

Alternative Water Sources and Wastewater Reuse

Water Availability Engagement



Population growth, economic growth and water variability are challenging the water management system in Alberta. New policy and regulatory tools could be used to increase water availability for Albertans and optimize the water management system to better address these issues while continuing to protect the aquatic environment.

This document provides background information on just one type of water management opportunity identified through conversations with stakeholders. It is intended to spark ideas and generate conversation.

The Government of Alberta invites your feedback on any opportunity to increase water availability in the province.

Enabling use of alternative water sources

For most of Alberta's history, water supply and availability and our water licensing system was focused on allocating the readily available, natural water sources in the environment such as rivers, creeks, lakes, groundwater aquifers, or wetlands.

Alternate water sources include:

- Stormwater
- Collected rainwater
- Collected household greywater
- Wastewater reuse
- Industrial process-affected water reuse
- Landfill leachate reuse
- Hydraulic fracturing flowback fluid reuse

Most alternative water sources are sources not supplied from fresh surface water or groundwater in the environment. Wastewater and stormwater form the majority of alternative water sources currently of most interest for use in Alberta. Other alternative sources include rainwater and greywater. The use of these sources can augment our existing water supplies while providing environmental and economic benefits.

Stormwater is a use – not a reuse – of water. Why does this matter? Since it's recognized as a water source, stormwater needs a water licence. In southern Alberta where some basins are closed, this means a licence transfer from an existing licensee is needed. This makes it costly and often infeasible as a potential source, even if it is otherwise practical or attractive.

An advantage of water reuse over accessing natural water supplies is that, in many cases, less water is being taken directly from the environment. Additionally, because end use water quality does not necessarily need to be potable, less energy and fewer inputs are required in treatment processes; this concept is often referred to as 'fit for purpose'.

A fit for purpose approach – matching water quality source to end use – saves energy by reducing treatment requirements. This concept encourages use of the lowest quality water necessary for the end use, while posing the least risk to the user, the public and the environment.

To address the potential human health and environmental risks associated with exposure to wastewater and stormwater, water reuse projects include the implementation of controls to minimize these risks.

What is return flow?

The term “return flow” is not defined in the *Water Act* or its regulations. In Alberta’s system of water licensing and water management, return flow considerations are important in how water is licensed for use. When talking about “reusing water or wastewater”, what is most often happening is someone wants to take and use the water that they previously would release back into the environment after they were finished with it (i.e., return flow). The challenge to resolve is that returned water may already be important for, or contributes to, needs or uses downstream, so claiming it for reuse can reduce downstream flow and might affect someone else’s licensed water supply.

Return flow is managed by the government to:

- ensure there are no adverse impacts to the aquatic environment or other water users not only from a diversion of water, but also from a return of water
- characterize the potential changes and impacts to downstream users and the aquatic environment resulting from a diversion
- provide regulators with a better indication of water available for allocation and for all management purposes, cumulatively, within watersheds.

Alberta relies on return flows to achieve its overall water management objectives, maximize the availability of water amongst water users while respecting the system of prior allocation (licence seniority) and assures we continue to meet transboundary obligations to downstream jurisdictions.

Water diversion is the process of capturing, storing, consuming, taking or removing water for any purpose. Sometimes this is described more generally as using water. Diverting water requires an authorization by the Government of Alberta, most often by issuing a licence.

Return flow is the quantity of water returned by a licence holder following their diversion and use of water. This might include raw water, process-affected water, captured runoff, treated wastewater or any combination of these. Return flows must be suitable quality before being discharged.

The opportunity

Alberta Environment and Protected Areas (EPA) wants to hear from Albertans about water reuse, including how the *Water Act* should recognize return flow as a fundamental component of the water management system, so that it more clearly describes Alberta’s authority for continued regulatory oversight.

The purpose is to assure the integrity of the overall water management system is maintained, and by doing so that alternative water sources and wastewater reuse innovation can be broadly enabled, with new and specific regulatory authority.

EPA will review how to incorporate net diversion licences and the circumstances when this type of situation can be considered. A net diversion licence is where a licence holder has been permitted to receive credit for returning water to the source of diversion. Notwithstanding those cases where a net diversion can be authorized under the conditions of a licence, Alberta will continue to issue licences for their allocation of water, regardless of how much water is returned.

Why can’t licensees just reuse, or provide their leftover water (return flow) to someone else, to reuse?

The *Water Act*, and Alberta’s previous water legislation, never explicitly contemplated this outcome.

Licences are issued to a specific licence holder, for a specific purpose and amount, and with conditions of use. Other uses or secondary users are not permitted unless expressly authorized or conditioned.

When the licensed purpose is complete, remaining water is expected to be returned, which acknowledges the province’s original ownership and its authority to decide, such as, whether returned water can be allocated in a new licence downstream or perhaps needs to be left instream to support other water management needs (for example, supporting environmental flows and levels or meeting transboundary commitments). Other uses, reuse, or secondary users are not permitted unless expressly authorized or conditioned.

Ownership of water is vested in the Crown as a natural resource managed for the benefit and use of all Albertans. This is a founding principle of our system, established under federal legislation (the 1894 *Northwest Irrigation Act*) even before Alberta became a province. Water is managed by government for the benefit of all Albertans and all use of water must be recognized or authorized under the provisions of the act.

Current reuse of water

The *Water Act* may not currently lay out a process or have specific tools to authorize reusing licensed water. Water reuse and using alternative sources such as treated waste waters make sense in some circumstances. Reusing is especially beneficial if it:

- reduces the impact on the natural environment by offsetting diversions that would otherwise come from rivers, lakes, streams or aquifers,
- reduces the water quality changes or impacts created by treated water discharges, or
- can create local alternative supply options and drought resiliency for some types of water users.

EPA created interim guidance that provided the circumstances and requirements where reuse of certain treated waste waters can be considered. The process uses an authorizing letter from a regulator to recognize a transfer of a treated wastewater for use by another party, and as appropriate amends the original *Water Act* licence to recognize reduced return flow resulting from the original diversion.

We want to hear from you

Consider these questions on alternative water sources and wastewater reuse before providing your feedback:

- How could return flow be defined in the *Water Act*, or recognized in licences, so it is clear what might be eligible, or needed, for enabling reuse or alternative water sources?
- What operational limitations might need to be considered for enabling reuse?
- Would there be a need to account for regional differences?

Get engaged

Learn more about the Water Availability engagement and have your say at alberta.ca/water-availability-engagement