

Report

Date

May 4, 2022

File:

Subject

Waterworks Amendment Bylaw No. 3866 for first three readings

PURPOSE

To introduce an amendment to Waterworks Bylaw No. 3620 that includes new restrictions to help reduce water consumption during times of peak usage, to help protect water supplies, extend the capacity of the Municipality's water distribution infrastructure, and to ensure that the Municipality's water restrictions are consistent with neighboring jurisdictions.

BACKGROUND

The Municipality has Stage 1 water use restrictions automatically implemented each year starting on May 1 and extending to October 31 (Stage 1 restrictions). Additional restrictions (Stage 2 and 3) are imposed as required.

Over the last several years, staff have been working with the Cowichan Valley Regional District (CVRD), member jurisdictions and private water systems to ensure that water use restrictions are appropriate and consistent throughout the region. The intent is to protect our respective water supplies, extend our water distribution systems' capacity, and simplify the implementation of restrictions.

Enacting additional water use restrictions is becoming increasingly important given projections for drier, hotter summers in the future due to climate change. During the summer of 2021, the Province requested that all water licensees enact further restrictions to curtail water use further. This is exacerbated by the population growth occurring within the Municipality and the region as a whole. While the request by the Province during the summer of 2021 was voluntary, the Province has the power to restrict water use to an amount less than what is permitted in any given water license where conditions warrant it.

Both the current (2011) Official Community Plan (OCP) and the 2022 OCP (Bylaw No. 3900), which is at first reading, recognize that one of the core functions of the Municipality is to ensure the provision of a clean and reliable source of water for the community. Both OCP documents also recognize the need to preserve water supplies so that the Municipality is in a position to deliver potable water to its residents and that there is sufficient water available in streams and aquifers to support agriculture and ecosystems. To that effect, the 2022 OCP has policy 9.1.1 (c): *"promote and incentivize water conservation policies and practices which may include:promote use of water conservation measures such as low-flow appliances and low water landscaping..."*

DISCUSSION

Rationale for Amending Water Restrictions

The Municipality's water use restrictions apply to those properties connected to the Municipality's three water distribution systems. For the said water systems, each of the Municipality's water supplies are governed by a water use license issued by the Province.

The amount of water used varies significantly throughout the year. **Figure 1** shows the total daily water consumption for all three water systems, along with the daily precipitation for 2020 and 2021. **Figure 2** shows the daily water consumption for all three water systems and the daily temperature and 7-day moving average temperature for 2020 and 2021. During the wetter months (generally October 1 to March 31), the daily water consumption is fairly constant at around 100 L/s. This is essentially the amount of water required without irrigation demand (hereafter referred to as "base consumption").

As temperatures increase and precipitation decreases, the amount of water consumed can increase significantly. During the second quarter of 2021, leading up to the heat dome, the amount of precipitation was 40% less than in the same period in 2020. By the time the heat dome occurred in late June 2021, water use was already higher than during the same period in 2020. Water consumption spiked to roughly 3.0 times base consumption versus 2.5 times base consumption in 2020. This is largely due to irrigation demand.

General Assumptions and Approach to Amending Water Restrictions

The provision of water to the community requires a reliable supply, is of potable quality, and a means to deliver the water at an adequate flow rate and pressure. This means that both the water source and the means to deliver the water from a given water source must be sufficient to meet the needs of the community.

The general intent of the proposed amendments to the water restrictions are explained below.

- 1) To maintain consistency with other jurisdictions.
- 2) It has been assumed that drip irrigation is the most efficient way to irrigate, followed by micro irrigation. Conventional irrigation systems and sprinklers are least efficient. This is due to the way the systems apply water and how the systems tend to be laid out. Conventional irrigation systems spray water into the air over a large area versus micro and drip irrigation systems that apply water more directly to a smaller area near the plants themselves. Hand watering is deemed to be a lower water use method because it is assumed to be more labour-intensive and less convenient than the other irrigation methods which can be programmed.
- 3) It has been assumed that the bulk of the water consumed for irrigation is for lawn watering. As such, the focus of the restrictions involves further curtailing of lawn watering, particularly for conventional irrigation systems and sprinklers. This assumption is based on lawns making up a much larger area than garden beds and that lawns tend to use conventional irrigation systems versus more efficient micro and drip irrigation systems.
- 4) In some cases, staff recommend relaxing restrictions. We have noted that this represents an increase in the Total Potential Watering Time (TPWT) and may have a tendency to increase water usage. However, it can be reasoned that providing some flexibility by increasing the TPWT is warranted.

- 5) To preserve the health of our *water supplies*: This will be accomplished by enacting more restrictive water use restrictions in all stages to reduce water consumption as a whole. This will continue to ensure that there is sufficient water available for potable use now and into the future.
- 6) To extend the capacity of our *water distribution systems*: This will be accomplished by further restricting water use in Stages 2 and 3 and adding a set of Stage 4 restrictions, reducing peak demand during high demand periods.
- 7) To clarify restrictions based on questions and comments from the public.

Proposed Restrictions

Table 1 through **Table 5** show the proposed restrictions, how the proposed restrictions compare to the current restrictions, and any explanatory notes. The figures attached are generally consistent in layout with the water restrictions chart posted on the Municipality's website, subject to proposed changes. Besides changes to the restrictions themselves, staff have also modified the table's layout and added some information and clarifying points based on questions received from the public over the last number of years.

The table is formatted and reads as follows:

- 1) Proposed restrictions are shown in black text.
- 2) The changes in restrictions as compared to the existing restrictions are shown, and explained, in the **red text** for each type of irrigation method and category of plant-type being watered.
- 3) Text associated with a red highlighted keyword **INCREASED (##%)** describes a change that will have a tendency to decrease restrictions or tendency to **increase** water use. If there is a number in brackets included, the number represents the % increase in TPWT compared to the current restrictions. Note that this does not necessarily mean that water consumption will increase by the stipulated amount for a given activity.
- 4) Text associated with a green highlighted keyword **DECREASED (##%)** describes a change that will have a tendency to increase restrictions or tendency to **decrease** water use. If there is a number in brackets included, the number represents the % increase in TPWT compared to the current restrictions. Note that this does not mean that water consumption will decrease by the stipulated amount for a given activity.

The approach taken and the more notable changes are generally described below. Further explanations as to why staff believe that water use will decrease, remain unchanged, or increase is provided in the tables.

- 1) **Watering Times:** The times when one can water have been changed for all types of irrigation and categories of plantings in order to provide more flexibility for residents and to try and spread out when irrigation may occur to reduce peak demand.
- 2) **New Stage 4 Restrictions:** Stage 4 restrictions have been added to restrict water use in extreme drought conditions further. This stage is aligned with Provincial Drought Code 5, a drought code for which the Municipality had no restrictions. These restrictions are intended to reduce peak demand.
- 3) **Adherence to Provincial Drought Codes:** Staff recommend that the Municipality move through the various stages of restrictions consistent with the Provincial Drought Code, except when it may be necessary to move to a more restrictive stage based on the situation for a given water system. This would make the Municipality's implementation approach consistent with that of neighboring jurisdictions.

- 4) **Updated Restrictions for Lawns:** Significant changes are proposed. Staff believe that lawn watering likely comprises most of the water used for irrigation. As lawns, when not watered during drier periods, will tend to go dormant and recover during wetter periods, staff believe that further restricting lawn watering, with some additional flexibility for hand watering, is the best approach to reducing water consumption. Refer to **Table 1** and **Table 2** for details.
- 5) **Updated Restrictions for New Lawns:** While the planting of lawns should be generally discouraged, staff acknowledge that new lawns will be planted nevertheless. As such, staff believe that further restrictions on lawn watering, with some additional flexibility for hand watering, is the best approach to reducing water consumption. Refer to **Table 1**, **Table 2** and **Table 5** for details.
- 6) **Vegetable Gardens, Fruit Trees:** With the exception of less efficient irrigation methods, staff recommend differentiating food-based plants from ornamental plants in order to allow for a less restrictive and more flexible watering regime for food-based plants. Restrictions remain unchanged for less efficient irrigation methods to encourage migrating to micro/drip irrigation. Refer to **Table 1**, **Table 2** and **Table 3** for details.
- 7) **Ornamental Trees, Shrubs, Flower Gardens:** While this plant type is not a food-based plant, they would suffer damage if not watered (unlike lawns). As such, staff recommend increasing restrictions for less efficient irrigation methods to encourage migrating to micro/drip irrigation, leaving the restrictions unchanged until Stage 3, when restrictions are increased slightly. Refer to **Table 1**, **Table 2** and **Table 3** for details.
- 8) **Other Outdoor Water Use:** There are no changes proposed.

OPTIONS

1. **(Recommended Option)** THAT Council give first, second and third reading to Waterworks Amendment Bylaw No. 3866, 2022.
 - Approving the proposed changes to water restrictions as recommended in this report will generally reduce water consumption, reduce the peak water use, and ensure that the restrictions imposed by the Municipality remain consistent with neighboring jurisdictions. This is consistent with the goals set out in the 2011 OCP and the proposed 2022 OCP of reducing water consumption. It also ensures that the Municipality will be making reasonable efforts to protect water supplies and maximize its infrastructure's capacity to deliver water to its residents.
2. Reject the proposed amendments to Waterworks Amendment Bylaw No. 3866, 2022.
 - Rejecting the proposed changes to water restrictions as recommended in this report will mean that the Municipality will not achieve its goal of reducing water consumption as set out in the 2011 and proposed 2022 OCP. In addition, peak water use during periods of high demand will continue, shortening the life of the Municipality's infrastructure and triggering upgrades sooner than what might otherwise be the case. It will also mean that the Municipality will not have water restrictions consistent with neighboring jurisdictions, making it more difficult administratively since the Municipality benefits from the coordination of restrictions through its cooperation with the CVRD communications group.

IMPLICATIONS

Consistencies with Current Programs and Policies

The proposed water restrictions:

1. are consistent with the goals of the 2011 and proposed 2022 OCP of reducing water consumption;
2. are consistent with Council's Strategic Plan goal to maintain the existing high level of service to the community; and,
3. ensure consistency with neighboring jurisdictions, and create efficiencies in working together as a region.

The Municipal Ticket Information Bylaw and the Bylaw Offence Notice Bylaw will need to be updated to reflect the proposed amendments to the Waterworks Bylaw. However, there is no urgency to update those bylaws as staff will be focused on educating the public on these changes in 2022, with enforcement by Bylaw Compliance Officers to commence in 2023.

Financial Implications

There may be some lost revenue due to less water consumption, but the base water usage level is fairly high, so the impact would be quite small. Staff will monitor the change in revenue and, if necessary, adjust consumption charges as required to ensure sufficient revenue to operate the water systems.

Personnel Implications

There are no anticipated personnel implications.

Environmental Implications

The proposed water restrictions will reduce general consumption to the benefit of the Municipality's water supplies.

Social Implications

The Stage 1 restrictions are intended to promote a culture of conservation by restricting lawn watering, where lawns have the benefit of being able to recover from such restrictions, without causing excessive impact to food-based plants and ornamental gardens that would suffer from a lack of watering. Regardless, the proposed water restrictions may cause some concern for residents who feel that they are paying for a service that is being further restricted. Outreach to the community will be required to explain why water use is being further restricted to help address those concerns. Restrictions will not be enforced this year in order to allow the public to become aware of the new restrictions.

Communication Implications

Outreach to the community will be required to explain why water use is being further restricted. Both the Communications and Bylaw Enforcement Departments have been engaged as part of the preparation of these new restrictions. The Municipality's Communications Department will be coordinating with the CVRD Communications Department regarding public outreach for the proposed restrictions.

RECOMMENDATION

THAT Council give first, second and third readings to Waterworks Amendment Bylaw No. 3866, 2022.

Report prepared by:

Clay Reitsma

Clay Reitsma, M.Eng., P.Eng.
Director, Engineering

Report reviewed by:

[George Farkas]

George Farkas
General Manager

Approved to be forwarded to Council:



Ted Swabey
Chief Administrative Officer

Attachments:

- (1) Waterworks Amendment Bylaw No. 3866
- (2) Waterworks Bylaw No. 3620 (amendments redlined)

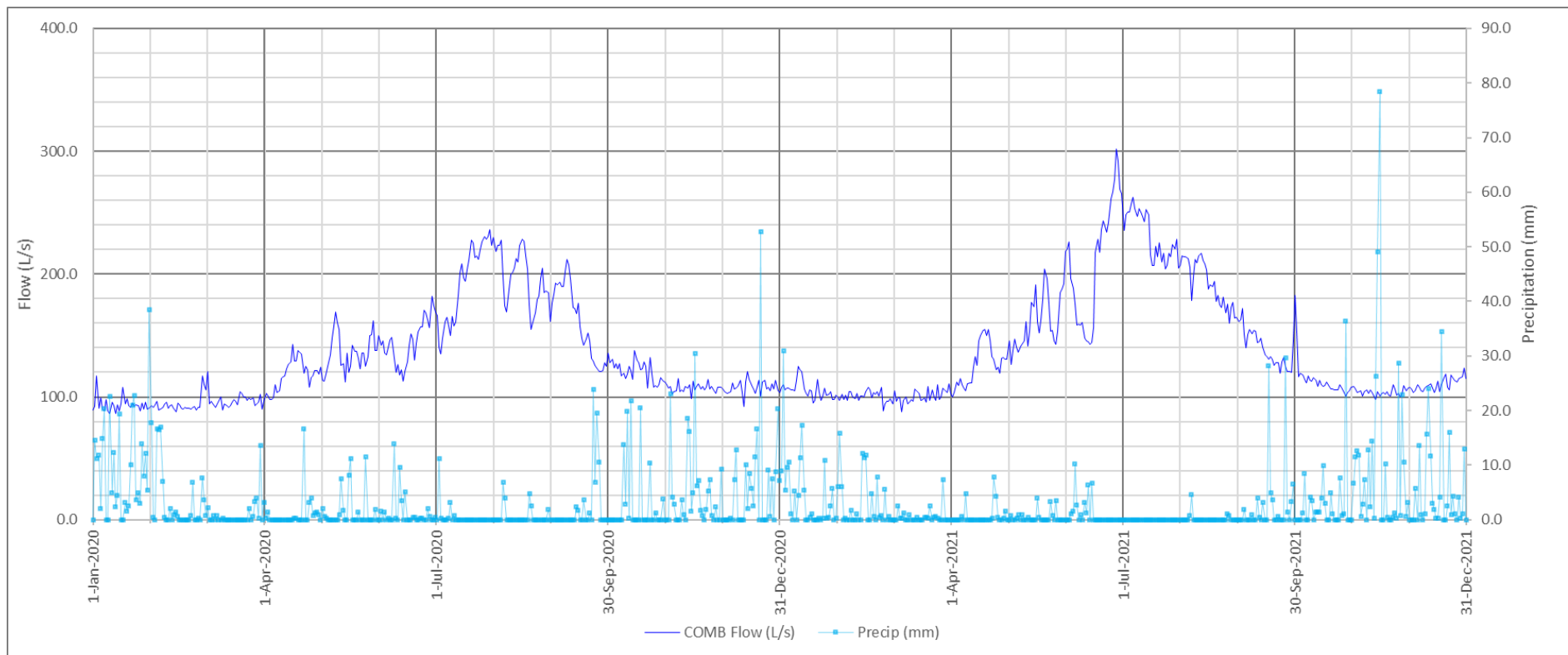


Figure 1 Daily water use (total for all three water systems) and daily precipitation (2020 and 2021).

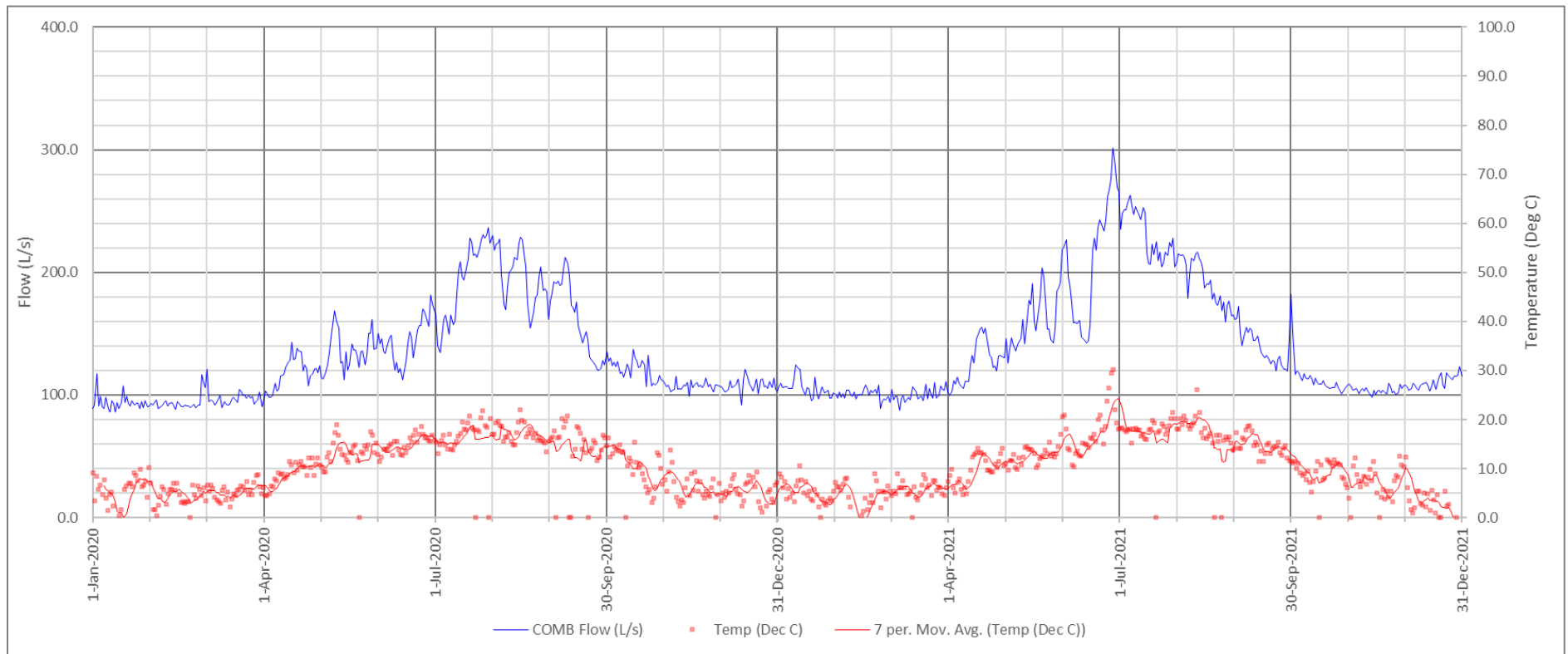


Figure 2 Daily water use (total for all three water systems), daily temperature, and 7-day (weekly) running average temperature (2020 and 2021).

Table 1 Changes to water restrictions: New Stage 4, Conventional Irrigation Systems, Sprinklers.

STAGE 1 May 1 – Oct. 31	STAGE 2 Provincial Drought Code 3 ¹ Effective Date As Required	STAGE 3 Provincial Drought Code 4 ¹ Effective Date As Required	STAGE 4 Provincial Drought Code 5 ¹ Effective Date As Required
No comments.	No comments.	No comments.	New Stage. Intended to address events such as 2021 heat dome and to provide additional restrictions to align with Provincial Drought Code 5.

Conventional Irrigation Systems, Sprinklers (7:00 pm – 9:00 am)

Vegetable Gardens, Fruit Trees / Ornamental Trees, Shrubs, Flower Gardens / Lawns,	2 hours / day Even Addresses – Wed & Sat Odd Addresses – Thu & Sun	2 hours / day Even Addresses – Wed Odd Addresses – Sun	Not Permitted	Not Permitted
	Times: CHANGED f 7a-9a or 7p-9p. Dates: DECREASED (43%) f Even Addr – Even Days, Odd Addr – Odd Days. Duration: NO CHANGE. TPWT: DECREASED (43%) (7.0 h/w to 4.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: DECREASED (50%) f Even Addr – Wed & Sat, Odd Addr – Thu & Sun. Duration: NO CHANGE. TPWT: DECREASED (50%) (4.0 h/w to 2.0 h/w).	NO CHANGE TPWT: 0 h/w.	Note: No previous restrictions to compare to. TPWT: 0 h/w.
New Lawns ²	2 hours / day Any Day Require Garden Irrigation Permit	1 hour / day Any Day Require Garden Irrigation Permit (Permit Must Be Obtained Prior to Stage 2)	1 hour / day Any Day Require Garden Irrigation Permit (Permit Must Be Obtained Prior to Stage 2)	Not Permitted
	Times: CHANGED from 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: NO CHANGE. TPWT: NO CHANGE (14.0 h/w).	Times: CHANGED from 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (50%) f 2 h/d. TPWT: DECREASED (50%) (14.0 h/w to 7.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (50%) f 2 h/d. TPWT: DECREASED (50%) (14.0 h/w to 7.0 h/w).	Note: No previous restrictions to compare to. TPWT: 0 h/w.

Table 2 Changes to water restrictions: Hand Watering.

	STAGE 1 May 1 – Oct. 31	STAGE 2 Provincial Drought Code 3 ¹ Effective Date As Required	STAGE 3 Provincial Drought Code 4 ¹ Effective Date As Required	STAGE 4 Provincial Drought Code 5 ¹ Effective Date As Required
Hand Watering (7:00 pm – 9:00 am)				
Vegetable Gardens, Fruit Trees	4 hours / day	4 hours / day	2 hours / day	2 hours / day
	Sub-category created from previous category of "Trees, Shrubs and Gardens". Added this sub-category to allow for different restrictions for food plants versus non-food plants.			
	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: INCREASED (50%) f 2 h/d. TPWT: INCREASED (50%) (14.0 h/w to 28.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: INCREASED (50%) f 2 h/d. TPWT: INCREASED (50%) (14.0 h/w to 28.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: NO CHANGE. TPWT: NO CHANGE (14.0 h/w).	Note: No previous restrictions to compare to. TPWT: 14.0 h/w.
Ornamental Trees, Shrubs, Flower Gardens	2 hours / day	2 hours / day	1 hour / day	1 hour / day
	Sub-category created from previous category of "Trees, Shrubs and Gardens". Added this sub-category to allow for different restrictions for non-food plants versus food plants.			
	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: NO CHANGE. TPWT: NO CHANGE (14.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: NO CHANGE. TPWT: NO CHANGE (14.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (50%) f 2 h/d. TPWT: DECREASED (50%) (14.0 h/w to 7.0 h/w).	Note: No previous restrictions to compare to. TPWT: 14.0 h/w.
Lawns	2 hours / day	1 hour / day	Not Permitted	Not Permitted
	Added this item to cover off this irrigation method for this category. This will likely result in an INCREASE in TPWT as this activity was likely occurring in manner consistent with the previous rules for lawn watering for "Conventional Irrigation Systems, Sprinklers" which was restricted to watering 3 to 4 days per week, whereas the new restrictions will allow for watering any day of the week. However, the increase in water consumption is expected to be slight because hand watering is likely to occur with smaller lawns, and hand watering is more onerous than using a conventional irrigation system or sprinkler.			
	Note: No previous restrictions to compare to. TPWT: 14.0 h/w.	Note: No previous restrictions to compare to. TPWT: 7.0 h/w.	Note: No previous restrictions to compare to. TPWT: 0.0 h/w.	Note: No previous restrictions to compare to. TPWT: 0.0 h/w.
New Lawns ²	2 hours / day	1 hour / day	1 hour / day Require Garden Irrigation Permit (Permit Must Be Obtained Prior to Stage 2)	Not Permitted
	Added this item to cover off this irrigation method for this category. This will likely result in NO CHANGE in TPWT because this activity was likely occurring consistent with the watering of established "Lawns" (without a permit) or "New Lawns" (with a permit) under "Conventional Irrigation Systems, Sprinklers".			
	Note: No previous restrictions to compare to. TPWT: 14.0 h/w.	Note: No previous restrictions to compare to. TPWT: 7.0 h/w.	Note: No previous restrictions to compare to. TPWT: 7.0 h/w.	Note: No previous restrictions to compare to. TPWT: 0.0 h/w.

Table 3 Changes to water restrictions: Micro/Drip Irrigation.

STAGE 1	STAGE 2	STAGE 3	STAGE 4
May 1 – Oct. 31	Provincial Drought Code 3 ¹ Effective Date As Required	Provincial Drought Code 4 ¹ Effective Date As Required	Provincial Drought Code 5 ¹ Effective Date As Required

Micro/Drip Irrigation³ (7:00 pm – 9:00 am)

Vegetable Gardens, Fruit Trees	4 hours / day	4 hours / day	2 hours / day	2 hours / day
	Sub-category created from previous category of "Trees, Shrubs and Gardens". Added this sub-category to allow for different restrictions for food plants versus non-food plants.			
	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: NO CHANGE. TPWT: NO CHANGE (28.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: NO CHANGE. TPWT: NO CHANGE (28.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (50%) from 4 h/d. TPWT: DECREASED (50%) (28.0 h/w to 14.0 h/w).	No previous restrictions to compare to. TPWT: 14.0 h/w.
Ornamental Trees, Shrubs, Flower Gardens	2 hours / day	2 hours / day	1 hour / day	1 hour / day
	Sub-category created from previous category of "Trees, Shrubs and Gardens". Added this sub-category to allow for different restrictions for food plants versus non-food plants.			
	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (50%) from 4 h/d. TPWT: DECREASED (50%) (28.0 h/w to 14.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (50%) from 4 h/d. TPWT: DECREASED (50%) (28.0 h/w to 14.0 h/w).	Times: CHANGED f 7a-9a or 7p-9p. Dates: NO CHANGE. Duration: DECREASED (75%) from 4 h/d. TPWT: DECREASED (75%) (28.0 h/w to 7.0 h/w).	No previous restrictions to compare to. TPWT: 7.0 h/w.

Table 4 Changes to water restrictions: Other Outdoor Water Use.

STAGE 1 May 1 – Oct. 31	STAGE 2 Provincial Drought Code 3 ¹ Effective Date As Required	STAGE 3 Provincial Drought Code 4 ¹ Effective Date As Required	STAGE 4 Provincial Drought Code 5 ¹ Effective Date As Required
----------------------------	--	--	--

Other Outdoor Water Use

Filling Pools & Hot Tubs	No Restrictions	No Restrictions	Not Permitted ⁴	Not Permitted ⁴
	NO CHANGE.	NO CHANGE.	NO CHANGE.	No previous restrictions to compare to.
Washing Vehicles or Boats	No Restrictions	No Restrictions	Permitted Under Certain Circumstances ⁵	Not Permitted
	NO CHANGE.	NO CHANGE.	NO CHANGE.	No previous restrictions to compare to.
Washing Driveways, Houses, Sidewalks	No Restrictions	Permitted Under Certain Circumstances ⁵	Permitted Under Certain Circumstances ⁵	Not Permitted
	NO CHANGE.	NO CHANGE.	NO CHANGE.	No previous restrictions to compare to.
Sport Fields ⁶	Reduced Watering	Reduced Watering, Conservation Measures	Reduced or Eliminated Watering	Reduced or Eliminated Watering
	NO CHANGE.	NO CHANGE.	NO CHANGE.	No previous restrictions to compare to.
Private Wells, Agriculture ⁷	Regulated by Provincial Government (Not Supplied from Community Potable Water Systems)			
	NO CHANGE. This category has been added for clarity.			

Table 5 Changes to water restrictions: Notes.

1	The various restriction Stages will be imposed in conjunction with the corresponding Provincial Drought Code. Jurisdictions may move to a given Stage ahead of the corresponding Provincial Drought Code based on state of the water system.
2	Irrigation of new lawns must follow the restrictions for established lawns. If additional watering is required, a permit must be obtained at which point water restrictions for new lawns must be followed.
3	Micro/drip irrigation delivers water to the root zone of the plants and uses less than 90 L/hr (20 imperial gallons per hour) at less than 25 psi. Weeper hoses are considered micro/drip irrigation, and are permitted; soaker hoses are not permitted. A weeper hose emits water through very small pores in the rubber; there is no water spray stream emitted from the hose, resulting in less evaporation than a soaker hose. A soaker hose has holes that are large enough to emit water as a spray stream, resulting in more evaporation than a micro/drip irrigation system or a weeper hose.
4	Pools filled prior to Stage 3 water use restrictions being implemented may be topped up to account for evaporation losses in order to avoid damage to pumps, etc. Municipal recreation facilities exempt.
5	For residential homeowners washing driveways, houses, or sidewalks is only permitted during Stages 2 and 3 in preparation for applying paints, preservatives or for pouring concrete. Commercial enterprises which require water use to facilitate normal business activities are exempt from some Stage 2 and 3 water restrictions. These include nurseries, turf farms or tree farms, car wash / detailers, power washing companies, window washing companies, etc
6	School and Municipal playing fields are often sand-based and require regular watering. For that reason they are exempt from sprinkling regulations. Regardless, efforts are made to reduce water use and the irrigation timings are adjusted to reduce evaporation and avoid times of higher water consumption.
7	If necessary the Provincial Government can require the curtailment of water use for private wells and for agricultural purposes.