



# 2025 Expansion Proposal Bow River Irrigation District

The expansion limit is the maximum number of irrigation acres allowed in the district. Our limit is now 295,000 acres and we are proposing a new limit of 320,000 acres.

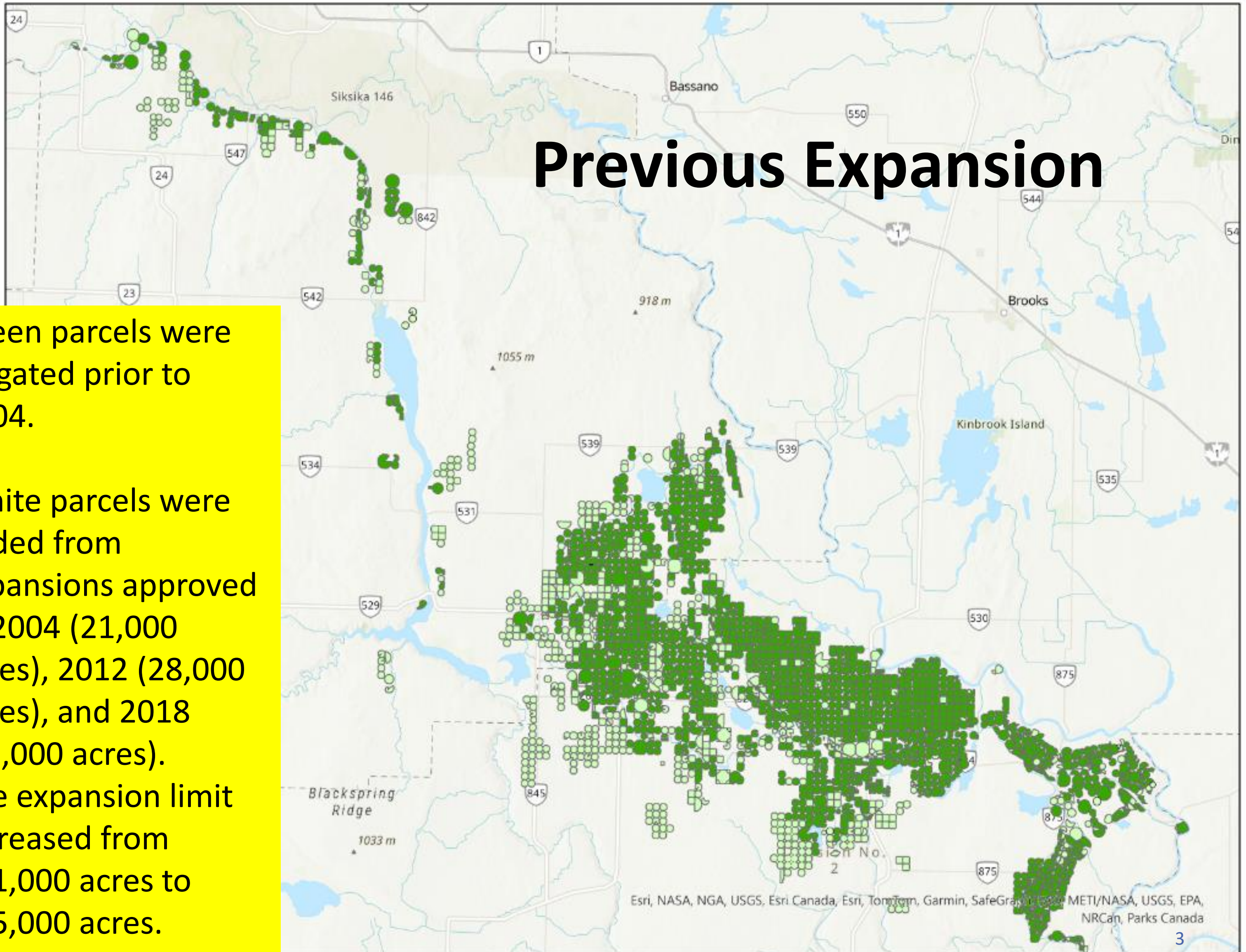
- To increase its expansion limit, a district must:
  1. Determine how the proposed expansion will affect water availability, including changes to the frequency and magnitude of water shortages.
  2. Make this information publicly available.
  3. Hold one or more public meetings.
  4. Hold a plebiscite where all irrigators can vote for or against expansion.
  5. Approve a bylaw changing the expansion limit if the plebiscite passes.

Expansion potential is influenced by the physical water supply and the licensed water allocation. Previous expansion plebiscites were approved in 2004, 2012, and 2018.

# Previous Expansion

Green parcels were irrigated prior to 2004.

White parcels were added from expansions approved in 2004 (21,000 acres), 2012 (28,000 acres), and 2018 (35,000 acres). The expansion limit increased from 211,000 acres to 295,000 acres.



# Bow River Irrigation District (BRID)

- Diversion weir on the Bow River at Carseland (GOA owns it)
- 1,070 km of canals & pipelines
- 9 reservoirs (470,000 ac. ft.)
- Maximum diversion rate: 1800 cfs
  - 490,000 ac. ft. allocation
  - Best priority: 1908



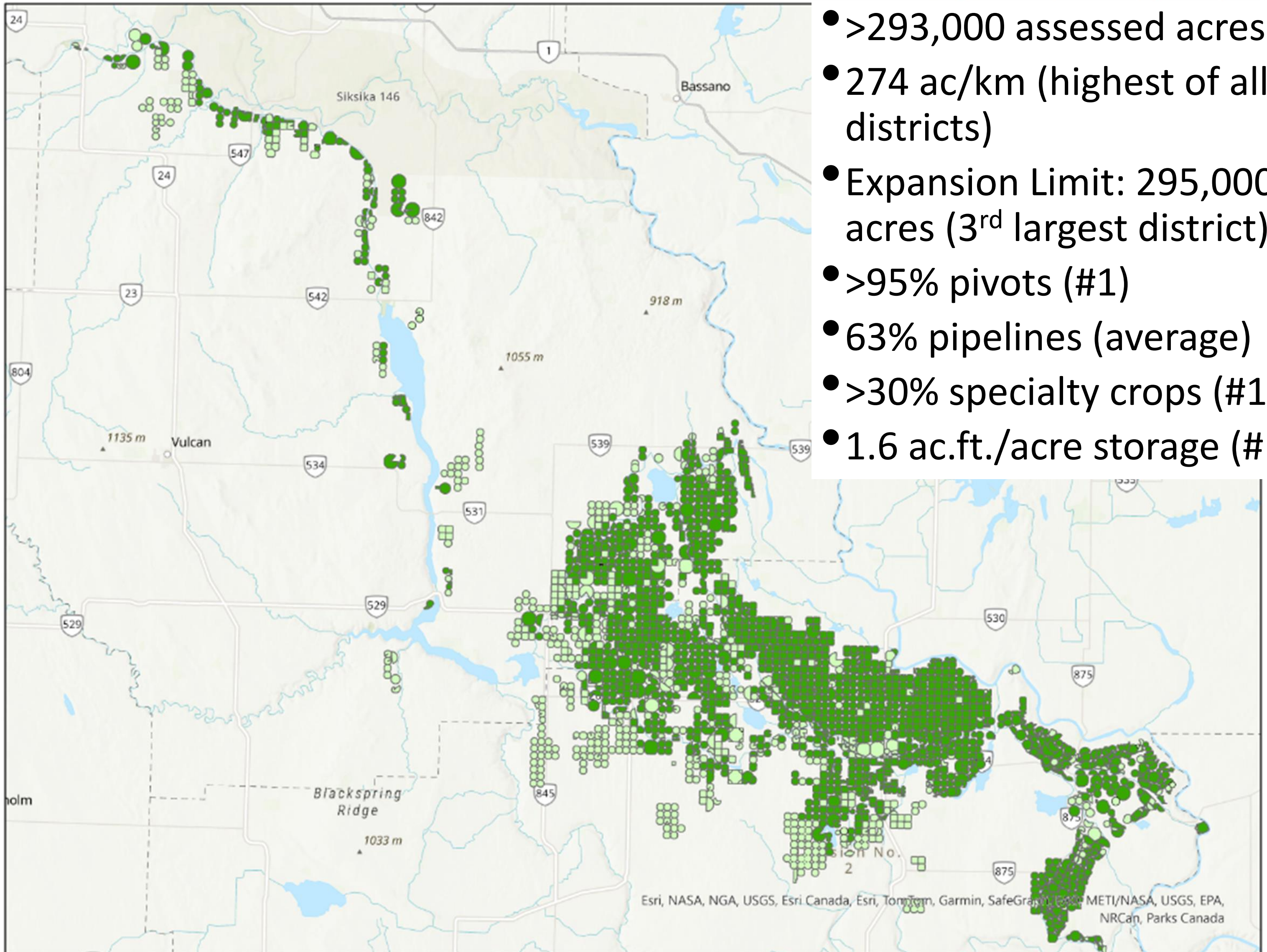
Government of Alberta  
infrastructure

BRID  
Infrastructure

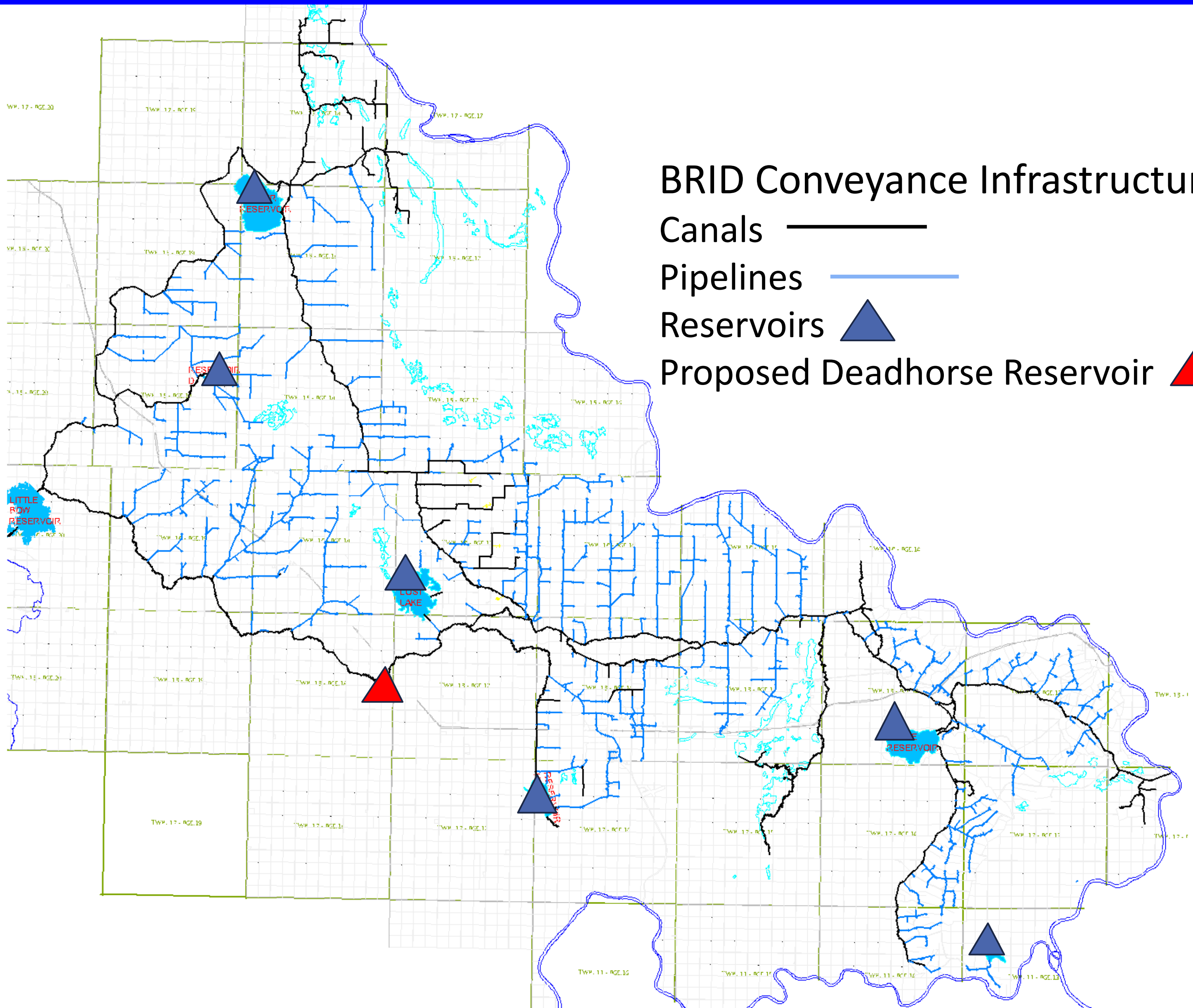
Construction began in 1909, operation began in 1920

Bow River

Oldman River



- >293,000 assessed acres
- 274 ac/km (highest of all districts)
- Expansion Limit: 295,000 acres (3<sup>rd</sup> largest district)
- >95% pivots (#1)
- 63% pipelines (average)
- >30% specialty crops (#1)
- 1.6 ac.ft./acre storage (#1)



# BRID Conveyance Infrastructure

Canals —————

Pipelines —————

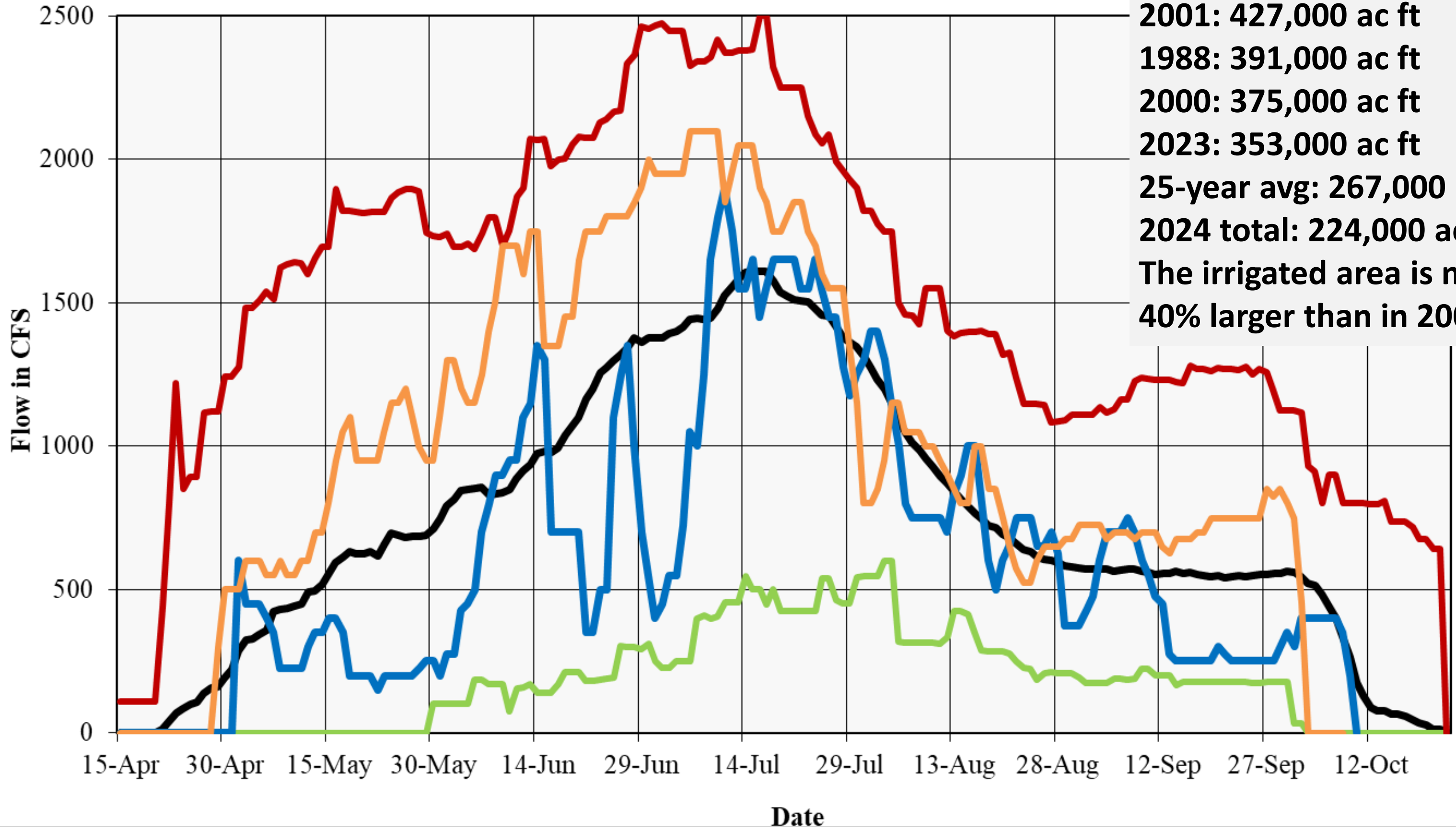
Reservoirs ▲

Proposed Deadhorse Reservoir ▲

# Irrigation Demand Comparison

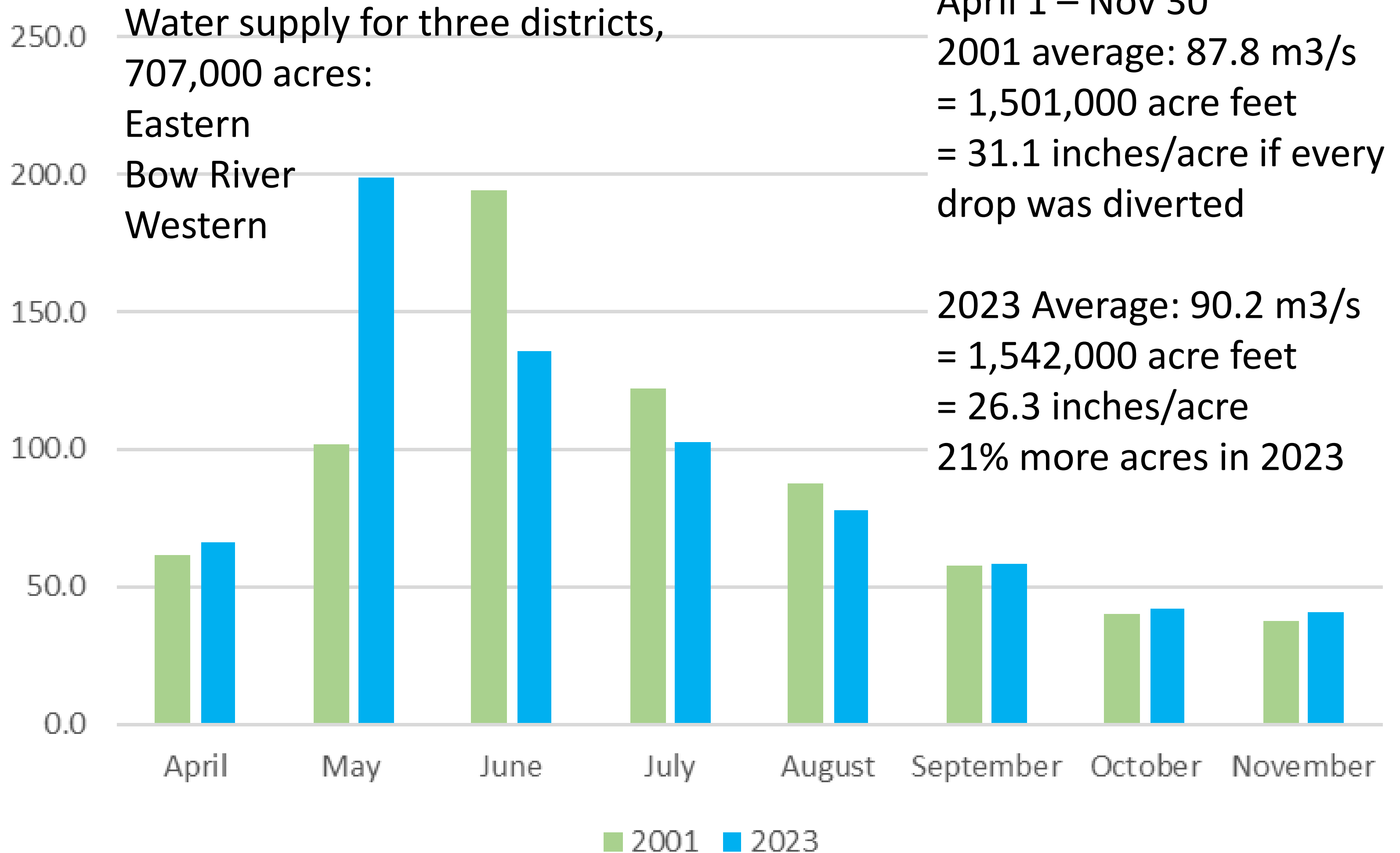
## Little Bow Reservoir Outflow

**2023 LBR outflow was the 4<sup>th</sup> highest on record.**  
**2001: 427,000 ac ft**  
**1988: 391,000 ac ft**  
**2000: 375,000 ac ft**  
**2023: 353,000 ac ft**  
**25-year avg: 267,000 ac ft**  
**2024 total: 224,000 ac ft**  
**The irrigated area is now 40% larger than in 2001.**



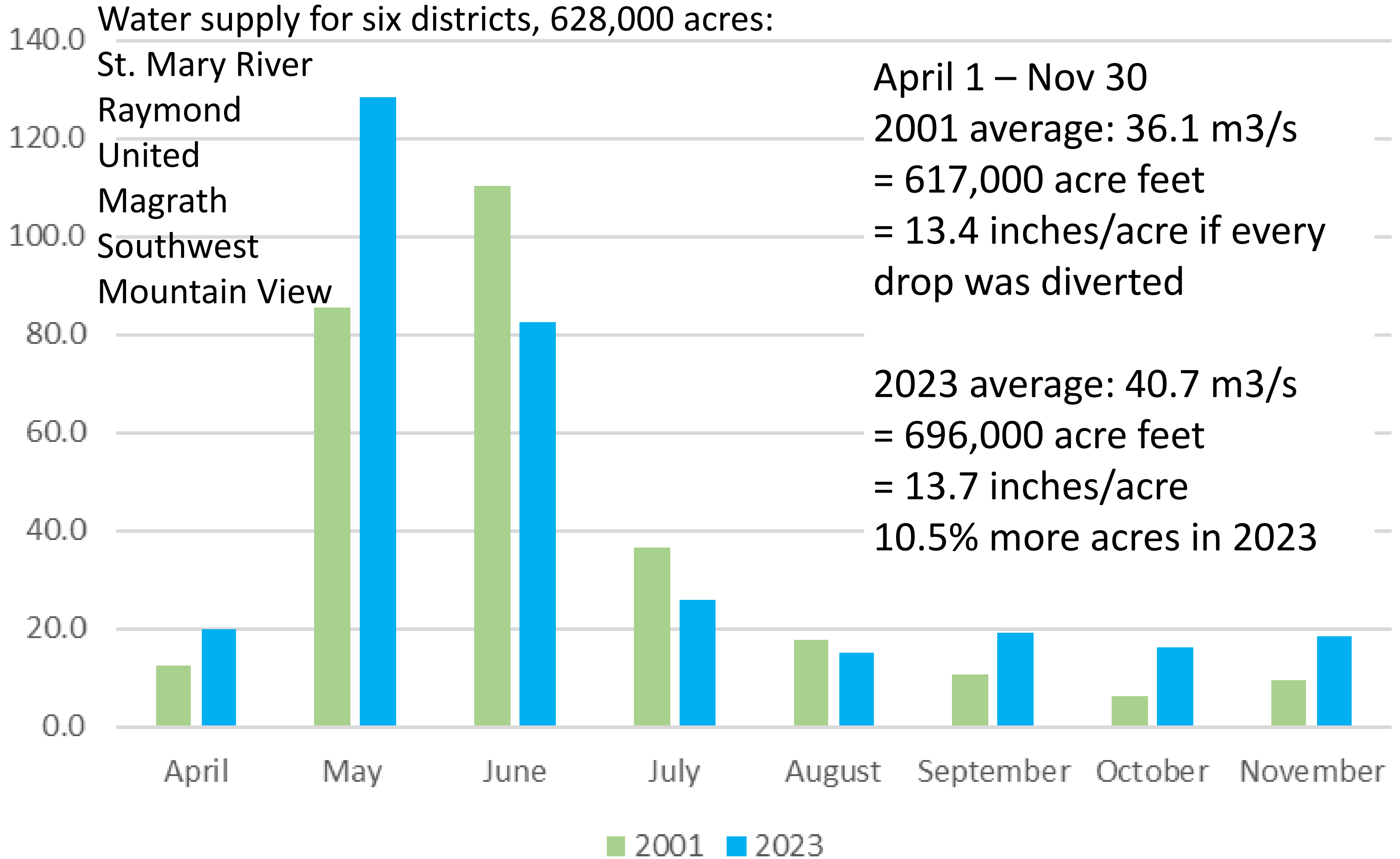
— Average 1976-2023    — Daily Record Minimum    — Daily Record Maximum    — 2024    — 2023

# Bow, Elbow, Highwood Combined Average flow (m<sup>3</sup>/s)





# Belly, Waterton, St. Mary Combined Average flow (m<sup>3</sup>/s)



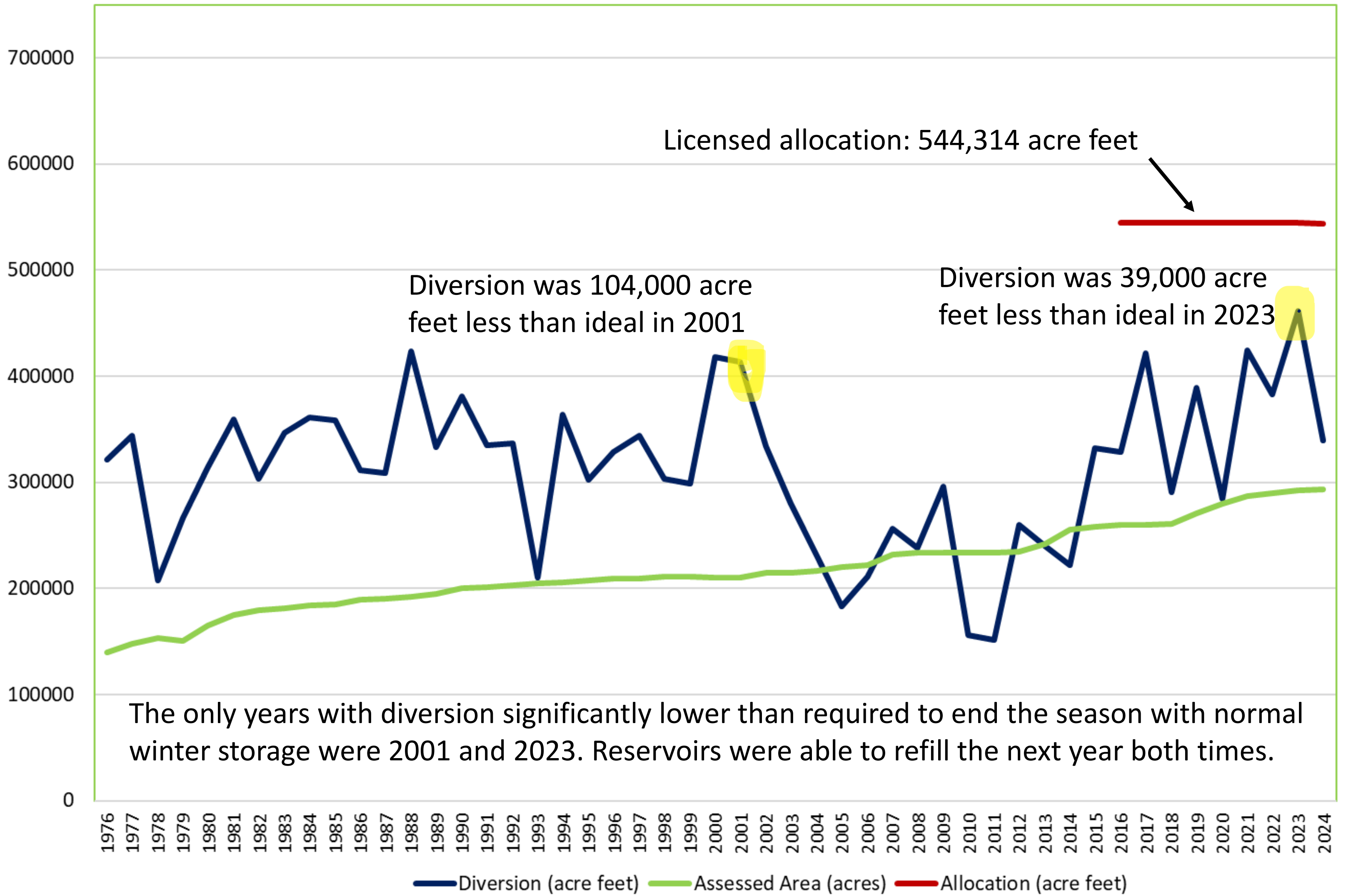
# Calgary's Impact

- Calgary's annual average diversion for the past ten years is 151,000 acre feet, but their return flow (treated wastewater) averages 85% of their diversion. This does not include increased runoff from paved surfaces.
- Calgary's annual net use (24,000 acre feet average) is small compared to irrigation diversions. The combined average annual diversion for BRID, EID, and WID for the past ten years is 948,000 acre feet.
- Because Calgary is upstream of irrigation diversions we do not compete for water. Calgary's growth does not affect our growth and vice versa.

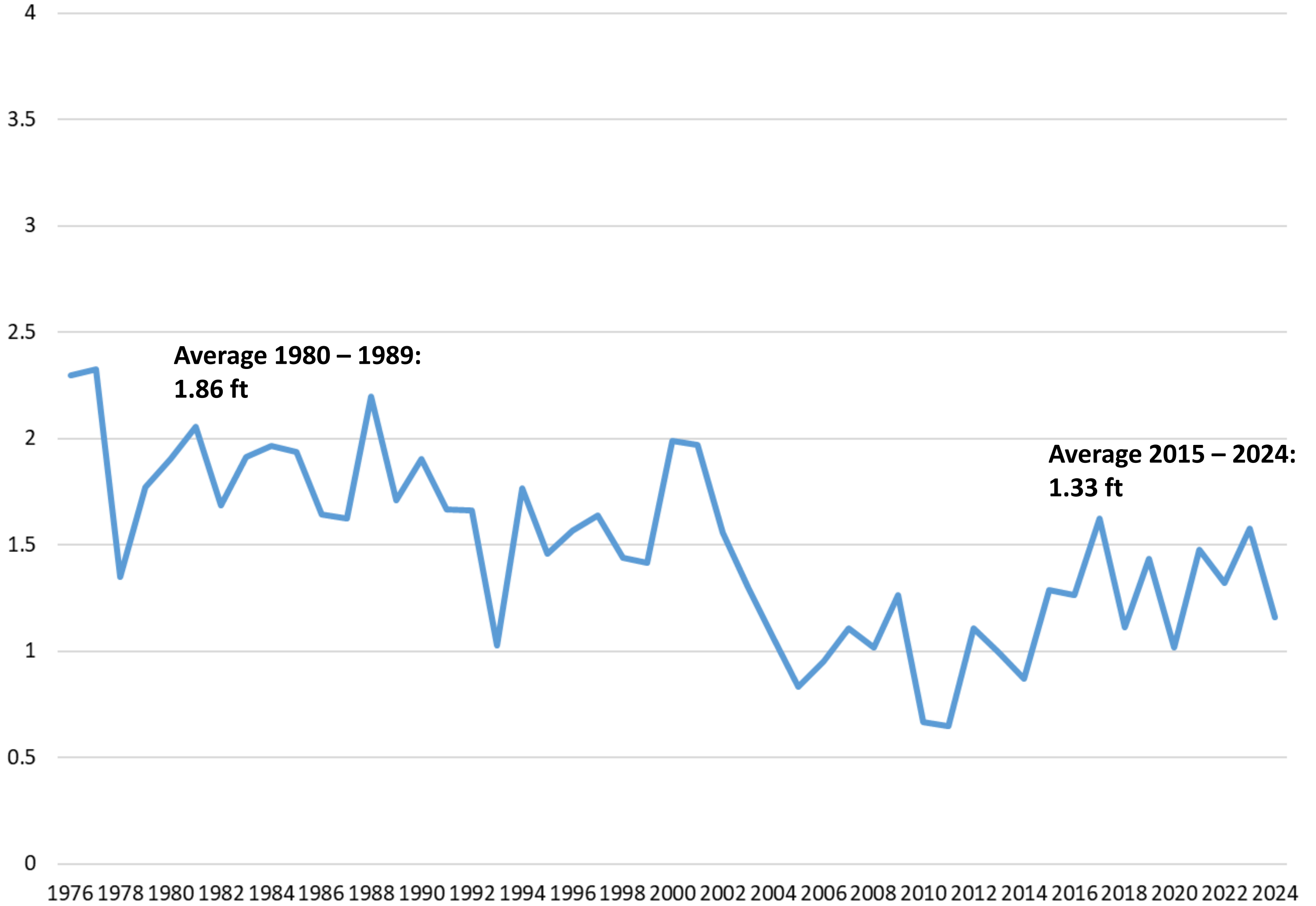
# Why Expand Again?

- Unused water is available as proven again in recent dry years  
- in 2023 reservoir storage was 88% of full winter storage at the end of the year.
- The Province funded the Alberta Irrigation Modernization Program to encourage expansion.
- We currently have requests for over 39,000 irrigation acres.
- Expansion revenue would upgrade infrastructure including building Deadhorse Coulee Reservoir.

# Diversion and Assessed Area - BRID

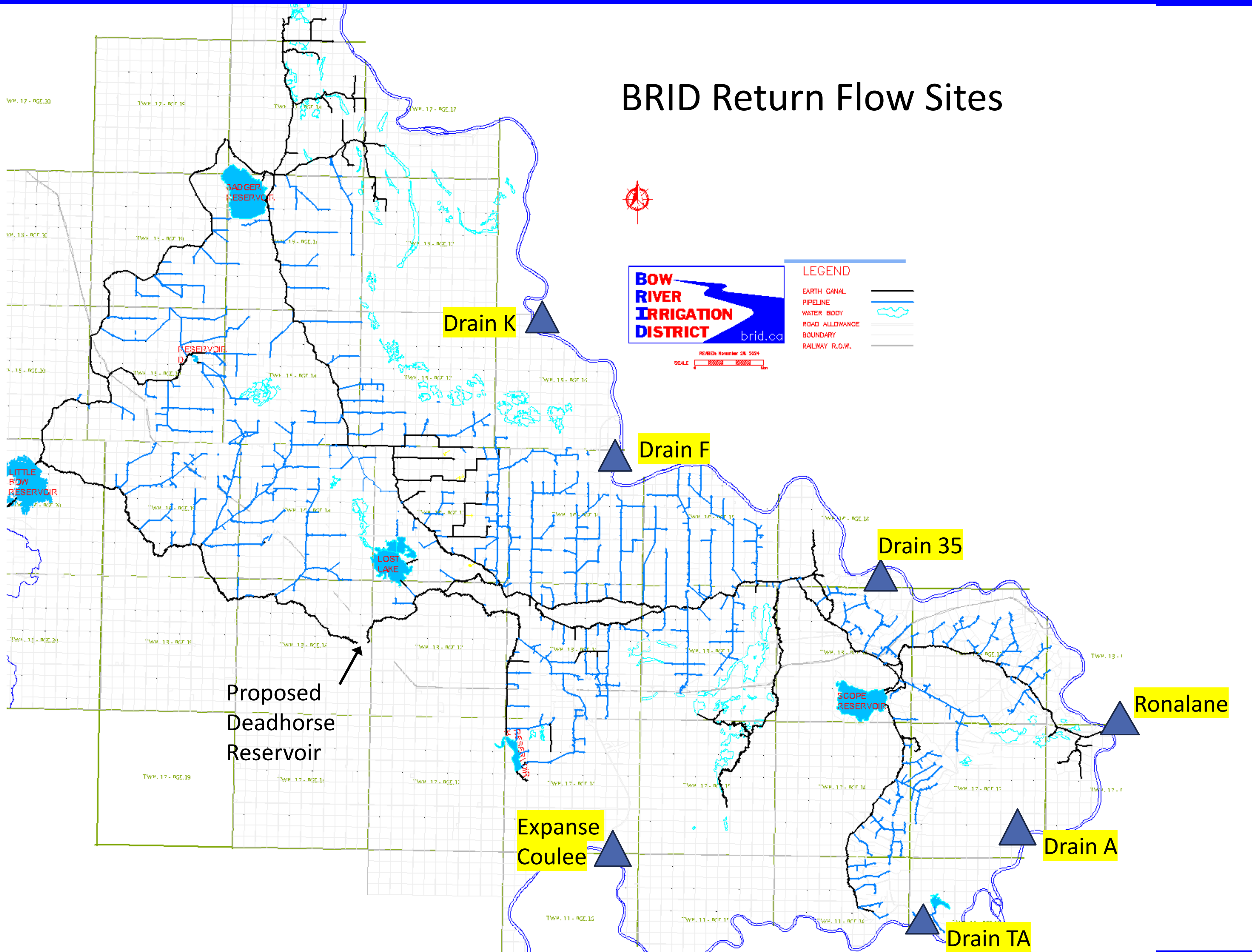


# Diversion/Unit Area (ft)



— BRID

# BRID Return Flow Sites



# Expected Return Flow Reductions 2018 - 2030

		Return Flow (acre feet)								
Location	Description	2023	2022	2021	2020	2019	Est. future reduction/ reason	Year		
Drain 35	Y Hays area	775	908	995	536	1,199	800 pipeline	2026		
Drain F	B/K Vauxhall	10,698	11,740	14,597	11,722	14,434	11,000 pipelines	2027		
Expanse Coulee	South Vauxhall	5,535	5,434	5,463	6,368	5,656	0			
Drain K	Lomond Lateral	5,497	6,622	5,760	7,805	9,218	5,200 pipeline	2030		
Drain A	South Hays Lateral O	442	2,839	6,052	5,950	4,703	4,000 already achieved	2023		
Drain TA	South Hays Lateral R	4,509	5,883	5,668	4,572	3,782	0			
Ronalane	Main Canal	5,696	11,218	9,081	25,732	27,327	6,000 Deadhorse reservoir	2028		
<b>Total</b>		<b>33,152</b>	<b>44,644</b>	<b>47,616</b>	<b>62,685</b>	<b>66,319</b>	<b>27,000</b>			

Deadhorse Coulee Reservoir will store over 10,000 acre feet of useable water in addition to reducing return flow.

Timing for adding new irrigation acres would probably be influenced by project completion dates.

# Probable Timeline and Process for Adding Irrigation Acres if Expansion is Approved

- The bylaw changing the expansion limit would not be approved until we are willing to accept and approve applications.
- Any acres reserved for intensification could then be available immediately.
- Acres for new parcels would be approved using the previous format: every applicant gets one parcel before anyone gets two, everyone wanting two gets two before anyone gets three, and so on until there are insufficient acres to grant another parcel to all interested applicants.
- 50% of dryland acres could be made available for use in 2027 (assuming B/K pipelines are completed), with the remainder available once Deadhorse Reservoir is completed, probably in 2028. Applicants that receive approval for parcels above the 50% threshold would have to wait until 2028 to irrigate the excess parcels.
- Applications would be reviewed to prevent any landowners from obtaining more than their share of irrigation acres.
- Standard requirements such as soil tests confirming irrigability and proof of easements for parcels not adjacent to the point of delivery would have to be met.



## BOW RIVER IRRIGATION DISTRICT - 2025 EXPANSION

### REQUIRED INFORMATION – Section 4(1) Irrigation Plebiscite Regulation

- a) The volume of water allocated to the district under all of the district's existing water licences:
- 150,000 acre feet; 1908-10-27-02;
  - 150,000 acre feet; 1913-03-25-01;
  - 80,000 acre feet; 1953-06-25-01;
  - 68 acre feet; 1975-11-10-005, 1977-08-25-002, 1978-09-19-001;
  - 22 acre feet; 1983-05-31-014;
  - 47 acre feet; 1978-06-07-020;
  - 60 acre feet; 1985-03-21-008;
  - 23 acre feet; 1990-10-23-009;
  - 69,780 acre feet; 1992-02-05-10;
  - 39,250 acre feet; 1992-02-05-011 (upon completion of the approved transfer of 750 acre feet to Cochrane).

The total existing licence allocation is 489,250 acre feet, upon completion of the approved transfer to Cochrane. Included within this total is 2,380 acre feet allocated to purposes other than irrigation and 1,780 acre feet which can be used for either irrigation or agricultural (stockwatering) purposes. To date, the district has entered into agreements which consume 2,365 acre feet of these allotments.

a) **the remaining volume of water available for crop use:**

The volume of water remaining for crop use is the total licenced volume less losses, return flows and other committed uses.

Total licenced volume	489,250 acre feet
Lost from canals and reservoirs	- 18,500 acre feet
Volume of return flow (3-year average)	- 42,900 acre feet
Water allocated exclusively to other uses	- <u>2,380 acre feet</u>
	<b>425,470 acre feet</b>

**This remaining licenced volume would provide 17.3” of water per acre at the present expansion level of 295,000 acres and 16.0” at the proposed expansion level of 320,000 acres.**

a) the gross volume of water required per acre at the farm turnout for crops, including data on:

i) the average net depth of water required per acre:

Over the last 10 irrigation seasons the average net depth delivered per irrigated acre was 11.2", with a high of 15.1" in 2017.

ii) the percentage of each crop type (2023):

Forages: 15.8%

Cereals: 46.9%

Specialty: 31.7%

Oilseeds: 5.4%

Undesignated: 0.2%

2015 data was used for the modelling calculations, and would require similar water volumes:

Forages: 17.0%

Cereals: 40.0%

Specialty: 30.0%

Oilseeds: 13.0%

i) the level of risk of a water shortage (deficit and frequency):

To assist with determining the level of risk of a water shortage for our last expansion Alberta Agriculture and Irrigation (AGI) and Alberta Environment and Protected Areas (AEPA) conducted a model analysis in 2018 examining 74 years of past weather and river flow records, and three possible expansion limits of 285,000, 310,000, and 335,000 acres. This analysis remains valid for the current proposed expansion, since the proposed new limit of 320,000 acres is within the modelled range.

Data on the canal infrastructure, on-farm irrigation systems and crop mix in 2015 were entered into the model to predict in which of those 74 years the BRID would have been deficient in supplying the crop demand. The model then ran nine scenarios at three levels of expansion (25,000, 50,000 and 75,000 acres added to the previous 260,000 acre limit) for the same set of years to determine when deficiencies would have occurred at those expansion levels. Three scenarios include the Western Irrigation District and Eastern Irrigation District expansions of 10% and one scenario includes a 20% expansion of the WID and EID.

In AGI's work on deficits and financial risks to irrigators, AGI determined that, as a guide, a significant risk would be a diversion deficit greater than 100 millimeters per year. An unacceptable risk was defined as a diversion deficit greater than 100 mm occurring more than 1 in 10 years. A deficit under 25 millimeters is of no concern and a deficit between 25 and 100 millimeters is a minor concern.

The baseline scenario (previous expansion limit of 260,000 acres) had no irrigation demand deficits over the 74 year range of the modelling.

None of the modelled scenarios had significant deficits greater than 100 millimeters. At the 50,000 acre expansion (310,000 acres), there were three years in 74 with a deficit between 25 and 100 millimeters and 9 years with a deficit under 25 millimeters. At the 75,000 acre expansion (335,000 acres), five years in 74 showed deficits between 25 and 100 millimeters and 24 years showed a deficit under 25 millimeters. One year showed a 98 millimeter deficit.

Small deficits under 25 mm were often attributed to the modelled demand exceeding the capacity of the outlet of Little Bow Reservoir, which is 3,100 cubic feet per second (cfs). This is far higher than our actual record high diversion at Little Bow Reservoir of 2,500 cfs set in July of 2021. This demonstrates the conservative nature of the model, since it calculates required flows much greater than we use. The total irrigated area in 2021 was 273,000 acres, so an expansion to 320,000 acres would increase the area by 17.2% relative to 2021. A corresponding 17.2% increase in the peak outflow from Little Bow Reservoir would result in a flow of 2930 cfs, which is still well below the design capacity.

Deficits of 25 to 100 millimeters were attributed to either a shortage of water supply (reservoir and river) or the design capacity limitation between the headworks reservoirs and the Little Bow Reservoir outlet. The capacity of the Lake McGregor Reservoir to Travers/Little Bow Reservoir is 2,800 cubic feet per second. The model assumes that no water is withdrawn from Lake McGregor Reservoir below an elevation of 871.74 meters, which is less than 2.4 metres below the full operating level. However, there is 180,000 acre feet of useable storage remaining at that level, which is 2/3 of the total storage, so except for irrigators pumping directly from McGregor, the results are conservative.

The district's assessment of the modelling results and comparison of the 2015 model inputs to current data identified two significant efficiency gains since the modelling was completed which make the results conservative:

1. Return flow was modelled at 60,750 acre feet in the 310,000 acres scenarios, whereas 42,900 acre feet is reasonable for current conditions, an improvement of 17,850 acre feet.
2. The on-farm system mix was modelled as 81% low pressure pivot, 9% high pressure pivot, 4% wheel moves, and 6% flood. The 2024 on-farm system mix is 89.2% low pressure pivot, 6.5% high pressure pivot, 1.7% wheel moves, and 2.6% flood. Using the current system mix in the model for a net application of 10" for actual plant water use would reduce water requirements by approximately 3,500 acre feet for the 310,000 acre scenarios.

Combining the water savings for the current return flow and on-farm systems, there would be 21,350 acre feet more water available than modelled, which would be enough for over 10,000 acres of irrigation. Therefore, the modelled results for 310,000 acres are conservative for the proposed 320,000 acre expansion, even without considering the storage in McGregor which the model does not use. Reductions of return flow expected in the near future and additional storage in the proposed Deadhorse Coulee Reservoir will further reduce the risk of water shortages.

- a) the total acres that could be irrigated based on the calculations made under clause (f):  
Based on the 2015 modelled irrigation demand, the district's current water allocation of 489,250 acre feet is sufficient to irrigate at least **335,000** acres. The current proposal is to expand by **25,000** acres to **320,000** acres.
- a) the present expansion limit:  
Bylaw 2018-04 set the present expansion limit at **295,000** acres.
- b) the number of acres on the current assessment roll:  
As of December 4, 2024 the BRID assessment roll held **293,153.1** acres.
- c) the proposed expansion limit:  
The BRID Board of Directors is proposing to increase the expansion limit to **320,000** acres.
- d) a description of the areas in the district where additional irrigation will be allowed if the district will not allow additional irrigation in all areas of the district:  
All areas of the district will be eligible for expansion with the only restriction being parcels potentially served from a conveyance system on which there are existing capacity restrictions.



# Related Topic - Capital Assets Charges

- BRID's current Capital Assets Charge is \$3,000/acre.
- SMRID's and LNID's Capital Assets Charges are \$4,000. EID's is \$3,672.
- The Capital Assets Charge for irrigation acres resulting from this expansion has not been determined.

# Irrigation Acres and Capital Assets Charges - Alternate Valuation

- Irrigation acres give irrigators the right to receive water from the BRID's water licences for irrigation.
- All irrigation in Alberta must be authorized through a water licence.
- The Province will not grant new water licences in the Bow River basin, but water licences can be transferred.
- Water licenses are trading privately for at least \$7,000 per acre foot.

# Next Steps

- The board will consider a resolution to hold a plebiscite after the public meetings.
- If the resolution is approved, the anticipated date for a plebiscite is February 12, with polling stations in Milo, Enchant, and Vauxhall.
- An advance poll may be held February 6 in Vauxhall.
- Notice will be provided to irrigators if the board approves holding a plebiscite.

# Summary

- Our water supply and licensed allocation will support a 25,000 acre expansion.
- The plebiscite question can only be whether you are for or against the proposed expansion.
- Capital assets charges are a related issue and can be changed any time by a bylaw. The current \$3,000 charge is lower than other large districts.
- Voting yes means we will expand. Voting no means there will be no new irrigation acres available at any price.
- Approval of expansion would provide funds to allow us to proceed with construction of Deadhorse Coulee Reservoir.
- If approved, the timing for adding new irrigation acres has not been finalized.

**Questions?**

