

Beaver-Cache Planning Region

Summary

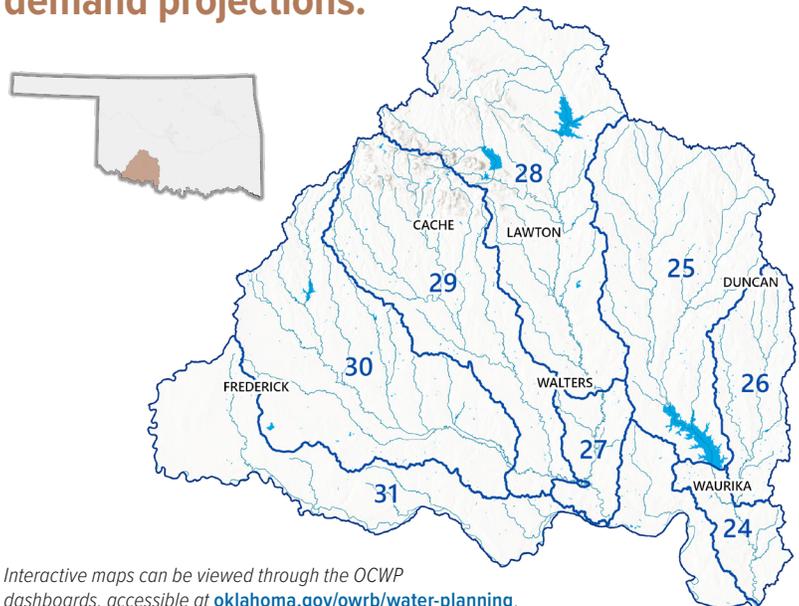
- Beaver-Cache Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 7,108 acre-feet per year (14%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the Beaver-Cache Region basins. Permitting of surface water in portions or all of Basins 24, 25, and 26 is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Beaver-Cache Region stakeholders expressed the need to consider conjunctive water management, reforming crop insurance, and investing in irrigation districts.



OWRB Water
Planning Page

oklahoma.gov/owrb/water-planning

The Beaver-Cache Region represents 2% of the state's 2075 projected population and 2% of the state's total 2075 water demand projections.



Interactive maps can be viewed through the OCWP dashboards, accessible at oklahoma.gov/owrb/water-planning.

Reliable water supplies must be physically available (wet water available at the time and place it's needed), legally available (having a permit to use the water), of suitable quality for its intended purpose, and have the necessary infrastructure to divert, convey, and treat the water if necessary. For the Beaver-Cache Region, to mitigate projected water supply shortages, the following strategies will typically be most effective:

- Reduce water demand through conservation, water loss reduction, and other activities (PS, SSI, OG, TE). **WSS**
- Reduce water demand through agricultural water saving options (CI, LS). **WSS**
- Continue/increase reliance on in-basin surface water (all sectors) in some basins. **WSS** **WDI**
- For some basins where existing and traditional strategies are unable to meet future demands, water reuse (PS, SSI) and water transfers (all sectors) may be effective. **WM** **WSS**

Options to address water quality concerns include expanding source water protection programs and expanding water quality studies. **WSS** **WDI**

Infrastructure limitations can be addressed through additional water funding. Possible sources of new funding include providers setting appropriate water rates, public-private partnerships, state programs, and federal programs. **WIW**

Water Demand Sectors: PS = Public Supply, SSI = Self-supplied Industrial, OG = Oil & Gas, TE = Thermoelectric Power, CI = Crop Irrigation, LS = Livestock, SSD = Self-supplied Domestic

OCWP Statewide Recommendations: The recommendations are designed to address current and anticipated water supply challenges. Areas where the OCWP Statewide Recommendations specifically address this region's challenges are noted throughout this fact sheet with the following icons: **WIW** Water Infrastructure & Workforce, **WM** Water Management, **WSS** Water Supplies & Storage, and **WDI** Water Data & Information

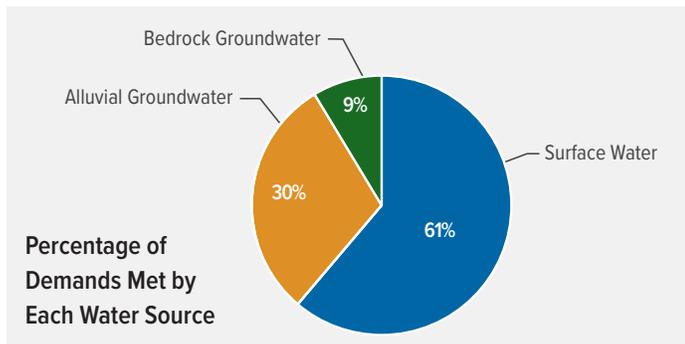
Population

2020	2030	2035	2045	2060	2075
151,280	145,794	141,271	131,970	119,567	106,973

Water Demand Projections

Water demands (withdrawals) are projected to decrease by 14% between 2020 and 2075.

The Beaver-Cache Region’s largest demand sector is Public Supply, representing 46% of the region’s 2075 water demands. The second largest demand sector is Crop Irrigation, representing 43% of the region’s 2075 water demands.



Water demand refers to the amount of water that needs to be withdrawn from surface waters and/or groundwater to meet the needs of people, communities, industry, agriculture, and other users. Changes in water demands correspond to growth or decline in population, agriculture, industry, or related economic activity. Demands were projected through 2075 for seven distinct consumptive water demand sectors.

In the Beaver-Cache Region, Crop Irrigation and Thermolectric Power demands will increase while Self-supplied Domestic, Livestock, and Public Supply demands will decrease between 2020 and 2075. There are no Self-supplied Industrial demands. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	532	518	506	478	441	406
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	16,517	17,560	17,633	17,813	18,104	18,362
Livestock	4,113	3,998	3,983	3,880	3,734	3,613
Oil & Gas	531	531	531	531	531	531
Public Supply	27,791	26,765	25,917	24,158	21,819	19,448
Thermolectric Power	187	127	120	155	181	204
Total	49,672	49,500	48,691	47,016	44,811	42,564

AFY = acre-feet per year; Small differences may result due to rounding.

Physical Water Shortages WIV WM WSS

To quantify physical surface water gaps and groundwater storage depletions through 2075, use of existing surface water and groundwater supplies was assumed to continue in current proportions while out-of-basin supplies will be used up to permit amounts or projected demands, whichever is less.

The Beaver-Cache Region is projected to experience surface water gaps (where demand exceeds supplies) and groundwater depletions (where water use exceeds the rate of recharge), as detailed in the tables below. The magnitude of shortages is projected for all planning years, and the frequency (probability) of a shortage occurring is estimated for 2075 demand conditions. Bedrock groundwater frequencies are constant because of the lack of direct connection to surface water hydrology. Frequent shortages with large magnitudes are indicative of the greatest need to implement alternative water management strategies.

SURFACE WATER GAP	2030	2035	2045	2060	2075	2075
	Magnitude (AFY)					Frequency
Basin						
24	-	-	-	-	-	0%
25	374	360	333	317	292	24%
26	-	-	-	-	-	0%
27	-	-	-	-	-	0%
28	-	-	-	-	-	0%
29	-	-	-	-	-	0%
30	16	6	-	-	-	0%
31	-	-	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
	Magnitude (AFY)					Frequency
Basin						
24	-	-	-	-	-	0%
25	-	-	-	-	-	0%
26	-	-	-	-	-	No AGW Demand
27	-	-	-	-	-	No AGW Demand
28	-	-	-	-	-	0%
29	3	-	-	-	-	0%
30	8	7	-	-	-	0%
31	-	-	-	-	-	0%

AFY = acre-feet per year

Physical Water Shortages Cont.

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	Magnitude (AFY)				
24	No BGW Demand				
25	119	95	58	32	-
26	388	383	374	363	351
27	113	107	96	80	64
28	320	278	191	82	-
29	30	26	18	9	-
30	312	310	305	300	294
31	314	313	313	312	311

AFY = acre-feet per year



Lake Lawtonka

Legal Water Availability WM WSS

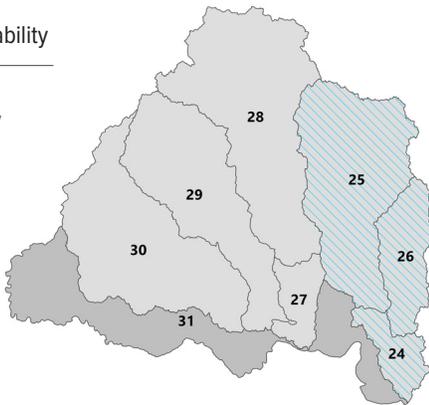
Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the Beaver-Cache Region basins. Permitting of surface water in portions or all of Basins 24, 25, and 26 is subject to provisions of the 2016 Water Settlement Agreement.

Surface Water Legal Availability

- Planning Basins
- Basins under GRDA authority
- Basins wholly or partially subject to the provisions of the 2016 Water Settlement Agreement

Surface Water Legal Availability (AFY) using 2075 Demands

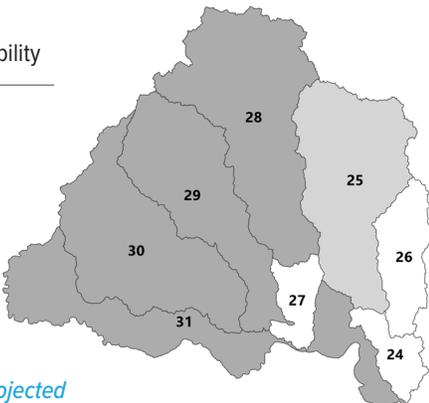
- 0
- <200,000
- 200,001-500,000
- 500,001-2,000,000
- 2,000,001-4,000,000
- >4,000,000



Groundwater Legal Availability

- Planning Basins
- Groundwater Legal Availability (AFY) using 2075 Demands

- <200,000
- 200,001-500,000
- 500,001-2,000,000
- 2,000,001-4,000,000
- >4,000,000



Legal water availability projected in 2075 varies across the region, with darker shading indicating more water available for appropriation.

Surface Water Resources

- WIW WM WSS WDI

The OCWP uses historical monthly streamflow data (1950-2021), which reflects current natural and human-created conditions (runoff, diversions and use of water, and impoundments and reservoirs) to represent the water that may be physically available to meet projected demand. The maximum amount of water a reservoir can dependably supply during a critical drought period is referred to as its yield. The table below provides information about remaining water supply yield that is available for permitting from existing reservoirs in the region.

Reservoir	Estimated Remaining Water Supply Yield to be Permitted (AFY)
Waurika	0
Dave Boyer	---
Ellsworth	0
Lawtonka	0
Parker Reservoir	0
Frederick	---

--- Indicates no information is available.
 AFY = acre-feet per year
 Estimated remaining water supply yield as of July 2025.

Groundwater Resources

WIW WM WSS WDI

For the OCWP physical water availability analyses, alluvial aquifers are defined as aquifers comprised of river alluvium and terrace deposits, occurring along rivers and streams and consisting of unconsolidated deposits of sand, silt, and clay. Alluvial aquifers are more hydrologically connected with surface water features (streams, rivers, lakes) than bedrock aquifers. Bedrock aquifers consist of consolidated (solid) or partially consolidated rocks, such as sandstone, limestone, dolomite, and gypsum. Bedrock aquifers are typically replenished slowly by recharge from surface infiltration (precipitation) and from adjacent aquifers.

Aquifer	Type	Class	Equal Proportionate Share (AFY/Acre)
Arbuckle-Timbered Hills	Bedrock	Major	temporary 2.0
Beaver Creek	Alluvial	Minor	1.0
Cache Creek	Alluvial	Minor	1.0
El Reno	Bedrock	Minor	temporary 2.0
Hennessey-Garber	Bedrock	Minor	1.6
Post Oak	Bedrock	Minor	2.0
Red River Reach 1	Alluvium and Terrace	Major	temporary 2.0
Red River Reach 2	Alluvium and Terrace	Major	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Southwestern Oklahoma	Bedrock	Minor	temporary 2.0
Tillman Terrace	Alluvial	Major	1.0

AFY = acre-feet per year

Bedrock aquifers with typical yields greater than 50 gallons per minute (gpm) and alluvial aquifers with typical yields greater than 150 gpm are considered major aquifers.

Water Quality

WIW WDI



Groundwater: Water quality concerns over arsenic, fluoride, and nitrate concentrations with a lack of seasonal data, especially in sensitive karst systems, make it difficult to track changes in water quality over time.



Lakes: Water quality in this region is impacted by elevated levels of nutrients, chlorophyll-a, and turbidity—factors that directly affect both recreational and water supply uses. As a result, lakes in this area are classified as eutrophic to hypereutrophic, reflecting their high nutrient concentrations and biological productivity. Elevated nutrient levels increase the risk of harmful algal blooms (HABs), which contribute to higher water treatment costs, taste and odor issues, and reduced recreational value—negatively affecting both recreation and water supply beneficial uses.



Streams: Rivers and streams are impacted by modification/impoundment, flow alteration, and agricultural runoff, leading to riparian loss, increased sedimentation, and increased nutrient concentrations. These factors contribute to poor aesthetics, habitat degradation, and increased treatment costs.

Water Infrastructure Needs

WIW

OWRB compiled near-term wastewater project needs, water supply project needs, and state flood plan project needs as part of developing the 2025 OCWP. Near-term costs include drinking water and wastewater projects by public utilities (various system sizes) and other entities (such as conservancy districts, department of wildlife, regional councils, and tourism). All flood mitigation projects in the database were identified by public water suppliers in the State Flood Plan.

Near-term Drinking Water Cost (2024 dollars)	Near-term Wastewater Cost (2024 dollars)	Near-term Stormwater Cost (2024 dollars)
\$677M	\$691M	\$0M

M = million

For drinking water, costs were projected for the next 20 years for public suppliers. While it is difficult to anticipate all the changes that may occur within this extended timeframe, it is beneficial to evaluate the order of magnitude of the long-range potential costs of meeting demands. Estimated costs include rehabilitation of existing water infrastructure and construction of new water infrastructure for growth and regulatory compliance. The costs are categorized according to system sizes:

- Small systems serve less than 3,300 people;
- Small-medium systems serve 3,301 to 10,000 people;
- Medium-large systems serve 10,001-100,000 people; and
- Large systems serve more than 100,000 people.

System Size	Near-term Drinking Water Cost (2024 dollars)	Future Drinking Water Costs through 2035 (2025 dollars) ¹	Future Drinking Water Costs through 2045 (2025 dollars) ²
Small	\$33M	\$989M	\$1.63B
Small-Medium	\$20M	\$434M	\$123M
Medium-Large	N/A	N/A	N/A
Large	\$200M	\$850M	\$443M
Non-Public suppliers	\$425M	N/A	N/A
Total	\$677M	\$2.27B	\$2.19B

M = million; B = billion; N/A = not applicable

1. Not inclusive of near-term costs.

2. Not inclusive of near-term or future drinking water costs through 2035.

Visit OWRB Water Planning page (<https://oklahoma.gov/owrb/water-planning.html>) for more information on region water quality and trend analysis.