Water Management Update (Draft)

Council Meeting – Governance & Priorities Committee

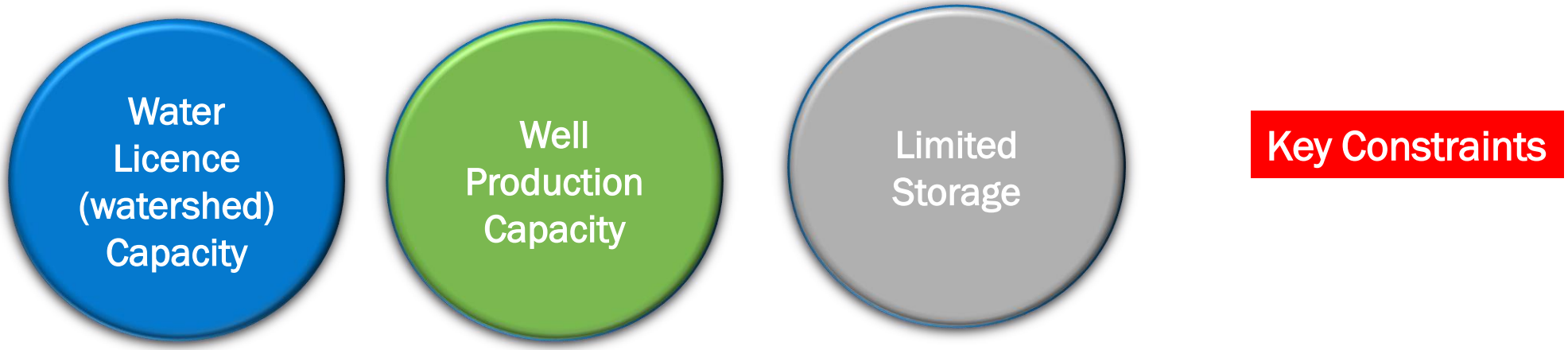
January 15th, 2024

Davey Robertson
Water Services Manager

Jeremy Huet
Operations and Utilities Director

Governance and Service Level Consideration

Council Consideration: Service level and utility rate changes that **improve conservation, resiliency and drought preparedness** in alignment with Council's Strategic Vision and watershed constraints.



Strategic Direction on Water

Municipal Development Plan

Goal = Sustainable Water

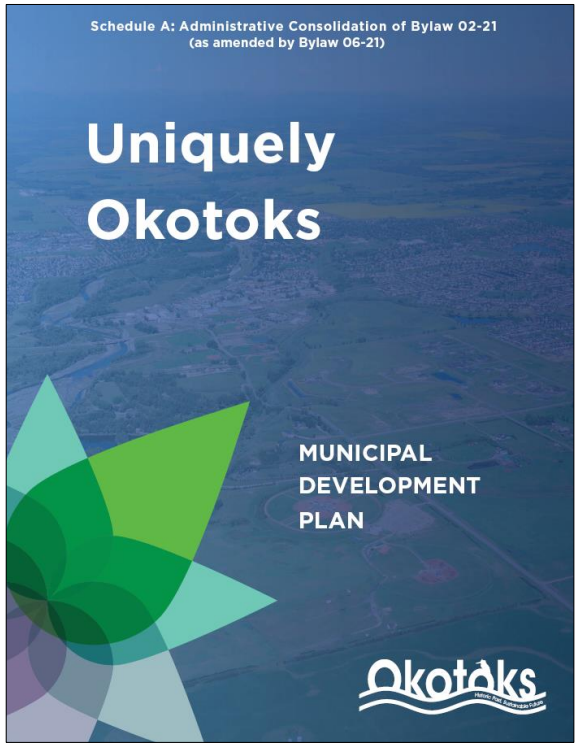
- Okotoks uses an end-to-end, watershed lens to protect and conserve our water while preparing for weather and climate change impacts.

Sample Policy

- 1.3.1 Align development approvals with the Town's water license capacity

  a) Ensure that approvals for development are granted in a fair and equitable manner in accordance with the Town's water allocation policy. (in LUB also)

- 4.2.1 a) Increase water conservation strategies,
- 4.2.1 f) Continue to design for non-irrigated landscapes and convert irrigated spaces to non-irrigated over time. Move to water re-use, non-potable water and stormwater use for irrigation of Town-owned public spaces.
- 4.2.1 g) Develop an aggressive peak water demand reduction program.
- 4.2.3 h) Implement an advanced water reuse strategy



*Complete details available in the Okotoks Municipal Development Plan

Strategic Direction on Water

Environmental Master Plan

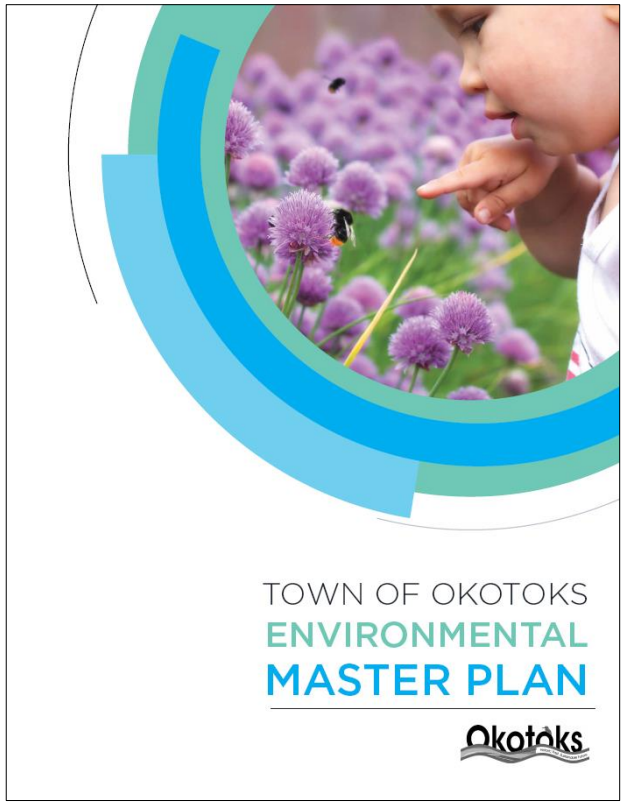
5 **Goal 5: Reduce water demand and consumption of drinking water and improve the water quality of our watershed**

GOALS

- Enhance the efficiency of the water system by increasing the capture and reuse of rainwater, stormwater, treated effluent and grey water
- Form regional partnerships to protect and manage the regional watershed
- Protect and improve water quality through riparian and wetland production and by reducing overland runoff and nutrient loads

TARGETS

- Achieve a 20% reduction in outdoor use of potable water (summer daily peak) by 2030
- Achieve & maintain lowest per capita gross water and residential potable water consumption rates in Canada
- Achieve and maintain an annual potable water system loss rate of less than 5%
- Meet or exceed Alberta's Potable Water Quality Guidelines in drinking water quality
- Meet or exceed Alberta's Environmental Quality Guidelines for Alberta surface waters



*Complete details available in the Okotoks Environmental Master Plan

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Alberta Drought Risk and Management

Issue: Several river basins are in significant drought conditions due to low rainfall and higher temperatures. El Niño conditions, higher winter temperatures and low current snow mountain pack are increasing the potential for significant 2024 drought conditions. Basins impacted include:

- **Milk River and Oldman River basins**
- **South Saskatchewan River basin**
- **Bow River basin (includes Sheep River)**
- **Red Deer and North Saskatchewan River basins**
- **Tributaries to the Peace, Athabasca, and Hay Rivers**

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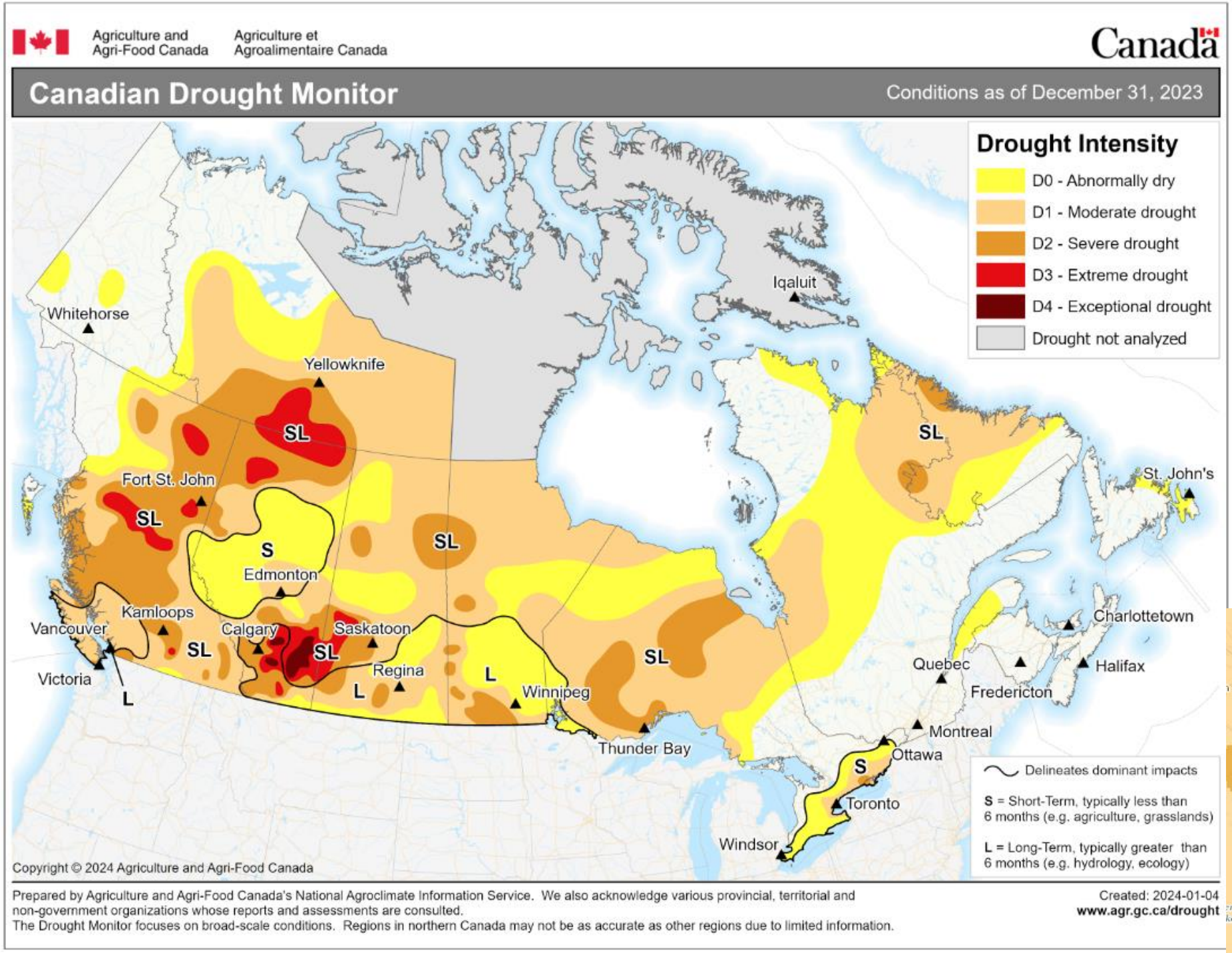
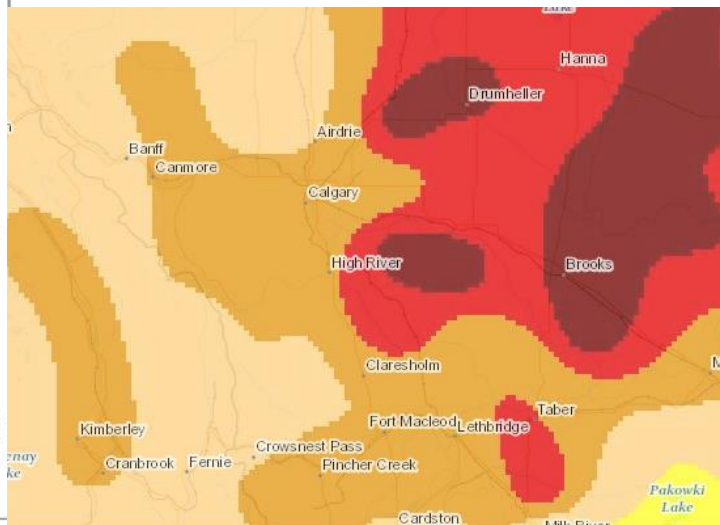


Agricultural Drought (based upon Soil Moisture). Usually results from a Meteorological drought.

The Canadian Drought Monitor is showing that Okotoks is in a severe drought with pockets of exceptional Drought in our vicinity.

Due to drought conditions additional pressure on our water supplies is to be expected.



Boat launch at the Island View day use area on the Oldman Reservoir

St. Mary's Reservoir from the boat launch dock

Hydrological Drought

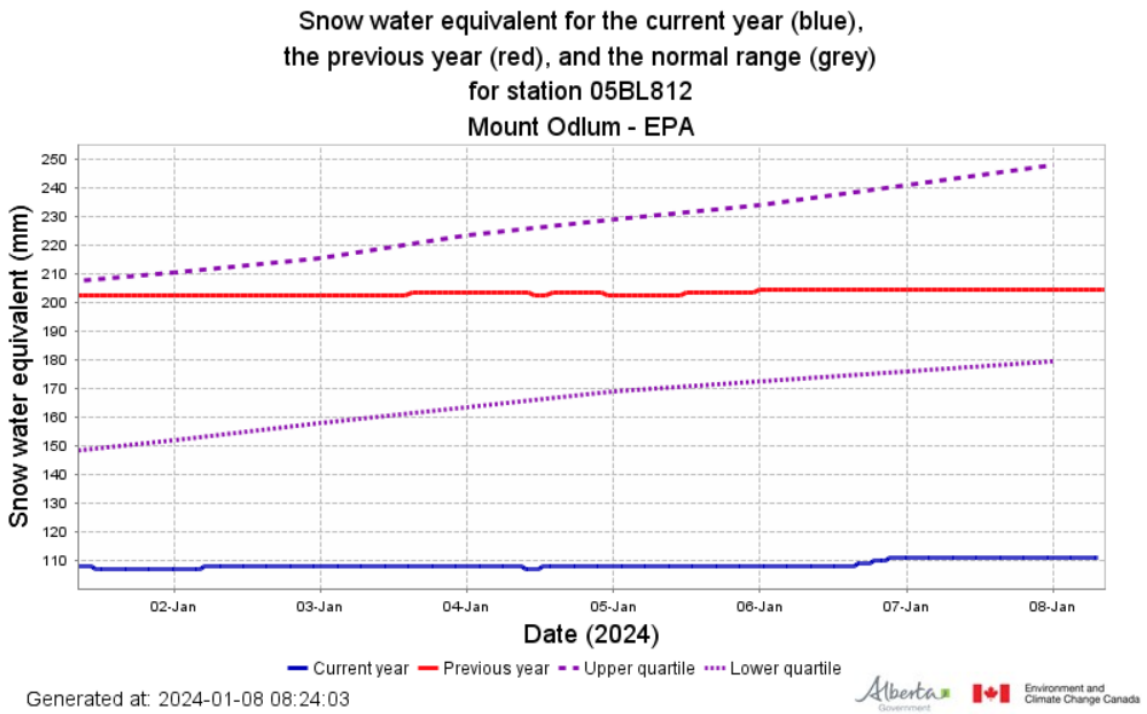
As of November 14, 2023:

- Bow River at Calgary - lowest since 2000.
- Oldman River at Lethbridge - third lowest since 2000.
- South Saskatchewan River at Medicine Hat - second lowest since 2000.
- Water storage at Oldman Reservoir is at 26% and holding. Normal at this time of year is 62-80%.
- Storage at St. Mary Reservoir is at 9.4% and holding. Normal at this time of year is 41-70%.

Storage “Insurance” has been depleted.

Photos from Alberta.ca/drought

Mount Odlum - EPA | Weekly Graph



Mount Odlum Precipitation:

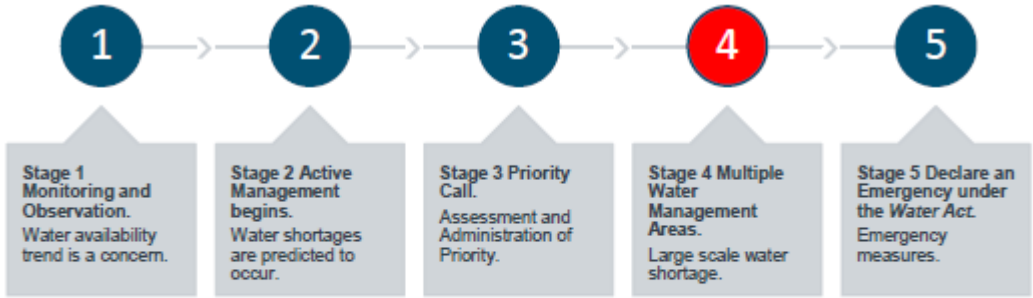
2024 Sheep River Flows are dependant on mountain precipitation (combination of snow pillow and precipitation).

As of Jan 8th, 2024 Mount Odlum snow pillow equivalents are approximately 50% of 2023 values.

Without significant snow accumulation/precipitation 2024 extreme drought conditions are expected.

Alberta Environment is warning of 2024 drought conditions and is currently at Stage 4 of their Water Management Plan.

Alberta Water Management Plan



Photos from Alberta.ca/drought

Alberta

What is Okotoks doing to promote water conservation and improve drought resilience?

Water Management and Conservation Tools:

- **Water Allocation Policy**
- **Water Bylaw and Utility Structure**
- **Water Shortage Response Plan (update in Q1/2024)**
- **Capital and Operating Projects**
  - Water Conservation
  - Process Optimization
- Water Conservation Programs and Rebates
- Governance/Policy Direction
  - Municipal Development Plan
  - Climate Action Plan
  - Environmental Master Plan

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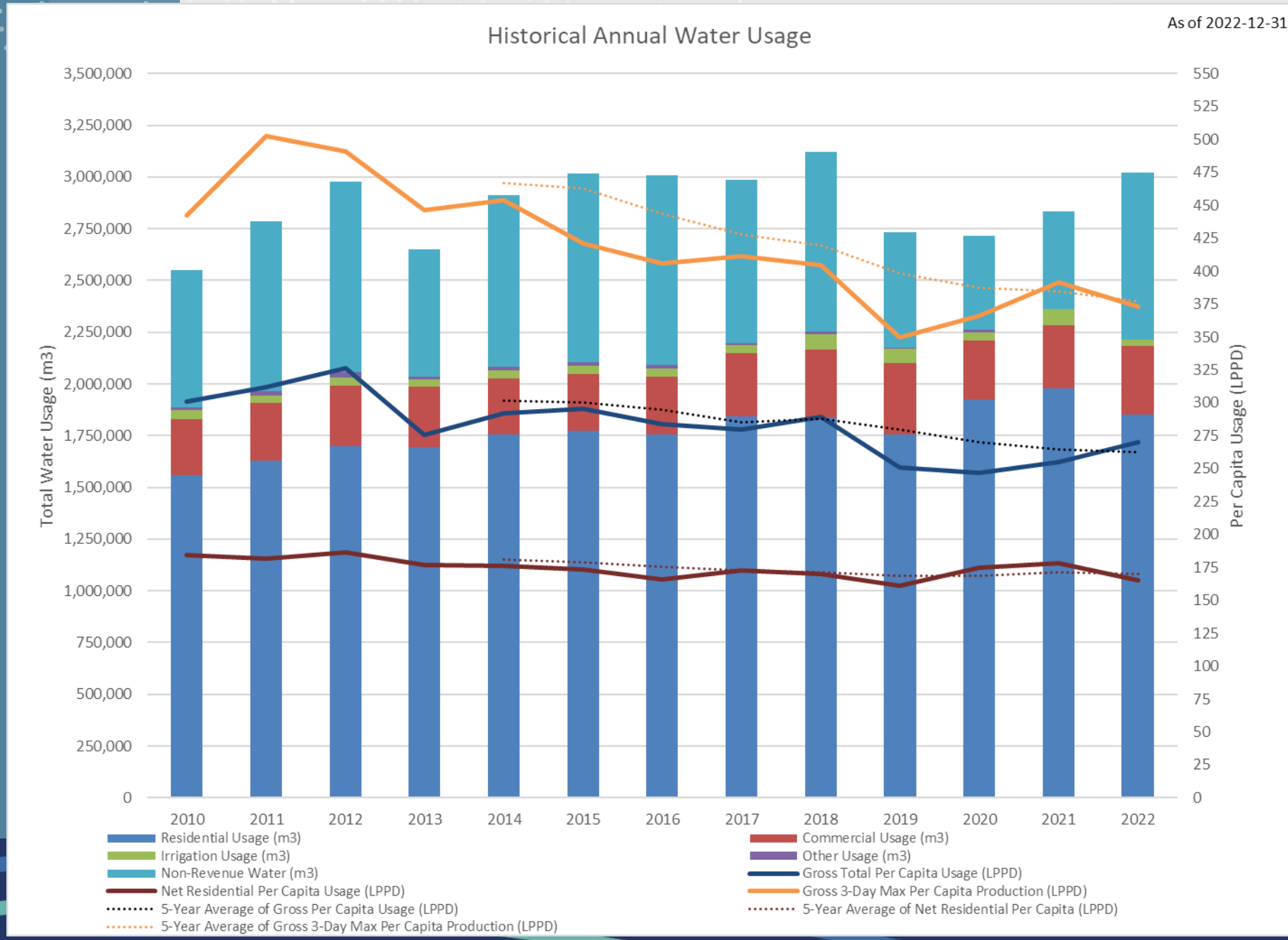
2022 Water Usage Summary

Generally Peak Day and Gross Average Consumption is Trending Down.

*2023 Total Consumption is higher due to Major Distribution Leaks (which have now been repaired). Data is not yet available for distribution.



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2023 Highlights

Commercial Water Audits

- Boston Pizza
- Foothills Composite High School
- Better Than Home Coin Laundry
- Sobeys
- Suds Car and Truck Wash

Projects

Horizontal Collector Well Drilled (2024 Operational Target)

Standby Power for West Well Field (Transfer Switch Installed for quick connect of ext. generator)

Lauden Park Stormwater Use (Lines installed + approvals. 2024 Operational Target)

Howard Park Raw Water Well Drilled and Tested – not viable

Process Optimization

- **Leak Detection** and repairs with new equipment
- **Effluent Reuse Study**

License Transfer Agreements

Coming in 2024:

- **District Metering Pilot**
- **Tillotson Stormwater Use**
- **Service Level and Utility Rate Changes?**
- **Irrigation assessments, target high users vs. on request only**

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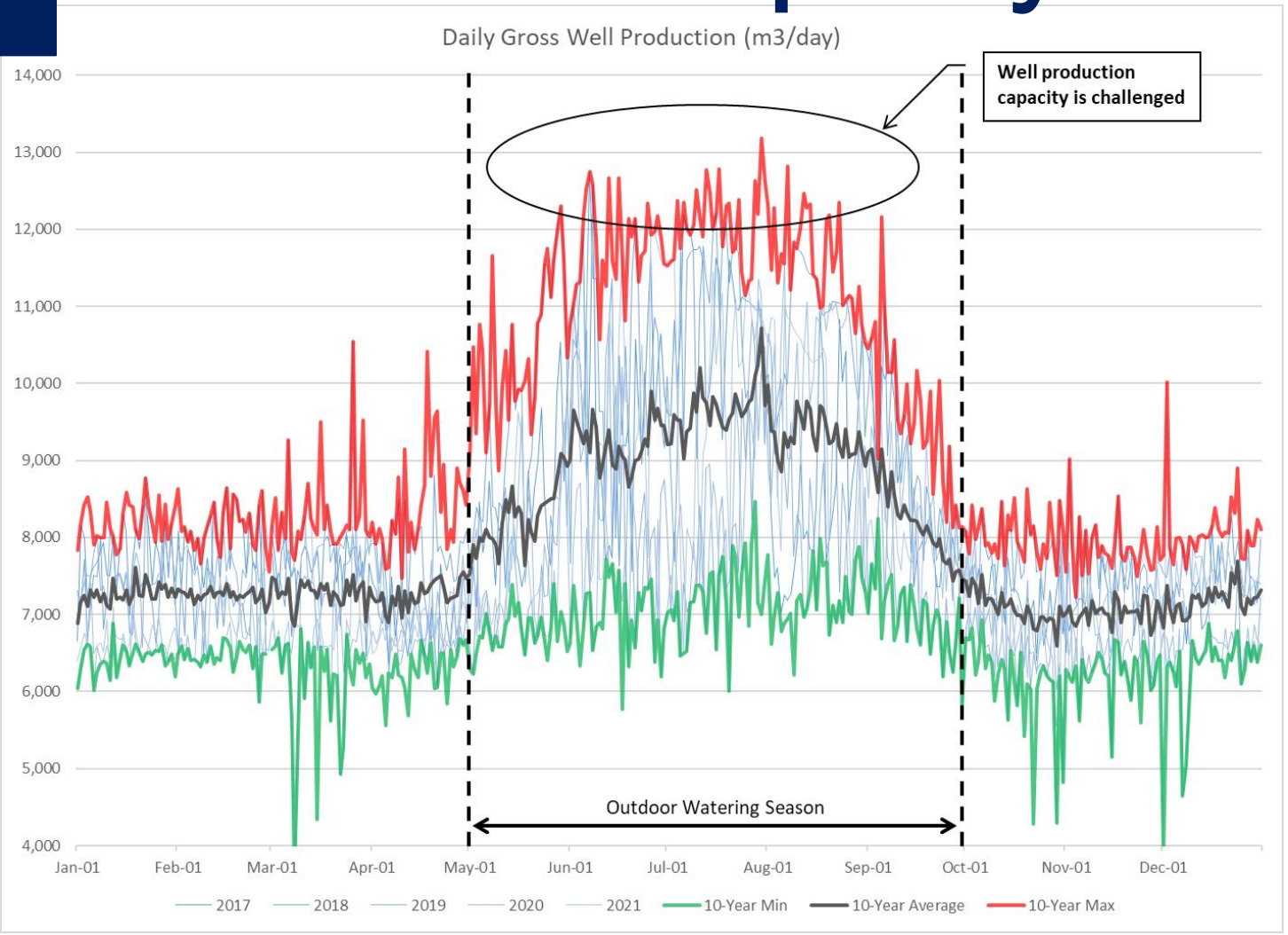
Production Capacity Risk (Peak Day)



Wells are challenged to produce peak day water demands

- The 13 Wells cannot produce consistently beyond ~12.5 ML/day. This can drop to 10 ML/day during low river flow conditions.
- Wells production is further impacted by during certain river conditions such as low flow.
- Watering restrictions are required to manage peak day demands

Seasonal Peaking Factor

- During summer months, demand increases by 40-60% due to outdoor watering

Water Treatment Plant (WTP) has Significant Available Capacity

- Utilizing approximately 60% of WTP peak capacity at current level of service
- WTP design capacity is 21.7 mL/day (to be confirmed with full-scale hydraulic test)

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Water Bylaw –Watering Conservation Schedule

CURRENT WATERING SCHEDULE – Stage 1
(6 available hours per week)

		General outdoor use	Automated irrigation only
SUN & THUR	**ODD Numbered Addresses**	6-9 AM **OR** 7-10 PM	2-5 AM
WED & SAT	**EVEN Numbered Addresses**	6-9 AM **OR** 7-10 PM	2-5 AM

Watering Conservation Schedule – WHY?

- Limit excessive watering
- Reduce seasonal peak demand, when river levels are lowest and wells are challenged to produce
- Maintain reservoir levels.
- Manage Water Licensing

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Proposed Outdoor Watering Schedule Option A

OPTION A - One day per week (3 available hours per week)				
General outdoor use				**Automated irrigation only**
THU	ODD Numbered Addresses	6-9 AM **OR 7**-10 PM	**OR**	2-5 AM
MON	EVEN Numbered Addresses	6-9 AM **OR 7**-10 PM		2-5 AM

1) Time exemption by permit for large automated systems only
2) Conservation schedule exemption for sports fields and non-potable

- Eliminate weekend watering when demands are highest
- Available hours per week reduced from 6 to 3 hours
- Reduce likelihood of activating stage 3 of the WSRP
- Improve reservoir recovery days
- Change in service level/impact to turf quality

- <u>Estimated annual water savings = 75,000 m3</u>

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Proposed Outdoor Watering Schedule Option B

OPTION B - 2 days per week (4 available hours per week)				
General outdoor use				**Automated irrigation only**
MON & THU	ODD Numbered Addresses	6-8 AM **OR** 8-10 PM	**OR**	2-4 AM
TUE & FRI	EVEN Numbered Addresses	6-8 AM **OR** 8-10 PM		2-4 AM

1) Time exemption by permit for large automated systems only
2) Conservation schedule exemption for sports fields and non-potable

- Maintains two day/week schedule (no weekends)
- Maintains 2 watering days to mitigate impacts to turf management
- Available hours per week reduced from 6 to 4 hours (33% reduction)
- Improve reservoir recovery days
- Estimated annual water savings = 40,000 m3

Proposed Watering/Conservation Schedule

- **CONSIDERATIONS**
  - Time exemption handled through permit for large automated systems only (with multiple irrigation zones)
  - Conservation schedule exemption for sports fields (to maintain service levels for playable surfaces and reduce injuries) and non-potable irrigation systems
  - Increased education & communication re: best practices for turf irrigation (irrigation assessments by Parks staff)
  - Focused communication: one time period per day (either AM **or** PM); not both

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Municipal Comparison of 2023 restrictions

Municipality	Base Schedule		2023	
	Total available hours/week	**More/Less Restrictive**	**Total available hours/week**	**More/Less Restrictive**
Okotoks	6		6	
Airdrie	18	Less	1	More
Calgary	168	Less	2	More
Cochrane	77	Less	35	Less
Diamond Valley	168	Less	168	Less
High River	168	Less	9	Less
Canmore	168	Less	0	More
Chestermere	168	Less	9	Less
Strathmore	119	Less	2	More
Region of Waterloo, ON	8.5	Less	8.5	Less

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Alternate Consideration 2A: Utility Rate Structure – Summer Discount

- The current methodology applies a discount on summer irrigation usage based upon winter average water usage.

- Should we revise the methodology to calculate wastewater variable charges as a fixed percentage of water billing? The intent of this change would be to ensure equitable billing of all water regardless of use (Consumptive vs. irrigation)?

- City of Calgary bills wastewater at 88% of metered water.
- An alternative consideration would be to eliminate the discount.

Alternate Consideration 2B: Utility Rate Structure – Tier 3 Rates

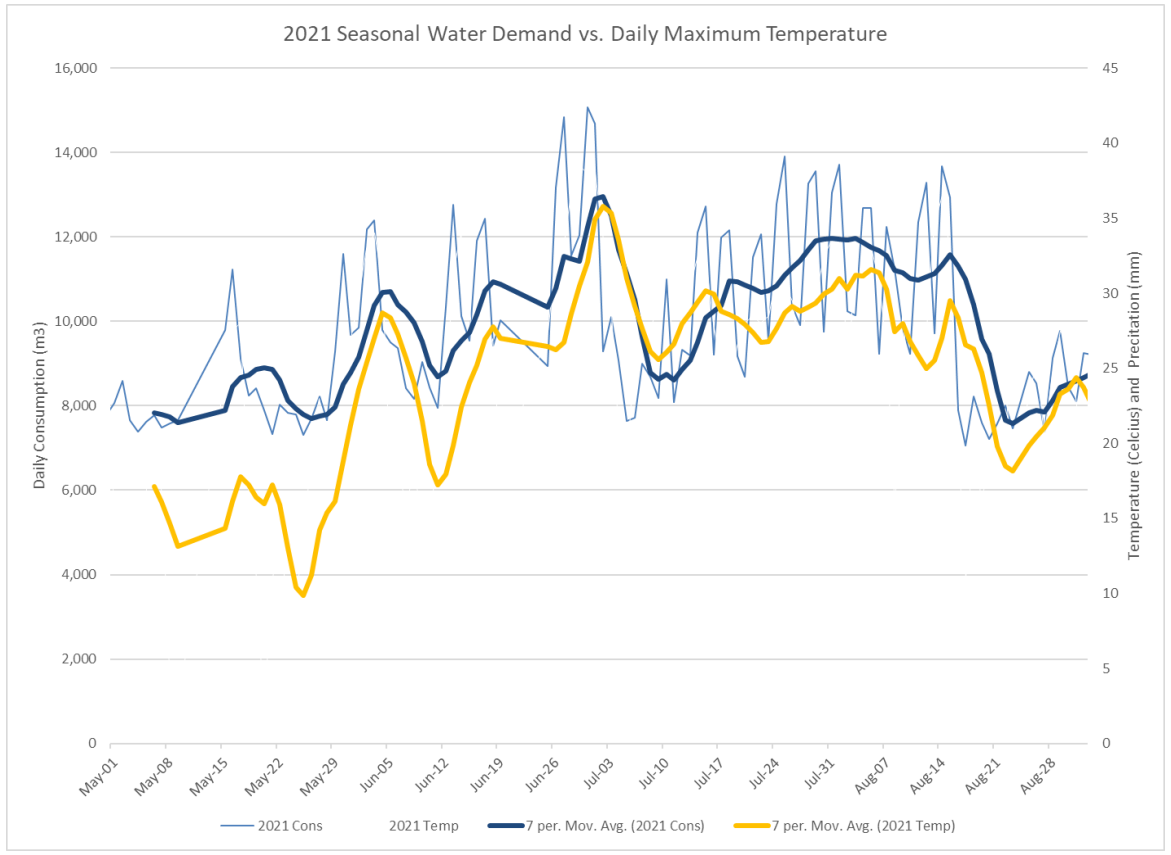
- Okotoks bills water on a progressive block structure to encourage conservation and discourage excessive use. Current block rate targets are outlined below.
- The target multipliers could be adjusted to add additional financial disincentive higher water consumption. Increasing the Tier 3 multiplier from 2x to 3x is expected to generate approximately $250,000 of revenue if existing average Tier 3 consumption remains at current average levels.

	Rate	Multiplier Target	% of water billed
Tier 1 (<23 m^3)	$1.70	1x	65%
Tier 2 (24-46 m^3)	$2.10	1.5x	25%
Tier 3 (>46 m^3)	$3.50	2x	10%

Water Shortage Response Plan

- **What is it?**
  - Plan that helps reduce outdoor watering demands to preserve water for consumption and fire protection.
  - Triggered by river and reservoir levels.
- **Why is it focused on outdoor watering?**
  - During summer months, Average Daily Demand increases by 40-60%.
  - Well production is challenged when river levels are low.
  - Outdoor watering Service levels are adjusted to reflect watershed capacity.

Temperature Correlated Water Usage



- **Temperature Correlated Water Use**
  - For every degree above 20°C (maximum day temperature), we observe an average daily increase of ~300m3/°C/day (over base usage)
  - Outdoor watering usually accounts for ~10% of annual total community usage (by volume)

*2023-09-18 Sheep River Flows from rivers.alberta.ca

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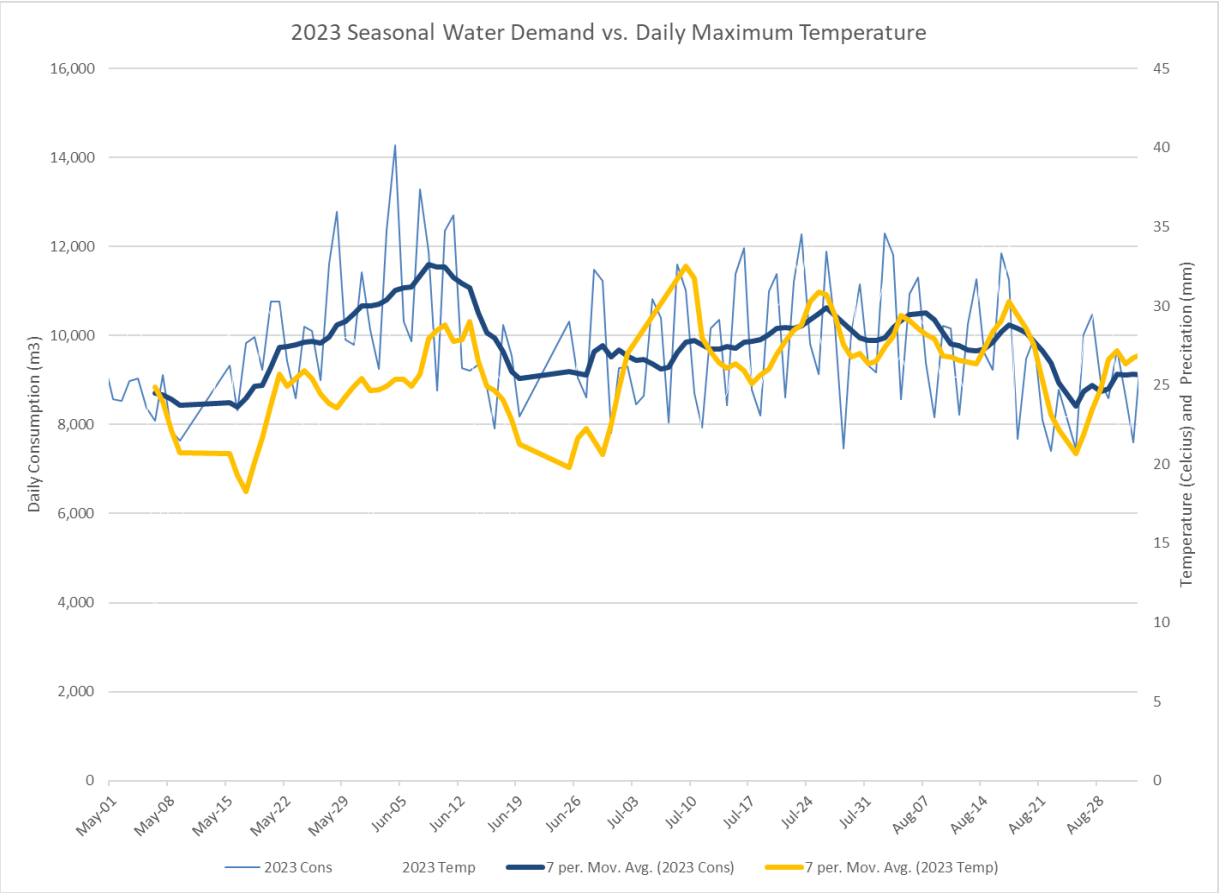
2023 WSRP Stage 2 Response



- **Water Shortage Response Plan – Stage 2**
  - Stage 2 initiated June 6th, remained until Sept 11
  - Increased public communication around water conservation
- **Temperature Correlated Water Use**
  - In 2023, peak days generally manageable: observed a ~40% reduction in daily temperature correlated water use increases (~180m3/°C)
  - Overall total watering volume did not significantly decrease.

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Water Shortage Response Plan – Proposed Updates

- **Proposed additional Stage in early 2024 update which includes**
  - Mandatory Shut down of all “non-essential” water use activities
    - i.e. carwash facilities, filling of pools/hot tubs, construction (flushing) water, etc.)
  - Voluntary reductions to in-home/facility use
  - Reductions to system wide pressure (as required and in consultation with the Fire Department)

Summary

Proposed service level changes:

- Changes to the outdoor watering schedule:
  - Focus on water conservation, resiliency and drought preparedness
  - Two options provided for council's consideration
- Changes to the Utility Rate Structure:
  - Change Methodology for the application of wastewater charges
  - Increase the Tier 3 Multiplier and Irrigation Rates
- Water Shortage Response Plan:
  - Add additional Stage that limits non-essential use and encourages indoor conservation