

# Water Supply FACTSHEET



Ministry of  
Agriculture, Food  
and Fisheries

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## WATER LICENCES FOR AGRICULTURE

Water licences are required to divert and use and/or store water from both surface and groundwater sources in British Columbia (B.C.) for many different purposes. This factsheet focuses specifically on agricultural water use purposes and the associated licensing requirements.

**Note:** This factsheet is provided as guidance only.

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## 1.0 WATER LICENCE BASICS

The *Water Sustainability Act* (WSA) was brought into force on February 29, 2016 to ensure a sustainable supply of fresh, clean water that meets the needs of B.C. residents today and into the future. Water licences are issued under the WSA for water use purposes supporting agriculture, commerce, domestic household requirements (see Section 3.0), habitat conservation, industry, natural resource development, power production, water storage and water supply.

Under the former *Water Act*, a water licence (referred to simply as licence from here on) was needed for the diversion, use and storage of surface water for most water purposes, including irrigation and livestock watering. The WSA maintained the provisions of the former *Water Act* and introduced a new requirement that all non-domestic groundwater users obtain a licence. Licensing groundwater establishes equity between surface water and groundwater users, and grants groundwater users the right to use water based on the same priority principles that apply to surface water users. Licences can be applied for online at the [Water Licence Application website](#). For more information on when a water licence is required, please see Section 5.0.

Licences authorize the licensee to use the water as described in their licence. When applying for a licence, applicants need to provide information to government including the amount of water needed, what the water will be used for, any 'works' that will be constructed to supply water to the land (the "appurtenant" land), and whether the applicant needs to occupy Crown land to divert and use the water. If Crown land occupation is required, the Province may need to issue a Permit over Crown Land (PCL). The holder of a licence is also responsible for paying annual rentals for the water licence and where applicable, the PCL.

When a licence is issued, it references the property description (or appurtenant land), and not the owner or occupier of the land. Licences historically included the name of the licensee on the document, but current practice is to only use the legal description of the property. If the land is sold or transferred, the licence stays with the property. Licences can be transferred to other land parcels by applying for a "transfer of appurtenancy". If the licence is transferred to another land parcel, the owner of the land will need to beneficially use the water on the new parcel to maintain the rights to the water.

Once a licence is obtained, the licensee usually has three years to make [beneficial use](#) of the water referred to in the licence (the specific terms and conditions on the licence will specify the requirement). Beneficial use means that the water is used for the purpose and in the quantity described in the licence, and that the water is used as efficiently as practicable. This beneficial use requirement is intended to encourage efficient use of water, to ensure as many water users as possible have access to the resource and to assist water managers in leaving enough water to meet the needs of the environment. A licensee may be required to provide evidence of their beneficial use in areas where there is frequent drought or low stream flows or where there is suspected overuse of water. Water managers have the authority to reduce a user's volume of water or cancel a license altogether if the water volume licensed is higher than needed or not being used at all.

For water uses that require licensing, a licence must be granted before the water can be lawfully diverted and used, except for existing use groundwater. Consequently, water users are advised to apply for and obtain a water licence before they purchase and install a water system. Existing groundwater users (i.e., non-domestic groundwater that was already in use before February 29, 2016) have until March 1, 2022 to apply for a licence. Please see Section 7.5.1 for more information.

A licence doesn't authorize the licensee to enter upon private land. A licensee must obtain the permission of any property owner whose land will be affected either by the construction of licensed works or by access. A licensee has the right to expropriate any land reasonably required for the construction, maintenance, improvement, or operation of works authorized or necessarily required under the licence. For more information, visit the provincial website on [Expropriation in the WSA](#) and publication: [A Water Licensee's Right to Expropriate Land](#).

## 2.0 AGRICULTURAL WATER USE PURPOSES

As described in Section 1.0, a water licence is required in most situations to allow the diversion and use of surface and groundwater in B.C. Water use purposes are defined in the WSA and the Water Sustainability Regulation (WSR). Typical purposes associated with agriculture include "irrigation", "storage", "livestock and animal", "crop harvesting, protection and composting" and "greenhouse and nursery". Irrigation and storage are described in the WSA, whereas the other purposes are found in the WSR under "industrial purpose". Those who need to use water for crop cooling can apply for a licence for industrial: Crop harvesting, protection and composting. For details on water use purposes, please refer to the document on [Definition for Water Use Purposes and Categories of Water Use Purposes, WSA, February 29, 2016](#).

## 3.0 DOMESTIC WATER USE PURPOSE

"Domestic purpose" under the WSA means the use of water for household purposes including for: a private dwelling household; fire prevention; private lawn and garden watering (up to 1,000m<sup>2</sup> or ¼ acre); and providing water to domestic animals or poultry kept as pets or for household use. Home businesses, irrigators industries, waterworks and others using water for non-household purposes are not considered "domestic" use. See [WSA s.2](#) for the full definition of "domestic purpose".

Groundwater used for domestic purposes is exempt from licensing requirements. Domestic groundwater users are strongly encouraged to [register their water well for free](#) as this helps government to ensure that domestic groundwater use is considered in decision making and during times of water scarcity.

Surface water used for domestic purpose may require a licence. If you rely on surface water for your domestic use, and the local surface or groundwater water source already has water rights issued to others or runs low on supply at different times of the year, you are advised to look into applying for a domestic surface water licence. Section 7.0 of this document provides contact information and resources for those who need help determining if a licence is needed.

## 4.0 WHEN IS A WATER LICENCE NOT REQUIRED FOR AGRICULTURAL PURPOSES?

Water that has entered a stream or the ground is the responsibility of the Province and, in most cases, a water licence will be required by agricultural producers to use water. Surface water that has not yet reached a stream, such as artificially collected precipitation or surface runoff, is not managed by the province. There are certain limited situations, however, where a producer can use water without obtaining a licence:

1. If a producer intercepts water before it enters a stream or the ground. The most common situations where this occurs are:
  - a. Water collected from a greenhouse roof or barn roof and stored in a reservoir or tank.
  - b. Surface runoff collected from a property during spring freshet flows and stored in a dugout. The dugout should be lined with an impermeable liner or clay layer to prevent groundwater seepage from entering the dugout. This is because water that has entered the ground becomes groundwater which

is managed by the province and needs to be authorized for non-domestic use (through a licence for example, or a regulation). If seepage enters the dugout, then a licence is required for the diversion, use or storage of water. More information on [water use in dugouts is available online](#).

2. Producers obtaining water from a water purveyor or an irrigation district will not require a licence. The water purveyor holds the licence with the Province in this situation and producers are covered under their licence. Water may be delivered through a piping or ditch network by the water purveyor.
3. Tanks or reservoirs that are filled with water provided by a water purveyor.

## 5.0 CONDITIONAL VERSUS FINAL WATER LICENCES

### 5.1 Conditional Licence

When a licence is first issued, it is called a Conditional Licence, as at this point usually no works are in place. A conditional licence may authorize the construction of works and will specify the amount of time the licensee has to begin beneficially using the water. Where needed, a Permit to install the works on Crown Land (a "PCL") to access the water is included in a Conditional Licence.

### 5.2 Final Licence

A final licence may be issued by the Province after the works have been completed, the actual quantity of water used is determined, and the location of water use verified. A final licence would not typically allow the installation of new works (such work having been completed under the conditional licence).

The Province does not regularly replace conditional licences with final licences, though there are some circumstances where a formal survey is carried out and final licences issued. For example, conflicts over water use or limited water availability may warrant conducting a formal water use survey to inform how licences can be adjusted and finalized to resolve the issues of concern.

Most water licences in B.C. are conditional licences. **A conditional licence is not inferior to a final licence; both provide equal water security based on the date of precedence specified in the licence.**

## 6.0 DIFFERENCE BETWEEN SURFACE WATER AND GROUNDWATER LICENSING

The key difference between groundwater and surface water licensing is regarding domestic water use (see Section 3.0 for more information on "domestic use").

Households relying on water from wells for their daily home use, garden watering (up to 1,000 sq. meters), pets and animals raised for home consumption, can use groundwater without a licence. Domestic water use is either up to 2,000 L/day for each home on a property or a higher amount that is authorized by a decision maker under the WSA. Surface water can be used for domestic purposes without a licence as long as the water taken from the stream is unrecorded (meaning not licensed or reserved for a specified use). To protect your surface water rights it is recommended that domestic use from a surface water source be licensed in areas that frequently experience water scarcity or where population is growing.

Licences for surface water and groundwater are similar in format and content, and they provide the same right of access to water. Licences contain priority dates (called dates of precedence, see [WSA s.20](#)) which establishes the order by seniority of water rights on the same stream or groundwater source, and informs the order in which users will have

access to water in times of water scarcity. This is generally the date the water application was received by government (currently through FrontCounter BC); however, it would be the date of first use of groundwater for an existing use groundwater licence. Surface water and groundwater sources are often interconnected, and during times of water scarcity, government will consider priority dates on connected sources when making decisions to protect more senior users or to protect instream flows for aquatic ecosystems.

If there is not enough water to meet the needs of all the licences issued on a source, including the domestic groundwater use, then access to water is first provided to (in order of priority):

1. domestic groundwater uses and those who hold domestic surface water licences for essential household use (not those relying on unrecorded surface water for domestic use),
2. the oldest (or first) licence issued on a source,
3. the next oldest (or second) licence issued on a source,
4. and so on according to the dates of precedence.

## 7.0 GROUNDWATER WELLS

For more information on wells please see the [Groundwater Wells and Aquifers](#) web page. To apply for a licence or to register your well, please go to the [Secure Your Water Rights Today](#) webpage.

### 7.1 Qualified Well Drillers and Pump Installers

Drilling wells and installing well pumps are restricted activities and in most cases must be performed by a [registered well driller or a registered well pump installer](#) who are required to submit records of their work. If you are considering installing a new well or well pump, consider asking the person you may hire whether they are registered.

### 7.2 The Groundwater Wells and Aquifers (GWELLS) registry

When someone applies for a groundwater licence, their well location becomes registered in the province's well database through the licensing process. However, there are many wells already in place that are used for domestic purposes and are not entered into the provincial well database. For those wells, consider submitting a well registration.

Well registration creates a well record which water managers rely on to assess whether an application for a new well has the potential to have an impact on registered wells on the same source of groundwater. The well database is called [Groundwater Wells and Aquifers \(GWELLS\)](#) and accessible to the public. To save time, you can look up your property to see if your well is already in the database. Alternatively, you can view the location of the well on your property in the [B.C. Agriculture Water Calculator](#). If the well is incorrectly located, click on "Submit feedback about this well" to let the Province know of the correct well location.

### 7.3 Search for a Well

All registered wells (domestic and non-domestic) can be searched on the [Groundwater Wells and Aquifers \(GWELLS\)](#) database.

## 7.4 Domestic Wells

Please read 7.2 for why it is important to register a domestic well in GWELLS. For more information how to register, visit the [Domestic Well Registration](#) webpage. Note there is NO COST to registering a domestic well.

## 7.5 Non-Domestic Wells

Wells that are used for purposes other than domestic must be licensed for use.

### 7.5.1 Existing (Historical) Groundwater Use

- a. If the groundwater use occurred on or before February 29, 2016, an “existing groundwater” licence is required. Proof of use prior to March 1, 2016 must be provided.
- b. **The deadline for applying for non-domestic existing groundwater use is March 1, 2022.**
- c. Application fees are waived for existing groundwater users who apply before the March 1, 2022 deadline. Although the application fee is waived, licensees pay annual rentals for the use of the water, and existing groundwater users are charged back-rentals for their use of the water from March 2016 forward to the date of application. Refer to the [Water Application Fees and Rental Rates](#) for water licence associated costs.
- d. Non-domestic existing groundwater users who have not applied by March 1, 2022 must stop using groundwater immediately, the licence application may be refused in water-stressed areas, and they will be treated as a “new user” and will lose recognition of their historical date of first use.
- e. Missing the deadline could also be costly and may include fines for using groundwater without having applied for a licence, a new-user one-time application fee, and the cost of additional assessments to support an application. The cost of conducting an assessment can be very expensive.
- f. **Apply online at: [groundwater.gov.bc.ca](http://groundwater.gov.bc.ca)**

### LEARN MORE

The online application has been improved over the years and resources are available to assist applicants to [apply](#):

- a. Register for a basic electronic identification ([basic BCeID](#)) if you do not have one
- b. [“How to Apply” video](#) (16 minutes)
- c. [Checklist](#) to learn about the required information for the applications
- d. [Questions and Answer on Groundwater Licensing](#)
- e. [Question and Answers on Livestock Watering and Dugouts](#)
- f. [A Step-by-Step Guide](#) to the application process
- g. Use the BC Agriculture Water Calculator to determine water volume and prepare a site plan to scale. [B.C. Agriculture Water Calculator](#)

### 7.5.2 New Groundwater Use

- a. A person who wants to begin using groundwater for a non-domestic purpose must first apply for and obtain a water licence. Visit this webpage to [Apply for New Water Licences](#).
- b. A water licence must be issued before water can be used for a non-domestic purpose. Refer to the [“Before You Drill” brochure](#).



## HELP

One-on-one assistance is available to help you submit an existing use groundwater application. If you need help with your licence application, please contact FrontCounter BC:

Toll Free: 1-877-855-3222

Email: [FrontCounterBC@gov.bc.ca](mailto:FrontCounterBC@gov.bc.ca)

## 8.0 WATER STORAGE

Water storage structures that contain water managed by the province (see Section 5.0) must be licensed. Dugouts are water storage structures which may or may not require a licence. This [Bulletin](#) describes different sources of water for dugouts and which ones require a licence. In brief, a licence is required if a dugout contains groundwater from an aquifer, including groundwater that seeps into the dugout, or water that is diverted from a stream. It is sometimes challenging to know where the water is coming from - the Bulletin discusses that in more detail.

It is common for groundwater to be pumped into the dugout or for groundwater to be drained away from farmland through drain tiles, or away from a home through perimeter drainage, into a dugout. In these circumstances, a storage licence is required.

Dugouts licensed for storage should have an impermeable liner or clay layer preventing seepage in and out of the dugout. Refer to the [Guidance on Farm Water Storage](#) factsheet.

In some cases, the construction of a reservoir or dugout will require a berm or dam. Regardless of whether a water licence under the WSA is required, all dams and berms are subject to the [Dam Safety Regulation](#) except for the following:

- a. The dam or berm is less than 7.5 m in height; and
- b. The maximum storage behind the dam or berm at full capacity is less than 10,000 m<sup>3</sup>.

## 9.0 WATER QUANTITY OR VOLUME AND WITHDRAWAL RATE

A licence states the volume of water in cubic meters (m<sup>3</sup>) that can be used during a specific time for the purpose identified.

Water volumes in licences are calculated in different ways depending on the use. For livestock, the water need is determined by considering how much water each animal requires a day, the number of animals and the number of days that use is required. For irrigation, it is the depth of water applied to the crop in a season calculated using the irrigated area, crop, soil, climate and irrigation system information.

The period of use will be different for different purposes. For example, irrigation licences are usually from April 1<sup>st</sup> to September 30<sup>th</sup>, but this can vary (e.g., by location). Livestock watering could be year-round, or limited to a specific time when the cattle are on the range. Crop cooling and frost protection also tend to have specific periods of use. Some older licences state a maximum annual quantity only. The current practice is to where possible include peak flow rates on licences to limit withdrawals on groundwater and stabilize stream flows in support of [Environmental Flow Needs \(EFN\)](#).

For irrigation and livestock watering purposes, the [B.C. Agriculture Water Calculator](#) can be used to determine the amount of water that should be applied for and to calculate the maximum withdrawal rate (peak flow rate). The Calculator can generate the annual irrigation water volume required for a specific farm based on the soil, crop,

irrigation system and irrigated area. For livestock watering, the water volume can be calculated for different types of animals and different periods of time. The calculator uses a 500-metre climate grid populated with climatic data averaged from year 2001 to 2010 (10 years) to determine the climatic moisture deficit.

## 10.0 KEY FEATURES OF A WATER LICENCE

The following are the main clauses included on a typical water licence, not all of which may be on every licence:

### 1. Source on which the Rights are Granted

This describes the stream(s) or aquifer(s) the licensee is authorized to divert/use/store water from.

### 2. Points of Diversion

These are indicated on a map attached to the licence. A diversion point indicates where water is being taken from the source. In many instances, ditches or pipes are used to transfer water from the source to the property.

### 3. Precedence Date of the Licence

Commonly referred to as a priority date, this date establishes the order by seniority of water rights on the same stream or groundwater source. This is generally the date the water application was received by government (currently through FrontCounter BC); however, it would be the date of first use for an existing use groundwater licence. Both groundwater and surface water licence priority dates will be considered where both sources are hydraulically connected. Precedence dates are important in times of water scarcity. For more information, see Section 6.0.

### 4. Water Use Purpose

The Water Use Purpose(s) specify the authorized use(s) for the licensed water e.g., irrigation, domestic (in a dwelling), industrial (livestock watering), etc. There is a distinct water rental rate applied to each purpose. See the B.C. web page on [water application fees and rental rates](#) for more detail.

### 5. Maximum Quantity of Water and Withdrawal Rate

The licence states the maximum quantity of water that may be diverted, used, or stored. In the past, irrigation licences were issued in acre-feet, which is the volume of water covering one acre to a depth of one foot. While older licences still show acre-feet, all new licences are issued in cubic metres (m<sup>3</sup>).

$$1 \text{ ac-ft} = 1,234 \text{ m}^3$$

$$1 \text{ m}^3 = 264 \text{ US gallons} = 220 \text{ Imperial gallons}$$

New irrigation water licences will quite often have a maximum withdrawal rate (or peak flow rate) stated. The units can be in liters per second (L/s) or cubic metres per second (m<sup>3</sup>/sec) for new licences, and cubic feet per second (ft<sup>3</sup>/sec) or US gallons per minute (US gpm) for older licences.

For irrigation purposes, the peak flow rate is determined based on a sprinkler irrigation system operating 24 hours per day, 7 days per week during the peak time of the year. The [B.C. Agriculture Water Calculator](#) provides this calculation for all areas of the province. A quick easy reference is that 1 mm/day of evapotranspiration (ET) is equivalent to 1 US gpm/acre. Therefore, a peak ET of 5 mm/day on a 20-acre farm (8.1 ha) will require a peak flow rate of 100 US gpm (peak ET of 5 mm/day x 20 acres = 100 gpm).

### 6. Licence Period

The licence states the period of the year during which the water may be used. Domestic use is typically authorized for the whole year, whereas purposes like irrigation may only be allowed during part of the year (a typical irrigation period is from April 1 to September 30). Livestock watering may be for a whole year but



may also be limited to less than the full year depending on the circumstances. Frost protection licences may have a period specified in the spring as well as the fall.

## 7. Appurtenancy

Licences contain an appurtenancy, which is the land upon which the water will be used, described by a legal description (District lot, Plan, etc.). The irrigated field(s), domestic or livestock watering locations can be located anywhere with the appurtenancy. An irrigation licence will, in addition to the appurtenancy, indicate the total area that may be irrigated within the property.

## 8. Authorized Works

Water licences typically specify the works that may be constructed to divert, convey, and store the water. Examples of works include wells, diversion structures, intakes pumps, mainline piping, and storage facilities, e.g., tanks, dugouts and reservoirs. Works are described in the licence and are identified on the licence map accompanying the water licence. The water use and storage may be on separate licences or combined on one licence. Storage licences may have various dates allowing the storage of water, but the period of use will generally be as above.

## 11.0 UNITS

Units used in irrigation system design are a mix of Imperial, US, and metric terminology (see unit conversions in Table 1 below). Water licences in B.C. follow the metric systems:

- **licence area units** are in hectares (ha)
- **licence quantity** volume units are in cubic metres (m<sup>3</sup>)
- **licence flow rate units** are in cubic metres per second (m<sup>3</sup>/sec); per day (m<sup>3</sup>/day); or per annum (m<sup>3</sup>/annum)

Table 1. Unit conversions of interest

	Miscellaneous Unit	Metric Unit
<b>Conversions to metric units (as used on water licences)</b>	1 acre (ac)	0.405 hectare (ha)
	1 acre-foot (ac-ft)	1,234 cubic metre (m <sup>3</sup> )
	1 cubic foot (ft <sup>3</sup> )	0.0283 cubic metre (m <sup>3</sup> )
<b>Other conversions of interest</b>	264 US gal (US gal)	1 cubic metre (m <sup>3</sup> )
	35.3 cubic feet per second (ft <sup>3</sup> /s)	1 cubic metre/second (m <sup>3</sup> /s)
	15,850 US gal per minute (US gpm)	1 cubic metre/second (m <sup>3</sup> /s)
	15.9 gallons per minutes (gpm)	1 liter per second (L/s)

## 12.0 WATER BILLING AND PRICING

There is a one-time application fee (minimum \$250) that is processed when you apply for authorization to divert and use water, for a PCL, for a change approval or for a drilling authorization. This application fee is waived for existing groundwater users who apply before the March 1, 2022 deadline (see Section 7.0).

Water users are required to pay annual water rentals to divert and use the allocated water once the licence or use approval is granted. Annual water rentals vary depending on the water use purpose and the quantity of water used. Use this [online rental estimator](#) to determine how much water rental may be payable (see examples in Table 2 below). Existing groundwater users are required to pay annual rentals retroactive to February 29, 2016, when the WSA took effect. More information on [water application fees and rental rates is available online](#).

Table 2. Example water rentals for a range of typical uses ([additional examples available online](#))

Example User	Volume (1,000 m <sup>3</sup> /yr)	Annual water rental effective Feb 2016 (\$)*	Application Fee (\$)
Individual domestic (excluding groundwater)	0.7	50	250
5 acres tree fruit with water storage	15 - irrigation	75	250
	15 - storage	75	250
50 acres of blueberries drip irrigation in lower mainland	92	78	250
100 head of dairy cattle	5	50	250
120 acres forage crop in Kamloops	444	377	500
Freshwater aquaculture operation	8,000	880	250

\*Effective February 29, 2016, all surface water licensees and non-domestic groundwater users are subject to the new rates.

[Application fees and annual rentals](#) are not required from:

- a. Provincial or federal ministries
- b. First Nations using water on reserve land,
- c. A person or entity that is exempt under a First Nations treaty final agreement from fees and rentals for water use out of a treaty water reservation. This exemption also applies to those people or entities that were using groundwater on Treaty lands on or before February 29, 2016.
- d. A person or entity that is exempt under the Nisga'a Final Agreement from fees and rentals for water use out of the Nisga'a Water Reservation. This exemption also applies to those people or entities that were using groundwater on Nisga'a Lands on or before February 29, 2016.
- e. Use approvals, change approvals, and permits that are processed by the BC Oil and Gas Commission.

### 13.0 WITHDRAWAL RATES

The maximum withdrawal rate (irrigation system flow rate) determined by the [B.C. Agriculture Water Calculator](#) assumes that the irrigation system is operating 24/7 (24 hours a day, 7 days per week during the peak time of year). This flow should be sufficient for all crops and irrigation system types. Therefore, the system is withdrawing the minimum amount of water from a stream during the peak time of the year to allow water for other users. This helps to conserve instream flow for fish. If, for instance, the withdrawal rate was to be doubled, and the irrigation system was only to operate at night, sufficient water could still be supplied to the farm, but the stream flows would be diminished at night. This would result in lower flows for fish during part of the 24-hour cycle. The irrigation pump, mainline and sprinkler system would also need to be doubled to supply sufficient water in a shorter period. This would result in higher costs for the farm. The Province is therefore starting to include peak flow rates on licences to limit withdrawals to stabilize stream flows in support of [Environmental Flow Needs \(EFN\)](#).

An irrigation system designed at the calculated peak withdrawal rate would not be able to irrigate every day during the irrigation season. It is also not necessary. The number of irrigation days can be estimated by taking the full licensed amount and dividing it by the peak withdrawal rate.

## 14.0 EXAMPLE OF A TYPICAL IRRIGATION LICENCE

### 14.1 Example Terms

The following is an example of terms one would typically find in an irrigation licence:

1. **Source** – South Thompson River
2. **Point of Diversion** – as indicated on map attached to the licence
3. **Precedence Date** – March 10, 1937
4. **Purpose** – Irrigation
5. **Quantity and Withdrawal Rate** – 118,500 m<sup>3</sup> per annum, at a rate not to exceed the maximum withdrawal rate of 15.7 L/s (or 250 US gpm)
6. **Period of water use** – from April 1 to September 30
7. **Land** – for D.L. 123 Plan 1234, of which 12 hectares may be irrigated
8. **Authorized works** – pipe, intake pump, pump house located at the riverbank

This licence allows 118,500 m<sup>3</sup> of irrigation water each year for 12 hectares of District Lot 123 using a pump system from the South Thompson River that has a peak withdrawal (pumping) rate of 15.7 L/s. The climatic moisture deficit and irrigation efficiency of 72% require an irrigation duty of 987 mm. The amount of water required for the season would be 12 hectares (120,000 m<sup>2</sup>) multiplied by 0.987 m (900 mm) = 118,500 m<sup>3</sup>. The [B.C. Agriculture Water Calculator](#) would give similar values.

Properties just a short distance away but at a much higher elevation would have a reduced volume and peak flow rate for the same acreage. Irrigation volumes may be half of the valley bottom and the peak flow rated reduced by 33%. This can be confirmed by using the [B.C. Agriculture Water Calculator](#) in other locations.

### 14.2 Example Calculations

In this typical irrigation licence example, divide the licensed quantity of 118,500 m<sup>3</sup> per annum by 15.7 L/s (or 1,357 m<sup>3</sup>/day) results in 87 days of irrigation. If it takes 10 days to irrigate the entire field (which is quite normal), this results in 9 irrigations per year (which is also quite normal). An irrigation season from May 1 to September 30 is about 150 days. Over the entire season, the irrigation system is operating about 60% of the time, longer during the summer but less in the spring and fall.

$$\begin{aligned} \text{Withdrawal Rate} &= 15.75 \text{ L/s} \\ &= 250 \text{ US gpm} \\ &= 1,357 \text{ m}^3/\text{d} \end{aligned}$$

$$\text{Annual Total Water Requirement (or Quantity)} = 118,500 \text{ m}^3$$

$$\begin{aligned} \text{Number of Irrigation Days} &= \frac{\text{Quantity}}{\text{Withdrawal Rate}} \\ &= \frac{118,500 \text{ m}^3}{1,357 \text{ m}^3/\text{d}} \\ &= 87 \text{ days} \end{aligned}$$

$$\begin{aligned}
 \text{Number of Irrigations per Year} &= \frac{\text{Number of Irrigation Days}}{\text{Number of Days to Irrigate the Entire Field}} \\
 &= \frac{87 \text{ days}}{10 \text{ days}} \\
 &= 9 \text{ irrigations per year}
 \end{aligned}$$

**Conversion Factors:**

1 gpm = 0.06309 L/s  
 1 L/s = 86.4 m<sup>3</sup>/d

## 15.0 CHECKING IRRIGATION WATER USE

Whether or not the licence contains a term establishing a maximum withdrawal rate, it is useful for licensees to check their irrigation flow rate against the licensed quantity. Worksheets for checking irrigation water withdrawal rates and annual water use against the licensed amount have been developed as part of the [Environmental Farm Plan \(EFP\) Program](#).

### 15.1 EFP Reference Guide

Irrigation worksheets are discussed in Chapter 9 Water of the [EFP Reference Guide](#).

### 15.2 EFP Irrigation System Assessment Guide

As part of the EFP Program, the [Irrigation System Assessment Guide](#) has a more in-depth review of irrigation system types in addition to the EFP Reference Guide.

### 15.3 B.C. Irrigation Management Guide

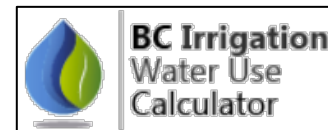
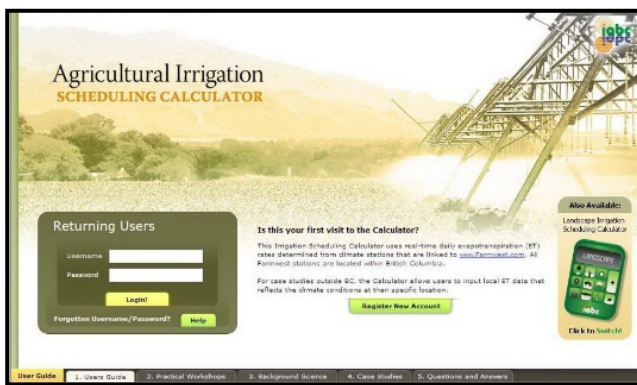
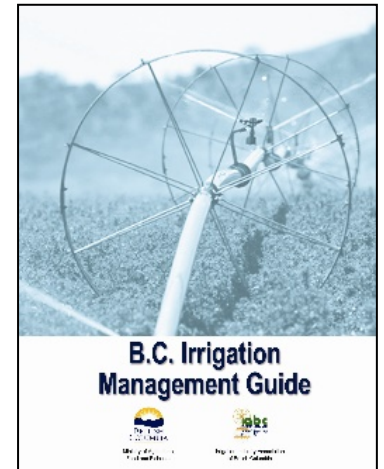
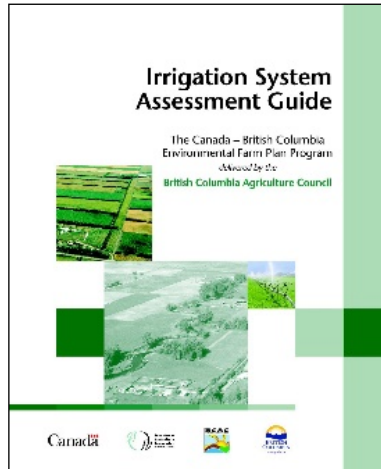
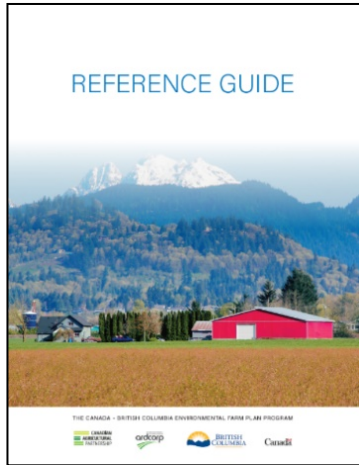
For complete irrigation assessment and management information, the [B.C. Irrigation Management Guide](#) contains the above assessment information with more details, and expands to scheduling, energy use, chemigation, frost protection and crop cooling as well as the use of reclaimed water. Visit the [Irrigation Industry Association of British Columbia \(IIABC\)](#) website for a professionally printed copy.

### 15.4 B.C. Irrigation Water Use Calculator

The Ministry of Agriculture, Food and Fisheries (AFF), the Partnership for Water Sustainability in British Columbia (PWSBC), and the BC Cattleman’s Association (BCCA) developed the [B.C. Irrigation Water Use Calculator](#) that can determine the actual irrigation use on farm based on irrigation system runtime, pump energy consumption and metered data. This calculator can help farmers to ensure the actual annual water use stay within the licensed volume.

### 15.5 Agricultural Irrigation Scheduling Calculator

The Ministry of Agriculture, Food and Fisheries (AFF) partnered with the Irrigation Industry Association of British Columbia (IIABC) to develop the [Agricultural Irrigation Scheduling Calculator](#). The calculator determines an irrigation schedule for all types of irrigation systems and uses daily evapotranspiration data obtained from Farmwest.



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- Partnership for Water Sustainability in BC
- Irrigation Industry Association of BC

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**DISCLAIMER**

The information that is presented in this factsheet serves as a guidance. While every effort has been made to ensure the accuracy and completeness of the information through reviews by provincial agencies, the information provided in this factsheet should not be considered as final. The Governments of Canada and British Columbia are committed to working with industry partners. Opinions expressed in this factsheet are those of the authors and not necessarily those of the Governments of Canada and British Columbia. Readers are highly encouraged to verify the information with provincial agencies who hold the legal responsibilities to administer and implement the regulations involved in the process.