

Getting Familiar With Water Quantity Threats

The goal of the *Clean Water Act, 2006* is to reduce the risk to the quality and quantity of municipal drinking water posed by activities in [vulnerable areas](#) surrounding wells and intakes. To address water quantity risks, water budget studies have been conducted through the Source Protection Program to understand and account for the availability and the uses of water now and in the future. Activities that can pose a risk to the quantity of municipal drinking water can be identified as [Significant Drinking Water Threats](#):

- Threat #19 - an activity that takes water from an aquifer or surface water body without returning the water taken to the same aquifer or surface water body (consumptive use); and
- Threat #20 - an activity that reduces the recharge of an aquifer

Drinking Water Quantity Threats

Activities that take water from an aquifer or surface water body without returning it to the same source (**Figure 1**) and/or reduce the ability of water to “recharge” or move from the surface to an aquifer (**Figure 2**).

Consumptive Use

Threat 19 occurs when water is taken and not returned and is no longer available for other users of the same water source. Taking water from an aquifer or surface water body that is used as a municipal drinking water source could result in the depletion of the supply and impair the long-term sustainability of the system.

Consumptive use activities are considered a Significant Drinking Water Threat in two types of vulnerable areas: Wellhead Protection Area Quantity (WHPA-Q) and Intake Protection Zone Quantity (IPZ-Q) that have a significant risk level.

Recharge Reduction

Threats 20 occurs when an activity reduces the recharge of the water table. Examples of activities that could reduce the amount of water infiltrating into the ground include paving of parking lots, construction of buildings and the pumping of water out of the ground, i.e., sump pumps. Similar to consumptive use, a reduction in recharge could result in the depletion of the supply and impair the long-term sustainability of the system. Recharge reduction activities are considered a Significant Drinking Water Threat in two types of vulnerable areas: Wellhead Protection Area Quantity (WHPA-Q) and Intake Protection Zone Quantity (IPZ-Q) that have a significant risk level.

Water Budget Studies

A water budget study evaluates the quantity of water that enters a watershed, is stored, and leaves the watershed. This information can be used to measure the amount of water available for human uses, while ensuring natural processes are maintained.



Figure 1: Activities taking water from an aquifer (groundwater) or surface water body (lake or river)



Figure 2: Activities reducing recharge of an aquifer's underground water sources (e.g., pavement)

The goal of water budget studies is to help water managers identify:

- Drinking water sources which may not be able to meet current or future demands; and
- Threats which may potentially impact the quantity of water available for municipal supply

Water budget studies are sorted into three tiers, with each tier providing increased scientific detail.

Tier 1 – Conceptual water budget

Watershed scale study that describes water use in the watershed.

Tier 2 – Water Quantity Stress Assessment

Builds on the Tier 1 study and increases the understanding of water pathways in the watershed. The Tier 2 study evaluates the degree of potential water quantity stress throughout an area by comparing the volume of water demand to that which is practically available for use. The findings of the Tier 2 study may identify specific municipal water systems that require an additional Tier 3 assessment.

Tier 3 – Water Quantity Risk Assessment

Completed for municipal systems that are located within subwatersheds that have been identified as needing further study in the Tier 2. The goal of the Tier 3 study is to estimate the likelihood that a municipality will be able to meet its planned water quantity needs considering increased municipal water demand, future land development, drought conditions, and other water uses using refined scientific scenarios and models.

The Ministry of the Environment, Conservation and Parks' [Source Water Protection Tables of Threats and Circumstances](#) lists the circumstances and areas where a water quantity activity could be a Significant Drinking Water Threat.