

THE ALBERTA DESKTOP METHOD FOR DETERMINING ENVIRONMENTAL FLOWS (INSTREAM FLOW NEEDS)

Background

Managing rivers and lakes requires policy and science to balance the use of water with the need to maintain healthy aquatic ecosystems. Flow regime and lake levels are altered by regulation (dams and structures) and off-stream water diversion and return flows. Land-use practice can adversely affect lakes, rivers, and adjoining terrestrial ecosystems (wetlands, riparian areas). Environmental Flow recommendations, commonly referred to as Instream Flow Needs (IFN), are defined as the science-based quantities and qualities of water that sustain the ecological integrity of riverine environments.

Science and philosophy behind Environmental Flow (or Instream Flow Needs) assessments have changed greatly in the last two decades. Alberta's *Water Act* and the *Water for Life* strategy support and encourage the establishment of IFNs. In the *Strategy for the Protection of the Aquatic Environment*, the Government of Alberta takes a holistic approach to aquatic management (water quantity, water quality, aquatic habitat, species) to ensure resources are maintained, restored, and enhanced. IFN recommendations have become an important part of water management planning and for establishing Water Conservation Objectives (WCOs) for watersheds. Policies and tools will need to be developed and implemented so outcomes remain aligned with best available science and public expectations.

What is the level of environmental flow recommended by the Alberta Desktop Method?

The formula for the Desktop Method is the greater of either:

- A 15% instantaneous reduction from natural flow or,
- The lesser of either the natural flow or the 80% exceedance natural flow based on a weekly or monthly (depending on the availability of hydrology data) time step.

What does it mean?

The recommendation is intended to be fully protective of the aquatic environment *in the absence of having site-specific information that could otherwise be used to establish an Environmental Flow*. The Alberta Desktop Method was developed with the intent that by staying within recommended limits, there is a very low probability of ecological effects to the aquatic environment (full aquatic ecosystem protection). It achieves this by preserving not only water quantity within the stream, but also the natural fluctuations that occur day to day, including peak events. **The Environmental Flow recommendation specifies for the lowest flows that occur up to 20% of the time, no abstractions of water should be permitted – providing an ecosystem baseflow. For the remaining 80% of the time when flows are higher, up to 15% of the natural flow can be taken (leaving 85% of water instream).** Ideally, the IFN is to be applied weekly, meaning that available water for use also adjusts at least weekly.

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When does it apply? When should it not be used?

The Alberta Desktop Method was developed primarily for rivers that have **natural flows** and to make a full protection flow recommendation where site specific instream flow data is not available. The Alberta Desktop Method can also be used to assess the degree of impact on flows in highly regulated systems (dams, weirs) and in systems where there is a high degree of flow allocation. The method should not be used when better scientific information is available.

Natural flows are defined as the quantity of water moving past a specific point on a natural stream or river where there are no effects from stream diversion, storage, power production, import, export, return flow, or change in consumptive use caused by land use activities.

Recorded flows are the “actual data” collected at a stream flow gauging station. Where no regulation occurs upstream and water diversion is low, recorded flows can be a suitable approximation of natural flow for a given river or stream (for example, rivers in the mountain headwaters or for many northern parts of the province). However, in rivers that are regulated, particularly in southern parts of Alberta, streams are highly affected by human activities. In those cases the magnitude and distribution of flow recorded by gauges is significantly different than what would have occurred naturally. The process by which these effects are eliminated or corrected is referred to as “naturalization”. The resulting data is a naturalized flow series that shows how the river flows would have occurred if humans were not present. **Only natural or naturalized flow data should be used to compute the Alberta Desktop recommendation.**

How will Alberta Environment use the Desktop Method recommendation?

The Alberta Desktop Method is a tool that will assist in water management and licensing decisions by describing a full level of protection for what would otherwise require a complex environmental assessment. It is not a substitute for site-specific evaluation. However, conducting reach- or site-specific Environmental Flow determination typically requires a high level of effort and significant resources. For many applications, the level of effort may not be justified, yet there is still a need to assure environmental protection in each licence that is issued. The Alberta Desktop Method also provides a faster and simpler way to evaluate the possibility of environmental impact.

Alberta Environment is committed to the outcomes of the *Water for Life* strategy and maintaining healthy aquatic ecosystems. While assigning a high level of protection, the Alberta Desktop Method recommendation still allows for social and economic use of water resources. Water licence applications will continue to be reviewed for third party and environmental effects. Alberta Environment will work with licensees to incorporate the operational considerations associated with the Alberta Desktop Method recommendation where a decision has been made to apply the criteria within a water licence.

For additional information, refer to the full report: “A Desk-top Method for Establishing Environmental Flows in Alberta Rivers and Streams”.