**May 7, 2021**

**To:** House of Commons Standing Committee on Environment and Sustainable Development

**From:** **Ryerson Urban Water** (RUW) members **Dr. Claire Oswald (Interim Academic Director),** Dr. David Atkinson, Dr. Kimberley Gilbride, Dr. Patricia Hania, Dr. Stephanie Melles, Dr. Roxana Suehring, Dr. Christopher Wellen

**Re:** RUW Submission to the House of Commons Standing Committee on Environment and Sustainable Development Re. **Brief on Freshwater in Canada**

The House of Commons Standing Committee on Environment and Sustainable Development invites stakeholders to submit a brief for the committee's study on freshwater. The following questions are provided to guide submissions.

## Questions for stakeholders in preparation for the House of Commons Standing Committee on Environment and Sustainable Development's study on freshwater

### *1. Introductory information*

a) Which issues related to protecting and managing freshwater does your organization work on?

Ryerson Urban Water (RUW) is a multi-disciplinary research centre at Ryerson University. RUW is a trusted, non-partisan source for research which includes more than 40 experts across 6 faculties and 13 Departments (RUW Member Expertise). Our researchers and their teams of graduate students come from the natural sciences, engineering, policy/regulatory, and social science arenas.

Our experts work on a broad range of urban water related topics, including water capture strategies such as green roofs and urban forests, low impact development and municipal master planning, engineered wetlands, urban water quality and ecosystem health, sophisticated wastewater/stormwater mitigation strategies, and cost-benefit economic strategies, and water law and policy. RUW has the expertise necessary to support the development of resilient sustainable water systems in urban areas.

Ryerson University is located in the downtown core of Canada's biggest metropolis, Toronto, and near one of the world's largest freshwater sources, Lake Ontario. An extensive network of streams and rivers drain through the city to the lake. Ryerson Urban Water leverages this geography to undertake unique education, outreach, and research

initiatives in collaboration with the local and regional urban water communities.

Ryerson Urban Water meets and engages regularly with members through monthly General Meetings and Executive Meetings, as well as, several working groups which draw researchers from across Ryerson University interested in urban water research and initiatives. In 2015, Ryerson Urban Water founded an Advisory Board (RUW Staff and Advisory Board) to provide feedback and guidance on RUW initiatives. Advisory Board members come from across the sector including government, conservation authorities, consulting engineers, and private industry. The RUW Office and RUW researchers are active and well-integrated into the external community, providing a robust network of partners and collaborators for RUW research.

***2. Interaction and collaboration with federal departments and agencies***

a) 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?

Yes, RUW members routinely collaborate with federal departments/or agencies on the following freshwater issues:

1) Nutrients, road salts, others - working relationship with scientists at CCIW in Environment Canada.
2) Nutrients in Agricultural catchments - working relationship with scientists at Agriculture and Agri-Food Canada in Guelph, Ontario.
3) Chemicals of Emerging Concern and plastic pollution - interacted with policy makers at Environment and Climate Change Canada.
4) Cumulative effects of disturbances (e.g., forest harvesting) in catchments on downstream freshwater lakes and fish mercury contamination. Working with scientists (Erik Emilson) at NRCan.
5) Long-range transport of chemicals into the Canadian Arctic - Collaboration with scientists at Fisheries and Oceans Canada and Environment and Climate Change Canada.

b) 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?

RUW's freshwater-oriented research requires collaboration with numerous federal agencies (e.g., ECCC, NRCan, AAFC, Fisheries and Oceans Canada). However, many urban water-related issues do not fit solely into one federal department/agency's jurisdiction. Rather, urban water issues require a multi-level governance approach that requires participation and interaction with municipal, provincial, federal, Indigenous communities, and sometimes, international jurisdictions, depending on the location of

the issue (e.g., Arctic waters, Great Lakes).

c) 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)?

We have had success in developing continued collaborations with Federal scientists in ECCC, NRCAN, and AAFC (see 2a). We have also had success in applying to Federal calls for proposals from ECCC.

d) 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?

Yes, we do foresee engagement with the new Canada Water Agency (CWA). At a minimum, a centralized CWA will make collaboration across federal agencies more streamlined and efficient when working on a cross-jurisdictional issue. Collaborating with NRCAN, ECCC, and/or AAFC will hopefully make it easier to see and form the linkages needed between agencies to address urban related water issues.

We are involved in the training of undergraduate and graduate students, as well as post-doctoral fellows, who offer their expertise to government agencies through academic-government collaborations. We foresee knowledge transfer as trainees share research results with stakeholders (e.g., government scientists and policymakers, water practitioners, non-governmental organizations, other academic researchers).

We also hope that policy responses that integrate the mandate of multiple agencies and departments will be easier (i.e. agricultural BMPs to improve water quality, road salt management).

Finally, in our expert opinion, the shared multi-jurisdictional nature of water means urban water issues have fallen through the cracks, leaving open the question: What federal department or agency can effectively provide leadership, research, and policy responses on urban water issues?

***3. Federal water legislation, policies and regulations***

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

As an independent organization, RUW has provided comments on proposed freshwater legislation, Canada Water Agency, Parliament's M-34 motion (Instruction to Standing Committee on Environment and Sustainable Development (Freshwater).

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

A key legislative gap is the need to modernize the *Canada Water Act,* 1985, R.S.C., 1985, c. C-11. Currently, this legislation overlooks Canada's interconnected waterscape leading to an under appreciation of local issues (e.g., freshwater salinization, chemicals of emerging concerns in wastewater effluent, road salt). Eventually, all of Canada's freshwater will find its way to one of our three surrounding oceans, crossing provincial, rural, urban, and international borders. Currently, the normative frame underpinning the *Canada Water Act* fails to recognize the interconnectedness of Canada's waterscape, and perpetuates the myth that Canada is freshwater rich. This myth is upheld by the federal government's limited focus on water quality and water quality management as set out in *Clean Water Act* (i.e., s. 2(1) CWA - conservation, development and utilization of water resources).

The mobility of chemicals through watersheds, and in some cases across watersheds (i.e., atmospheric pollutants), is a gap in federal water legislation that needs to be addressed. Lack of regulation and management of environmental chemical (long-range) transport leads to the movement of pollution from urban, agricultural and industrial areas into freshwater, and eventually marine, environments. In addition, the management of federal waters should be premised upon SMART objectives (i.e., Specific, Measurable, Attainable, Relevant, and Time-Bound). In the spirit of SMART objectives, the legislation should include disclosure requirements in order to understand what substance is being released into surface and groundwater (river systems, lakes, storage ponds, wetlands), including municipal infrastructure systems (e.g., sewer systems), and oceans. The public's right to know should also be included in the legislation. The public should be informed and understand what is being discharged into their local watersheds. In advancing this right to know, the federal government should establish a reporting structure to provincial, municipal and First Nations in recognition of the interconnected and transboundary nature of Canada's waterscape, and the need to inform local citizens of any water security risks.

Legislative reform of the *Canada Water Act* should include the adoption of a participatory mode of water governance where federal, provincial, territorial, municipal, and Indigenous governments work together. The scope of this participatory model should be broad enough to consider both a national, regional and local perspective that includes participation of a diverse range of participants, beyond provincial and federal governments, such as First Nations, Metis, Inuit, municipal governments, industry, non-governmental organizations, and members of the public. This inclusive participatory model should consider the diversity of Indigenous worldviews of water, and an Indigenous gendered perspective of knowing water. Adopting a participatory governance model would ensure a broad and diverse range of participants can actively participate in decision making. It will also facilitate consideration of local and regional water security threats facing the public, agricultural, industry and commercial sectors. For example, threats to water supply in the prairies,

salt water intrusion along coastal waters into aquifers including Arctic river-systems.

Another legislation gap in the *Canada Water Act* is the lack of an oversight body, such as a Water Advisory Body. This oversight body should be structured at a federal level to reflect Canada's broad ocean drainage areas, thereby placing greater emphasis on the flows of freshwater in Canada's interconnected waterscape. That said, all seven of these drainage regions (each represented by a sub-agency) should have similar levels of staffing and support. The Advisory Body would take into account the shared constitutional responsibilities for the subject of water. A shared responsibility that is conferred upon federal and provincial governments but also includes the delegated powers to municipal government, and water responsibilities of First Nations through, for example, self-government arrangements. Federal agency support should weigh the import of (urban) population size and pressures, Indigenous governance, industrial (forestry, mining, agricultural) pressures and economic value of the ocean drainage, as well as the relative importance of maintaining and conserving the rarity of Canada's wild rivers and freshwaters.

Legislative reform should recognize that Canada's waterscape is an issue of national concern that impacts local citizens, Indigenous territories, economic sectors, international affairs, and contributes to Canadian's mental wellbeing. Given this national concern status, the Advisory Board's role should be structured to oversee the governance of the agency at a national level, with the sub-agencies reporting to a Chair (for example, Chief Water Officer) and with representation on the Board, and the Chair reporting to a responsible Cabinet Minister.

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

Great Lakes Basin watersheds

- Regulating and enforcing increased monitoring plus taxation of industries for contaminants of emerging concern. These could be monitored at sewage treatment plants and sewage ponds/retainment ponds.
- Leveraging existing infrastructure to harmonize (spatially and temporally) water quantity and quality monitoring in human-dominated (urban, agriculture) watersheds with frequent flooding and degraded water quality.

Mackenzie River Basin:

- Monitoring of long-range river-based transport of persistent, mobile, and toxic chemicals into the Canadian Arctic.
- Transboundary watersheds generally (trans-country and trans-province)

Watersheds draining into the Hudson's Bay lowlands:

- Developing closer collaborations with First Nations and government partners to ensure increased, adequate, and consistent monitoring of wild river systems and their estuaries that drain into the Hudson Bay (e.g., Moose, Albany, Attawapiskat, Winisk, and Severn). The Hudson Bay system is underprotected. See: Knowledge for Policy Digital Observatory for Protected Areas (DOPA) https://dopa-explorer.jrc.ec.europa.eu/

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

Regulation and management of environmental chemical pollution of watersheds that span multiple provinces and undergo long-range water-based transport into the Canadian Arctic.

Improving polluter accountability - particularly for discharge of persistent, mobile, and toxic contaminants that can pose long-term risks to drinking water security.

Ensuring coordination of long-term water quantity and quality monitoring in areas experiencing rapid changes in land use, as well as pristine reference systems.

Stronger regulation of road salt usage for organizations (public and private) that are not covered by the federal Code of Practice for the Environmental Management of Road Salt (i.e., <500 tonnes per year).

e) 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?

There needs to be a linkage between the federal and provincial government on water issues. Private sector can be helpful in driving innovation, yet the leadership should remain at the federal government. This is particularly important with regards to the monitoring of emissions and potential harm of pollutants from industrial processes. Here, industry should be called upon to contribute to funding for monitoring and mitigation of impacts, rather than providing the monitoring data themselves.

For example, if the proposed Canada Water Agency were legislated as an independent agency (i.e., independent of federal/provincial/municipal governments) similar to models in other countries (e.g., Alterra in the Netherlands), as this could help drive innovation and facilitate CWA, academic, and industry partnerships.

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

Yes, our expertise on the contribution of wastewater treatment plants to the release of contaminants of emerging concern into freshwater sources was specifically sought to

help support discussions on Bill-28 for changes to CEPA.

***4. Collection of information and data***

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

We generally find the collection and open reporting of freshwater related data to be uncoordinated in Canada. Data is collected at all levels of government (federal, provincial, municipal), as well as by non-governmental organizations and academic institutions. Protocols for data collection, storage and reporting are not always standardized, making it difficult to fully utilize all data and assess gaps.

Water quality in particular is poorly monitored. For instance, despite the Federal government having multiple commitments to reducing nutrient inputs to the Great Lakes, we often lack the data to accurately estimate the amounts of nutrients entering the Great Lakes, and usually lack the data to estimate the sources of those nutrients. A similar problem exists with respect to other water quality issues. We lack reasonable estimates of inputs of water quality problematic chemicals (road salts, fertilizers, etc.) at the scale that would help estimate their source and transport.

We need mandated industry disclosure of what and how much is being released into water systems (including sewer systems, river systems, lakes, storage ponds, wetlands) across sectors.

We recognize that monitoring everything everywhere all the time is not feasible due to resource limitation; however, Canada needs a water monitoring strategy that spans all levels of government. This monitoring strategy needs to have long term sites for trend analysis and random sites for state analysis. The Ontario Broad Scale Lakes Monitoring Program is a good example of how to do this, and can lead to addressing questions like, How are towns across Canada doing in terms of water quality?

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

Yes, we believe there should be improvements in freshwater-related data-sharing because currently not all data sets are openly available and reporting protocols are not standardized. For example, the Water Survey of Canada model for collecting and reporting water quantity data could be mirrored for water quality.

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

Systematic monitoring of microplastics as well as monitoring and identification strategies for chemicals of emerging concern (CECs) are currently lacking. This information is essential to building a spatially integrated understanding of emerging

risks to freshwater and drinking water security across Canada and can lead to effective risk analysis and prioritization of pollutants both from a scientific and regulatory perspective. Publicly available monitoring data from a federal monitoring program or an open access database of microplastic and CECs analysed through federally funded research would help meta-analysis of contaminant profiles and spatial patterns and enable the identification of pollutants of concern as well as areas with high exposure.

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

We have had a very difficult time accessing the road salt usage data that is voluntarily reported to ECCC under the federal Code of Practice for the Management of Road Salt. We were told that data agreements would be required with each municipality before it would be shared with us. This legal barrier should be removed. We require this data for determining watershed-scale non-point source road salt inputs for several ongoing studies in Ontario.

Data on chemical formulation and physical chemical properties registered on CEPA's domestic substance list. The lack of specific information makes it very difficult to evaluate the potential environmental impact of chemical discharge and to prioritize new CECs for monitoring and risk analysis. The federal government should support a database that provides detailed composition and discharge data for chemical products to the regulator, similar to the UK's system under the Harmonized Mandatory Chemical Screening (HMCS) of Offshore Chemicals under the OSPAR convention.

The data on agricultural practices is currently reported at extremely coarse scales. As a result, we are not able to effectively identify priority areas for remedial measures. For instance, fertilizer use is presented at provincial scale, and many practices are presented at county scale. There are many research projects focused on simply estimating fertilizer inputs at a county scale or finer. These different projects get different answers! In the United States, fertilizer and manure inputs are presented at a county scale, and this enables identification of priority watersheds and priority areas. There should be a better coordination of agricultural land use and management monitoring and a finer scale of reporting. Further, the federal and provincial governments spend significant amounts of money on farm-based management improvements. Yet we do not know where these improvements actually happened! This means that when recommending improvements to land management we do not know how many remedial actions have already been completed. Further, we are not able to access any information on nutrient levels in the soil currently, despite this information existing. This makes it hard to estimate the effects of legacy nutrients. All of these barriers to accessing existing information make it hard for researchers to identify priority watersheds, and make it very difficult to recommend remedial measures. Nutrient pollution is responsible for expensive upgrades to municipal water systems and some water service outages (e.g., Toledo in summer 2014). So the lack of data access makes it hard to protect urban water supplies.

Geospatial web browsers that consolidate and visualize data are often slow to load and problematic because they often do not provide easy access to download source data, nor do they have consistent metadata.

e) 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?

Yes, the lack of standardized data across jurisdictions is certainly a challenge for us to conduct our research.

***5. International and business issues***

a) 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 international role is critical. Water security and management are international questions that are heavily impacted by global anthropogenic climate change as well as pollution. Canada should strive to be a leader on finding solutions and mitigating global threats to water security by (1) setting ambitious goals for the protection of freshwater and (2) supporting and taking the lead of international initiatives including a International Panel on Chemical Pollution and Waste Management

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

Yes. CA Federal government should agree to international minimum global tax for private sector and financial institutions (21% rate) so long as a designated portion is allocated to transboundary water issues.

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

The federal government should provide a one-stop gateway and concierge to research funding programs available in all jurisdictions including federal departments, provincial departments, and other jurisdictions. As well, the federal government should provide a central repository for data that can be shared and accessible across jurisdictions. Access to data across jurisdictions would avoid duplication and enable building upon work already accomplished.

Moreover, the federal government should be placing priority on Canada's freshwater by financially supporting and promoting freshwater-specific research through research funding and programs.

**Contact:** For further information please contact Dr. Claire Oswald, (Interim) Academic Director of Ryerson Urban Water at coswald@ryerson.ca or 647-225-1016.