June 11, 2021

RE: Study on Freshwater

Dear Members of the House of Commons Standing Committee on Environment and Sustainable Development,

Thank you for the opportunity to submit a written brief to inform your study of options to streamline the federal role with respect to freshwater management in Canada and to improve collaboration with other levels of government and non-government stakeholders.

As a respected and trusted accelerator of knowledge into practice and policy with a strong track record of convening governments, academics, industry and non-profit organizations around Canada's most pressing water challenges, Canadian Water Network (CWN) is in a unique position to offer its perspective on the critical role the federal government plays and can play to catalyze action and achieve Canada's water management goals.

We see a strong opportunity for the federal government to advance federal priorities by catalyzing and enabling collaboration and progress on federal and societal objectives connected to freshwater management by expanding recognition and resourcing of a structured convening function that leverages the significant work of government and non-government actors across Canada.

CWN's perspective is rooted in 20 years of experience working with key players across Canada's evolving water sector. As a federally funded Network of Centres of Excellence (2001-2017), we fostered multi-disciplinary research collaborations that connected end-users to knowledge, which led to improved water quality, reduced risks to public health, hundreds of millions in cost savings, and more than 100 policy and practice changes. In doing so, we found that achieving progress and impact for complex freshwater challenges strongly relies on not only convening the right people and knowledge, but actively and intentionally structuring the right conversations. Whereas applied research finds and develops opportunities for knowledge uptake into practice and policy, the structured convening role achieves innovation and impact, accelerating knowledge into practice and policy by actively creating spaces that are relevant to end-user contexts and decision needs. Within these spaces, intentionally curated conversations enable identification and alignment around shared objectives, highlight opportunities for effective collaboration and drive progress on water management priorities.

In direct response to this unmet need for structured convening across Canada with respect to key water management challenges, CWN seized an opportunity to provide value through a structured convening role in the municipal water sector and launched the Canadian Municipal Water Consortium (2008-current). Hosted, structured and facilitated by CWN, the Consortium brings together senior decision makers from the municipal water sector from across the country, in collaboration with federal and provincial governments and industry, to undertake national initiatives that curate and frame knowledge to help municipal water utilities anticipate and respond to critical challenges and emerging trends. Today, the Consortium's membership has grown to include senior leaders from 23 of Canada's largest and most progressive municipal water utilities, many of whom have described the Consortium's structured convening role as invaluable for leveraging knowledge and experience across the country to improve their decisions and investments.

In addition to the Canadian Municipal Water Consortium, CWN's focus as an independent, national non-profit (whose goal is *getting communities to the future they want through water)* (2017-current) has been on leading programs and initiatives that apply our structured convening approach to enable progress on a broad range of complex environmental, social and economic issues with a critical connection to water. As the Canadian water landscape evolves and national, regional and local priorities shift, CWN is at the forefront of identifying opportunities where alignment around shared objectives can have the most value. Recent focus areas have included climate change, resource development and land management, and contaminants of emerging concern, among others. We leverage partnerships and collaborations with federal, provincial and municipal governments, industry and NGOs across the water sector and beyond — particularly other sectors with related and adjacent interests — to achieve progress on Canada's water-related challenges.

Through participation in the Canada Water Agency public consultations in 2020-2021, CWN observed widespread and repeated calls for enhanced coordination and collaboration across the water sector, as well as a desire for federal leadership to leverage existing knowledge, resources and expertise. These observations were reflected in Environment and Climate Change Canada's June 2021 What We Heard report. During the consultations, we also heard participants repeatedly voice the need to better resource and formalize support for collaboration. This message clearly resonates with our experience that effective collaboration must include intentional convening to achieve alignment around shared objectives, outcomes and results — a task which cannot reasonably be achieved without skilled facilitation and dedicated funding.

We have provided our responses and supporting evidence to the questions posed by the Standing Committee, and hope the Committee will conclude there is a clear role for the federal government in expanding the recognition and resourcing of a structured convening function that leverages the work of government and non-government actors to advance federal freshwater priorities. This role could be well served through development of a dedicated federal government function, and/or through federal support for external accelerators of knowledge to practice and policy such as Canadian Water Network.

I look forward to the opportunity to speak further with members of the Standing Committee on this important priority.

Sincerely,

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House of Commons Standing Committee on Environment and Sustainable Development Study on Freshwater

Canadian Water Network Responses to Questions for Stakeholders

1. Introductory information

1a. On which issues related to protecting and managing freshwater does your organization work?

Canadian Water Network (CWN) works on a wide range of complex environmental, social and economic issues related to freshwater management in response to the needs of the collective community, many of which involve federal regulation and policy. We work in areas where aligned and meaningful connections across the water sector — and other sectors that depend on water — are needed to achieve progress on societal objectives, as illustrated with examples in the sections below.

CWN's Canadian Municipal Water Consortium is a concrete example of how structured convening provides value. It brings together senior decision makers from the municipal water sector in collaboration with federal and provincial governments and industry across the country to undertake national initiatives that curate and frame knowledge to help municipal water utilities anticipate and respond to critical challenges and emerging trends. Projects and initiatives undertaken within the Municipal Consortium are driven by the needs of our members, spanning drinking water, wastewater, stormwater and urban watershed management issues.

As the Canadian water landscape evolves and national, regional and local priorities shift, CWN actively identifies opportunities to develop programs and initiatives in areas where alignment around shared objectives can have the most value. Recent focus areas have included climate change, resource development and land management, and contaminants of emerging concern, among others.

2. Interaction and collaboration with federal departments and agencies

2a. Does your organization interact with federal departments and/or agencies on freshwater issues? If so, on which issues and with which departments and/or agencies?

Given the centrality of water to many federal mandates (e.g., environment and climate change, agriculture, public health, public safety, natural resources, infrastructure and finance, among others) and CWN's role as an effective convener, our work relates to several federal government departments and agencies, in addition to provincial/territorial, municipal and Indigenous

governments. We have conducted numerous projects and initiatives with financial support from different federal departments whose mandates touch on water. In applying our structured convening approach to projects and initiatives, we have often requested the participation of federal government representatives to lend their perspectives to inform our work and ensure its relevance to federal priorities.

Selected examples of CWN's interactions with federal departments on freshwater-related projects and initiatives in recent years include:

- With financial support from Environment and Climate Change Canada (ECCC), CWN convened a National Expert Panel on Emerging Contaminants in Municipal Wastewater to conduct a national review of contaminants in municipal wastewater and Canada's options to deal with them. This project culminated in a public report providing critical insights to inform and empower decision makers and stakeholders to choose the most effective wastewater treatment investments, policies and practices.

- In partnership with the Insurance Bureau of Canada and with support and participation from Natural Resources Canada (NRCan), CWN brought together municipal water utilities, the insurance industry, international modelling firms, and the federal government to determine what data was needed to enhance flood risk evaluation models and explore ways to improve data sharing across public and private sectors.

- In response to the COVID-19 pandemic, CWN created the COVID-19 Wastewater Coalition in April 2020, a national collaboration of municipalities, utilities, researchers, public health agencies and governments to accelerate sharing of knowledge on the application of wastewater-based epidemiology (WBE) for SARS-CoV-2 in Canada. The Coalition's national Phase I Inter-Laboratory Study was conducted from July to September 2020 in direct collaboration with Canada's National Microbiology Laboratory (part of the Public Health Agency of Canada) to accelerate national experience and understanding of the potential for the emerging techniques to support Canada's response to COVID-19 pandemic management.

- ECCC engaged CWN in 2020 to conduct a review of the fit-for-future nature of Canada's 1987 Federal Water Policy and assess opportunities to address ongoing and future needs through modernizing or renewing the policy.

2b. Do the specific freshwater issues targeted by your organization fit within the mandate of a given federal department and/or agency or do they relate to more than one department and/or agency? If more than one, have you been able to identify a lead department and/or agency with which to engage?

Freshwater is connected to and influenced by multiple federal departments and agencies and their mandates. This makes freshwater a classic whole-of-government issue and a challenge to coordinate. However, it is precisely because water matters to so many facets of society that it is a key entry point for achieving many government priorities and goals, including economic well-being, climate resilience, food security, sustainability and regeneration, and human health.

This reality is reflected in CWN's work, where the freshwater challenges we convene around are frequently reflected in the priorities and mandates of multiple federal departments and agencies. Often, the lead federal department for our initiatives has been ECCC, but depending on the issue, other departments have played critical roles. CWN's approach and skillset as a convener for effective collaboration have been called upon by different federal departments and agencies familiar with CWN's approach and value.

As one of the federal government lines of inquiry on freshwater issues, ECCC engaged CWN in 2020 to provide a high-level review of the fit-for-future nature of Canada's 1987 Federal Water Policy and assess opportunities to address ongoing and future needs through modernizing the policy. An outcome of this work was CWN's development of an analytical framework that the federal government could apply during the policy renewal process.

The framework for federal policy renewal proposed assessing and categorizing opportunities for water policy actions based on the degree to which they can achieve federal government objectives: (1) can be delivered primarily through federal actions and initiatives alone; (2) requires effectively engaging partners in collaborative action to succeed; or (3) can provide co-benefits or pose risks to other federal departments, as well as engage more diverse (non-traditional) partners.

Given that water is a shared responsibility, CWN acknowledges the critical role of Indigenous nations, provinces and territories, municipalities, and watershed/regional and binational organizations, as well as a range of stakeholder organizations in protecting and managing Canada's freshwater. No one government, department or entity can achieve Canada's water management goals alone, underscoring the imperative for collaboration and coordination both within and extending beyond the federal government.

2c. Have you encountered notable successes in engaging with the federal government on freshwater issues? If so, please specify. If you have not had success in doing so, what in your opinion is the reason (e.g., no program available tailored to your needs, no identifiable service or unit within a department and/or agency with which to engage)?

Created in 2001 as a federally funded Network of Centres of Excellence (NCE), CWN's original mandate was to connect leading research on Canada's most challenging freshwater issues with decision makers who could put this knowledge into practice. From 2001 to 2017, CWN administered and managed more than $61.5 million in federal funding and attracted an additional $45 million in co-investments from the private sector and other levels of government. CWN fostered multi-disciplinary collaboration within the research community and connected end users to projects, which led to improved water quality, reduced risks to public health, hundreds of millions in cost savings, and more than 100 policy and practice changes.

Encouraged by these successes as a federally funded NCE, but recognizing the limitations of the traditional research model to fully realize innovation and uptake, CWN saw a need and an opportunity to further support Canadian communities in addressing complex freshwater management challenges. Our experience reinforced that achieving progress on these challenges is strongly reliant on not only convening the right people, but actively and intentionally structuring conversations that enable effective and accelerated progress. Whereas applied research finds and develops opportunities for knowledge uptake into practice and policy, the structured convening role accelerates knowledge into practice and policy by actively creating spaces that are relevant to end-user contexts and decision needs. Within these spaces, intentionally structured conversations enable alignment around shared objectives, highlight opportunities for effective collaboration and drive progress on water management priorities.

A concrete example of CWN's experience with both challenges and successes in engaging with the federal government on freshwater issues has been our work on addressing municipal and local government challenges relating to wastewater, urban and agricultural runoff, stormwater and flooding management. The federal government has responsibilities for protecting the quality and quantity of surface waters and habitats, building climate resilience and ensuring public safety through many federal regulations and policies (for example, Fisheries Act, Species at Risk Act, Public Safety Act, Great Lakes Water Quality Agreement, Canada-United States-Mexico Agreement, Pan-Canadian Framework on Clean Growth and Climate Change, among others). However, the actions and solutions that most strongly impact water quality and public safety on the ground are implemented by municipal water, wastewater and stormwater system operators, which are governed by provincial and local regulations. This fundamental issue of jurisdictional

overlap creates challenges for involving relevant federal government participants spanning sufficient regulatory and research expertise to enable effective federal participation in advancing the work of the broader water management community. Conversely, in areas where structures have been put into place to enable interjurisdictional collaboration (e.g., addressing nutrient management through the Great Lakes Water Quality Agreement), there is an enhanced ability to apply effective convening approaches.

With the breadth of interests involved and the significant cuts that have occurred to federal water science over the past couple of decades (e.g., elimination of the Wastewater Technology Centre at the Canada Centre for Inland Waters), relevant federal bandwidth for both provision of science and participation in CWN initiatives has also been a complicating factor in our work to more effectively include federal government perspectives and experience. A more detailed analysis of these challenges and opportunities to address them are provided within the National Expert Panel on Emerging Contaminants in Municipal Wastewater's culminating public report, undertaken by CWN with financial support from ECCC.

Despite the clear value of CWN's role as illustrated by our many experiences with collective water management needs, opportunities for us to apply our role are constantly evolving as national, regional and local priorities shift. Our work is complicated by a lack of clarity over who should lead coordination efforts in particular, making it difficult to secure long-term federal or provincial funding. In addition, until recently there has been insufficient recognition of the need to go beyond funding for applied research or knowledge translation initiatives to realize intended innovation and uptake. Programs supporting knowledge translation and mobilization have remained largely focused on looking for opportunities to apply research outputs for value, rather than creating spaces that ensure end-user contexts and decision needs shape the framing and generation of knowledge, which is fundamental in making that knowledge effective for application by decision makers. **The Standing Committee's freshwater study represents a timely opportunity for the federal government to invest in a dedicated structured convening role with the ability to reach across a broad range of freshwater issues while putting end-user needs front and centre.**

2d. Do you foresee engaging with the new Canada Water Agency? If so, in what way? What are your organization's expectations with respect to the Agency?

CWN recognizes that the forthcoming creation of a Canada Water Agency (CWA) and the concurrent Standing Committee on Environment and Sustainable Development's freshwater study present a unique window of opportunity and receptiveness for input on the path forward

for freshwater management in Canada, including the role of and support provided by the federal government. We see the federal government's significant consultation, reflection and consideration of how the CWA can be structured to best support Canada's needs as an important opportunity for CWN to directly engage with the federal government in designing solutions. CWN participation in creating and shaping a successful CWA is one of the key ways we can interact with the CWA.

Through participation in the CWA public consultations in 2020-2021, CWN observed widespread and repeated calls for enhanced coordination and collaboration across the water sector, as well as a desire for federal leadership to enable the leveraging of existing programs, resources and expertise. Consultation participants repeatedly voiced the need to dedicate resources — and in some cases formalize — support for collaboration.

ECCC's June 2021 What We Heard report on stakeholder and public engagement expressed concern about lack of coordination and a 'siloed inter-jurisdictional approach' to freshwater management. Consultation participants noted a key opportunity to take a whole-of-government approach, aligning policies and actions, as well as increasing collaboration, communication and information sharing across different levels of government and partner organizations.

During the consultations, we also heard participants voice the need to better resource and formalize support for collaboration. This message clearly reinforces CWN's experience that effective collaboration must include intentional convening to achieve alignment around shared objectives and outcomes — a task which cannot reasonably be achieved without skilled facilitation and dedicated funding.

We believe there is a clear opportunity for the federal government to expand the recognition and resourcing of a structured convening function that leverages the work of government and non-government actors to advance federal freshwater priorities. This role could be well served through a dedicated function within the CWA or by supporting external accelerators of knowledge to practice and policy such as CWN. We would be pleased to engage with the federal government in the development of the CWA to leverage the value of our structured convening approach to advance federal freshwater priorities.

3. Federal water legislation, policies and regulations

3a. Does your organization interact with federal departments and/or agencies on policies, legislation, regulations, or funding programs related to freshwater? If so, please specify.

A recent example of CWN's interaction with the federal government and its agencies on its funding programs was the Federation of Canadian Municipalities' (FCM) engagement of CWN in 2019 to conduct a qualitative study on key municipal trends, needs and best practices, and innovations in the water sector.

FCM administers the Green Municipal Fund (GMF), a program funded by Infrastructure Canada that helps communities reduce their energy use and improve air, water and soil quality. To effectively support Canadian municipalities in implementing appropriate and sustainable solutions, the GMF needs to remain relevant to municipalities, anticipate trends in the industry, and share innovation and best practices. To help meet this need, FCM asked CWN to report on current water management trends, issues and best practices within the sector, to analyze the drivers and needs of the sector, and identify opportunities for innovation.

Clarifying a national picture of knowledge and practice and articulating opportunities to move forward is central to CWN's mandate of accelerating, advancing and improving water management decisions. It is also consistent with CWN's experience that effective uptake of solutions by stakeholders requires a "pull" approach that is rooted in clearly understanding, analyzing and framing considerations based on what is shaping and driving decisions for end-users' solution choices.

Leveraging CWN's existing knowledge of municipal water sector priorities through our Canadian Municipal Water Consortium, we designed a study that that would articulate and ground truth CWN's insights on trends in the municipal water sector, further analyze the drivers and needs of this sector, identify leading practices and opportunities for innovation, and point to opportunities for FCM to support the water sector. This process involved synthesizing current knowledge and engaging stakeholders from across the water sector to validate and augment our knowledge through a consultation process that included a survey of water managers across Canada and in-depth interviews with key stakeholders.

CWN's approach to ground truthing the key trends revealed by our ongoing work in the Canadian Municipal Water Consortium was critical in helping to improve the effectiveness of federal funding programming and support to the water sector. This project with FCM helped achieve a

shared vision of ensuring municipalities have the information they need to protect, use and manage community resources, including water, efficiently.

3b. Can you identify any current gaps in federal water legislation, policies, regulations, and/or initiatives, or in general across jurisdictions? If so, please specify.

The recent CWA public consultation process shed light on what Canadians and professionals in the water sector see as important to advance freshwater management and policy. While the CWA itself may not direct its focus on policy and regulatory reform, advancements in freshwater management are inextricably linked to framing the possibilities that policies and regulations structure enable or restrict. Ultimately, considering the possibilities for implementation of freshwater management will require reflection on how the prevailing policies and regulations support or inhibit actions. It will be important to ensure that evolving experiences continue to inform policy and regulatory review and development.

The following two examples highlight CWN's ability to convene structured conversations at a national level on critical water management issues and present opportunities for an effective path forward to advance federal freshwater priorities.

Contaminants in Municipal Wastewater

In 2017-2018, CWN conducted a national review of contaminants in municipal wastewater to explore options to address contaminants of emerging concern. Leveraging our national network of researchers and practitioners, we convened, at the request of the federal government, a National Expert Panel on Emerging Contaminants in Municipal Wastewater to identify gaps and offer critical insights on wastewater treatment investments, policies and practices.

In its culminating report, the expert panel articulates key opportunities and implications for future wastewater treatment in Canada and provides a blueprint to inform government policy, regulations and funding decisions. The panel points to key gaps that persist today, including:

- A need to further advance risk-based, integrated and cumulative-effects approaches to regulation and management;
- The need for infrastructure and other programs to incent and reward actions that treat regulatory limits as a baseline, and recognize and embrace the combined risk reduction and co-benefit potentials of potential actions;

- Development of a clearer picture of the state of knowledge of our water resources that draws together insights from a wide range of knowledge sources; and

- Support for critical research to support decision making, as well as resourcing of increased environmental monitoring.

Federal Water Policy Renewal

Canada's existing Federal Water Policy (FWP) was created in 1987 to establish direction and action across the federal government with respect to its roles in freshwater management. Since then, profound shifts in law and other policies have occurred, including a host of Supreme Court decisions relating to Indigenous rights. This alone warrants FWP renewal. However, there have been many major societal changes and challenges over the past 34 years, including the increased risks associated with climate change, pollutants, biodiversity loss, and the volume and speed at which technology and data have advanced through the digital revolution.

A renewed and modernized FWP would provide the federal government with opportunities to both lead and enable broader collective and coordinated action on water. Given the importance of water to government priorities and the strong resonance that water has with Canadians, economic sectors and aspects of society, a renewed FWP could also:

- Support a whole-of-government approach that ensures that actions underpin government mandates, including recognition of the role and knowledge of Indigenous peoples;

- Catalyze and coordinate action on freshwater across federal departments;

- Model an approach to enable other jurisdictions/partners in freshwater management;

- Involve actors beyond those in the usual water community, ensuring diversity and inclusion throughout the policy development and implementation process; and

- Move to more adaptive approaches that respond to changing realities, priorities and goals.

3c. Do you feel the federal government could play a more effective role in protecting watersheds in Canada? If so, which watersheds and how?

CWN recognizes the potential and ability of the federal government to play a key role in addressing issues for all watershed and transboundary (shared) water resources in Canada. In particular, we see the ability to lead and enable collaborations that leverage existing knowledge and resources as one of the federal government's most powerful and underapplied roles. Creating and supporting watershed-based initiatives, such as those described below, would enhance the federal government's ability to fulfill this role.

Within Canada, regulatory processes designed to prevent or mitigate adverse impacts have often focused on environmental impact assessments on a project-by-project basis. This approach has not been effective in supporting broader goals of integrated watershed management nor cumulative effects assessment, which involves monitoring and predicting environmental changes beyond a single project in a particular area to consider accumulated effects over time and the watershed as a whole.

In 2010, CWN launched the Canadian Watershed Research Consortium to connect local stakeholders and decision makers with leading Canadian researchers in developing regional monitoring frameworks for watershed management and cumulative effects assessment. CWN convened representatives from six watershed research nodes annually for six years to compare research results and observations. This work contributed to a community of practice that led to more consistent monitoring approaches, better understanding of baseline conditions and variability, as well as predictive models and adaptive management.

Collective learnings across the watershed nodes translated into recommendations for the design and implementation of cumulative effects monitoring frameworks across Canada. This initiative speaks in part to the 'how' and serves as a model in bringing partners together to support the co-creation of watershed-based monitoring frameworks that are context-specific. No single framework can address the requirements of Canada's diverse watersheds; it requires a team effort. Lack of funding (in most cases) to advance watershed management, coordination of efforts and cumulative effects assessments as a central focus means much of this work is done off the side of people's desks.

CWN recognizes that watersheds currently prioritized for protection and restoration include the Great Lakes Basin and Lake Winnipeg Basin, with a strong federal role in managing these transboundary watersheds.

3d. Are there areas of freshwater policy, legislation and/or regulation where you feel the federal government should play a greater role?

As highlighted throughout this submission, we see the most underutilized opportunity for the federal government to play a greater role in freshwater management as being related to enabling and supporting convening, harmonization, and integrated curation and consideration of knowledge and resources. Achieving results through a structured pan-Canadian approach to convening, aggregating and curating knowledge is the greatest need and opportunity for federal contribution to success. This applies across the vast majority of priority freshwater resource issues, including cumulative effects management and flood protection.

3e. Are there areas of freshwater policy, legislation and/or regulation that you feel the federal government should vacate and leave to another level of government or to the private sector?

In freshwater management there are rarely clear lines of separation to demarcate areas in which the federal government, other levels of government or the private sector should or should not be involved. Rather, it typically comes down to an assessment of which areas are most effectively led or actioned by the various levels of government or private sector. In our report to the federal government on the future-ready nature of the current federal freshwater policy, CWN recommended that the federal government conduct a cross-departmental review of federal actions and regulations, applying a water lens to assess the degree to which the actions, regulations and interventions of other levels of government and the private sector influence or control the ability to achieve federal goals and mandates. We encourage the federal government to use the results of such an exercise to determine where it may be most useful to refocus a federal government leadership role to more of an enabling one.

3f. Are you aware of instances where federal freshwater policy, legislation, regulations, and/or initiatives have clearly benefited from your organization's input?

The following examples highlight recent instances where federal initiatives have clearly benefited from CWN's work.

Accelerating discussions on application of wastewater-based epidemiology for SARS-CoV-2

Over the past year, CWN responded to the urgency of the COVID-19 pandemic by accelerating discussions on the applications of wastewater-based epidemiology (WBE) in Canada. We created the COVID-19 Wastewater Coalition to guide Canada's understanding of community spread of the virus as revealed in wastewater and provide a critical foundation upon which the Public

Health Agency of Canada and provincial governments could then build their programs to aid in pandemic management. The COVID-19 Wastewater Coalition was instrumental in facilitating research, early rapid sharing of ideas and developing an innovative technique to monitor COVID-19 infection in wastewater. It also developed several maps as a visual narrative of where this work is now underway in Canada. Canada is contributing to global efforts on WBE being applied in more than 55 countries at over 2200 sites (and counting), as captured by COVIDPoops19.

Informing decisions on effective municipal wastewater treatment investments, policies and practices

In 2018, CWN's National Expert Panel on Emerging Contaminants in Municipal Wastewater provided the federal government with a blueprint of critical insights to inform decision makers and stakeholders in choosing the most effective wastewater treatments investments, policies and practices. The panel's recommendation to make wastewater data more accessible helped advance ECCC's Wastewater Systems Effluent Regulations Reported Data, which was published in 2019. The panel's recommendation to incent and reward innovations beyond minimum regulatory standards was influential in other jurisdictions, including the province of Quebec.

4. Collection of information and data

4a. Do you believe that there is sufficient data collected and made available publicly about freshwater in Canada?

Data sufficiency is challenging as an end goal. We acknowledge the many governments, Indigenous communities, academic institutions, non-profit organizations and private sector companies currently involved in gathering data and curating knowledge on freshwater, climate and biodiversity. This includes scientific models and monitoring, community-based monitoring and Indigenous ways of knowing. We believe this important work should be supported, and where relevant, made publicly available and accessible for decision making.

A specific example of data deficiency is Canada's fragmented and incomplete understanding of flood risk and its implications for communities. Many communities seek to address flood risk more accurately, but efforts have not been coordinated, thus leaving gaps in foundational data.

To address some of these gaps, CWN undertook a pilot project aimed at Improving Flood Risk Evaluation and Risk Management through Cross-Sector Sharing of Richer Data. Working in partnership with the Insurance Bureau of Canada and supported by Natural Resources Canada, we examined how results for pluvial flood hazard maps derived from large-scale risk models are

different (and to what degree) when richer datasets are used. This project led to tangible benefits for Canadian municipalities and utilities. Through participation in this project, EPCOR Water Services in Edmonton was able to secure access to insurance flood maps for the City of Edmonton and shift to a risk-based approach to prioritizing flood mitigation measures, resulting in $3 billion in capital costs savings of and shortening the payback period from 80 years to 20 years.

4b. Do you believe there should be improvement in freshwater-related data-sharing?

Making solid decisions for freshwater requires good quality data for long-term planning. CWN convenes senior municipal water managers across Canada bi-annually to share knowledge and discuss insights on pressing issues. Through this venue, we heard repeatedly that challenges with data management, including data sharing and accessibility, plague most municipalities and water utilities. This challenge is further compounded by a vast array of technical solutions and a steep demand to digitize water and wastewater operations, which puts more pressure on data management and sharing capabilities, and also necessitates upskilling the workforce to manage the data being collected.

As an example of a specific call for improvements in data sharing, CWN's National Expert Panel on Contaminants in Wastewater's blueprint for federal action included a recommendation to establish a coordinated national system of collecting, assessing and sharing data on wastewater treatment among Canadian municipalities and utilities. The panel's recommendation to make wastewater data more accessible helped advance ECCC's Wastewater Systems Effluent Regulations Reported Data, which were published in 2019.

In another example, CWN's COVID-19 Strategic Sharing Group leveraged our structured convening role to enable information sharing for Canadian municipalities during a national crisis. National discussions were held weekly during 2020 that supported utility leaders across Canada in planning, prioritizing and responding to the pandemic. Feedback from participants indicated CWN's agile response and ability to get the group up and running in a matter of days following the March 2020 lockdown was instrumental in enabling municipal water utilities across the country to share knowledge as they faced new challenges during this unprecedented time.

4c. Is there any specific type of data or information you would like the federal government to provide to freshwater stakeholders?

The adoption of asset management plans has been increasingly on the rise in Canada, but questions still remain on what effective asset management structures look like and how they are being implemented for planning and prioritization efforts within municipalities.

In 2017, CWN partnered with Public Sector Digest (PSD) and the Canadian Water and Wastewater Association (CWWA) to leverage asset management data for improved water infrastructure planning. This project helped provide greater understanding of what asset data are being collected by Canadian municipalities and utilities, and how data are used to support decisions regarding maintenance and repair, replacement and strategic planning. Our national survey and in-depth interviews with utilities pointed to opportunities for all levels of government, including Infrastructure Canada, to strengthen asset management programs by better supporting the collection of asset management data in Canadian municipalities.

In 2018, CWN also partnered with Federation of Canadian Municipalities (FCM), PSD and CWWA to develop five case studies of Canadian municipalities collecting data to support infrastructure vulnerability assessments and increase climate resilience. Each case study offers a road map to help guide other municipalities/utilities.

4d. Has your organization experienced challenges obtaining well-organized data from the federal government on issues relating to freshwater?

The impacts of climate change are being experienced by Canadians more and more frequently, and with more severe consequences. Flooding from severe storms and overflowing water bodies has caused significant damage to Canadian communities over the past two decades. To make effective decisions about adapting to climate change (including flood management), municipalities, provincial/federal levels of government and the private sector need relevant, timely and reliable climate data. Canada's Expert Panel on Sustainable Finance recommended the establishment of a Canadian Centre for Climate Information and Analytics (C3IA) as an authoritative source of climate information and decision analysis.

Canadian Water Network, with support from IBC, undertook a study in 2020 on how to best frame the new C3IA so that it will be useful for, and used by, municipal decision makers. CWN's final report, Framing the C3IA to Advance Municipal Flood Management, provides insights and recommendations to ensure the C3IA would have strong value for Canadian municipalities.

This project generated the framing for a made-in-Canada solution to improve data collection and knowledge sharing on flood risk evaluation, and pointed to the importance of effectively curating knowledge from other sectors for comparison. Important breakthroughs were realized through cross-sector conversations on who is using what data/information, how they define risk, and whether their data could be beneficial to municipalities and utilities. The project pointed to the importance of effectively curating knowledge from other sectors for comparison, and revealed that by learning how other sectors (including upper levels of government) define and assess risk, municipalities are better positioned to address flood risk.

The C3IA represents a clear and nationally relevant opportunity to support Canadian municipalities in protecting citizens, the environment and local economies from the impacts of climate change. Understanding the needs of these decision makers, as well as exactly what data, information and knowledge will need to be shared or accessed, will be critical to its success.

4e. Is the lack of standardized data or information across government jurisdictions a problem or challenge for your organization in accomplishing its objectives with respect to protecting and managing freshwater?

Data underpins our ability to understand and manage our freshwaters over time. Currently, data are collected for a variety of reasons and in a variety of ways specific to support the local projects it informs. However, data and metadata standards must be a best practice for managing data collected by public institutions such as municipal, provincial and federal governments. Currently, there are no national set data standards for water quality data. The Water Survey of Canada provides a national standard for hydrometric data, including the data management continuum from data collection, quality assurance, and data storage and management.

Through conversations with our Municipal Consortium, we have observed that it is not necessarily the lack of standardized data or information that poses the real challenge. The real challenge is knowing who has what information and who is working on addressing what issues, which is where CWN's structured convening role, as described above, adds value.

5. International and business issues

5a. Should Canada play a greater role internationally in helping find solutions, either through government and/or the private-sector involvement, to the challenge of global freshwater security?

Yes, Canada's private and public sectors have strong potential to increase their contributions to finding solutions to global freshwater security challenges. The technology and innovation

community has called for better harmonization of water management approaches, as well as streamlined access to funding to increase the success of innovations at home and abroad.

In a 2013 report that CWN commissioned for the Blue Economy Initiative, in conjunction with the Royal Bank of Canada and the Gordon Foundation, author David Crane explored opportunities for Canada to play a greater role as a "water solutions country" to accelerate clean technologies and research expertise in addressing global water security challenges. Building on this report, CWN convened the water sector to discuss Canada's potential to support innovation and leverage resources for a more robust global economy, with urban water and wastewater infrastructure, agriculture and renewables at the forefront.

Beyond technology development, Canada has a major role to play in what is, in our perspective, being increasingly seen as the most important area of innovation to address water security globally: innovations in governance, management and finance. Better integration of non-traditional players in the water spaces and government departments into such discussions represents a big opportunity for progress. The insurance sector and investment banking have become more central players in the climate change and risk communities and have a growing role in addressing water-related issues. The continual highlighting of water and climate-related risks among the top 5 global risks by the World Economic Forum annual Global Risks Rankings demonstrates the importance of engagement of both government and the business sector in addressing global risks. Canada should be at the forefront of recognizing and addressing these risks and opportunities. Other federal departments and agencies like Statistics Canada are playing increasingly important roles in the area of environmental accounting to better understand and support the role of ecosystem approaches to addressing global needs and risks.

CWN serves as Canada's representative on the Global Water Research Coalition (GWRC), a global platform for the exchange and generation of water knowledge. CWN's CEO currently serves as Board Vice Chair for GWRC. Through interactions with our international colleagues at GWRC, we are continually looking at where collective action to support global water issues can bring value. Canada is seen as a key player with much expertise to provide to the global community in the areas of advancing water knowledge and impacts.

In keeping with the thesis of this submission, supporting vital boundary organizations like CWN that can help identify and accelerate progress on priorities that are shared among members of Canada's private sector, levels of government and knowledge providers to the benefit of Canada and global citizens will be key to realizing this potential.

CWN wishes to highlight for the government that, whereas many recognize the important role of the technology accelerators within the innovation ecosystem, there is an equally important but under-recognized role and under-supported need for knowledge accelerators and associated support systems to move knowledge into policy and practice. This is precisely the role CWN has sought to play following repeated demonstration of its need during our NCE tenure. We see this as critical for Canada's approach to innovation through water and international contributions in that space.

5b. Do you feel Canadian private-sector companies, including financial institutions, can and should play a role internationally?

Yes, and it is an imperative. As discussed in response to the question above, the private sector, including insurance and investment companies, corporate water users, and technology providers, have a key role to play in collaborative international action on water. There are huge risks and costs associated with water use for production and in the delivery of water services, as well as uncertainties around who should bear those costs. Technological solutions are often prioritized, but innovations in governance, finance, and equity considerations are needed most.

In engaging the private sector, we need to ensure water remains a fundamentally public issue in Canada, and that the perspectives of Indigenous governments, other levels of government, and the Canadian public are included in shaping and achieving a restorative future.

5c. What role can the federal government play in better supporting freshwater-related academic research, R&D, businesses, products, and services?

The Canadian federal government has always played a lead role in provision of support to Canada's main research mechanism — academic research. In the face of global reductions in many research and development programs as part of fiscal management and austerity measures, it is critical that Canada's federal government maintains its support of vital academic research and the elevation of the knowledge produced not only to commercialization for technologies, but also acceleration of knowledge to policy, management and actions, as discussed above.

For example, one of the recommendations from the National Expert Panel on Emerging Contaminants in Municipal Wastewater convened by CWN was to coordinate investment in science and Indigenous knowledge-based research and technology transfer to improve the understanding of risks and recognize meaningful co-benefits.

As captured in the recommendation above, maximizing the value and benefits from Canadian research not only requires federal investment of resources, but the coordination of investments

across sectors accompanied by an enhanced understanding of how these investments have value to different end-users, both within and outside the federal government. As an NCE, CWN saw repeated examples of this desire and need. Assisting Canada's federal granting agencies with the same approach to ensuring creation of effective spaces that better daylight how decision makers can use and apply information — creating an effective "pull" for prioritizing investments and research design and assessing its relevance to decision making — is one opportunity CWN sees to achieve more impact and value nationally and internationally from its research investments.

There has been intense public interest and a wide range of recommendations and opinions expressed by the water community in response to both the CWA consultations and Standing Committee's Freshwater Study. It is our view that the one approach that is likely to have most value for the largest number of stakeholders will be for the federal government to invest in a dedicated structured convening role with the ability to reach across a broad range of freshwater issues while putting end-user needs front and centre. This role could be well served through a dedicated function within the CWA, or by supporting external accelerators of knowledge to practice and policy such as CWN. We would be pleased to engage with the federal government to leverage the value of our structured convening approach to advance federal freshwater priorities.