Nations and are in the process of coming to a shared understanding of a way forward.¹⁰⁷⁵

The Congress of Aboriginal Peoples, which “represents the interests of Métis, status and Non-status Indians, and Southern Inuit Indigenous People living off-reserve in Canada”¹⁰⁷⁶ argued “that mechanisms are needed for off-reserve Indigenous Peoples to exercise their rights to all aspects of water.”¹⁰⁷⁷ They cautioned:

The foremost consideration for [the Congress of Aboriginal Peoples (CAP)] to be able to engage with the CWA ... is the lack of capacity and long-term resourcing. Without capacity CAP is left disadvantaged and unaware of policy and legislative changes and other opportunities to engage in national water discussions.¹⁰⁷⁸

Some witnesses advised that the Canada Water Agency not encroach on provincial jurisdiction, instead focusing on areas of exclusive federal jurisdiction or shared jurisdiction.¹⁰⁷⁹ Similarly, witnesses cautioned that the Canada Water Agency not duplicate functions already well fulfilled by other levels of government, other

1074 ENVI, [Evidence](#), 2 November 2023, 1110 (Laura Tanguay); ENVI, [Evidence](#), 21 November 2023, 1105 (Alexandre Lillo); World Wildlife Fund-Canada, [Brief submitted to ENVI](#), undated, published on the ENVI website 13 May 2021; Canadian Coalition for Healthy Waters, [Brief submitted to ENVI](#), undated, published on ENVI website 4 April 2024; Centre for Indigenous Environmental Resources, [Brief submitted to ENVI](#), 7 February 2024; ENVI, [Evidence](#), 30 January 2024, 1640 (Deborah Carlson).

1075 Assembly of First Nations, [Brief submitted to ENVI](#), 23 November 2023, p. 3.

1076 Congress of Aboriginal Peoples, [About us](#).

1077 Congress of Aboriginal Peoples, [Brief submitted to ENVI](#), November 2023.

1078 Ibid.

1079 ENVI, [Evidence](#), 12 December 2023, 1245 (Mathieu Madison); Saskatchewan Mining Association, [Brief submitted to ENVI](#), 10 June 2021; ENVI, [Evidence](#), 30 January 2024, 1635 (Ray Orb).



stakeholders, or other federal entities.¹⁰⁸⁰ Tyler McCann stressed that the Canada Water Agency “should be a convener and an enabler, not a regulator”¹⁰⁸¹ and should include farmers in collaborative discussions to find water and agriculture-related solutions.¹⁰⁸²

Following careful consideration of the opinions shared regarding the Canada Water Agency in testimony and briefs, the Committee offers the following recommendations:

Recommendation 83

That the Government of Canada, through the Privy Council Office, conduct a comprehensive analysis of all existing federal water policies, laws, regulations, and programs with a view to implementing a truly whole-of-government approach to freshwater management and protection in Canada, one that strengthens ties among all federal departments and agencies with responsibility for freshwater issues.

Recommendation 84

That the Canada Water Agency ensure that it respects the mandates and jurisdiction of provinces, territories, and municipalities.

Recommendation 85

That the Canada Water Agency ensure that it does not duplicate the work of other water management entities including, but not limited to, those set up by provinces, territories, municipalities, watershed districts, and drainage basin organizations.

Recommendation 86

That the Government of Canada align Innovation, Science and Economic Development Canada’s cleantech support programs with the Canada Water Agency’s priorities and action plans for improving freshwater management and protection in Canada.

1080 WaterPower Canada, [Brief submitted to ENVI](#), 11 June 2021; ENVI, [Evidence](#), 30 January 2024, 1635 (Ray Orb); ENVI, [Evidence](#), 30 January 2024, 1750 (Shawn Jaques).

1081 ENVI, [Evidence](#), 23 November 2023, 1110 (Tyler McCann).

1082 Ibid., 1125.

Recommendation 87

That the Canada Water Agency work with all industries, including those not typically included in water governance discussions, as well as work within the unique regional considerations of water management and water issues of the provinces.

Recommendation 88

That the Government of Canada invest sufficient human and financial resources to address challenges concerning freshwater: restoration, new technology, fish population recovery, infrastructure, etc.

APPENDIX A: FRESHWATER RESPONSIBILITIES OF FEDERAL DEPARTMENTS AND AGENCIES—EXCERPT FROM ENVIRONMENT AND CLIMATE CHANGE CANADA’S, *TOWARD THE CREATION OF A CANADA WATER AGENCY: DISCUSSION PAPER*

FRESHWATER TRANSBOUNDARY MANAGEMENT

Global Affairs Canada with Environment and Climate Change Canada (ECCC) cooperate to help guide and support the work of the International Joint Commission (IJC). The IJC, created by the Boundary Waters Treaty of 1909, provides a forum for joint effort with the United States to manage waters that mark or cross the 8,891 kilometre-long border.

The Government of Canada also works collaboratively with provinces and territories to support four domestic transboundary water boards that oversee one-third of Canada’s land mass.

FRESHWATER SCIENCE AND INFORMATION

Health Canada works with its provincial and territorial partners to develop and update the Guidelines for Canadian Drinking Water Quality. ECCC coordinates national monitoring programs to provide information on water quality, flow, and levels across rivers and lakes in Canada. ECCC is also responsible for the Federal Sustainable Development Strategy (FSDS) that sets out the Government of Canada’s environmental sustainability goals—including clean and healthy lakes and rivers to support economic prosperity and the well-being of Canadians. It also identifies the actions to achieve them.

ECCC manages the Canadian Environmental Sustainability Indicators, which measure progress on the FSDS, including freshwater issues. ECCC’s Canadian Centre for Climate Services helps Canadians understand and become more resilient to climate change by providing access to information, building local capacity, and offering training and support.

Natural Resources Canada (NRCan) maps surface waters and major Canadian aquifers. NRCan also provides tools and data to support freshwater management, such as the

National Hydrographic Network, the Federal Geospatial Platform, Open Maps, and the Open Science and Data Platform.

Statistics Canada collects and reports statistics on industrial and agricultural water use, water supply, and water yield, and produces water accounts and water supply and demand analysis.

Agriculture and Agri-Food Canada's (AAFC) Drought Watch program provides agroclimate information to farmers. AAFC also conducts research and develops technology to address agricultural water issues.

The National Research Council undertakes research on issues such as flood protection, water quality, and wastewater treatment. Transport Canada and the Canadian Coast Guard provide mariners with navigation information.

Fisheries and Oceans Canada (DFO) manages Canada's fisheries and ensures healthy and sustainable ecosystems through protection of aquatic species and their habitat, as well as sound science.

LEGISLATION, REGULATION, AND DEPARTMENTAL MANDATES

The Minister of Environment and Climate Change has the authority to enter into agreements with provinces under the *Canada Water Act*, which is also used to support research and monitoring activities for the conservation, development, and use of water resources in Canada. The Minister is responsible for regulating certain types of pollution in water bodies through the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act, 1994*, and the *Canadian Environmental Protection Act, 1999*. ECCC is also responsible for enforcing this legislation and associated regulations.

The Minister responsible for Parks Canada protects freshwater ecosystems through the powers of the *Canada National Parks Act* and the *Canada National Marine Conservation Areas Act*, and safeguards national historic sites, including historic waterways.

Public Safety Canada is mandated to reduce disaster risk through policy and programming, and manages water-related emergencies through the Government Operations Centre.

The Department of National Defence offers support in domestic emergencies such as floods.

The Minister of Fisheries, Oceans and the Canadian Coast Guard administers and enforces the *Fisheries Act*, which provides a framework for the proper management and control of

fisheries; and the conservation and protection of fish and fish habitat, including by preventing pollution. The Aquatic Invasive Species Regulations under the Act enable the Minister to enforce prohibitions and controls to manage aquatic invasive species. DFO is also responsible for the protection of aquatic species under the *Species at Risk Act*.

The Minister of Transport regulates shipping and navigation, which offer protections to freshwater and marine habitats. Examples include the Vessel Pollution and Dangerous Chemicals Regulations made pursuant to the *Canada Shipping Act, 2001*. The Minister of Transport is also responsible for the *Canadian Navigable Waters Act*.

The Minister of Foreign Affairs administers the *International Boundary Waters Treaty Act*, through which Canada's obligations under the *Boundary Waters Treaty* of 1909 are implemented in Canadian law.

Crown-Indigenous Relations and Northern Affairs Canada is responsible for Crown-Indigenous relations and water management in Nunavut, where responsibilities have not been transferred to other governments. Where Crown-Indigenous Relations and Northern Affairs Canada is in negotiations with Indigenous groups, issues related to freshwater management and administration may be part of these discussions and negotiated agreements.

Indigenous Services Canada works with Indigenous peoples to support the provision of drinking water and wastewater services and First Nations-led solutions to water issues on First Nations reserve lands.

FUNDING AND INNOVATION

Infrastructure Canada provides funding to other orders of government for drinking water and wastewater infrastructure, and for infrastructure to mitigate floods and other extreme events.

The Canada Infrastructure Bank has earmarked funds for irrigation infrastructure and green energy projects (e.g., hydroelectricity).

Innovation, Science and Economic Development Canada and NRCan support water technology development and commercialization.

Canada's Regional Development Agencies work closely with businesses and innovators in their regions and support the Government of Canada's Innovation and Skills Plan. Western Economic Diversification Canada recently funded a study of water issues in the Prairies.

ECCC funds programs in major watersheds, such as the Great Lakes, the St. Lawrence River, and Lake Winnipeg.

DFO is responsible for funding programs that support the conservation of aquatic species and habitats.

AAFC supports agricultural discovery science and innovation to address priorities including soil and water conservation.¹

1 Environment and Climate Change Canada, [*Toward the Creation of a Canada Water Agency: Discussion Paper*](#), pp. 8–11.

APPENDIX B: MAP OF INDIGENOUS TERRITORY IN ALBERTA

This map illustrates, among other things, treaty and settlement areas of Indigenous Peoples in Alberta, along with selected locations of Indigenous communities.¹ In green, the map shows the area covered by Treaty 8, which includes the Kearl Oil Sands Mine and the Indigenous communities whose leaders and representatives testified before the Committee in relation to the leaks from the Kearl site.

1 Source: The Alberta Teachers' Association, [*Acknowledging Land and People*](#).

Figure 1—Map of Indigenous Territory in Alberta



APPENDIX C: LIST OF WITNESSES

The following table lists the witnesses who appeared before the committee at its meetings related to this report. Transcripts of all public meetings related to this report are available on the committee's [webpage for this study](#).

44th Parliament – 1st Session

Organizations and Individuals	Date	Meeting
Department of Fisheries and Oceans Kate Ladell, Director General, Ecosystems Management Hilary Oakman, Acting Regional Director, Aquatic Ecosystems, Ontario and Prairie Region	2023/10/24	79
Department of Natural Resources Sumit Gera, Senior Director, Canadian Geospatial Data Infrastructure Sylvain Vallières, Acting Program Manager, Flood Hazard Identification and Mapping Program	2023/10/24	79
Department of the Environment Daniel Wolfish, Acting Assistant Deputy Minister, Canada Water Agency David Harper, Director General, Monitoring and Data Services Directorate Cecile Siewe, Director General, Industrial Sectors and Chemicals Directorate Joanne Volk, Director General, Water Science and Technology Caroline Blais, Director, Forest Products and Fisheries Act	2023/10/24	79
Department of Transport Isa Gros-Louis, Director General, Indigenous Relations and Navigation Protection Joanna Manger, Director General, Marine Safety and Security	2023/10/24	79

Organizations and Individuals	Date	Meeting
Department of Agriculture and Agri-Food Kevin Norris, Director, Resilient Agriculture Policy Division Catherine Champagne, Environmental Scientist	2023/10/26	80
Department of Foreign Affairs, Trade and Development Niall Cronin, Executive Director, United States Transboundary Affairs	2023/10/26	80
Department of Health Greg Carreau, Director General, Safe Environments Directorate	2023/10/26	80
Department of Indigenous Services Nelson Barbosa, Director General, Community Infrastructure Branch Curtis Bergeron, Director, Strategic Water Management Directorate	2023/10/26	80
Department of Fisheries and Oceans Kate Ladell, Director General, Ecosystems Management Hilary Oakman, Acting Regional Director, Aquatic Ecosystems, Ontario and Prairie Region	2023/10/31	81
Department of Natural Resources Alexandre Beaulieu, Senior Director, Canada Centre for Mapping and Earth Observation, GeoBase	2023/10/31	81
Department of the Environment Daniel Wolfish, Acting Assistant Deputy Minister, Canada Water Agency David Harper, Director General, Monitoring and Data Services Directorate Cecile Siewe, Director General, Industrial Sectors and Chemicals Directorate Caroline Blais, Director, Forest Products and Fisheries Act Arash Shahsavarani, Director, Water Quality Monitoring and Surveillance Division	2023/10/31	81

Organizations and Individuals	Date	Meeting
Department of Transport Isa Gros-Louis, Director General, Indigenous Relations and Navigation Protection Joanna Manger, Director General, Marine Safety and Security	2023/10/31	81
As an individual Benoit Barbeau, Full Professor, Polytechnique Montréal	2023/11/02	82
Atlantic First Nations Water Authority Inc. Carl Yates, Interim Chief Executive Officer	2023/11/02	82
Canadian Environmental Law Association Theresa McClenaghan, Executive Director Laura Tanguay, Water Policy Coordinator	2023/11/02	82
Canadian Water and Wastewater Association Robert Haller, Executive Director Hiran Sandanayake, Chair, Climate Change Committee	2023/11/02	82
Environmental Defence Canada Michelle Woodhouse, Program Manager, Freshwater and Great Lakes Protections	2023/11/02	82
Ontario Federation of Anglers and Hunters Alison Morris, Coordinator, Invading Species Awareness Program Mark Ryckman, Manager of Policy	2023/11/02	82
Rural Municipality of South Qu'Appelle No. 157 George Peslari, Reeve	2023/11/02	82
As an individual Deborah Curran, Executive Director, Environmental Law Centre, University of Victoria Alexandre Lillo, Law Professor, Université du Québec à Montréal Robert Sopuck, Former Member of Parliament Andrew Stegemann, Former National Director, Our Living Waters	2023/11/21	85
B.C. Wildlife Federation Jesse Zeman, Executive Director	2023/11/21	85

Organizations and Individuals	Date	Meeting
Regional Environmental Council of Estrie David O'Connor, Project Manager, Invasive Species	2023/11/21	85
The EcoAmbassador Luxmy Begum, Founder	2023/11/21	85
Wildsight Wyatt Petryshen, Science Policy Advisor	2023/11/21	85
As an individual Julian Aherne, Associate Professor, School of Environment, Trent University Eddy Charlie, Co-Organizer, Victoria Orange Shirt Day	2023/11/23	86
Canadian Agri-Food Policy Institute Tyler McCann, Managing Director	2023/11/23	86
Fertilizer Canada Frank Annau, Director, Product Stewardship	2023/11/23	86
International Association for Great Lakes Research Jérôme Marty, Executive Director	2023/11/23	86
Mohawk Council of Kanesatake Grand Chief Victor Bonspille Eugene Nicholas, Director of Environment Tracy P. Cross, CD, Retired Police Chief of Kanesatake	2023/11/23	86
Wildsight Randal Macnair, Conservation Coordinator, Elk Valley	2023/11/23	86
As an individual Beatrix Beisner, Professor and Researcher, Université du Québec à Montréal Diane Orihel, Associate Professor in Aquatic Ecotoxicology. Queen's University	2023/11/30	88
ALUS Bryan Gilvesy, Chief Executive Officer	2023/11/30	88
Assiniboine River Basin Initiative Wanda McFadyen, Executive Director	2023/11/30	88

Organizations and Individuals	Date	Meeting
Forum for Leadership on Water Marc Hudon, Member Ralph Pentland, Member	2023/11/30	88
Watersheds BC Zita Botelho, Director	2023/11/30	88
As an individual Beatrix Beisner, Professor and Researcher, Université du Québec à Montréal Diane Orihel, Associate Professor in Aquatic Ecotoxicology, Queen's University	2023/12/05	89
Assiniboine River Basin Initiative Wanda McFadyen, Executive Director	2023/12/05	89
Forum for Leadership on Water Marc Hudon, Member	2023/12/05	89
As an individual Deborah Curran, Executive Director, Environmental Law Centre, University of Victoria Dominique Monchamp, Coordinator, Canadian Coalition for Healthy Waters David O'Connor, Project Manager, Invasive Species, Regional Environmental Council of Estrie Andrew Stegemann, Former National Director, Our Living Waters	2023/12/07	90
ALUS Bryan Gilvesy, Chief Executive Officer	2023/12/07	90
As an individual Robert Sopuck, Former Member of Parliament	2023/12/12	91
Forum for Leadership on Water Ralph Pentland, Member	2023/12/12	91
Regroupement des organismes de bassins versants du Québec Mathieu Madison, President of the Board of Directors	2023/12/12	91

Organizations and Individuals	Date	Meeting
Watersheds BC Zita Botelho, Director	2023/12/12	91
As an individual Aaron Atcheson, Partner, Miller Thomson LLP Caleb Behn Sylvie Paquerot, Retired Associate Professor	2024/01/30	93
International Observatory on Nature's Rights Yenny Vega Cárdenas, President Amélie Delage, Intern, Pro Bono Student Canada, McGill University	2024/01/30	93
Saskatchewan Association of Rural Municipalities Ray Orb, President	2024/01/30	93
Water Security Agency Shawn Jaques, President and Chief Executive Officer David Cooper, Vice-President, Agriculture Services and Economic Development	2024/01/30	93
West Coast Environmental Law Association Deborah Carlson, Staff Lawyer	2024/01/30	93
As an individual Martyn Clark, Professor, Hydrology, University of Calgary Alain Pietroniro, Professor, Department of Civil Engineering, University of Calgary John Pomeroy, Distinguished Professor and Canada Research Chair, University of Saskatchewan	2024/02/01	94
BC Watershed Security Coalition Coree Tull, Co-Chair	2024/02/01	94
Canadian Nuclear Association Jill Baker, Vice-President, Regulatory Affairs, Policy and Corporate Events Sorouche Mirmiran, Director, Regulatory Affairs	2024/02/01	94

Organizations and Individuals	Date	Meeting
Eau Secours Rébecca Pétrin, Chief Executive Officer Gabrielle Roy-Grégoire, Project Manager, Water Governance	2024/02/01	94
Fédération de l'UPA Outaouais-Laurentides Maria José Maezo, Agri-Environmental Consultant	2024/02/01	94
Ontario Federation of Anglers and Hunters Brook Schryer, Assistant Coordinator, Invading Species Awareness Program Adam Weir, Fisheries Biologist	2024/02/01	94
Rivershed Society of British Columbia Justine Nelson, Executive Director Miki Eslake, Program Coordinator	2024/02/01	94
As an individual James Famiglietti, Professor, Arizona State University Marie Larocque, Professor, Université du Québec à Montréal Beth Parker, Professor, University of Guelph, Director, Morwick G360 Groundwater Research Institute Mike Wei, Professional Engineer	2024/02/06	95
Alberta Irrigation Districts Association Alex Ostrop, Chair Richard Phillips, Vice-Chair	2024/02/06	95
Environmental Defence Canada Aliénor Rougeot, Program Manager, Climate and Energy	2024/02/06	95
Irrigation Saskatchewan Jillian Brown, Executive Director, Saskatchewan Irrigation Projects Association	2024/02/06	95
As an individual Oliver Brandes, Co-Director, POLIS Project on Ecological Governance, Centre for Global Studies, University of Victoria Alan Shapiro, Strategic Advisor, Foresight Cleantech Accelerator, BC Net Zero Innovation Network	2024/02/08	96

Organizations and Individuals	Date	Meeting
AquaAction Soula Chronopoulos, President	2024/02/08	96
Canadian Water Quality Association Shelley Peters, Executive Director Jason Jackson, Professor and Education Consultant	2024/02/08	96
Centre des technologies de l'eau Patricia Gomez, Scientific Coordinator, Co-Founder of Clean Nature	2024/02/08	96
City of Montréal Maja Vodanovic, Mayor of the Borough of Lachine, Executive Committee Member	2024/02/08	96
Foresight Canada Heather Crochetiere, Director, Industry Innovation	2024/02/08	96
Réseau Environnement Mathieu Laneuville, President and Chief Executive Officer	2024/02/08	96
As an individual Steven Frey, Director of Research, Aquanty	2024/02/13	97
DataStream Aislin Livingstone, Program Manager	2024/02/13	97
Fondation Rivières André Bélanger, General Manager	2024/02/13	97
International Institute for Sustainable Development Scott Higgins, Senior Research Scientist, Experimental Lakes Area	2024/02/13	97
Living Lakes Canada Kat Hartwig, Executive Director Georgia Peck, Manager, Lakes Program Paige Thurston, Program Manager, Columbia Basin Water Monitoring Framework	2024/02/13	97
Manitoba Forage and Grassland Association Duncan Morrison, Executive Director	2024/02/13	97

Organizations and Individuals	Date	Meeting
Ottawa Riverkeeper Larissa Holman, Director, Science and Policy	2024/02/13	97
Rescue Lake Simcoe Coalition Claire Malcolmson, Executive Director	2024/02/13	97
As an individual Chandra Madramootoo, Distinguished James McGill Professor, McGill University	2024/02/15	98
DIGDEEP George McGraw, Founder and Chief Executive Officer	2024/02/15	98
Forum for Leadership on Water Emily Lorra Hines, Director Robert Sandford, Senior Government Relations Liaison, Global Climate Emergency Response, United Nations University Institute for Water, Environment and Health	2024/02/15	98
Great Lakes Fishery Commission Gregory McClinchey, Director, Policy and Legislative Affairs Lisa Walter, Coordinator, Aquatic Connectivity	2024/02/15	98
International Joint Commission (Canadian Section) Susan Chiblow, Commissioner Merrell-Ann Phare, Commissioner Christopher Wilkie, Secretary	2024/02/15	98
Nature's Rights Mumta Ito, Founder and President	2024/02/15	98
United Nations University Institute for Water, Environment and Health Kaveh Madani, Director	2024/02/15	98
Water Rangers Kat Kavanagh, Executive Director	2024/02/15	98
Centre for Indigenous Environmental Resources J. Michael Miltenberger, Special Advisor	2024/02/27	99
Conseil régional de l'environnement et du développement durable du Saguenay-Lac-St-Jean Jimmy Bouchard, Support Representative	2024/02/27	99

Organizations and Individuals	Date	Meeting
Council of the Great Lakes Region Mark Fisher, President and Chief Executive Officer	2024/02/27	99
CropLife Canada Pierre Petelle, President and Chief Executive Officer Terri Stewart, Executive Director, Chemistry	2024/02/27	99
Forum for Leadership on Water Alain Pietroniro, Professor	2024/02/27	99
Mikisew Cree First Nation Billy-Joe Tuccaro	2024/02/27	99
Nutrien Ltd. Tim Faveri, Vice President, Sustainability and Stakeholder Relations Mike Nemeth, Senior Advisor, Agriculture and Environment Sustainability	2024/02/27	99
World Wildlife Fund-Canada Elizabeth Hendriks, Vice-President, Restoration and Regeneration	2024/02/27	99
As an individual Mandy Olsgard, Senior Toxicologist and Risk Assessor Sébastien Sauvé, Full Professor FrederickJ. Wrona, Professor, Svare Research Chair, Integrated Watershed Processes	2024/03/21	101
Canadian Cattle Association Ryan Beierbach, Chair, Canadian Roundtable for Sustainable Beef Duane Thompson, Co-Chair, Environment Committee	2024/03/21	101
Environmental Defence Canada Cassie Barker, Senior Program Manager, Toxics	2024/03/21	101
Kebaowek First Nation Lance Haymond	2024/03/21	101

Organizations and Individuals	Date	Meeting
Office of the Auditor General Jerry V. DeMarco, Commissioner of the Environment and Sustainable Development Milan Duvnjak, Principal James McKenzie, Principal	2024/03/21	101
Western Copper and Gold Paul West-Sells, President Shena Shaw, Vice-President, Environmental and Community Affairs	2024/03/21	101
As an individual Roy Brouwer, Professor and Executive Director, Water Institute, University of Waterloo Frédéric Lasserre, Full Professor, Université Laval	2024/04/18	104
ALTRA Martin Bureau, Vice-President, Innovation and Head of the PFAS Center of Excellence	2024/04/18	104
Canadian Nuclear Safety Commission Melissa Fabian Mendoza, Director Haidy Tadros, Strategic Advisor	2024/04/18	104
Okanagan Basin Water Board Anna Warwick Sears, Executive Director	2024/04/18	104
Prairie Provinces Water Board Nadine Stiller, Chair	2024/04/18	104
Government of British Columbia James Mack, Assistant Deputy Minister, Ministry of Water, Land and Resource Stewardship Fin Donnelly, Parliamentary Secretary, Fisheries and Aquaculture	2024/06/04	111
Government of Prince Edward Island Sean Ledgerwood, Acting Manager, Water and Air Monitoring, Department of Environment, Energy and Climate Action	2024/06/04	111

Organizations and Individuals	Date	Meeting
Government of the Province of Newfoundland and Labrador Haseen Khan, Director, Water Resources Management Division, Department of Environment and Climate Change	2024/06/04	111
Water Security Agency Shawn Jaques, President and Chief Executive Officer David Cooper, Vice-President, Agriculture Services and Economic Development	2024/06/04	111
Department of the Environment Daniel Wolfish, Assistant Deputy Minister, Canada Water Agency Wayne Jenkinson, Executive Director, National Hydrological Services Caroline Blais, Director, Forest Products and Fisheries Act Arash Shahsavarani, Director, Water Quality Monitoring and Surveillance Division Laura Cervoni, Acting Director, Freshwater Policy, Canada Water Agency	2024/06/11	113
Government of Alberta Kate Rich, Assistant Deputy Minister, Policy, Environment and Protected Areas	2024/06/11	113
Government of Northwest Territories Julian Kanigan, Assistant Deputy Minister, Environmental Management, Monitoring and Climate Change, Department of Environment and Climate Change	2024/06/11	113
Government of Yukon Heather Jirousek, Director, Water Resources, Department of Environment Brendan Mulligan, Senior Scientist, Groundwater, Water Resources, Department of Environment	2024/06/11	113

APPENDIX D: LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the committee related to this report. For more information, please consult the committee's [webpage for this study](#).

International Association of Hydrogeologists

APPENDIX E: LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the committee related to this report. For more information, please consult the committee's [webpage for this study](#).

44th Parliament – 1st Session

Alexander, Lauren

ALUS

Aqua Action

AquaAction

Arctic Research Foundation

Assembly of First Nations

Atlantic First Nations Water Authority Inc.

Begum, Luxmy

Canadian Cattle Association

Canadian Coalition for Healthy Waters

Canadian Environmental Law Association

Canadian Water and Wastewater Association

Canadian Water Quality Association

Centre for Indigenous Environmental Resources

Charlie, Eddy

Chemistry Industry Association of Canada

Clark, Martyn

Coalition Navigation

Congress of Aboriginal Peoples

Council of the Great Lakes Region

DataStream

de Gaspé Beaubien Foundation

Ducks Unlimited Canada
Environmental Defence Canada
EPCOR Utilities Inc.
Fédération de l'UPA Outaouais-Laurentides
Fondation Rivières
Foresight Canada
Forest Products Association of Canada
Forum for Leadership on Water
Government of Yukon
Great Lakes Fishery Commission
International Association for Great Lakes Research
International Association of Hydrogeologists
International Joint Commission (Canadian Section)
International Observatory on Nature's Rights
Laki, A. G.
Living Lakes Canada
Mikisew Cree First Nation
Olsgard, Mandy
Ontario Federation of Anglers and Hunters
Orihel, Diane
Ottawa River Institute
Ottawa Riverkeeper
Pietroniro, Alain
Réseau Environnement
Réseau québécois sur les eaux souterraines
Sanexen Environmental Services Inc.
Surfrider Foundation Canada
Syngenta Canada Inc.
T. Bjornson & Associates Consulting Inc.
United Nations University Institute for Water, Environment and Health

Water Rangers

We the Nuclear Free North

Wrona, Frederick

York Region Environmental Alliance

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the committee requests that the government table a comprehensive response to this Report.

A copy of the relevant *Minutes of Proceedings* ([Meetings Nos. 36 and 37](#)) from the 45th Parliament, 1st Session and ([Meetings Nos. 79 to 82, 85, 86, 88 to 91, 93 to 99, 101, 104, 106, 111, 113 and 115](#)) from the 44th Parliament, 1st Session is tabled.

Respectfully submitted,

Shannon Miedema
Chair

Dissenting Opinion from the Conservative Members of the Environment & Sustainable Development Committee

Conservative members of the Standing Committee on Environment and Sustainable Development dissent from this report.

We cannot support many of the recommendations because too many expand federal reach, blur jurisdictional lines, and mistake process for progress. Canadians do not need freshwater policy built around declarations and legal experiments. They need reliable infrastructure, enforceable rules, and decisions made by the people closest to the watersheds affected.

The problem with the majority report is not that it takes freshwater too seriously. It is that it confuses ambition with action. More federal structures, strategies, and processes do not automatically mean cleaner lakes, safer drinking water, better drainage, or healthier watersheds. Communities dealing with aging pipes, boil water advisories, flooding, drought, and infrastructure backlogs do not need another statement of ambition. They need support, clear responsibility, and a government that can get the basics right.

Freshwater is fundamental to life in Canada. We drink it, cook with it, wash with it, grow food with it, generate power with it, and rely on it to sustain communities, industries, ecosystems, and local economies. From small towns to major cities, dependable freshwater underpins public health, agriculture, energy production, business activity, and the landscapes that help define this country.

Few countries have been entrusted with freshwater resources on the scale that Canada has. Our lakes, rivers, wetlands, and watersheds are an extraordinary national inheritance. But abundance is not a licence for complacency. Having more freshwater than most countries does not mean we can manage it carelessly.

Conservatives believe freshwater policy should be grounded in results. The objective should be straightforward: protect water quality, support healthy ecosystems, and ensure families can rely on safe and dependable water systems.

Unfortunately, the approach taken in this report too often moves in the opposite direction. It favours federal expansion over local expertise, broad statements over results, and new layers of process over tools that already exist. Conservatives reject that approach in favour of freshwater policy that respects provinces, territories, Indigenous communities, municipalities, and local authorities.

The sheer number of recommendations illustrates the problem. Rather than setting priorities, the report piles one federal action on top of another. New strategies, new frameworks, new roles, and new studies are recommended across nearly every part of freshwater policy. That may create the appearance of purpose, but it does not create discipline. A report that recommends everything prioritizes nothing.

A central concern is the report's push to expand the role of the Canada Water Agency. Freshwater management in Canada is not a blank slate. The governments, communities, and local bodies closest to the water already carry much of this responsibility. They understand local conditions, operate existing systems, and in many cases already hold the legal responsibility and expertise needed to manage water effectively.

Groundwater is a clear example. It is local and already regulated by provinces and territories. If monitoring can be improved, then improve it through existing authorities. Share better data. Support the science. Strengthen capacity. But groundwater should not become the back door to federal control.

The report seems to recognize this risk, then walks straight into it. It recommends that the Canada Water Agency respect provincial, territorial, and municipal jurisdiction and avoid duplicating existing water management bodies. Yet throughout the report, it repeatedly points the Agency toward new roles in groundwater, agriculture, data standards, coordination, national planning, and broad policy leadership. In other words, the report tells the Agency not to duplicate existing work, then hands it a to-do list that risks doing exactly that.

That is the contradiction at the heart of the report. It recommends respecting jurisdiction in one breath then recommends expanding federal reach in the next. Conservatives believe the federal role should be clear and useful. It should support science, infrastructure, enforcement, and data-sharing where it adds value. It should fill gaps, not occupy every available space.

The report makes a similar mistake on agriculture. It suggests the Canada Water Agency should become a federal “convener and enabler” on freshwater in the sector. That may sound harmless, but farmers have heard this song before. A new federal table becomes a new federal process. A new federal process becomes new paperwork. And no farmer ever irrigated a field, drained a ditch, or protected an acre with a stack of federal forms.

For farmers, water policy is crucial for their success. It determines whether fields flood, irrigation works, soil is protected, livestock can be watered, and food can be grown. Farmers do not manage water from a conference table. They manage it field by field and season by season, through drought, flooding, drainage, irrigation, and soil conditions.

The people who manage water on the ground already know where it is needed, where it is flooding, where it is scarce, and what actually works. Farmers need clear rules, practical tools, better infrastructure, and faster approvals. They do not need another meeting about how to have more meetings.

Recommendation 23 uses the language of local decision making but still points back to federal control. It calls for “regional approaches” to freshwater policy, yet a plan is not truly regional just because a federal agency divides the country into regions. Freshwater management begins with the people and governments closest to the water, the ones who understand the watershed, maintain the infrastructure, manage the land, and live with the consequences of these decisions.

That is where the knowledge sits. They understand the trade-offs that must be managed. They know where water flows, where it backs up, where it is under pressure, and where infrastructure is failing. The federal government can help where it should, but another coordinating table can become the soft launch of another federal veto.

More broadly, the report risks duplication and confusion. Expanding federal roles in areas such as water diagnostic testing could overlap with existing provincial programs and infrastructure funding. The recommendation to explore “all options” to address oil sands impacted water also creates concern. Freshwater policy should rely on clear legal standards and established regulatory processes, not open-ended mandates that create uncertainty.

This is another example of the report identifying a real issue and responding with an overly broad federal answer. Where clarity is needed, it reaches for scope. Where accountability is needed, it recommends more process. Where delivery is needed, it adds another layer.

Recommendation 4 is one of the clearest examples of the report moving away from practical water protection. It calls for considering “legal personhood” for the Saint Lawrence River. This may sound harmless, but it is not. At a time when communities need functioning infrastructure, better monitoring, and stronger enforcement, this is not a serious substitute for action.

What makes Recommendation 4 even weaker is that the report’s own evidence points to the risks. The committee heard that assigning legal personhood to water could create disputes over who represents the waterway and whether guardians could use that authority to block infrastructure development. The committee also heard that the better path may be to strengthen the responsibilities of public authorities and impose real sanctions, rather than simply asserting new rights. That should have been the lesson.

The obvious question is who gets to speak for the river. Who decides what its interests are? Who has authority to act on its behalf? Who is accountable when those claims affect ports, municipalities, infrastructure, navigation, or trade? Appointing “guardians” may sound nice, but in practice it would create disputes over jurisdiction and control.

The Saint Lawrence is not only an ecosystem, it is a source of drinking water, a shipping route, a trade corridor, and a central part of the economy. Giving it legal personhood could turn clear environmental obligations into open ended litigation. Instead of improving stewardship, the result could be more lawsuits, slower approvals, regulatory confusion, and years of uncertainty.

The Saint Lawrence does not need a legal personality. It needs governments willing to enforce the law and make decisions without turning a working waterway into a courtroom experiment. If existing tools need to be strengthened, strengthen them. If rules need to be enforced, enforce them. But do not replace them with an unserious legal experiment that raises more questions than it answers.

Recommendation 43 raises an issue that should be beyond debate. Every Canadian, including those in small, rural, remote, and Indigenous communities, should have access to safe, clean, and affordable drinking water. Conservatives support that goal. The problem is that this recommendation restates a promise this government has been making for years without enough focus on how to finally deliver it.

The challenge is not whether governments can say the right thing. The challenge is whether they can get the right things built and working. In many communities, the barriers are aging infrastructure, high construction costs, difficult geography, operator shortages, and slow project delivery. Indigenous communities in particular have heard repeated federal promises on drinking water, yet too many families have continued to live with advisories.

Recognizing access to clean drinking water as a “right” does not, by itself, create the infrastructure required to deliver it. Rights must be meaningful in practice. For communities still facing drinking water advisories, the test is not whether the federal government can restate the principle. The test is whether it can get results.

This is where the report loses touch with the people it claims to help. For a family under a drinking water advisory, the issue is not whether the federal government can find stronger language for the same promise. The issue is whether the system works. A right that exists only in a report is not much comfort to a parent boiling water at home.

The government should focus on what gets water running safely and reliably. That means targeted, cost-shared investments for small, rural, remote, and Indigenous communities. It means support for trained local operators, faster approvals, and partnerships that respect jurisdiction.

Recommendation 11 would fold the United Nations' 30x30 conservation target into freshwater management. That is exactly the kind of recommendation that weakens this report. Instead of asking what specific water systems need, what infrastructure is missing, what pollution problems must be fixed, or what monitoring gaps should be closed, the recommendation reaches for another international target and tries to retrofit Canadian freshwater policy around it. That may make for an impressive line in a speech at a global conference, but it is not a substitute for domestic water management.

This recommendation shows the government's habit of treating conservation as a branding exercise. Instead of starting with the actual condition of a watershed, the infrastructure needed, the pollution source, the aquifer pressure, or the local land use reality, the report reaches for the 30x30 target and works backward.

That is not serious freshwater policy. The number comes first, the announcement comes second, and the consequences for landowners, municipalities, farmers, industries, and local communities come later.

Conservatives support conservation that produces actual environmental gains, not conservation treated like a scoreboard. Freshwater protection is not won by colouring in a map or chasing an international target. It is won by protecting wetlands, restoring habitat, and investing in infrastructure that keeps water systems healthy. Those outcomes can be measured, funded, enforced, and improved. Freshwater policy should be built around Canadian watersheds, Canadian communities, Canadian infrastructure, and results that Canadians can see.

The report's international agenda is one of its most revealing sections. At the same time Canadian communities are still dealing with aging water systems and drinking water advisories, the report recommends that Canada pursue a global water strategy, promote itself as a global water leader, participate in international freshwater conferences, and even take steps to host or co-host a future United Nations Water Conference.

That is exactly the kind of recommendation that makes this report feel out of touch. Conferences do not fix water mains. Global strategies do not train operators. International declarations do not repair treatment plants. Canada can and should share expertise where it serves Canadian interests, but credibility abroad starts with competence at home.

Before the government starts planning its next appearance on the international water circuit, it should make sure our own communities have water systems that work. Leadership is not measured by how many conferences Ministers attend, it is measured by whether families can trust the water coming out of the tap.

We have valuable freshwater expertise to share, and international cooperation can be useful when it serves clear Canadian interests. But leadership should be measured by results at home. Hosting conferences does not repair water systems or help communities still waiting for reliable service. Our credibility abroad depends on success here at home.

Conservatives support a freshwater approach grounded in jurisdictional respect, local expertise, and clear outcomes. Water management works best when provinces, territories, Indigenous communities, municipalities, and local authorities are empowered to lead. They understand their watersheds, infrastructure, risks, and community needs.

The federal government should support that system, not complicate it. Its role should be focused on areas where it can make a real contribution, including infrastructure funding, science, data, enforcement, and cooperation with the governments and communities already responsible.

Our approach is straightforward. Strengthen water infrastructure, enforce pollution standards, keep regulations clear and workable, and respect the people closest to the water. The goal is not a bigger federal machine, another layer of process, or another conference speech. The goal is water systems that work, rules that mean something, and healthier watersheds for the families, farms, communities, and industries that depend on them.

SUPPLEMENTARY REPORT OF THE BLOC QUÉBÉCOIS ON THE REPORT OF THE FRESHWATER STUDY OF THE 43RD AND 44TH PARLIAMENTS

The Bloc Québécois supports the recommendations of the freshwater report but believes that certain clarifications should be added to better reflect the interests of Quebec.

Here are the Bloc Québécois's additions to the report's recommendations:

1. Regarding the Canadian Water Agency and freshwater policies, the Bloc Québécois points out that the federal government's responsibility is limited to the management of boundary and transboundary waters, international pollution, and the management of lakes and rivers located on federal lands. The provinces are primarily responsible for managing water resources within their borders.
2. In Quebec, the Act Affirming the Collective Nature of Water Resources and Aimed at Strengthening Their Protection confirms the legal status of water resources as part of the community's heritage, specifies the responsibilities incumbent upon the Province of Quebec as the resource's guardian on behalf of citizens, and defines the rights and duties of the community, and the Act respecting the conservation of wetlands and water environments recognizes the ecological functions performed by wetlands and water environments, specifies the role of watershed organizations and regional roundtables, and entrusts regional county municipalities and local municipalities with the responsibility of developing and implementing a regional plan for wetlands and water environments within their respective territories.
3. That the activities of the Canada Water Agency be carried out in a manner that respects the jurisdiction of the provinces and territories and in collaboration with them.
4. Add a right to opt out with compensation for provinces and territories that wish to do so to Recommendation 24: That the Government of Canada work in collaboration with the provinces to establish freshwater security funds to contribute to climate change mitigation efforts (notably to address droughts, floods, and wildfires).
5. Add to Recommendation 25: That provinces and territories wishing to do so may receive the funding intended for a youth climate group and manage it themselves.
6. Regarding Recommendation 29, which states that the Government of Canada should support the Lake Diefenbaker irrigation project, including through funding, the Bloc Québécois recommend that projects of similar scale in terms of freshwater in other provinces and territories should also be funded, in the interest of upholding the principle of equity.

7. Regarding Recommendation 51, which proposes that the Government of Canada assist local communities in freshwater data monitoring and governance, and financially assist local organizations dealing with their concerns, the Bloc Québécois believes this support should take the form of granting the necessary funds to provinces and territories so they can implement the local work themselves.
8. According to the Bloc Québécois, all recommendations mentioning the Federation of Canadian Municipalities should also consider the Fédération des municipalités du Québec and the Union des municipalités du Québec.