



Water Shortage Plan

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Version History

Version	Details	Date
Version 1.0	Draft water Shortage response Plan	May 1, 2024
Version 1.1	Final Water Shortage Response Plan	June 18, 2024

Background

On January 11, 2024, all municipalities in Alberta received a letter from Minister of Environment and Protected Areas, Rebecca Schulz (Appendix A), requesting that given the existing drought conditions in the province, all municipalities should develop water shortage plans.

The City of Edmonton's Epcor Utilities, provides potable water to the City of Edmonton plus various water commissions who serve their member municipalities surrounding Edmonton, including Parkland County. Epcor was contacted and confirmed that there is very little risk that the North Saskatchewan River water levels would be low enough from drought conditions that water shortages would be triggered, therefore the urgency to develop water shortage plans is far less for Epcor than it is for municipalities in Alberta without a large, reliable water source.

However, there are risks of restrictions in water supply to Epcor's customers as was experienced recently in January 2024, when mechanical issues in Epcor's E.L. Smith Water Treatment Plant forced a reduced output of potable water and restrictions had to be made for both City of Edmonton customers and regional customers. Therefore, this report highlights necessary measures to be taken by Parkland County in coordination with the other regional customers of Epcor in the event of a water shortage caused by any particular event including drought.

Current System

Appendix B shows a map of Edmonton and the regional area served by Epcor Utilities. Epcor supplies potable water to several Water Commissions whose membership consists of the municipalities served by these Commissions. One of these Commissions is the Capital Region Parkland Water Commission (CRPWSC), whose members include the City of Spruce Grove, the Town of Stony Plain, and Parkland County. From the CRPWSC, the County supplies potable and firefighting water to the Acheson Industrial Area and the Big Lake country residential subdivisions.

The CRPWSC also connects to the West Interlake District Water Services Commission (WILD) whose membership consists of 12 municipalities, one of which is also Parkland County. Appendix C shows the map of the WILD Water Services Commission service area. From the WILD Commission, the County supplies potable and firefighting water to the hamlets of Wabamun and Entwistle.

The Regional Water Customers Group (RWCG) is an informal group consisting of the managers of the regional water commissions served directly by Epcor. Strathcona County employees manage and coordinate the group's activities including negotiating directly with Epcor on a postage stamp water rate for all regional customers and coordinating water usage of member commissions. The member commissions then coordinate with member municipalities on any necessary water restrictions. Water levels in water reservoirs are monitored by municipal staff and communicated to the RWCG to ensure sufficient potable and firefighting water is available. Should water restrictions be required for any reason, a coordinated response is communicated by the RWCG to the commissions who in turn communicate to member municipalities so that all

regional municipalities respond in a similar, coordinated manner as outlined below for Conditions A through D.

Potable Water Usage Ban/ Restriction:

A Potable Water usage ban or restrictions notice explains which water-related activities are banned or restricted and who is affected. Please note that the ban or restrictions would apply to the Parkland County Truck Fill station and to the customers who are connected to the Municipal Water Supply systems within Parkland County including the Acheson Big Lake Area, Wabamun and Entwistle.

In drought conditions or due to a water supply issue, EPCOR and the Regional Water Customer Group, composed of the Water Commissions surrounding Edmonton, may impose a water ban or restrictions to ensure water reservoir levels are maintained and to ensure there is enough potable water for essential uses.

Table below describes different levels of restrictions that may be communicated to customers when a water ban is in effect.

Condition	Water Restriction/ ban requirement	Examples of non-essential potable water usage restrictions
A (Some Restrictions)	<ul style="list-style-type: none"> Ban on municipal operations 	<ul style="list-style-type: none"> Water main flushing Sewer main flushing Fire fighting training Street sweeping
B (More Restrictions)	<ul style="list-style-type: none"> Ban on municipal operations. Water restrictions requiring the general public to REDUCE non-essential water use 	<ul style="list-style-type: none"> Water main flushing Sewer main flushing Fire fighting training Street sweeping Irrigation, watering lawn Fleet vehicle washing (including buses) Spray decks (unless in recirculation mode with appropriate signage) Other non-essential water use (non-essential use is defined by all water not used for human consumption) Truck Fill Out of Service but keeping Barrel fill open
C (Most restrictive)	<ul style="list-style-type: none"> Ban on municipal operations. Water ban PROHIBITING residents from non-essential water use 	<ul style="list-style-type: none"> Water main flushing Sewer main flushing Fire fighting training Street sweeping

		<ul style="list-style-type: none"> • Irrigation, watering lawn • Fleet vehicle washing (including buses) • Spray decks (unless in recirculation mode with appropriate signage) • Dishes, laundry, car washing etc. • Other non-essential water use (non-essential use is defined by all water not used for human consumption)
D (Extreme)	<ul style="list-style-type: none"> • Water contained for Firefighting only. No other water usage is permitted. 	<ul style="list-style-type: none"> • No water usage other than Fire Fighting purpose will be allowed. • Emergency command center needs to be activated to look for alternate source of water for essential potable water requirements.

Current Inventory:

Currently Parkland County has a total of 5 potable water reservoirs as described in table below.

Name	Location	Capacity (m3)	Fed by
Acheson Zone 3 Reservoir	27021 Ellis Road, Acheson	5000	CRPWSC
Acheson Zone 4 Reservoir	25607 Acheson Road, Acheson	9000	CRPWSC
Wabamun Lower Reservoir	5122 53 Street, Wabamun	500	WILD
Wabamun Upper Reservoir	North of highway 16	1000	Parkland County from lower reservoir
Entwistle Reservoir	4524 49 Street, Entwistle	817	WILD

Acheson/ Big Lake Area Water Distribution System:

Acheson Zone 3 and Acheson Zone 4 pump houses supply water to Acheson Industrial Area along with 18 subdivisions in the Big Lake area. Below is the list of Big Lake Subdivisions receiving potable water:

- Legend Estates
- Spring Meadow Estates
- Greenbriar Estates
- Grandview Estates
- Walker Lake Estates
- Royal Spring Estates

- Morningside Properties
- Lake Ridge Estates
- Country Squire Estates
- Countryside Ravines
- Country Estates
- Lakeshore Estates
- Helenslea
- Helenslea Heath
- Helenslea Estates
- Helenslea Heath III
- The Southern Properties
- Park Lane Estates

The Acheson Big Lake area daily average demand is 3109 m³/day. With 14000 m³ combined reservoir capacity between Zone 3 and Zone 4 reservoirs, this area can go up to 4 days (i.e. $14000 \text{ m}^3 / 3109 \text{ m}^3/\text{day} = 4.6 \text{ days}$) without receiving water from Capital Region Parkland Water Service Commission under normal or average consumption.

Acheson Zone 3 Pump House:

The Zone 3 pump house is fed by the Capital Region Parkland Water Service Commission (CRPWSC). The Zone 3 Reservoir has a total of 5 distribution pumps including 1 Fire pump, 2 jockey pumps and 2 variable speed service pumps. This Pump House also provides Truck Fill and Barrel Fill services. The Zone 3 pump house typically supplies water during night hours and if the Zone 4 reservoir cannot meet the high demands. It has a water storage capacity of 5000 m³.

Acheson Zone 4 Pump House:

The Zone 4 pump house is fed by the Capital Region Parkland Water Service Commission (CRPWSC). The Zone 4 pump house has a total of 2 distribution pumps and no fire pump. This reservoir mostly supplies water during daytime and fulfilling the higher demands. It has a water storage capacity of 9000 m³.

Wabamun:

The Hamlet of Wabamun has two reservoirs, upper and lower, to meet daily demands. The lower reservoir is being fed by the West Inter Lake District (WILD) Commission. Wabamun's average daily demand is 293 m³/day. With 1500 m³ combined reservoir capacity between Upper and Lower reservoirs, Wabamun can go up to 5 days (i.e. $1500 \text{ m}^3 / 293 \text{ m}^3/\text{day} = 5.11 \text{ days}$) without receiving water from the WILD Commission under normal or average consumption.

Lower Reservoir:

The Lower Reservoir is being fed by West Inter Lake District (WILD) and has a water storage capacity of 500 m³. It has 4 pumps in total including 1 Fire pump, 2 service pumps and 1 jockey pump. This reservoir is used for filling the upper reservoir using either the service pumps or the jockey pump.

Upper Reservoir:

The Upper Reservoir is located on the hill just north of Highway 16. Due to its elevation, this reservoir distributes water through gravity feed back to the Hamlet. It has a water storage capacity of 1000 m3. This reservoir is mostly used for supplying normal day to day demands of a hamlet.

Entwistle:

The Hamlet of Entwistle has one distribution Pump House with a water storage capacity of 817 m3. It is being fed by the West Inter Lake District (WILD) Commission. It has 1 fire engine pump along with 2 Jockey pumps to meet the hamlet's day to day demands. This small reservoir is also responsible for supplying water to the Entwistle Community Center Pool and providing production water to a major wood pallet manufacturer. Entwistle's average daily demand is 483 m3/day. With 817 m3 of total reservoir capacity, Entwistle can go up to 1 days (i.e. $817 \text{ m}^3 / 483 \text{ m}^3/\text{day} = 1 \text{ days}$) without receiving water from West Inter Lake District (WILD) commission under normal or average consumption. The County is currently constructing a new large (1500m3) reservoir that should be operational in late 2025.

Entwistle used to treat raw water from groundwater wells before the pump house started receiving potable water supplied by the WILD commission in February 2023. Until the new reservoir is built, the raw water wells are on standby along with the existing water treatment system. In case of any drought related emergency, the county has an option to turn on the treatment system and use the wells to fill the water reservoir.

Water Usage Restriction Plan:

If, for any reason, any of the Commissions including the Capital Region Parkland Water Commission (CRPWSC) and the West Inter Lake District (WILD) Commission, EPCOR or the Regional Water Customer Group (RWCG) imposes any water restrictions on Parkland County, Parkland County will have to impose the same restrictions to its customers.

Additionally, the Water Shortage Plan defines when the county would impose which particular water restriction depending on the direction of the RWCG or Commissions. Since the County has various reservoirs with different capacities in the Acheson Big Lake area, Wabamun and Entwistle, each area requires a different Water Usage Restriction Plan as described below. Before imposing restrictions, the county will communicate with the respective water commission to gain additional water supply in the reservoirs to help meet the demand. However, if the commission is unable to meet the water demands, water bans will be necessary to maintain adequate water levels in the reservoirs.

Acheson big Lake Area:

Total Combined Volume in Reservoir (m3)	Capacity of the reservoir (%)	Water Level Restriction	Water supply last (Days)
14,000	100	No Condition	4.6
11,200	80	Level A	3.6
9,800	70	Level B	3.15
9,100	65	Level C	3

2800	20	Level D	Not Applicable
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Wabamun:

Total Combined Volume in Reservoir (m3)	Capacity of the reservoir (%)	Water Level Restriction	Water supply last (Days)
1,500	100	No Condition	5.11
1,050	70	Level A	3.58
900	60	Level B	3.06
825	55	Level C	2.81
300	20	Level D	Not Applicable

Entwistle:

Total Volume in Reservoir (m3)	Capacity of the reservoir (%)	Water Level in Reservoir (m)	Water Level Restriction	Water supply last (Days)
817	100	4.10	No Condition	1.69
653	80	3.50	Level A	1.35
572	70	2.90	Level B	1.18
531	65	2.70	Level C	1.09
400	49	2.30	Level D	Not Applicable

Risk Analysis

This risk analysis is performed considering the water shortages either imposed by EPCOR or commission or by Parkland County due to a failure in the water distribution system.

The likelihood is a measure of the frequency with which any event is likely to occur. 5 levels of likelihood are used, and their definitions are shown below to describe the assessed frequency and a nominal value is attached to each.

Likelihood	Definition	Value
Most Unlikely	Conceivable but extremely small chance of happening in next 4-5 years	1
Unlikely	Is possible and cannot be ruled out in next 4-5 years.	2
Medium	As likely as not to happen in next 4-5 years.	3
Probable	Would be expected to happen in next 4-5 years but there is a small chance it may not.	4
Almost Certain	Would be confident this will happen at least once in next 4-5 years	5

The consequence is a measure of the severity of the event which is likely to occur. Five levels of consequence are used, and their definitions shown below.

Consequence	Definition	Value
Insignificant	Interruption < 8 hrs	1
Minor	Interruption 8-12 hrs	2
Moderate	Interruption 12-24 hrs	3
Severe	Interruption >24 - 48 hrs	4
Catastrophic	Interruption >48 hrs	5

Below is the risk scoring matrix.

Consequence		1	2	3	4	5
Likely Hood	1	Low 1	Low 2	Low 3	Medium 4	Medium 5
	2	Low 2	Medium 4	Medium 6	High 8	High 10
	3	Low 3	Medium 6	High 9	High 12	Extreme 15
	4	Medium 4	High 8	High 12	High 16	Extreme 20
	5	Medium 5	High 10	Extreme 15	Extreme 20	Extreme 25

Risk Register:

ID	Risk Description	Likelihood	Consequences	Score	Last review Date	Impacted area	Treatment Description
1.0	Water supply restrictions from EPCOR	4	5	20		Acheson Big Lake, Wabamun, Entwistle	Follow EPCOR's Water Usage Restriction Plan
2.0	Water supply restrictions from CRPWS	3	5	15		Acheson Big Lake, Wabamun, Entwistle	Follow CRPWS Water Usage Restriction Plan
3.0	Water supply restrictions from WILD	3	5	15		Wabamun, Entwistle	Follow WILD Water Usage Restriction Plan
4.0	Water supply restrictions from Parkland County as follow					Acheson Big Lake, Wabamun, Entwistle	
4.1	Main Line Break	5	2	10			Impose appropriate level of water ban based on available water in reservoir until line break is fixed
4.2	Distribution Pump Failure	3	1	3			Impose appropriate level of water ban based on available water in reservoir until line break is fixed
4.3	Contaminated water in Reservoir	1	5	5			Clean reservoirs periodically
4.4	Natural disaster damages pump house	1	5	5			Wabamun and Acheson has two reservoirs providing enough backup. County is building a new reservoir in Entwistle so the current reservoir can become a backup reservoir.
4.5	High firefighting demands	4	4	16			Consult with commission to see if they can provide additional water required for firefighting.
5.00	Absolute no water in any reservoir to supply	1	5	5			Activate Emergency Command Center for supplying alternate source

Communication Plan:

Table below provides roles and responsibilities of each stakeholder impacted during Water Usage Restrictions.

Stake Holder Name	Contact Information	Role/ Responsibility
Capital Region Parkland Water Service Commission (CRPWSC)	<ul style="list-style-type: none"> * Amir Khan akhan@stonyplain.com 780.963.8645 * Brett Henkel brett@cbmax.org 780.903.6032 	Communicate any water restrictions from EPCOR or from CRPWSC to Public Works, Parkland County.
Western Inter Lake District (WILD)	<ul style="list-style-type: none"> * Dwight Darren Moskalyk ddm@kronprinzconsulting.ca * Administration (WILD) wildwatercommission@gmail.com 780.967.0271 	Communicate any water restrictions from WILD to Public Works, Parkland County
Public Works, Parkland County	<ul style="list-style-type: none"> * Jaitik Berawala Jaitik.berawala@parklandcounty.com 780.818.7692 * Tanner Simpson Tanner.simson@parklandcounty.com 780.818.7694 	<ul style="list-style-type: none"> * Monitor water capacity in all reservoirs as per Water Usage restriction plan section of this document. * Communicate any water restrictions from CRPWSC or WILD to Communications , Customer Service, Fire Services and Parks, Recreation & Culture, Parkland County. * Enforce Water restrictions. * Contact major water user customers to reduce/ or stop water usage.
Communications , Parkland County	<ul style="list-style-type: none"> * Communications, Parkland County communications@parklandcounty.com 	Publish water usage restrictions on social

			media and Parkland County website.
Customer Service, Parkland County	* Customer Service, Parkland County customerservice@parklandcounty.com		Address customer concerns relating to water usage restrictions.
Fire Services, Parkland County	* Fire Services, Parkland County parklandfirechiefs@parklandcounty.com	* To be aware of Water Usage Restrictions. * To be aware of critical water levels in any of the reservoirs during water usage restrictions.	
Emergency Management, Parkland County	* Emergency Management, Parkland County emergencymanagement@parklandcounty.com	* To be aware of critical water levels in any of the reservoir during water usage restrictions.	
Parks, Recreation & Culture, Parkland County	* Suzanne Merrills Suzanne.merrills@parklandcounty.com 780.968.3236	* To be aware of any water restriction. * Stop filling swimming pool in Entwistle. * Stop operations of Wabamun, Spray Park.	
Roads & Drainage, Parkland County	* Roads & Drainage, Parkland County roadsmaintenance@parklandcounty.com	* To be aware of any water usage restrictions. * Stop street sweeping or any project consuming water.	