

Groundwater Use

Household purposes

Water used for household purposes including drinking, cooking, washing and sanitation.

Allocation

The maximum amount of water a user can legally take from a water source.

Licence

The legal document issued under the *Water Act* giving a user the right to divert a specific maximum quantity of water per year, at a specific location for a specific purpose.

Did you know?

On a per capita basis, approximately 20% or over 600,000 Albertans rely on groundwater for domestic or household uses.

Groundwater Availability

Approximately 40,000 cubic kilometres (km³) of groundwater exists in Alberta—enough to cover the entire province in about 60 meters of water. Though this seems like a lot, we cannot feasibly access or use much of this water even with modern technology. Only about 0.01 percent of the groundwater in Alberta is thought to be recoverable.

Though groundwater exists nearly everywhere in the province, its availability varies geographically. Aquifer depth, yield and water quality determines the availability of groundwater for use in any given location. The greatest amount of usable groundwater in Alberta is found in buried channel aquifers (high yielding sand and gravel depositions) located throughout the province and in shallow bedrock sandstones, coals and fractured shales such as the Milk River, Paskapoo and Belly River geological formations. Groundwater is also found in localized, glacial sand and gravel deposits but these supplies are more limited.

Groundwater Allocations in Alberta

How much groundwater is allocated?

When water is diverted under Alberta's *Water Act* for use other than for **household purposes**, the water quantity is referred to as an **allocation**. Agricultural, industrial, municipal and other water users must apply to Alberta Environment for a **licence** to divert and use only their assigned allocation of water.

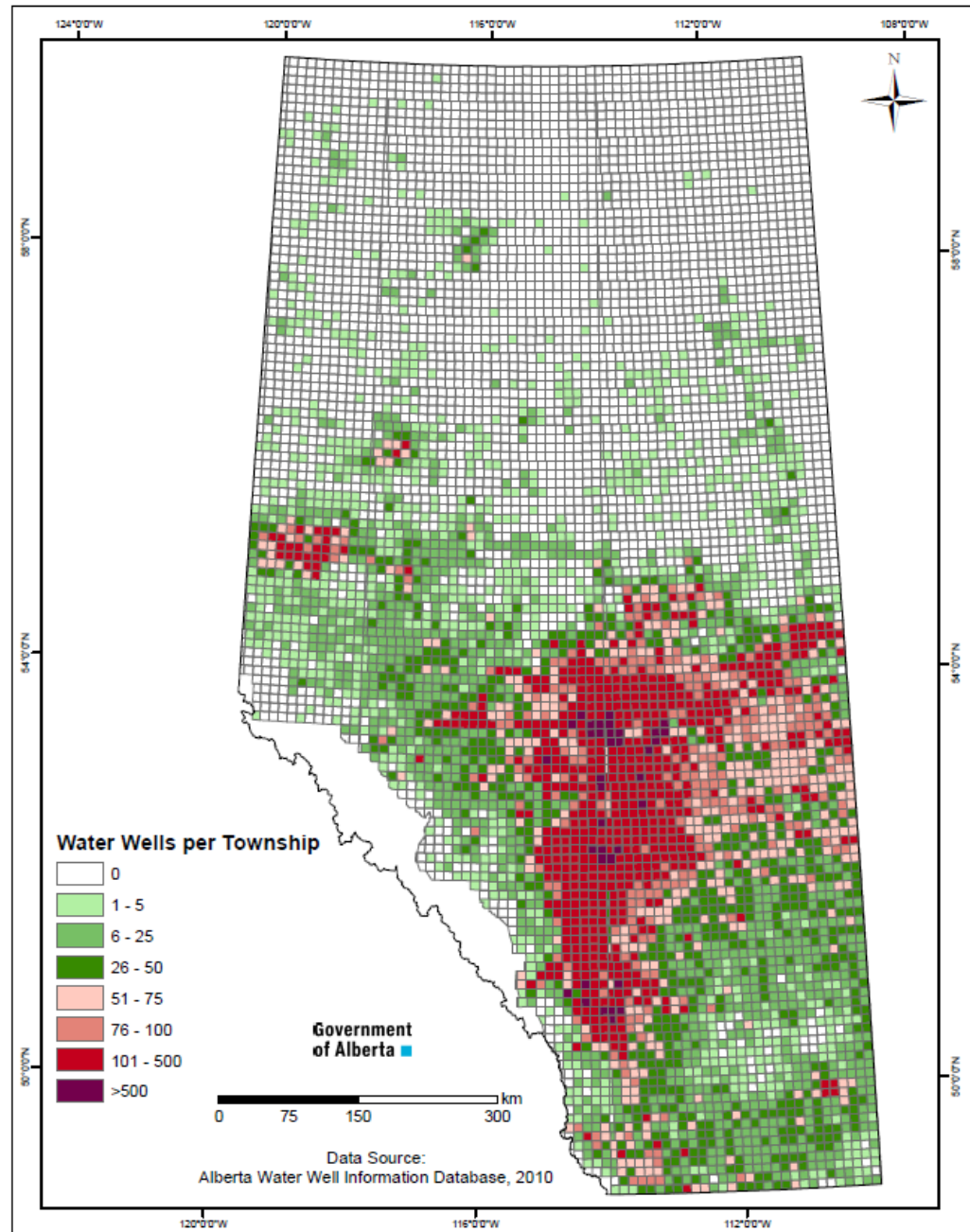
Groundwater used for household purposes does not require a licence under the *Water Act*. Albertans living on property under which groundwater exists have the statutory right to use up to 1250m³ (275,000 imperial gallons) of water per year for household purposes.

Where is groundwater allocated in the province?

Like surface water, groundwater supplies are not evenly distributed across the province, and aquifer depths, yields and water quality vary. Consequently, allocations vary across the province. The map below shows the location of

water wells in Alberta. While the majority of wells occur between Edmonton and Calgary, groundwater wells exist all over the province.

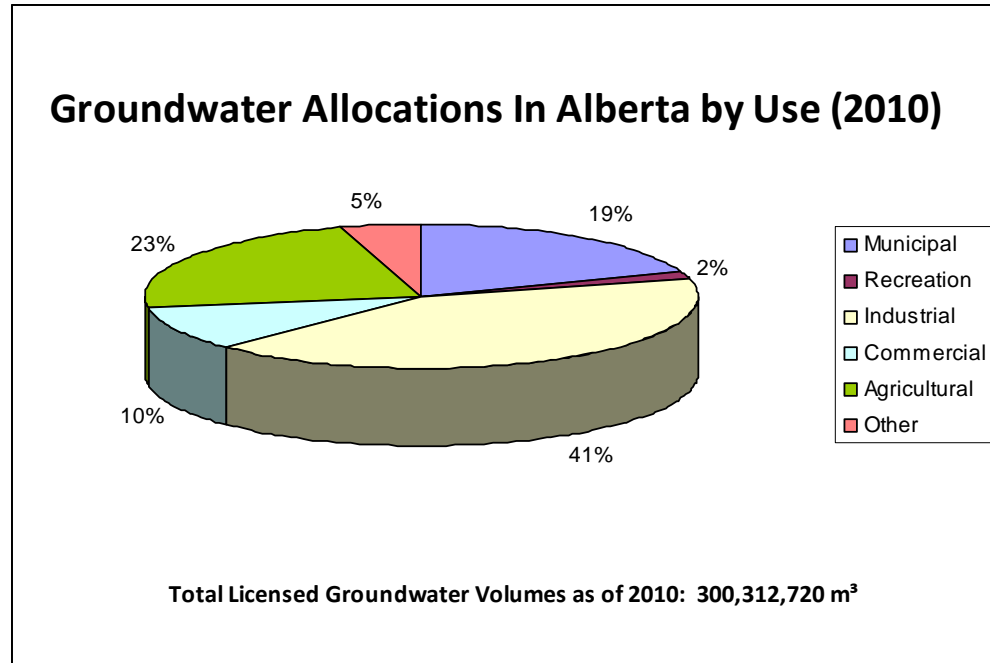
Water Well Density 2010



Credit: Alberta Environment.

How is groundwater used across the province?

Groundwater allocations vary by sector use. In Alberta, the sectors with the largest allocations of groundwater, as seen in the figure below, are industrial (oil and gas) and agriculture.



Credit: Alberta Environment

Of all the water licensed for use in Alberta, only about three per cent comes from groundwater. In 2010, a total of 9.9 billion cubic metres (m³) of water was allocated but only 300 million m³ of that volume came from groundwater. While licensees are legally entitled to divert these amounts annually, the actual amounts used could be significantly less because licensees do not always use their full allocation.

The oil and gas sector was allocated 41 per cent of the total allocated volume of non-saline (fresh) groundwater, for drilling, processing, injection and enhanced oil recovery. However, the use of fresh groundwater is gradually being surpassed by the use of saline groundwater, as industry moves forward with unconventional oil and gas recovery projects such as steam injection and Steam Assisted Gravity Drainage operations (SAGD). Industry is also making strides in water conservation, improved efficiencies and recycling processes.

Twenty three per cent of the total allocated volume of groundwater was allocated to the agricultural sector, for stock watering and crop irrigation. This is less than one per cent of the total volume of water allocated for agricultural purposes. Most water used for agriculture comes from surface water sources.

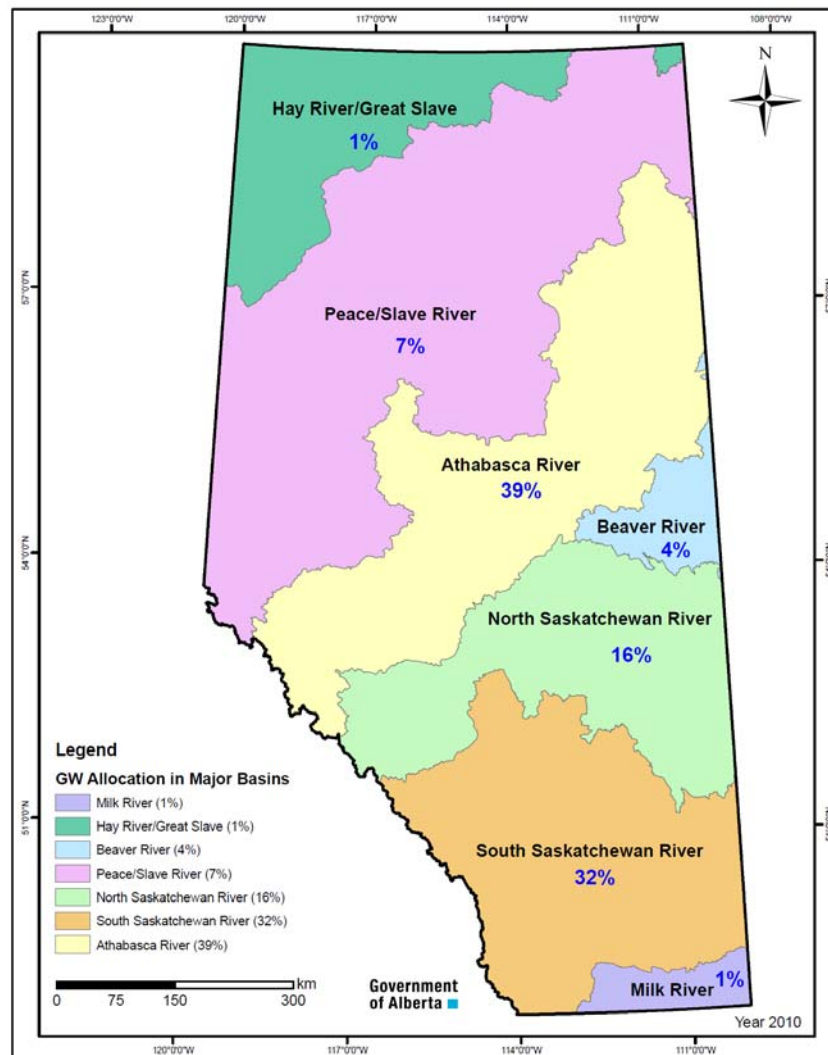
Municipal water supplies accounted for 19 per cent of the total allocated volume of groundwater. Many municipalities in Alberta rely on groundwater as their only water source or use groundwater in combination with surface water sources.

The commercial sector was allocated 10 per cent of the total allocated volume of groundwater. Examples of commercial uses include manufacturing, construction, golf courses, market gardens, and water hauling.

By far the biggest use of fresh groundwater in Alberta is for household purposes which include drinking, cooking, washing and sanitation. Because water used for household purposes does not require a licence under the *Water Act*, it is not included in provincial statistics on total allocated volumes of groundwater. Estimates of fresh groundwater used for household purpose varies from 250,000 to 400,000 m³ per year.

Groundwater allocations also vary geographically. The map below illustrates the percentage of groundwater allocation by major river basin.

Groundwater Allocation by Major Basins



Credit: Alberta Environment

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