2025 OCWP
Oklahoma Comprehensive Water Plan

Technical Summary Report

March 2026 / FINAL

OKLAHOMA Water Resources Board

US Army Corps of Engineers

carollo
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Abbreviations

AFY	acre-feet per year
AGW	alluvial groundwater
BGW	bedrock groundwater
Carollo	Carollo Engineers
CI	Crop Irrigation
EPS	equal proportionate share
FSA	Farm Service Agency
GIS	geographic information system
gpm	gallons per minute
GRDA	Grand River Dam Authority
H2O Tool	Oklahoma's H2O Tool
ID	identification
LS	Livestock
MAY	maximum annual yield
NRCS	Natural Resource Conservation Service
OCWP	Oklahoma Comprehensive Water Plan
O&G	Oil and Gas
OWRB	Oklahoma Water Resources Board
PS	Public Supply
SSD	Self-Supplied Domestic
SSI	Self-Supplied Industrial
TE	Thermoelectric Power
US	United States
USACE	United States Army Corps of Engineers
WATER	Water Assessments, Trends, and Environmental Research
WMS	water management strategy(ies)
WSIN	Water Supply and Infrastructure Needs

SECTION 1 GUIDE TO THIS REPORT

This report summarizes the technical work completed as part of the 2025 Update to the Oklahoma Comprehensive Water Plan (OCWP). A reliable water source is contingent upon having physically present water for diversion and use (physical supply or "wet water"), necessary water rights to divert water (legal supply or "paper water"), adequate water quality for intended use, and sufficient infrastructure to divert, treat, and convey the water for use. The OCWP evaluates supply and demand factors at the region and/or basin level.

The 2025 OCWP provides projections of water demands, supply availability, and potential shortages over a 50-year period (2025 through 2075) and includes an inventory of infrastructure needs and strategies to address known and anticipated water supply challenges. Matching the approach used for the 2012 OCWP, the 2025 OCWP conducted analyses of water supply, demand, and management in each of 82 distinct watershed "basins" across the state. Results from those 82 basins were aggregated into 13 regions that summarize water resources conditions across the state (Figures 1a and 1b).

This report, prepared by Carollo Engineers (Carollo) in partnership with the OWRB, incorporates technical input on certain elements of the work that was provided by the United States Army Corps of Engineers (USACE), including the following components.

- Overview of the 2025 OCWP
- Statewide water assessment
- Summary of 2025 OCWP resources
- Region and basin summaries (Appendix A)
- Glossary (Appendix B)
- Public Water Suppliers and Communities within each basin (Appendix C)
- Water Quantity Conversion Factors (Appendix D)
- Future Drinking Water Cost Methodology (Appendix E)
- Differences Between Surface Water Physical and Legal Availability (Appendix F)

Public engagement, a critical element of the 2025 OCWP process, included meetings held with a variety of stakeholders and water interest groups across the state. Attendees, including local and state officials, tribal nation representatives, public water utilities, regulated industries, commercial agricultural producers, economic development entities, and other representative organizations, assisted with the areas listed below.

- Identifying the most pressing local water issues and policy needs
- Guiding the identification and deployment of solutions to address those issues and needs
- Charting a course toward reliable, resilient water management locally and statewide

The following can be accessed online at the Oklahoma Water Resources Board's (OWRB) Water Planning website (https://oklahoma.gov/owrb/water-planning.html).

- *2025 OCWP Executive Summary* that focuses on policy and recommendations
- Interactive geographic information system (GIS) dashboards on water demand projections, water supply analyses, water shortages, water quality, and water management strategies (WMS). The dashboards allow users to view these data at the statewide, region, and basin levels for various planning years.
- Technical reports on data sources and methodology

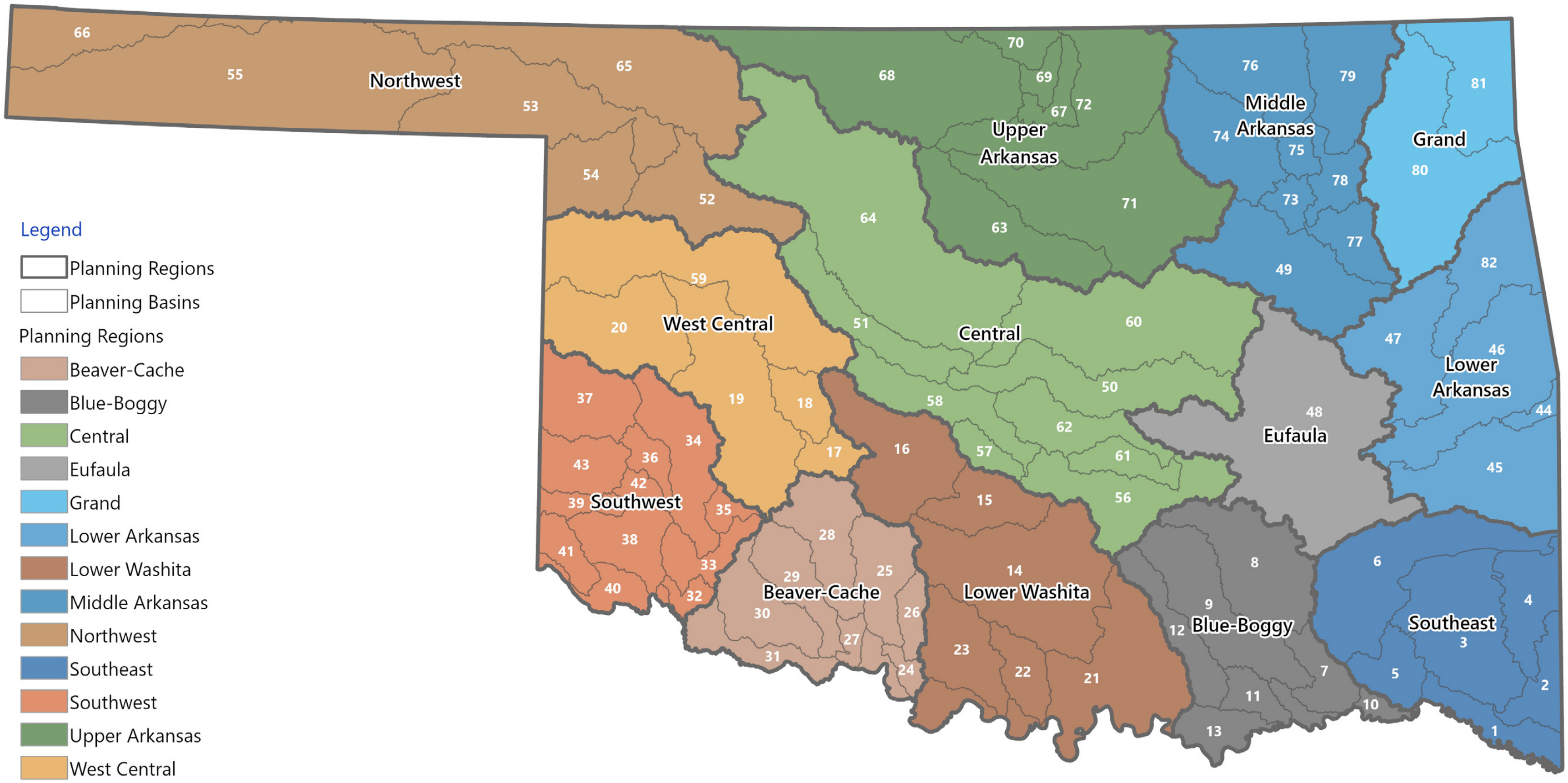


Figure 1a OCWP Planning Regions and Basins

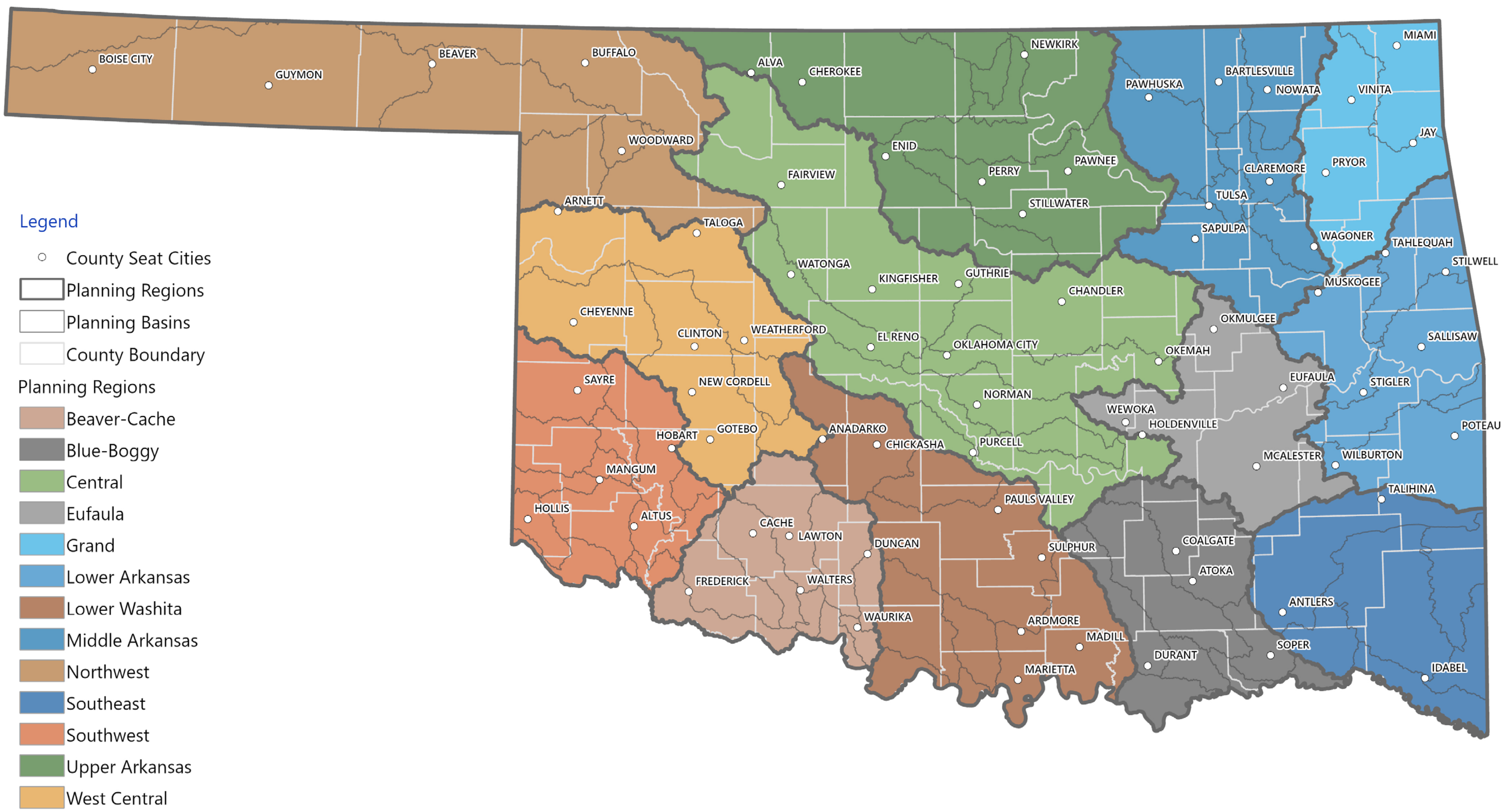


Figure 1b OCWP Planning Basins and Oklahoma Counties

SECTION 2 OCWP OVERVIEW

The OCWP is deeply connected to OWRB's mission and organization. The OWRB's mission is to manage, protect, and improve Oklahoma's water resources to meet long-term water supply, water quality, flood mitigation, and infrastructure needs. Figure 2 illustrates the OWRB's organizational structure.

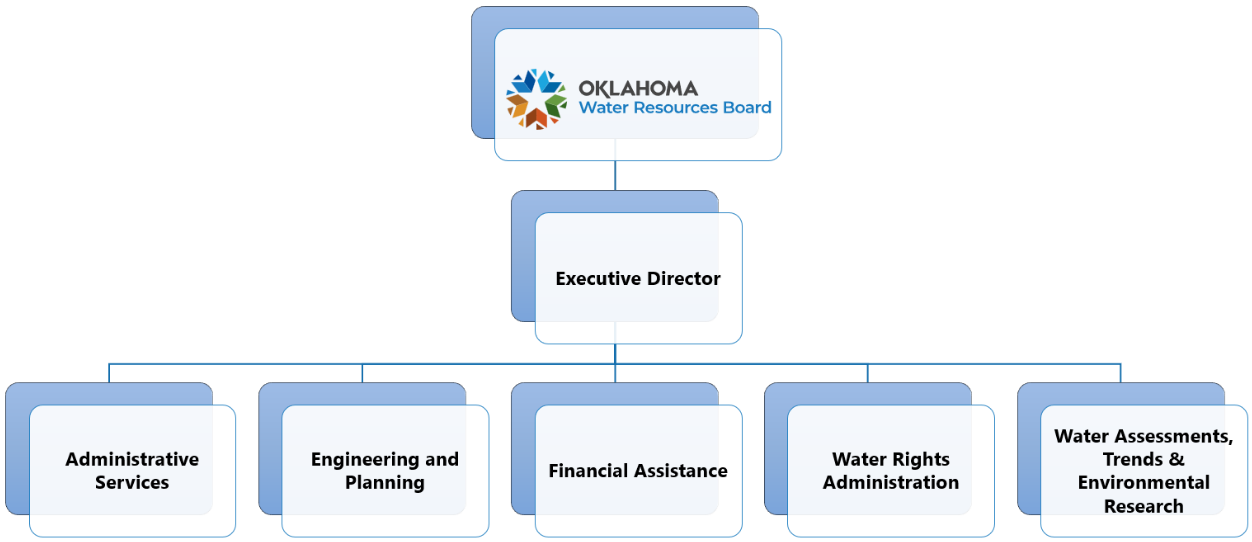


Figure 2 OWRB's Organizational Structure

The OWRB is responsible for coordinating updates of the OCWP and managing recommended initiatives, studies, and projects. In 1974, the Oklahoma Legislature enacted 82 O.S. §1086.2(1), which requires that the OWRB decennially develop a strategic guide for managing the state's water resources over the next 50 years. The OCWP was first published in 1975, with subsequent updates in 1980, 1995, 2005, and 2012. The Oklahoma Legislature appropriated funds for the current update.

Several entities, some of whom are listed below, contributed to the success of the 2025 OCWP through funding, technical assistance, and policy input, and those who participated are greatly appreciated.

- OWRB (via the State Legislature) provided the primary source of funding for the 2025 OCWP. OWRB contracted with Carollo to support technical studies and stakeholder engagement activities.
- USACE through their Planning Assistances to States program provided funding and technical assistance for many items, including the state flood plan, water supplier surveys, infrastructure needs survey, focus basins identification and meetings, and water management strategies evaluation. USACE contracted with Freese and Nichols and Michael Baker International for some of this technical work on the 2025 OCWP.
- Several members of other state agencies participated in the 2025 OCWP by sharing their data and allowing their staff to engage in the project. Key agencies that supported the 2025 OCWP include the Department of Commerce, Department of Environmental Quality, Oklahoma Conservation Commission, Department of Agriculture and Forestry, Oklahoma Corporation Commission, and Department of Wildlife Conservation.

- Other members of federal agencies that participated in aspects of developing the 2025 OCWP include the United States (US) Department of Agriculture - Natural Resources Conservation Service (NRCS), US Department of Interior – Bureau of Reclamation, and US Department of Agriculture - Farm Service Agency (FSA).
- Tribal nation representatives participated in the 2025 OCWP public meetings. The Chickasaw Nation, Choctaw Nation, and Cherokee Nation participated in additional ways including engagement in focus basin dialogue, workgroups, and meetings with the 2025 OCWP team to discuss technical and policy ideas.
- Other entities provided data, input, and engaged in development of the 2025 OCWP, including but not limited to members of the Oklahoma Rural Water Association, Oklahoma Farm Bureau, cities, master conservancy districts, irrigation districts, energy corporations, and universities, along with many individuals that contributed time and ideas to shape and strengthen the 2025 OCWP's products and its recommendations.

The 2025 OCWP used an organized phased approach to focus on key issues, incorporate the state's first flood plan, and build recommendations using local input. 2025 OCWP tasks are organized into five phases (plan, analyze, develop, rollout, and engagement) as shown in Figure 3. Work plan tasks were completed based on priority and funding availability.

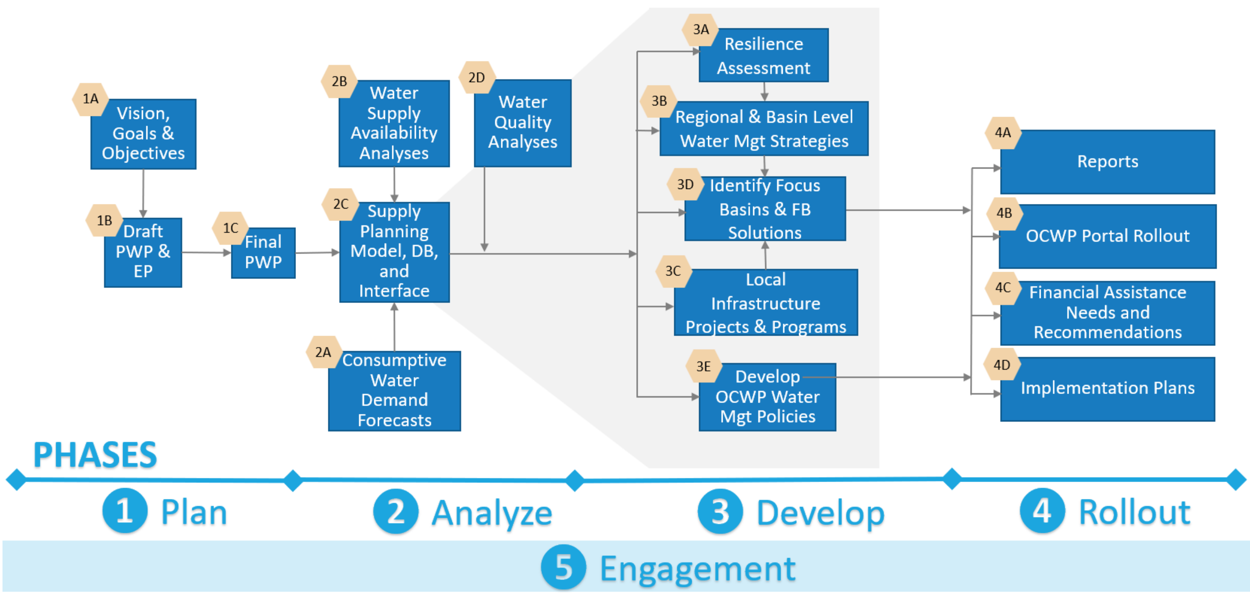


Figure 3 2025 OCWP Task Organization

Key areas of focus for the 2025 OCWP are included below.

- Identify basins with projected water challenges or opportunities
- Recommend water management strategies
- Catalog immediate and future infrastructure investment needs
- Advance 2012 OCWP policy recommendations
- Integrate Oklahoma's first statewide flood plan
- Conduct focused engagement throughout the process
- Provide accessible 2025 OCWP deliverables

2025 OCWP statewide and regional recommendations were informed by, and developed to address, findings from these technical studies and input from the 2025 OCWP stakeholder engagement program (Figure 4). This program was anchored by a 4-year series of Regional Meetings around the state and a series of Focus Basin meetings in parts of the state with particular water management challenges and concerns. The 2025 OCWP recommendations are summarized in the *2025 OCWP Executive Summary*.

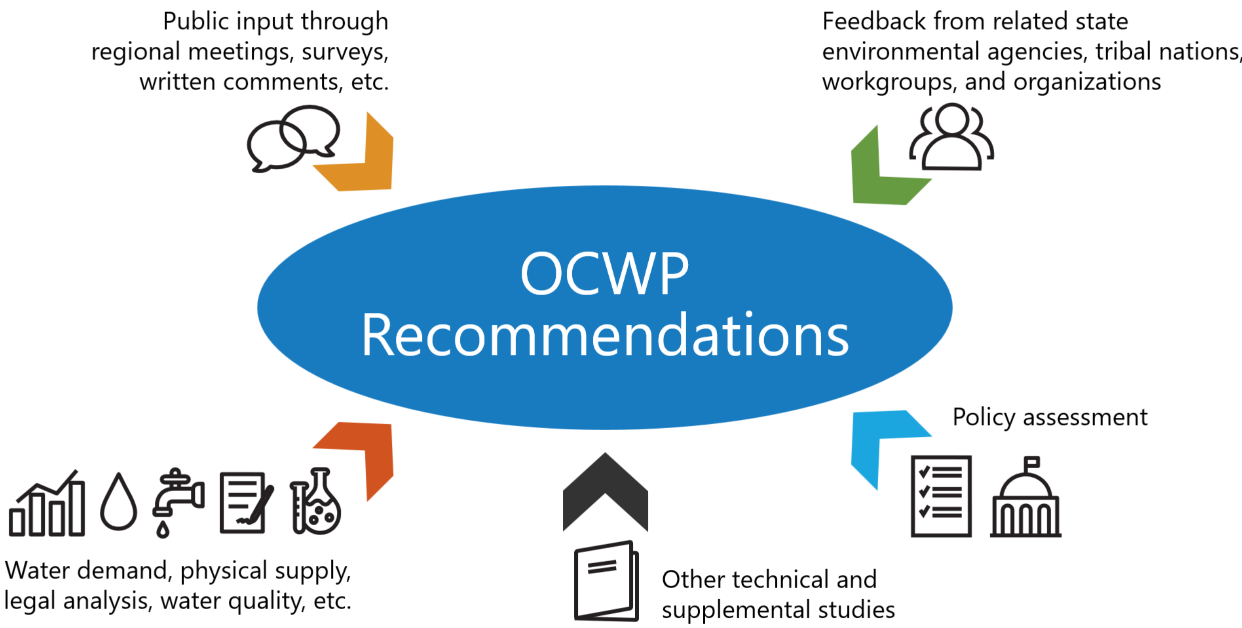


Figure 4 Sources of Input that Informed 2025 OCWP Statewide and Regional Recommendations

Recommendations were influenced by feedback received from a variety of stakeholders, which included municipal water utilities, rural water districts, state legislators, agricultural producers, OWRB Board members, agencies (e.g., Oklahoma Department of Environmental Quality, Oklahoma Conservation Commission, Oklahoma Department of Wildlife Conservation, etc.), nonprofit organizations, consulting engineers, engaged citizens, and more. With such a broad range of interests represented, a wide variety of perspectives from across the state were heard and documented. Meetings included a variety of topics to support discussion among attendees, each driven by a purpose to attain targeted feedback. This approach was used for many of the other stakeholder meetings such as foundational listening sessions, Bureau of Indian Affairs meetings, meetings with the Chickasaw, Choctaw, and Cherokee Nation, and focus basin meetings.

Focus basins across Oklahoma were identified in areas that have significant water supply challenges under current and/or projected future conditions. A basin was selected from the Northwest, Southwest, Northeast, and Southeast meeting regions to represent challenges statewide, and explore a range of potential local solutions. Meetings were held in each focus basin to better understand local stakeholders' point of view on challenges and feasibility of solutions.

Stakeholder feedback was solicited from a variety of surveys used to support the development of the 2025 OCWP. Broad commentary on the 2025 OCWP was gathered via a Public Survey. Other surveys aimed at collecting more specific information. The Water Supply and Infrastructure Needs (WSIN) survey gathered information on historical population, water use information, water workforce, and infrastructure needs from communities across Oklahoma. Similar, the Local Projects and Programs Survey was solicited to expand on the WSIN survey to further collect more infrastructure needs information from

Oklahoma communities. Additionally, participants at the 2024 Governor's Water Conference and the Round 5 Regional Meetings were asked to provide feedback on proposed funding ideas for water infrastructure and planning across the state.

Other focused feedback was collected via workgroups. As part of developing the 2025 OCWP, OWRB convened and facilitated a series of technical workgroups. Each workgroup was charged with investigating challenges and opportunities associated with a particular element of water management applicable to many or all parts of the state. Each of these workgroups is described below.

- The Oklahoma Source Water Collaborative was developed through a multi-agency collaborative effort in conjunction with the 2025 OCWP to better understand source water protection efforts in the state.
- The Water Workforce Workgroup was established to identify and remove barriers that prolong the critical and unprecedented staff shortage in the water workforce, as water professionals across Oklahoma operate, maintain, and improve the systems that deliver safe drinking water and manage wastewater, playing a key role in protecting public health.
- Two Irrigated Agriculture workgroups (one in the Southwest and one in the Northwest) were formed to discuss water-related concerns, challenges, and needs, and to explore mitigation options with the understanding that crop irrigation is the largest consumptive water use sector in Oklahoma.
- The Oklahoma Water Reuse Workgroup was developed through a multi-agency collaborative effort in conjunction with the 2025 OCWP to identify strategies to facilitate additional water reuse in Oklahoma.

SECTION 3 STATEWIDE WATER ASSESSMENT

This section summarizes 2025 OCWP analyses of water demand projections, water availability, water shortages, water quality, WMS assessment, and water infrastructure needs. Appendix A provides water assessment summaries for each planning region and basin. Region and basin fact sheets provide information on population and water demand projections, physical water shortages, legal water availability, and water management strategies. Region fact sheets also contain information on surface water and groundwater resources, water quality, and water infrastructure needs.

3.1 Population Projections

One of several important drivers of water demand is population and employment. In Oklahoma, approximately 91 percent of the population and nearly all commercial and light industrial establishments are serviced by public water systems. The Oklahoma Department of Commerce prepared a tabulation of population projections for the state in 2023 that estimates population to the year 2070 for each county (Chiappe et al., 2023). These population projections are based on the most recent demographic data from the 2020 US Census and historical population trends. Linear forecasting was used to extrapolate the population for each county through 2075. A more detailed explanation of the methodology and data sources used for the forecasted population is contained in the *Water Demand Forecast* report and on the 2025 OCWP Water Demand Dashboard (https://oklahoma.gov/owrb/water-planning.html).

Statewide, population is expected to increase by more than 800,000 people (20 percent) between 2020 and 2075. Table 1 lists the statewide population in 2020 and projections for incremental planning years. Figure 5 shows the projected population by basin in 2075.

Table 1 Statewide Population in 2020 and Projections by Year

Year	2020	2030	2035	2045	2060	2075
Population	3,959,171	4,094,626	4,149,476	4,279,621	4,547,508	4,764,040

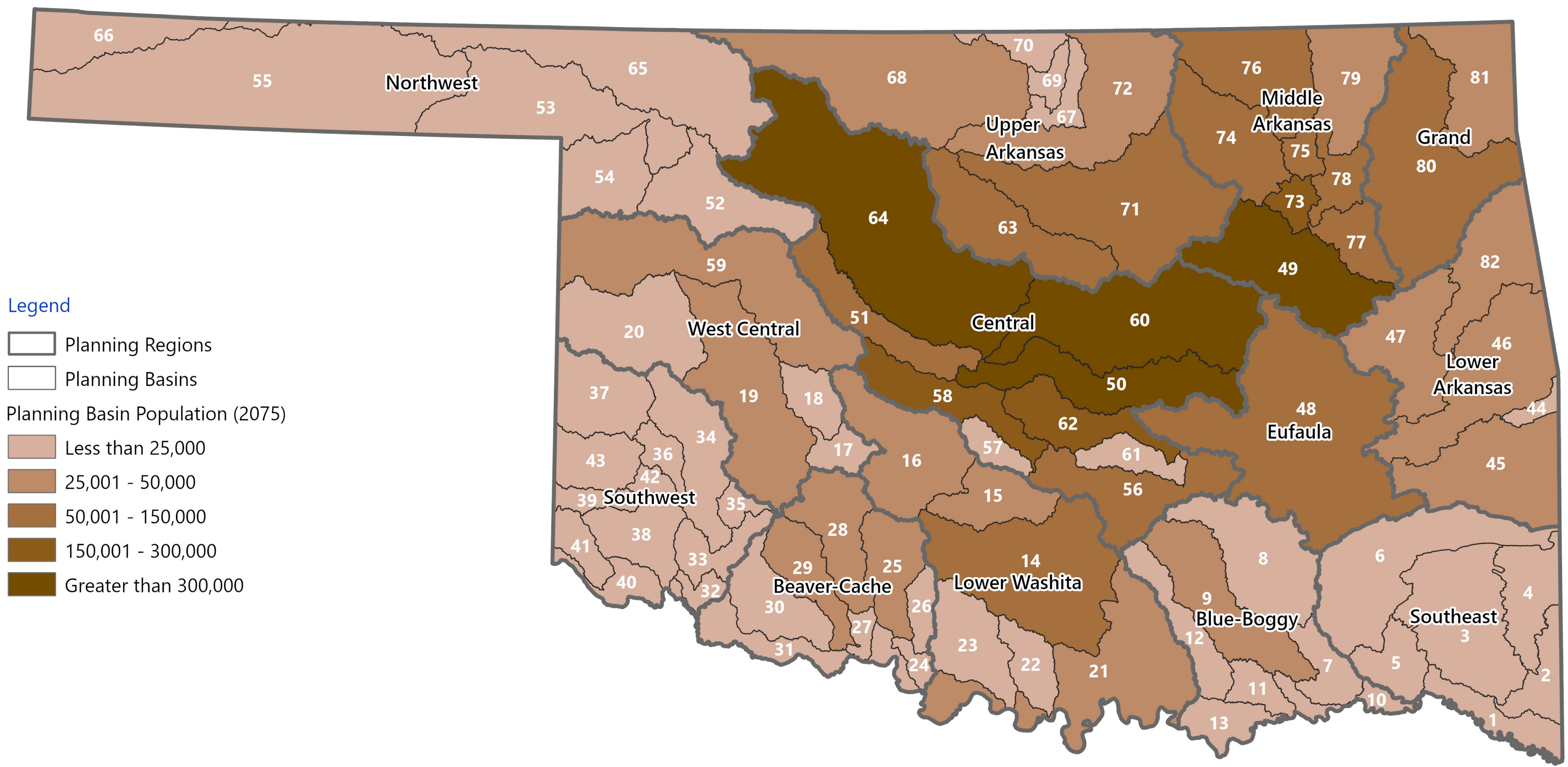


Figure 5 Statewide Projected 2075 Population by Basin

3.2 Water Demand Projections

Projecting water demands 50 years into the future is inherently driven by a range of factors that each carries significant uncertainty. Nevertheless, this is a foundational element of future water supply planning. The 2025 OCWP adapted conventional methodologies to forecast demands for each of the seven OCWP water use sectors. Water demand projections are assigned to the location where the water is actually used, not where it originates. As a result, when water is transferred out of basin, the source basin's demand projections do not include that use. However, these out-of-basin transfers are still incorporated into the physical and legal water availability analyses for the source basin and the receiving basin.

Consistent data and methodology are applied across the state allowing the comparison between basins and regions. A more detailed explanation of the methodology and data sources used for the 2025 OCWP demand forecasts is provided in the *Water Demand Forecast* report and on the 2025 OCWP Water Demand Dashboard (https://oklahoma.gov/owrb/water-planning.html).

For all water users except Thermoelectric Power, total water withdrawals are presented. Total withdrawal represents the amount of water pumped or diverted from the source to meet the needs of the user. In nearly all instances, some proportion of the diverted water is returned to surface water (augmenting stream flows or lake levels) or released back into underlying groundwater aquifers. Public Supply and Crop Irrigation include a factor which accounts for returns in Oklahoma's H2O Tool (H2O Tool), discussed in Section 3.3, to estimate water supply availability on a basin scale.

For Thermoelectric Power, because it is typical for there to be onsite cooling ponds or direct use of return flows, the H2O Tool utilizes consumptive demands to estimate water supply availability on a basin scale.

Demand projections were developed for each of the 82 OCWP planning basins for the following demand sectors:

- **Public Supply (PS):** PS refers to water users receiving water from municipal or public water systems or those served by a community or rural water district. Demands met by PS include water provided to households that is used inside and outside the home for domestic activities. PS demands also include water provided by municipal or public systems to all non-residential properties, such as office buildings, existing data centers, shopping centers, industrial parks, schools, churches, hotels, etc. Demands associated with producing oil, gas, and power, as well as those of large industrial facilities that utilize their own water supply (self-supplied), are not included in this demand sector. To forecast PS demands, data were collected for the water use factor, existing municipal water use, and the projected rate of use (projected population growth). Demands are assumed to grow proportionally to population, which is equivalent to assuming that water use per person stays constant and there are no changes in per capita water demands. This conservative approach is taken due to the uncertainty associated with changes in demand trends. Statewide PS demand is expected to increase by 18 percent between 2020 and 2075.
- **Self-Supplied Domestic (SSD):** The SSD sector captures water use from households not connected to a public water supply system. These households are primarily located in rural areas of the state. While some SSD homes use well water for livestock or crop irrigation purposes, the demands for the SSD sector only represent water use for indoor household purposes and outside for gardening, car washing, domestic animal care, recreation, etc. To forecast SSD demands, data was compiled regarding the percentage of population that is self-supplied and the residential per capita daily water use by county. Statewide SSD demand is expected to increase by 17 percent between 2020 and 2075.
- **Oil and Gas (O&G):** Water is used in association with many O&G production activities, including use as a supplemental fluid in enhanced recovery of petroleum resources; during drilling and completion of an oil or gas well; during workover of an oil or gas well; as rig wash water; as coolant for internal combustion engines for rigs, compressors, and other equipment; and for sanitary purposes. Future

trends in the O&G industry, which are driven by many factors, such as economy, price, and technology, are highly uncertain. Thus, the forecast for the O&G sector makes use of the best available data for both the present and future demands. Two key pieces of information were developed for the O&G forecast by sub-sector: 1) water use per drilling activity and 2) historical drilling activity. Drilling activity is assumed to stay at or below the maximum observed drilling activity of approximately 3,000 wells per year following seismic directives issued in 2017, meaning that statewide O&G water use is estimated to be constant between 2020 and 2075.

- **Thermoelectric Power (TE):** TE generation uses water to cool equipment and condense the steam used to drive thermoelectric generators. Unlike other water demand sectors included in the 2025 OCWP, there is a very large difference between the amount of water diverted for this use versus the amount of water consumed. Both withdrawal and consumption rates vary from one plant to another due to variations in heat source, prime mover (a device that converts energy to electricity), cooling system type, evaporation rates, and thermal efficiency. For completeness, all electricity generation types are included in the power generation demand sector. To forecast TE demands, data was collected on power generation for each facility and water used per unit of power generated. Much of the TE information came from the US Energy Information Administration. For TE, because it is typical for power generating facilities to have onsite cooling ponds or direct use of return flows, the H2O Tool utilizes consumptive demands to estimate physical water supply availability on a basin scale. Statewide TE demand (consumptive) is expected to decrease by 12 percent between 2020 and 2075.
- **Self-Supplied Industrial (SSI):** The SSI demand sector of the 2025 OCWP demand forecast represents water use from large industrial users who do not receive public water supply. In the case of the OCWP, the large SSI users include sand and gravel companies, gypsum production plants, weapons manufacturing plants, concrete producing plants, petroleum refineries, paper mills, and dairy manufacturing plants. These industries use water for purposes such as fabricating, processing, washing, diluting, cooling, incorporating water into a product, or for sanitation needs within the manufacturing facility, among others. The data used in this sector was obtained from OWRB annual surface water and groundwater permit reports. Because future conditions at these individual facilities are unknown, this sector was forecasted into the future using a combination of employment and population projections. Statewide SSI demand is expected to increase by 10 percent between 2020 and 2075.
- **Livestock (LS):** LS water uses include animal nutrition, animal cooling, sanitation, and waste removal. Current estimates of LS water demands were developed based on the major LS groups prevalent in each basin in Oklahoma and their respective daily water requirements. Major LS categories evaluated include cattle, dairy cows, sheep, hogs, horses, and poultry. Daily water requirements for each LS group include those used for drinking water, cooling, and sanitation and waste removal requirements. Statewide LS demand is expected to decrease by 5 percent between 2020 and 2075.
- **Crop Irrigation (CI):** CI water demand for a given county is driven by the type of crops planted, number of acres planted, climate and weather patterns, precipitation available to the crop, supplemental irrigation water required, and type of irrigation system utilized. The methodology multiplies total irrigated acres by the weighted average water requirement per irrigated acre by county. Oklahoma FSA data were collected to serve as the estimate of irrigated acres by crop and county. The future irrigated acres were capped based on total cultivated acres available within a county. CI water requirements were obtained for all crops, except wheat, from the NRCS Irrigation Guide Report, Oklahoma Supplement. The wheat irrigation assumptions were adjusted to reflect the nearby metered use from Kansas. Statewide CI demand is expected to increase by 14 percent between 2020 and 2075.

Statewide, water demands will increase by 13 percent between 2020 and 2075, due in part to projected increases in the state's population, a robust agricultural sector, and industrial water uses. These changes in demand will be lower to the extent further efficiencies and advanced water conservation measures are implemented by Oklahoma's businesses, industries, residents, and irrigators. Table 2 lists statewide water demand projections by sector and by planning year. Figure 6 shows statewide 2075 water demand projections by basin.

Table 2 Statewide Water Demand in 2020 and Projections by Sector and by Planning Year (AFY)

Year	2020	2030	2035	2045	2060	2075
SSD	34,650	36,070	36,384	37,196	38,954	40,446
SSI	67,107	65,416	66,042	67,552	70,818	73,522
CI	1,068,913	1,140,116	1,155,591	1,179,455	1,204,608	1,221,984
LS	88,750	87,721	88,020	86,874	85,271	84,222
O&G	35,562	35,562	35,562	35,562	35,562	35,562
PS	606,251	624,288	631,654	649,144	685,270	713,935
TE	62,473	48,786	47,863	43,520	49,043	55,093
Total	**1,963,706**	**2,037,959**	**2,061,116**	**2,099,303**	**2,169,526**	**2,224,764**

Notes:
AFY - acre-feet per year

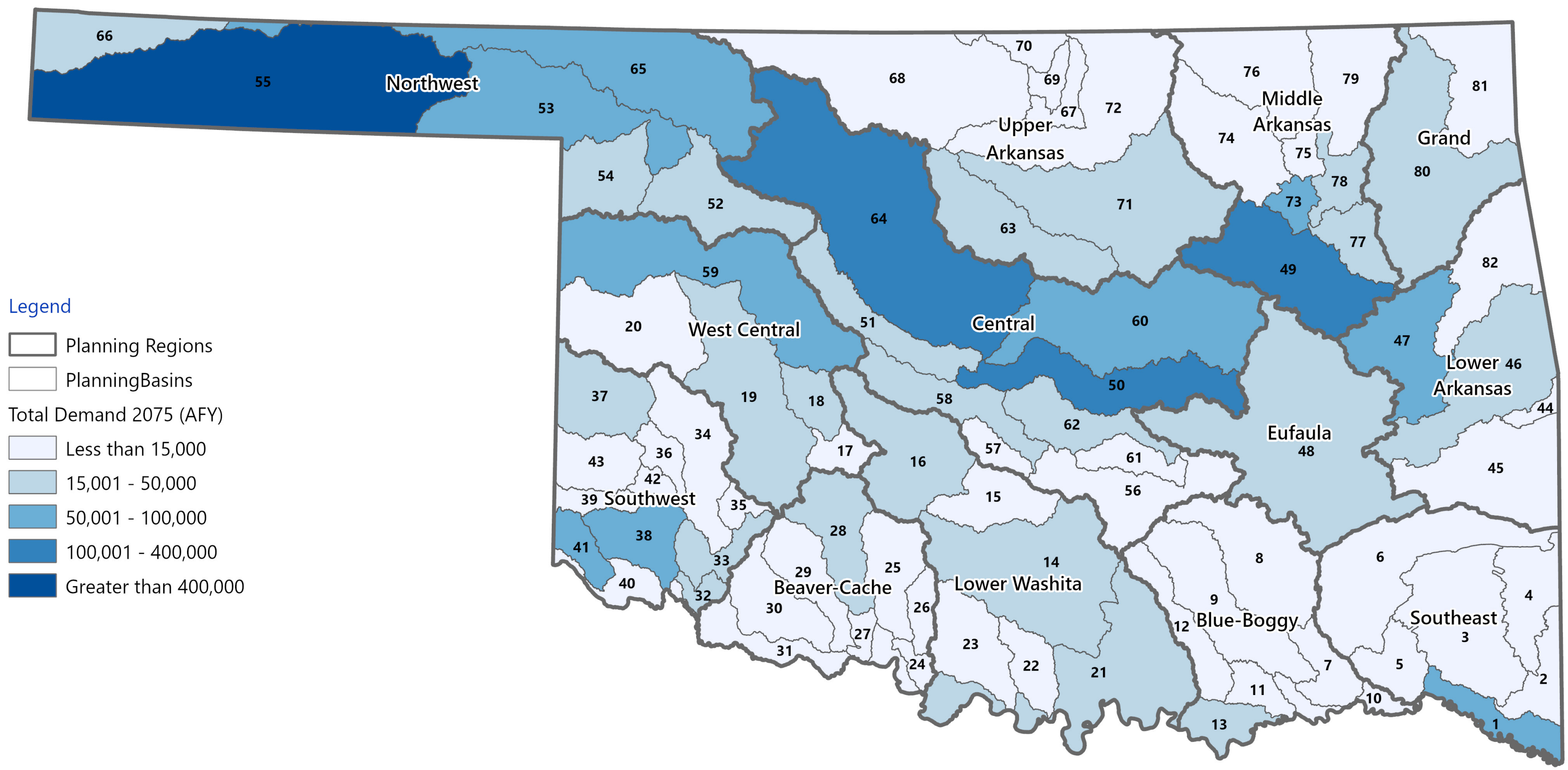


Figure 6 2075 Projected Total Water Demand by Basin

Water use information provided to OWRB as part of permit obligations includes the type of water source (groundwater or surface water) associated with each permit. This information is used to differentiate water demand supplied from surface water, alluvial groundwater (AGW), and bedrock groundwater (BGW) sources. The ratio of supply source for each demand sector was assumed to remain constant throughout the planning period, to characterize future conditions if existing practices were to continue into the future. Figure 7 illustrates the statewide portion of demands met by each type of water supply source.

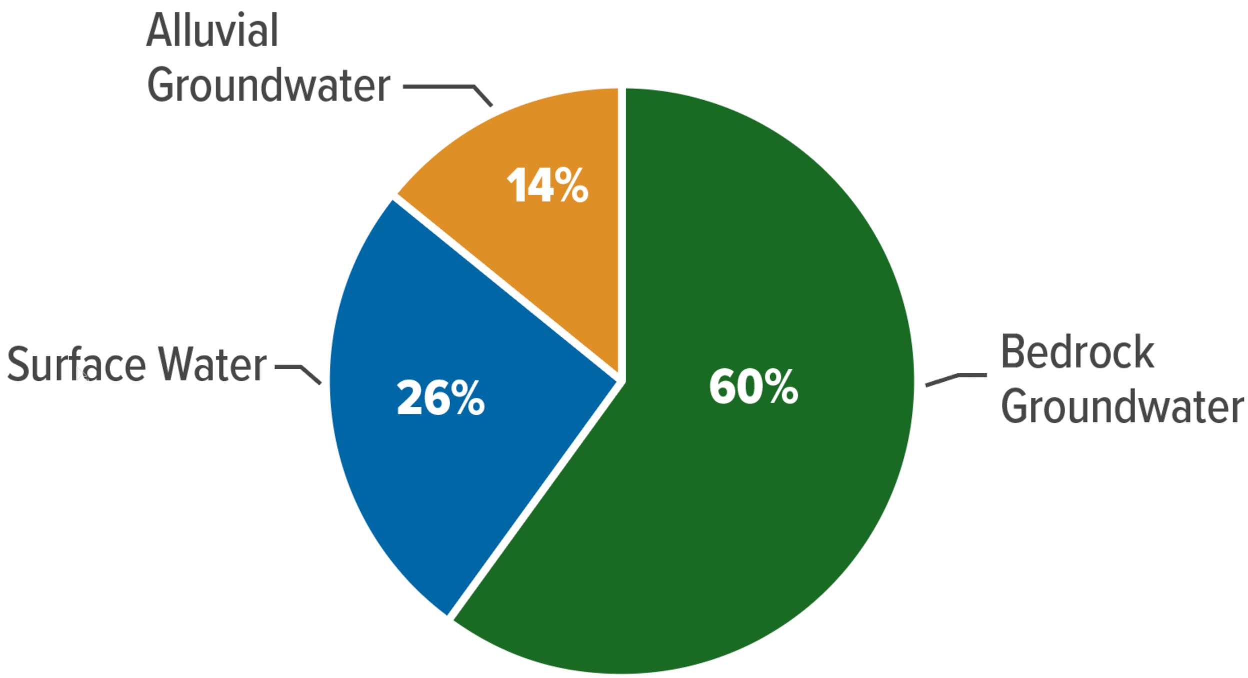


Figure 7 Statewide Projected 2075 Water Demand by Water Source Type

Figure 8 illustrates each region's 2075 total water demand and water sector distribution.

Figure 9 illustrates the magnitude change in basin water demand between 2020 and 2075 and Figure 10 illustrates this change as a percentage.

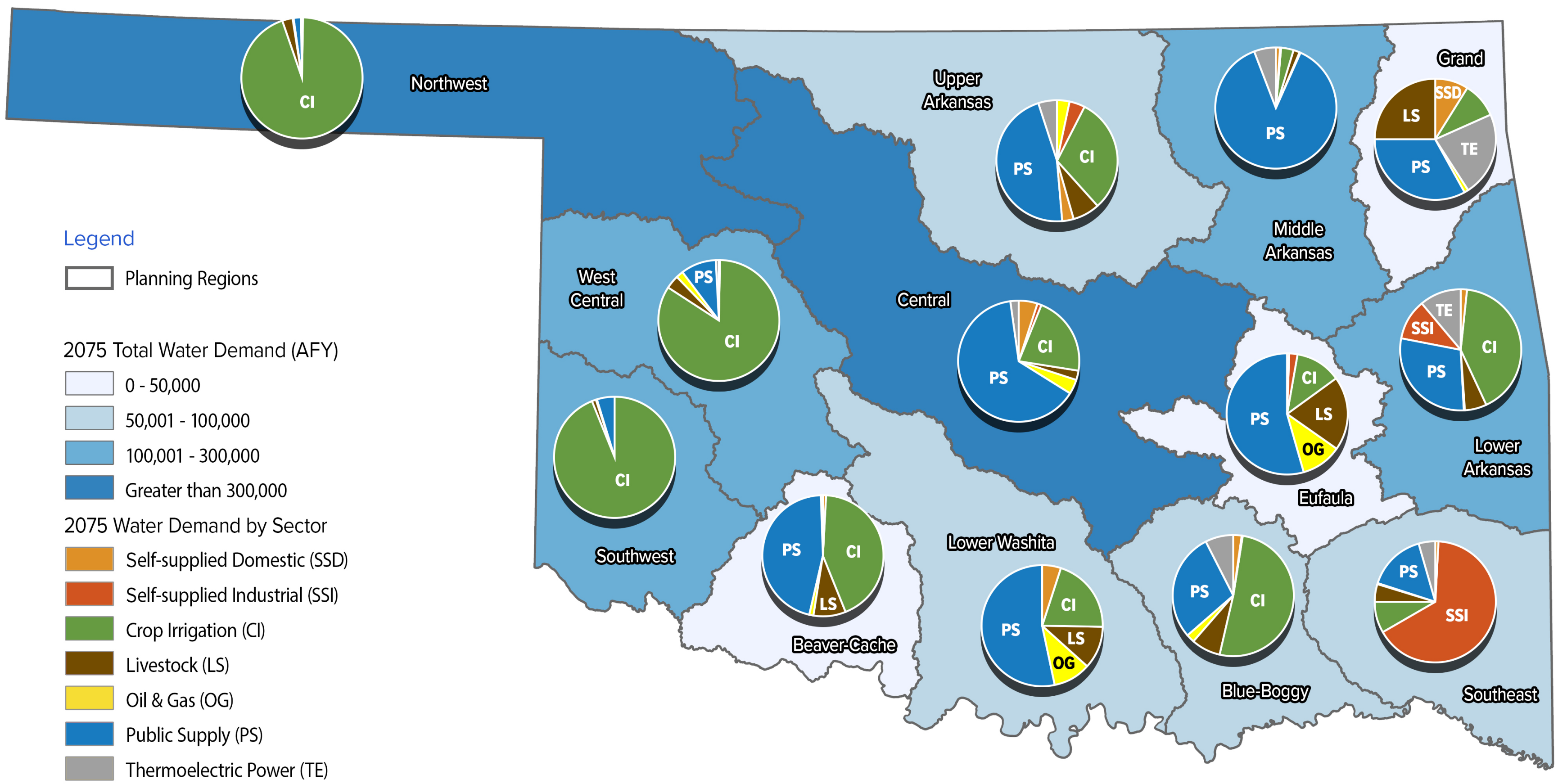


Figure 8 2075 Total Water Demand and Water Sector Distribution

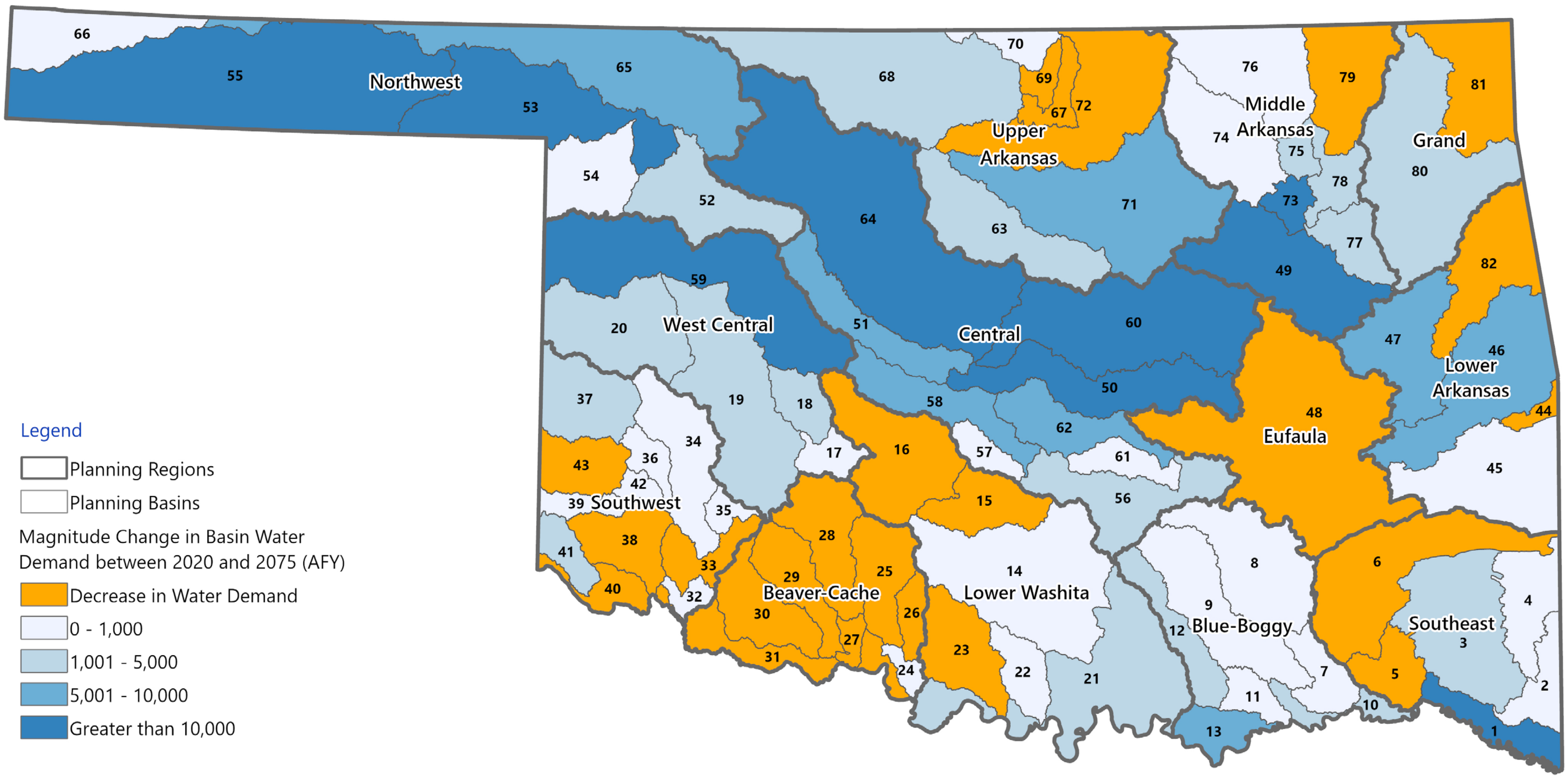


Figure 9 Magnitude Change in Basin Water Demand Between 2020 and 2075

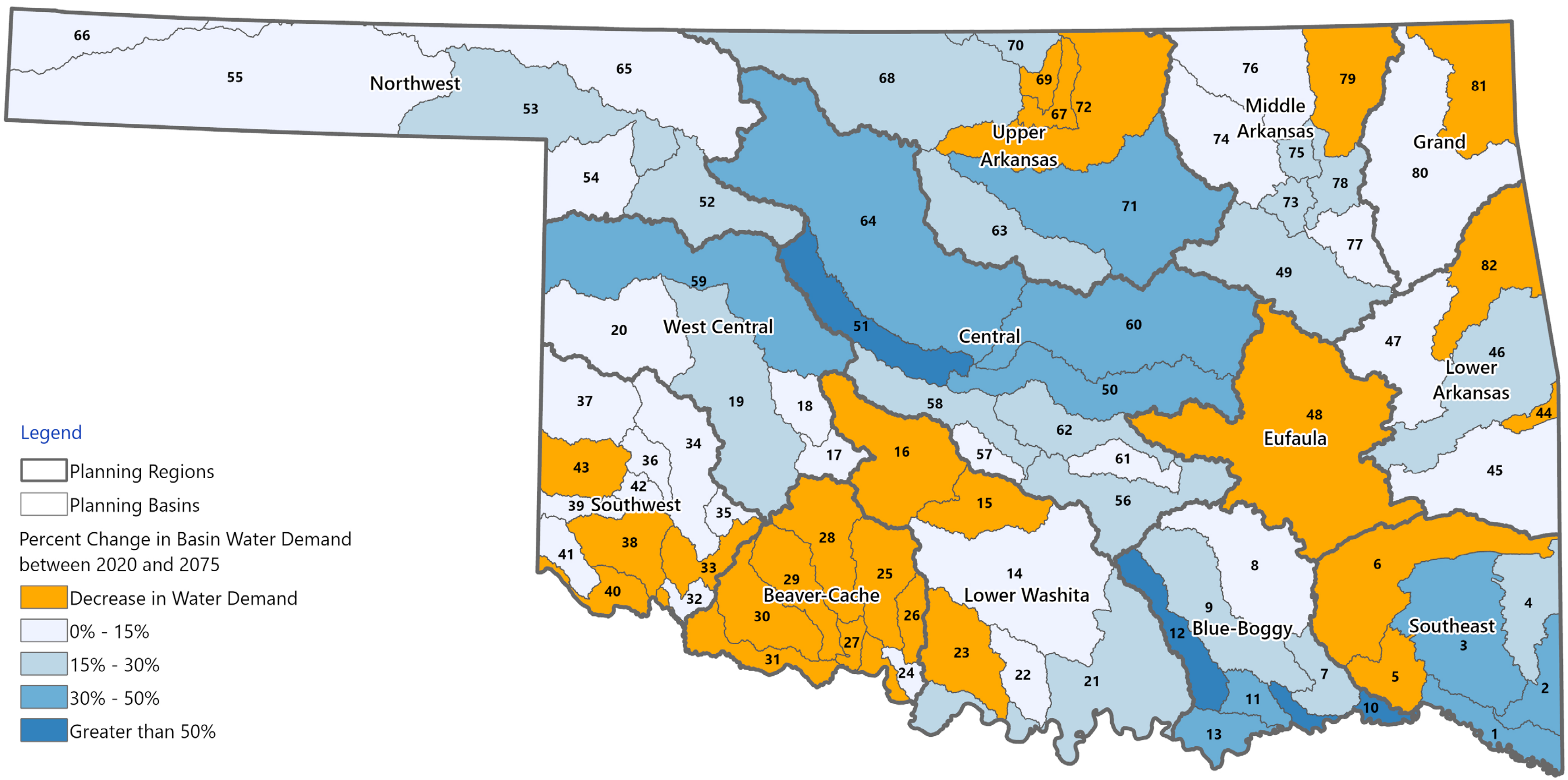


Figure 10 Percent Change in Basin Water Demand Between 2020 and 2075

3.3 Water Availability

Reliable water supplies must be physically available (wet water available at the time and place it is 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. The following subsections summarize 2025 OCWP analyses and findings for the physical and legal availability of water in each basin through 2075, and subsequent sections summarize water quality and infrastructure needs. More information on the differences and similarities between surface water physical and legal supply availability are discussed in Appendix F.

3.3.1 Physical Supply Analysis

The primary objectives of the physical supply availability analysis were to characterize statewide physical water supply availability through the 2075 planning horizon, compare these supply projections with demand projections, and quantify anticipated shortages in physical supply at the basin level. This analysis was performed for the three supply sources: surface water, AGW, and BGW. The term "gap" refers to forecasted surface water shortages, where there may be months or years where projected basin-level surface water supplies will be insufficient to meet projected demands in that basin. Groundwater "depletion" refers to a forecasted condition where groundwater demand will exceed the rate of groundwater recharge, resulting in a net reduction in water remaining in aquifer storage. A more detailed explanation of the methodology and data sources used for the physical supply analysis is contained in the *Physical Water Supply Availability* report and on the 2025 OCWP Water Supply Dashboard (https://oklahoma.gov/owrb/water-planning.html).

As a key foundation of the 2025 OCWP technical work, a sophisticated database and GIS-based analysis tool was created to compare projected water demand to physical supply for each of the 82 OCWP basins. The H2O Tool, adapted from and significantly modernized and updated from the 2012 H2O Tool, was then used to closely examine basin-level demand and supplies. It also identifies areas of potential future physical supply availability constraints and water supply shortages monthly across a wide range of hydrologic conditions.

A primary input to the H2O Tool is the 2025 OCWP demand projections. Supply inputs include surface water data for each of the 82 basins based on daily streamflow gage data collected by the US Geological Survey for water years 1950 through 2020. As such, these data explicitly include the historical drought of record for each basin. Groundwater resources were characterized using previously developed assessments of aquifer storage and recharge rates. Aquifer-based data was proportioned to the 82 basins (surface water watersheds) to facilitate calculations of physical water supply availability.

Current demand, diversions, return flows, and AGW/surface water interactions are physically manifested in the streamflow period of record. The H2O Tool takes those monthly streamflow data and subtracts out the projected monthly surface water and AGW demand to estimate the amount of streamflow available in that future planning year. For BGW, the analysis compares monthly BGW demand to monthly recharge rates.

The water supply availability analysis represents a statewide screening-level analysis. By its nature, such a statewide analysis requires simplifying assumptions. Examples of some of the primary assumptions in this analysis are included below.

- Water rights or permit obligations are not explicitly considered in the physical supply availability assessment described in this report. Legal water supply availability analysis is addressed separately and documented in Section 3.3.3 and the *Legal Availability Analysis*.

- Water quality and other in-stream issues are not considered in the physical supply availability assessment but are being evaluated via other elements of the OCWP.
- Changes in groundwater aquifer volumes and water levels are not explicitly tracked (in other words, the analysis does not predict the actual water level of an aquifer at any future date).

Figure 11 illustrates the 2075 predominant water supply source for each basin.

Figure 12 illustrates the estimated average annual streamflow in 2075, and Figure 13 shows the estimated minimum annual streamflow in 2075 after meeting projected surface water demands. These maps reflect the range of hydrologic conditions from 1950 through 2020 (water years), the period of record in each basin across the state. Maps showing stream systems, lakes, and groundwater aquifers are available on OWRB's website (https://oklahoma.gov/owrb/data-and-maps/gis-data.html).

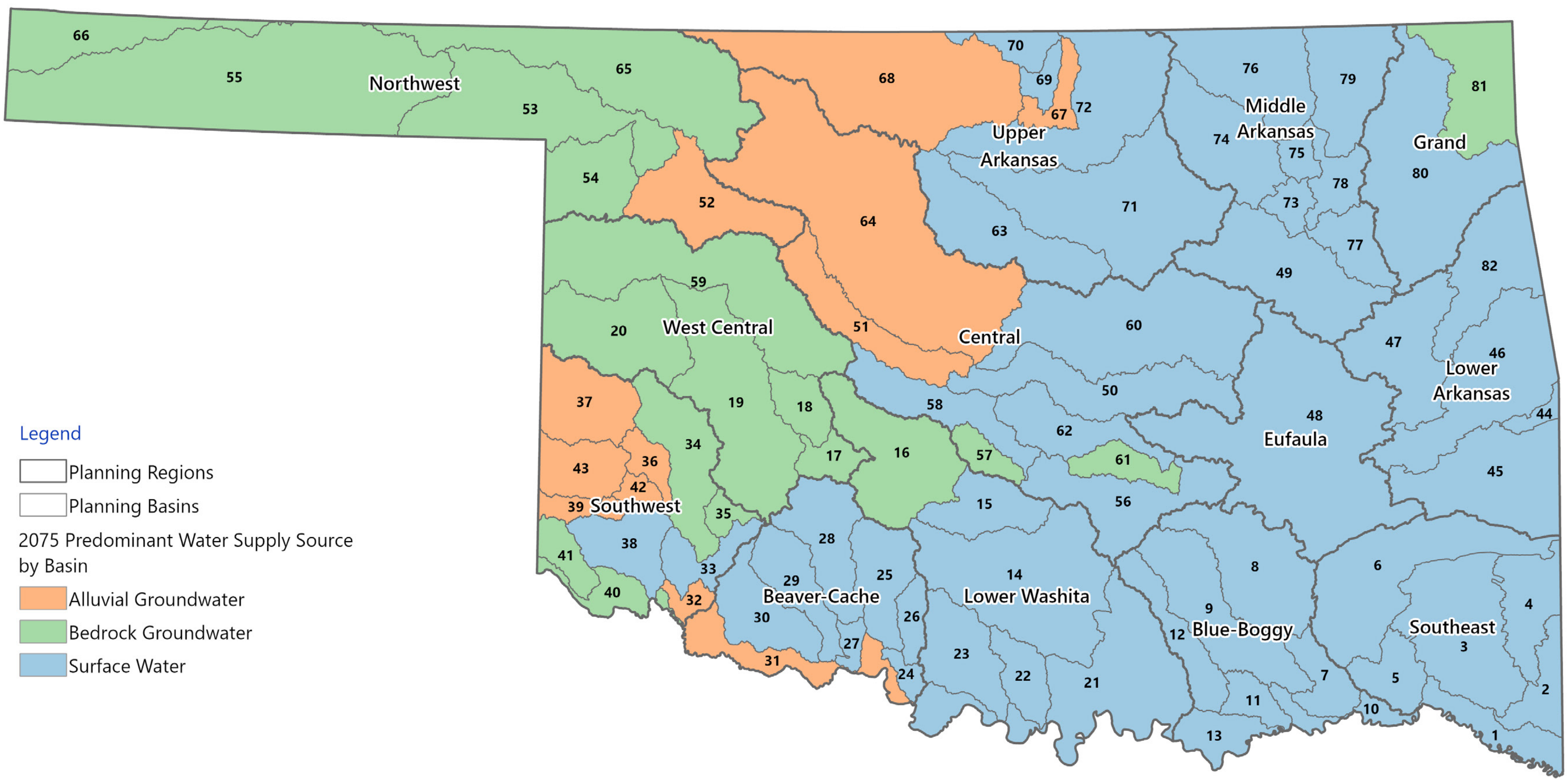


Figure 11 2075 Predominant Water Supply Source by Basin

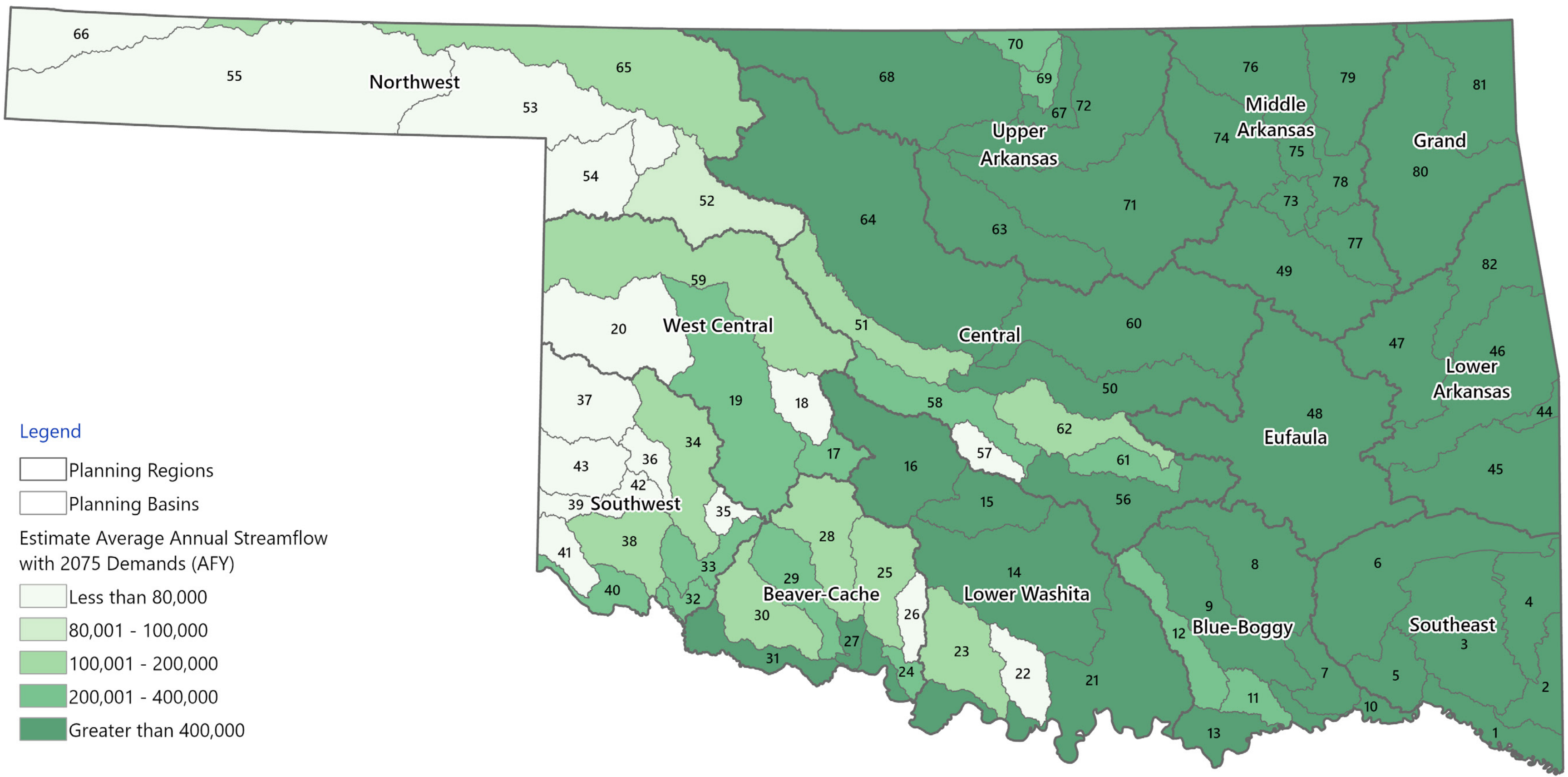


Figure 12 Average Annual Streamflow After Supplying 2075 Demands

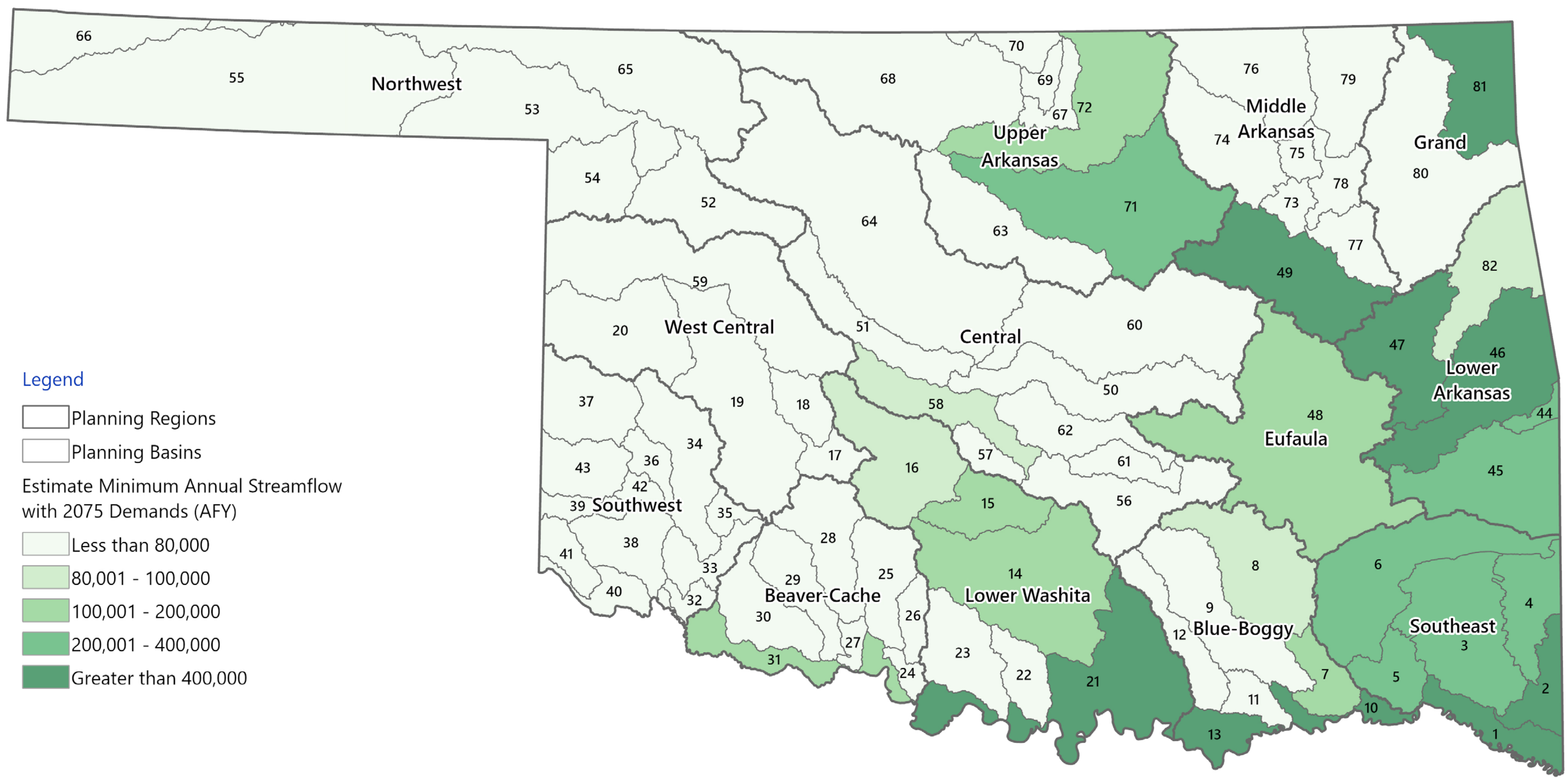


Figure 13 Minimum Annual Streamflow After Supplying 2075 Demands

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. Table 3 identifies aquifers across the state, showing type, class, and equal proportionate share (EPS). A temporary EPS indicates that a maximum annual yield (MAY) has not been approved as of July 2025. Maps showing groundwater aquifers are available on OWRB's website (https://oklahoma.gov/owrb/data-and-maps/gis-data.html).

Table 3 Groundwater Aquifer Data

Aquifer Name	Type	Class(1)	Equal Proportionate Share (AFY/acre)
Antlers	Bedrock	Major	2.1
Arbuckle-Simpson	Bedrock	Major	0.2
Arbuckle-Timbered Hills	Bedrock	Major	Temporary 2.0
Arkansas River	Alluvial	Major	Temporary 2.0
Ashland Isolated Terrace	Alluvial	Minor	Temporary 2.0
Beaver Creek	Alluvial	Minor	1
Blaine	Bedrock	Major	Temporary 2.0
Boone	Bedrock	Minor	Temporary 2.0
Broken Bow	Bedrock	Minor	Temporary 2.0
Cache Creek	Alluvial	Minor	1
Canadian River	Alluvial	Major	Temporary 2.0
Cherokee Group	Bedrock	Minor	Temporary 2.0
Chikaskia River	Alluvial	Minor	Temporary 2.0
Cimarron River	Alluvial	Major	Temporary 2.0
East-Central Oklahoma	Bedrock	Minor	Temporary 2.0
El Reno	Bedrock	Minor	Temporary 2.0
Elk City	Bedrock	Major	1
Enid Isolated Terrace	Alluvial	Major	0.5
Fairview Isolated Terrace	Alluvial	Minor	Temporary 2.0
Garber-Wellington	Bedrock	Major	2
Gerty Sand	Alluvial	Major	0.65
Haworth Isolated Terrace	Alluvial	Minor	1
Hennessey-Garber	Bedrock	Minor	1.6
Holly Creek	Bedrock	Minor	Temporary 2.0
Isabella Isolated Terrace	Alluvial	Minor	Temporary 2.0
Kiamichi	Bedrock	Minor	Temporary 2.0
Little River	Alluvial	Minor	1

Aquifer Name	Type	Class(1)	Equal Proportionate Share (AFY/acre)
Loyal Isolated Terrace	Alluvial	Minor	Temporary 2.0
Marietta	Bedrock	Minor	Temporary 2.0
Middle Neosho River	Alluvial	Minor	Temporary 2.0
North Canadian River, Reach 1	Alluvial	Major	1
North Canadian River, Reach 2	Alluvial	Major	1
North Canadian River, Reach 3a	Alluvial	Major	0.8
North Canadian River, Reach 3b	Alluvial	Major	1.3
North Fork of the Red River	Alluvial	Major	1
North-Central Oklahoma	Bedrock	Minor	Temporary 2.0
Northeastern Oklahoma Pennsylvanian	Bedrock	Minor	Temporary 2.0
Northern Neosho River	Alluvial	Minor	Temporary 2.0
Ogallala Northwest	Bedrock	Major	1.4
Ogallala Panhandle	Bedrock	Major	2
Ogallala Roger Mills	Bedrock	Major	Temporary 2.0
Ogallala-Whitehorse	Bedrock	Major	Temporary 2.0
Pennsylvanian	Bedrock	Minor	Temporary 2.0
Pine Mountain	Bedrock	Minor	Temporary 2.0
Post Oak	Bedrock	Minor	2
Potato Hills	Bedrock	Minor	Temporary 2.0
Red River Reach 1	Alluvium and Terrace	Major	Temporary 2.0
Red River Reach 2	Alluvium and Terrace	Major	Temporary 2.0
Red River Reach 3	Alluvium and Terrace	Major	Temporary 2.0
Red River Reach 4	Alluvium and Terrace	Major	Temporary 2.0
Roubidoux	Bedrock	Major	Temporary 2.0
Rush Springs	Bedrock	Major	Temporary 2.0
Salt Fork of the Arkansas River	Alluvial	Major	Temporary 2.0
Southern Neosho River	Alluvial	Minor	Temporary 2.0
Southwestern Oklahoma	Bedrock	Minor	Temporary 2.0
Texoma	Bedrock	Minor	Temporary 2.0
Tillman Terrace	Alluvial	Major	1
Vamoosa-Ada	Bedrock	Major	2
Verdigris River Groundwater Basin	Alluvial	Minor	Temporary 2.0
Washita River Reach 1	Alluvium and Terrace	Major	2
Washita River Reach 3	Alluvium and Terrace	Major	1.5
Washita River Reach 4	Alluvium and Terrace	Major	1
Western Oklahoma	Bedrock	Minor	Temporary 2.0

Aquifer Name	Type	Class[(1)]	Equal Proportionate Share (AFY/acre)
Woodbine	Bedrock	Minor	Temporary 2.0
Antlers	Bedrock	Major	2.1
Arbuckle-Simpson	Bedrock	Major	0.2
Arbuckle-Timbered Hills	Bedrock	Major	Temporary 2.0
Arkansas River	Alluvial	Major	Temporary 2.0

Notes:
(1) 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.

The 2025 OCWP water availability analyses predict if BGW storage depletions will occur based on the net of the projected BGW demand and estimated rate of BGW recharge for each aquifer. Recharge rates for bedrock aquifers were estimated using available literature and were applied at a constant monthly rate throughout the year. The county or aquifer recharge rates were distributed to the 82 planning basins proportional to the fraction of the aquifer that underlies each basin. BGW recharge rates for each basin are shown in Table 4.

Table 4 Recharge Estimates for Bedrock Groundwater by Planning Basin

Planning Basin Identification (ID)	BGW Recharge Rate (AFY)
1	15,216
2	8,237
3	9,429
4	37
5	13,500
6	8,908
7	17,475
8	3,787
9	40,492
10	6,730
11	3,515
12	51,588
13	5,193
14	42,008
15	964
16	42,940
17	17,950
18	29,537
19	68,186
20	21,421
21	93,583

Planning Basin Identification (ID)	BGW Recharge Rate (AFY)
22	8,162
23	617
24	--
25	7,133
26	--
27	--
28	7,978
29	1,341
30	--
31	--
32	--
33	--
34	20,672
35	--
36	--
37	10,588
38	20,439
39	3,006
40	15,466
41	19,233
42	--
43	--
44	37
45	--
46	105,591
47	34,821
48	4,130
49	3,475
50	49,246
51	517
52	3,113
53	8,231
54	9,727
55	24,596
56	16,545
57	--

Planning Basin Identification (ID)	BGW Recharge Rate (AFY)
58	15,051
59	66,215
60	91,849
61	14,355
62	36,948
63	15,229
64	25,305
65	2,328
66	3,052
67	--
68	--
69	--
70	--
71	38,603
72	2,227
73	--
74	25,282
75	--
76	19,480
77	--
78	--
79	15,694
80	217,874
81	119,467
82	119,507

3.3.2 Physical Water Shortages

This section focuses on the anticipated gaps between physical supply and demand. A more detailed explanation of the methodology and data sources used for these the physical supply analysis is contained in the *Physical Water Supply Availability* report and on the 2025 OCWP Water Shortages Dashboard (https://oklahoma.gov/owrb/water-planning.html).

The H2O Tool provides the ability to analyze any of a number of scenarios and potential future conditions. The following conditions were used to assess the baseline physical supply availability.

- The return flows from a given basin are delivered to the next downstream basin.
- The change in upstream demand affects the supply availability downstream. For example, return flows generated in a basin will continue to flow downstream until the supply is depleted.
- Supplies in BGW aquifers are not hydrologically connected to surface water.

- Existing interbasin supplies were used to satisfy the receiving basin's incremental demand (2030 to 2075) up to the permitted transfer capacity or the incremental demand in the receiving basin, whichever is less.
- Future demand in a basin is supplied by a combination of local sources and interbasin transfers, to the extent a permitted interbasin transfer exists today.
- All effects of well pumping on groundwater supply availability remain in the basin where the groundwater demand (and wells used to supply that demand) is located.

The maximum surface water gap for the period of record is defined as the maximum of the sum of the monthly gaps for a given year for each basin. For example, for the 2030 planning horizon, the change in surface water demand (2030 demand minus 2020 demand) is subtracted from the available surface water supply (historical hydrology) to estimate the gap. Similarly, for the 2075 planning horizon, the change in surface water demand (2075 demand minus 2020 demand) is subtracted from the available surface water supply (historical hydrology) to estimate the gap. Recognizing that conditions vary substantially from one area to another in any given year, the entire period of record for monthly streamflows (water years 1950 through 2020) was used to estimate the anticipated magnitude and probability of surface water gaps.

AGW and BGW shortages are referred to as storage depletions rather than gaps because each aquifer has a certain amount of water in storage that may be used before there is no remaining supply. A BGW storage depletion is assumed to occur if the BGW demand exceeds the bedrock aquifer recharge rate, while an AGW storage depletion is assumed to occur if the AGW demand exceeds the available streamflow after the surface water demand has been subtracted (because of the hydrologic linkage between AGW and surface water).

The potential for gaps and storage depletions in each basin was analyzed for future demand projections for planning years 2030, 2035, 2045, 2060, and 2075. Both the magnitude and the probability (or "frequency," based on period of record hydrologic variability) of supply gaps and storage depletions are important considerations in water supply planning. Frequency is calculated dividing the number of years with at least one monthly water shortage by the total number of years in the record. For instance, many communities or water users would take steps to mitigate shortages if they were anticipated to be high in both magnitude and probability. However, investments in infrastructure to mitigate a low-probability, high-magnitude shortage may not be economically feasible, depending on local conditions and priorities. Conversely, a high-probability, low-magnitude shortage (e.g., less than 500 AFY) might be addressed by demand management measures. Potential solutions for addressing anticipated supply needs are addressed in Section 3.5 Water Management Strategies of this report.

Figure 14 illustrates the median annual surface water supply gap for 2075 demand conditions. Figure 15 illustrates the maximum annual surface water supply gap for 2075 demand conditions, which is the anticipated shortage under the historically driest hydrology. Figure 16 illustrates the potential frequency of having a surface water gap of **any** magnitude by basin for the 2075 demand condition. Thirty-two basins are projected to have no surface water gap in 2075.

Similarly, Figures 17 and 18 illustrate the median and maximum AGW storage depletions that would be anticipated for the 2075 demand condition when compared to the 70-year period of record hydrology, and Figure 19 illustrates the anticipated probability of AGW storage depletions for the 2075 demand conditions. Forty-seven basins are projected to have no AGW storage depletion in 2075.

Figure 20 illustrates the BGW storage depletions for the 2075 incremental demand scenarios. Thirteen basins are projected to have no BGW storage depletions in 2075.

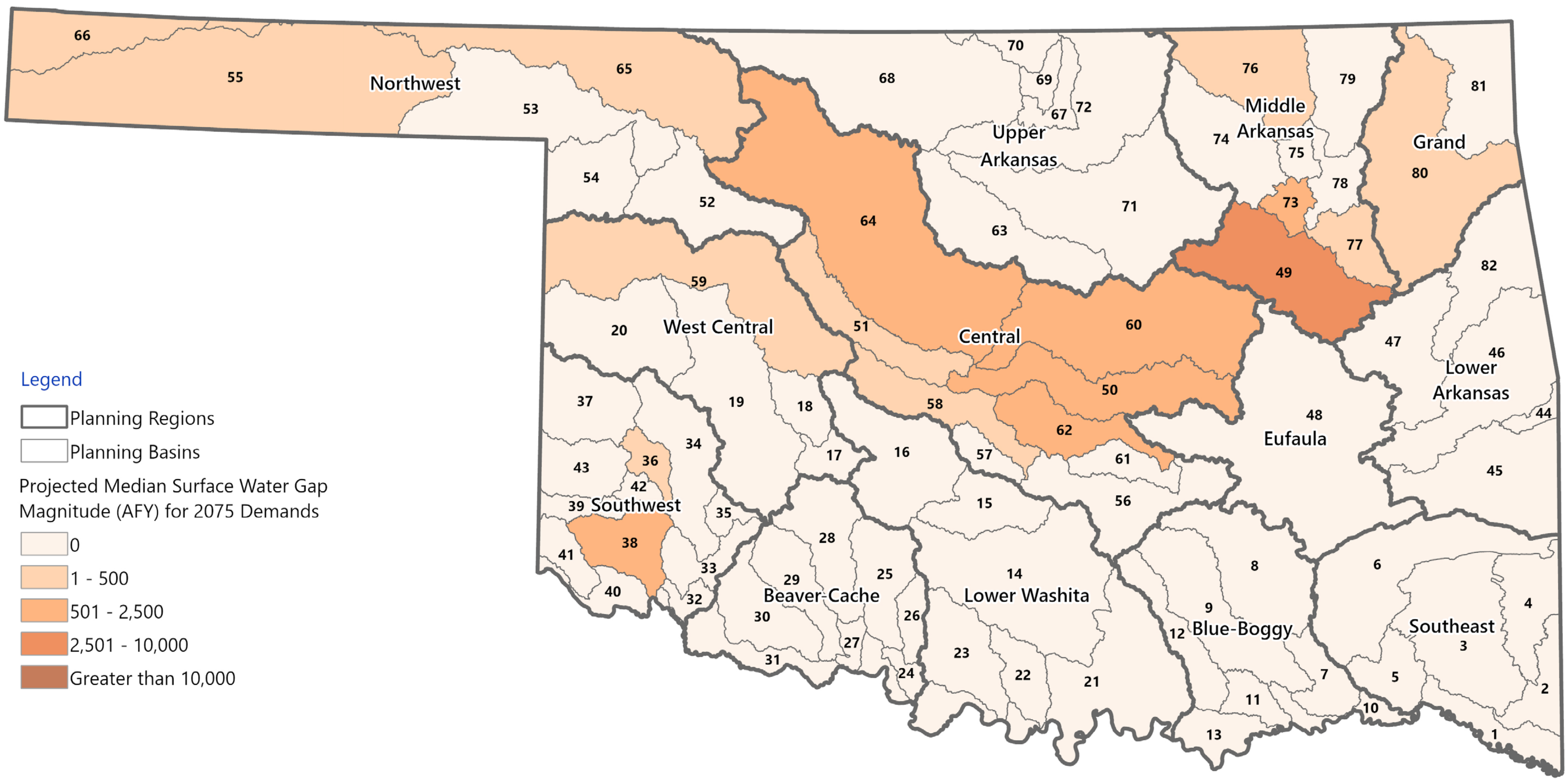


Figure 14 Median Annual Surface Water Supply Availability Gaps for 1950 through 2020 Historical Hydrology and 2075 Demands

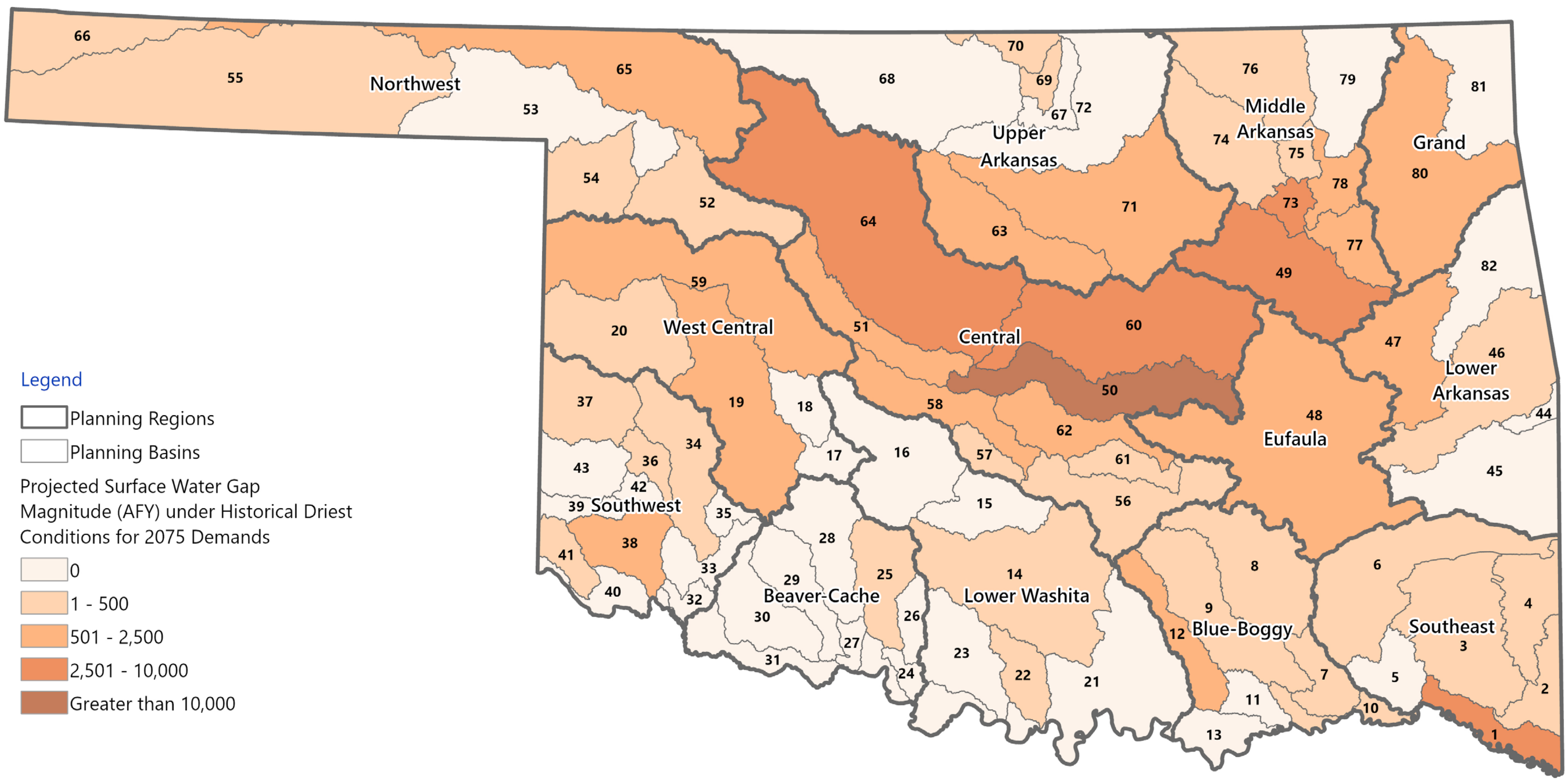


Figure 15 Maximum Annual Surface Water Supply Availability Gap for 1950 through 2020 Historical Hydrology and 2075 Demands

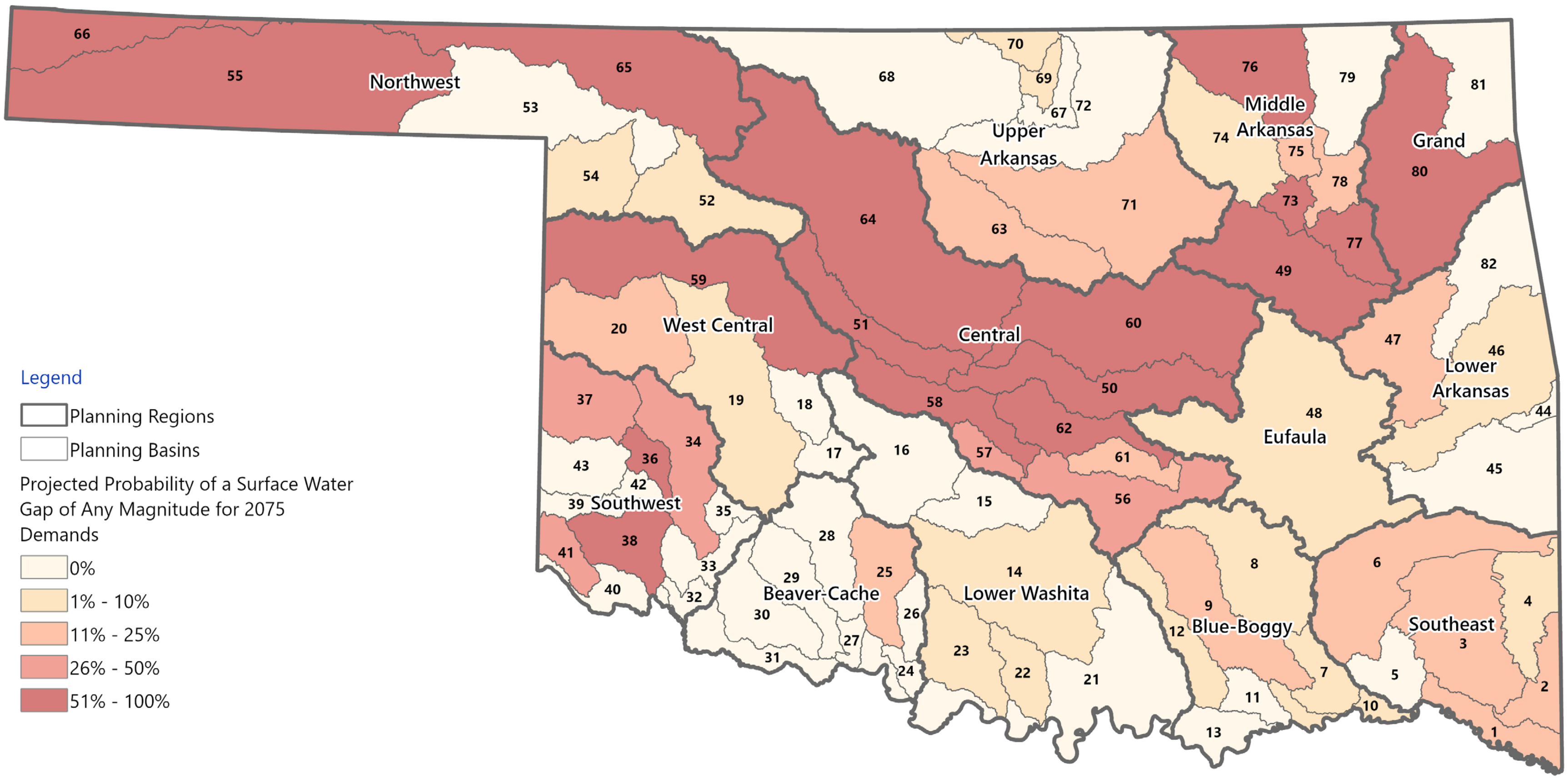


Figure 16 Frequency of Annual Surface Water Supply Gaps for 2075 Demands

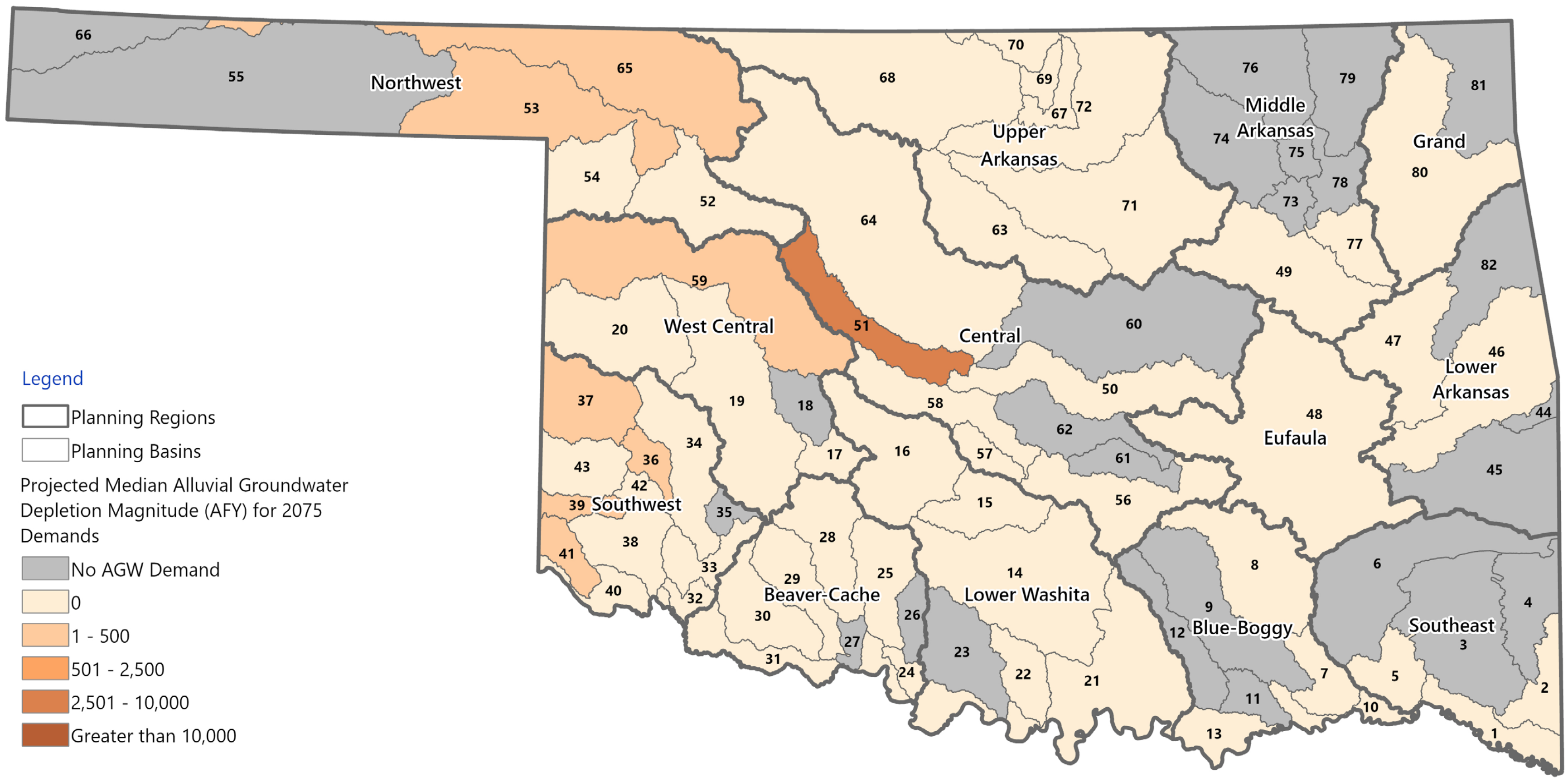


Figure 17 Median Annual Alluvial Groundwater Storage Depletions for 1950 through 2020 Historical Hydrology and 2075 Demands

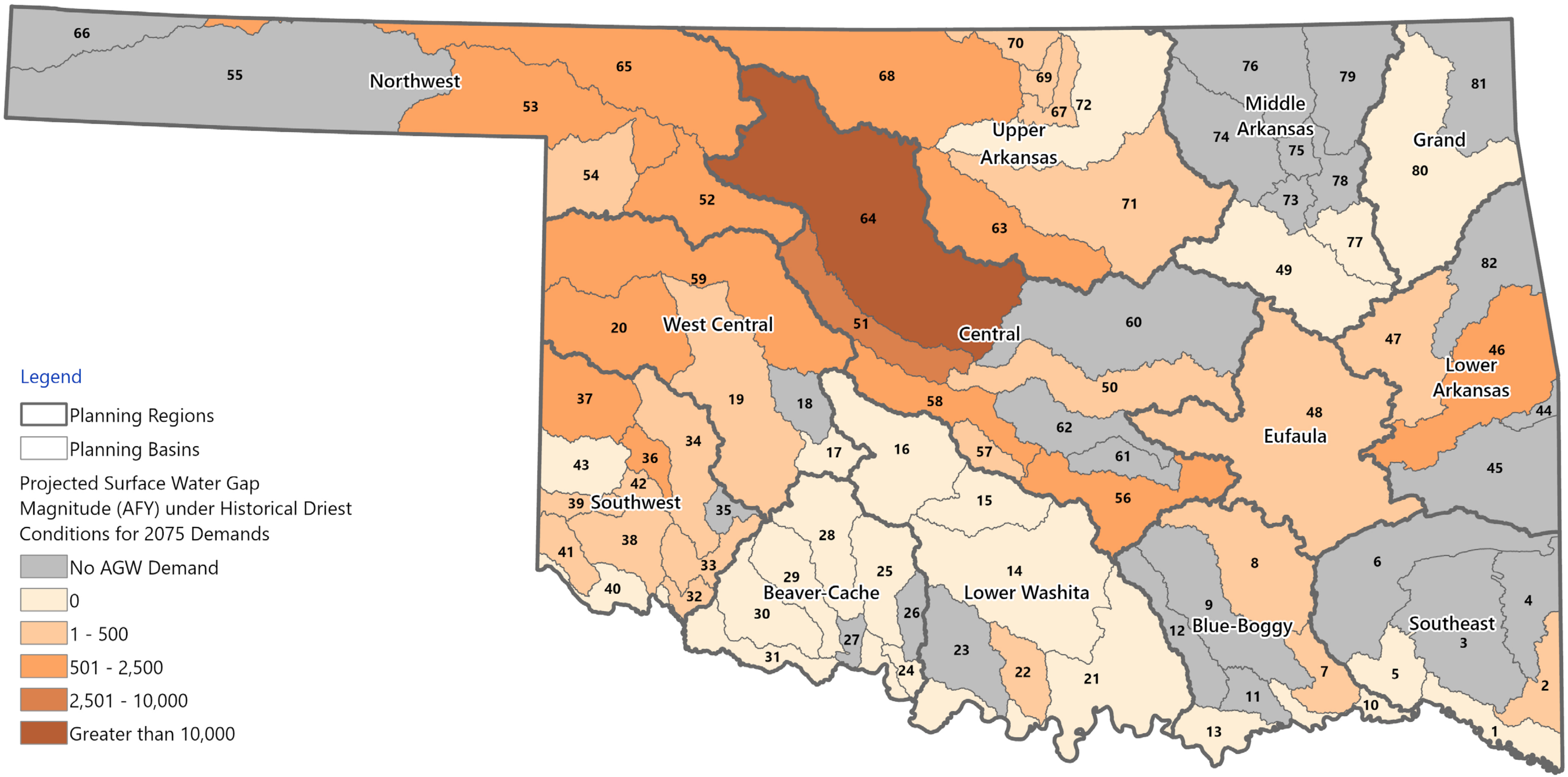


Figure 18 Maximum Annual Alluvial Groundwater Storage Depletions for 1950 through 2020 Historical Hydrology and 2075 Demands

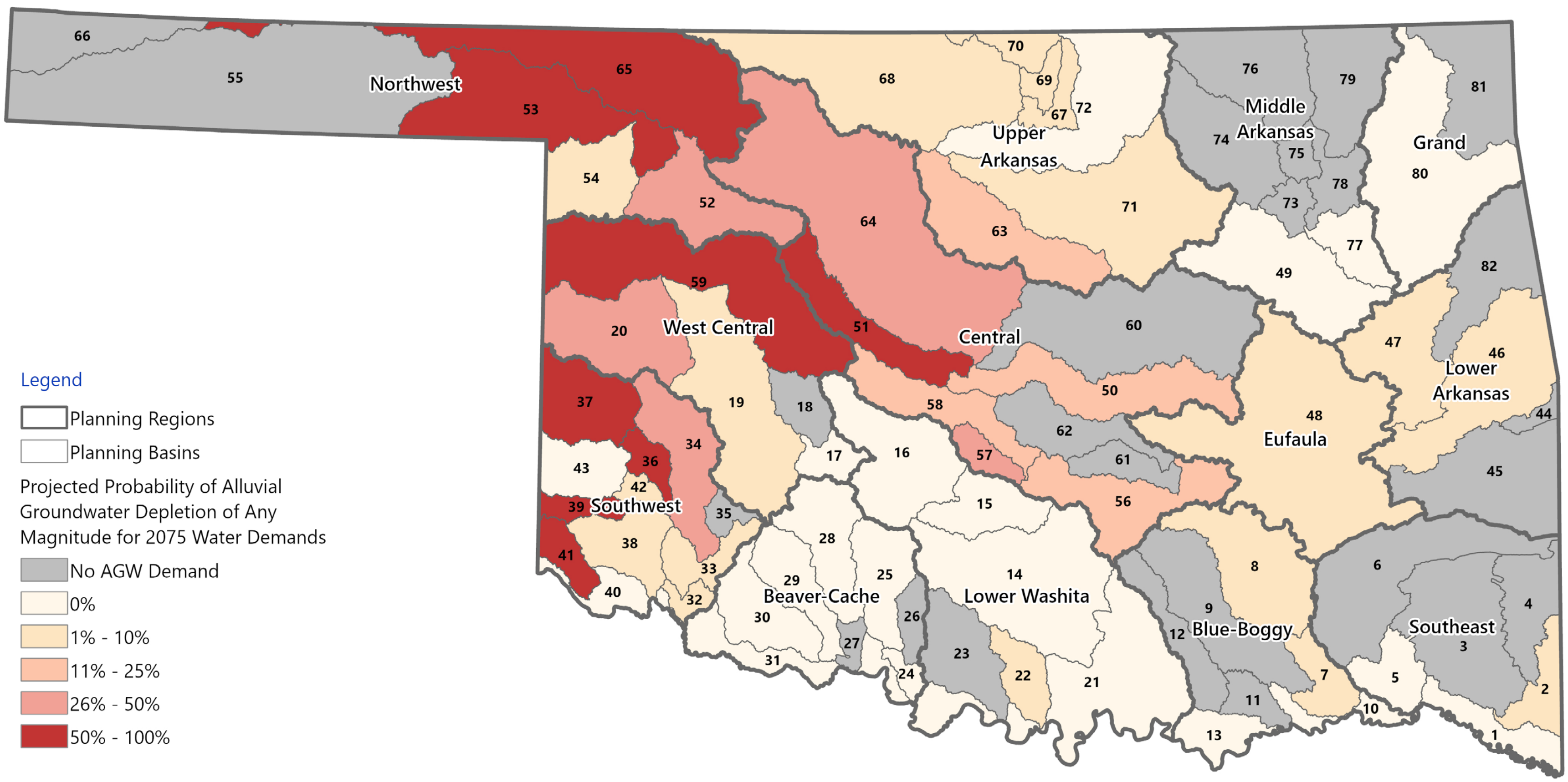


Figure 19 Probability of Annual Alluvial Groundwater Storage Depletions for 2075 Demands

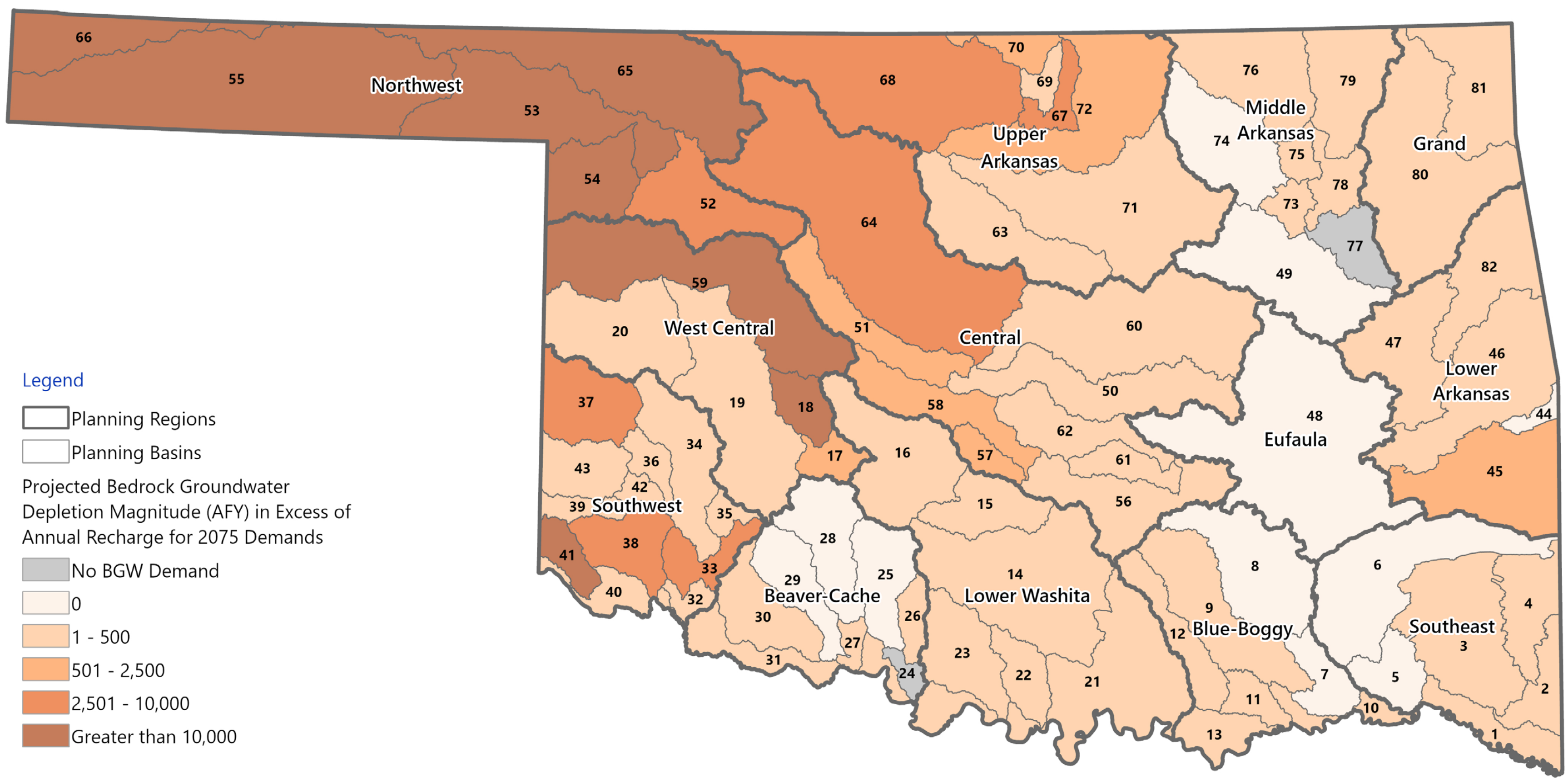


Figure 20 Bedrock Groundwater Storage Depletions in Excess of Annual Average Recharge for 2075 Demands

There are several known limitations and uncertainties associated with the physical shortage methodology and input data. The key known limitations are listed below.

- Localized surface water gaps or AGW/BGW storage depletions may not be evident at the basin level, such that the magnitude and/or probability of localized shortages might be greater than those shown via this analysis for each 2025 OCWP basin.
- Future proportions of surface water and AGW/BGW used to satisfy future demand for a given basin and water use sector may differ from current proportions.
- Grand River Dam Authority (GRDA) active contracts are implicitly included in the input dataset using surface water diversion amounts identified in the OWRB Water Rights database (OWRB 2024).
- The statistical method used to estimate flows where actual data are missing is not constrained to a minimum flow value; therefore, periods of zero flow may be created when actual flows may have occurred.
- Drawing down the water in a reservoir may influence the timing or quantity of gaps, especially when the majority of consumptive use occurs upstream of the stream gage.
- To account for compact obligations, the simplifying assumption of upstream states were assumed to use 60 percent of all available flow into Oklahoma (meaning Oklahoma receives 40 percent of flow from upstream states).

3.3.3 Legal Supply Analysis

The primary objectives of the permit supply availability analysis were to characterize statewide legal water availability through the 2075 planning horizon, compare the legal/permit availability projections with demand projections, and identify whether water will be available for permitting. This analysis was performed at the basin level for surface water and groundwater. A more detailed explanation of the methodology and data sources used for these the physical supply analysis is contained in the *Legal Availability Analysis* report and on the 2025 OCWP Water Supply Dashboard (https://oklahoma.gov/owrb/water-planning.html).

3.3.3.1 Surface Water Legal Supply

Surface (or stream) water is defined as water in a "definite stream" (a watercourse in a definite, natural channel, with defined beds and banks, originating from a definite source or sources of supply) and may be intermittent or irregular flow. Stream water is considered to be publicly owned. OWRB manages permitting of surface water except in the Grand River Basin (where GRDA has full authority for appropriation of stream water). In 2016, the State of Oklahoma, the OWRB, the Choctaw Nation of Oklahoma, Chickasaw Nation, and City of Oklahoma City reached a water rights settlement involving Sardis Lake and the Kiamichi River Basin. Basins that are wholly or partially subject to the provisions of the 2016 Water Settlement Agreement are identified in Figure 21.

The maximum amount of water a reservoir can dependably supply during a critical drought period is referred to as its yield. Table 5 provides information about remaining water supply yield that is available for permitting from existing reservoirs.

Table 5 Statewide Reservoir Yield and Remaining Amount Available for Permitting

Name	Authority	Primary Basin ID	Water Supply Yield (AFY)	Existing Permits (AFY)(1)	Available Yield for New Permits (AFY)(1)
Albany Lake	USACE	13	35,845	36,865	0
Altus City	City of Altus	33	47,100	90,430	0
Arbuckle	Bureau of Reclamation	14	24,000	24,000	0
Arcadia	USACE	60	12,320	19,935	0
Atoka	City of Oklahoma City	8	92,067	93,891	0
Bell Cow	City of Chandler	60	4,558(2)	4,144	414
Birch	USACE	74	3,360	2,800	560
Bixhoma	City of Bixby	49	--	1.12	--
Bluestem	City of Pawhuska	74	--	2	--
Boomer	City of Stillwater	71	--	--	--
Broken Bow Lake	USACE	4	58,386	10,780	47,606
Brushy	State of Oklahoma, Leased	46	--	3,000	--
Canton	USACE	52	16,240	18,480	0
Carl Albert Lake	City of Talihina	6	--	1,500	--
Carl Blackwell	Oklahoma State University	70	7,000	15,600	0
Chandler	City of Chandler	60	--	882	--
Chickasha	City of Chickasha	16	--	5,200	--
Claremore	City of Claremore	78	--	3.89	--
Clear Creek	City of Duncan	14	2,000	2,000	--
Cleveland City	City of Cleveland	71	--	--	--
Clinton	City of Clinton	19	--	--	--
Coalgate	City of Coalgate	8	--	3,224	--
Copan	USACE	76	3,360	3,340	20
Crowder	State of Oklahoma	18	--	--	--
Cushing	City of Cushing	71	--	--	--
Dave Boyer	City of Walters	28	--	--	--
Dead Warrior	City of Cheyenne	20	--	0	--
Dripping Springs	City of Okmulgee	48	7,214	7,800	0
Duncan	City of Duncan	14	--	738	--
El Reno	City of El Reno	51	--	--	--

Name	Authority	Primary Basin ID	Water Supply Yield (AFY)	Existing Permits (AFY)(1)	Available Yield for New Permits (AFY)(1)
Elk City	City of Elk City	34	--	--	0
Ellsworth	City of Lawton	28	23,500	27,737	0
Elmore City Lake	Soil Conservation Service	14	77	238	0
Eucha/Spavinaw Lakes	City of Tulsa	80	84,000	181,000	0
Eufaula	USACE	48	76,451	43,100	33,352
Fairfax City	City of Fairfax	72	--	--	--
Fort Cobb	Bureau of Reclamation	18	18,000	18,000	0
Fort Gibson	USACE	80	0	0	--
Foss	Bureau of Reclamation	20	18,000	17,634	366
Frederick	City of Frederick	30	--	3,400	--
Fuqua	City of Duncan	14	3,427(2)	1,245	2,182
Grand	GRDA	81	0	0	--
Great Salt Plains	USACE	68	0	0	0
Greenleaf Lake	USACE	47	0	239	0
Guthrie	City of Guthrie	64	--	771	--
Healdton	City of Healdton	22	3,000(2)	1,473	1,527
Hefner	City of Oklahoma City	64	--	0	--
Henryetta	City of Henryetta	48	--	3,727	--
Heyburn	USACE	49	1,904	2,085	0
Holdenville	City of Holdenville	56	--	3,150	--
Hominy Municipal	City of Hominy	74	--	667	--
Hudson	City of Bartlesville	76	--	--	--
Hudson (Markham Ferry)	GRDA	80	0	0	--
Hugo Lake	USACE	5	64,960	556,947	0
Hulah	USACE	76	13,888	13,886	2
Humphreys	City of Duncan	14	3,226	5,408	0
Jean Neustadt	Soil Conservation Service	14	2,150	1,267	883
John Wells	City of Stigler	46	--	--	--
Kaw	USACE	72	187,040	149,420	37,620
Keystone	USACE	71	22,400	13,968	8,432
Konawa	OG&E	56	--	8	--

Name	Authority	Primary Basin ID	Water Supply Yield (AFY)	Existing Permits (AFY)[1]	Available Yield for New Permits (AFY)[1]
Langston	City of Langston	63	--	1,500	--
Lawtonka	City of Lawton	28	23,500	23,500	0
Liberty	City of Guthrie	64	--	893	--
Lloyd Church	City of Wilburton	45	1,523	2,305	0
Lone Chimney	Tri-County Development Authority	71	2,509[2]	2,507	2
Lugert-Altus	Bureau of Reclamation	36	47,100	90,430	0
McAlester	City of McAlester	48	9,200	16,000	0
McGee Creek	Bureau of Reclamation	8	71,800	64,608	7,192
McMurtry	City of Stillwater	71	3,002	3,002	0
Meeker	City of Meeker	60	202	407	0
Murray	State of Oklahoma	21	1,008	12,860	0
New Spiro	City of Spiro	44	--	--	--
Okmulgee	City of Okmulgee	48	--	4,434	--
Oologah	USACE	79	172,480	185,938	0
Optima	USACE	55	--	0	--
Overholser	City of Oklahoma City	51	--	--	0
Parker Reservoir	Wichita Mtns Wildlife Refuge	29	--	--	0
Pauls Valley	City of Pauls Valley	14	--	1,993	--
Pawhuska	City of Pawhuska	74	--	0	--
Pawnee	City of Pawnee	71	--	--	--
Perry	City of Perry	71	--	2,270	--
Pine Creek Lake	USACE	3	94,080	33,605	60,475
Ponca	City of Ponca City	72	2,529	9,000	0
Prague City	City of Prague	60	549	549	0
Purcell	City of Purcell	57	--	21,900	--
RC Longmire	City of Pauls Valley	14	3,360	3,361	0
Robert S Kerr	USACE	46	0	1,000	0
Rock Creek Reservoir	Soil Conservation Service	14	1,220	1,267	0
Sahoma	City of Sapulpa	49	--	4.8	--
Sand Springs Lake	City of Sand Springs	49	8,750	8,750	0
Sardis Lake	USACE	6	156,800	122,443	34,457

Name	Authority	Primary Basin ID	Water Supply Yield (AFY)	Existing Permits (AFY)(1)	Available Yield for New Permits (AFY)(1)
Shawnee Twin Lakes	City of Shawnee	50	4,400	8,000	0
Shell	City of Sand Springs	49	--	4.8	--
Skiatook	USACE	74	16,240	45,449	0
Sooner	Oklahoma Gas and Electric Company	72	3,600	3,600	0
Sparks Lake	Soil Conservation Service	60	27	36	0
Sportsman	City of Seminole	48	--	3,000	--
Stanley Draper	City of Oklahoma City	62	--	0	--
Stilwell City	City of Stilwell	46	--	2,000	--
Stroud	City of Stroud	60	1,299(2)	1,100	199
Talawanda #2	City of McAlester	48	--	3,000	--
Taylor	City of Marlow, Leased	14	--	1,892	--
Tecumseh	City of Tecumseh	50	--	418	--
Tenkiller Ferry	USACE	82	30,016	179,891	0
Texoma	USACE	21	168,000	117,909	50,091
Thunderbird	Bureau of Reclamation / Central Oklahoma Master Conservancy District	62	21,700	49,603.6	0
Tom Steed	Bureau of Reclamation	35	16,000	16,100	0
W.R. Holway	GRDA	80	0	0	0
Waurika	USACE	25	40,549	44,806	0
Waxhoma	City of Barnsdall	74	--	295	--
Wayne Wallace	State of Oklahoma	45	--	--	--
Webbers Falls	USACE	47	0	11,202	0
Weleetka	City of Weleetka	48	--	233	--
Wes Watkins	Pottawatomie County Development Authority	50	--	5	--
Wetumka	City of Wetumka	50	--	750	--
Wewoka	City of Wewoka	48	--	957	--
Wiley Post Memorial	City of Maysville	15	538	700	0
Wister	USACE	45	22,400	29,706	0

Notes:
-- Indicates no information is available.
(1) Estimated remaining water supply yield as of July 2025.
(2) Estimated yield.

The 2025 OCWP surface water permit availability analysis followed OWRB's methodology for the evaluation of surface water available for appropriation whenever a regular stream water permit application is reviewed. The basin outlet was selected as the diversion point. Interstate compact inflows were included for 10 basins on Oklahoma's borders that receive water from neighboring states and compact-required outflows from 17 basins along the Red River and Arkansas River that are subject to interstate compact requirements. In-basin reserves were included in the total set-asides per basin (not just for inter-basin transfers). The in-basin reserve was calculated as 10 percent of runoff with domestic use and compact reserve requirements subtracted. Set asides include domestic use and existing appropriative uses (active permits, pending permit applications, reservoir dependable yields, and normal storage in NRCS ponds). If the upstream basin has insufficient flow to meet demands, indicating a surface water gap, that upstream basin's surface water gap does not impact the downstream basin's water availability calculation. Figure 21 provides the estimated amount of water available for permitting after satisfying 2075 surface water demand projections. Seventy-five of the 82 planning basins are expected to have legally available surface water remaining for appropriation in 2075.

3.3.3.2 Groundwater Legal Supply

Oklahoma law defines groundwater as "fresh water under the surface of the earth regardless of the geologic structure in which it is standing or moving outside the cut bank of any definite stream" (82 OK Stat §1020.1). The owner of the land owns the groundwater beneath the surface and may develop the water for beneficial use subject to reasonable regulation by the State. Use of groundwater is governed by the Oklahoma Groundwater Law (60 OK Stat §60).

The MAY of each major groundwater basin or subbasin (or aquifer) is a determination by OWRB of the total annual amount of fresh groundwater that can be produced based upon a minimum basin or subbasin life of 20 years (82 OK Stat §1020.5). After the MAY is determined, OWRB can issue regular permits that allocate the EPS of the MAY for each acre of land dedicated to the permit application that overlies the aquifer. OWRB also has authority to issue temporary permits to use groundwater before the determination of the MAY for a basin; the law provides that "the water allocated by a temporary permit shall not be less than two (2) acre-feet annually for each acre of land owned or leased by the applicant" (82 OK Stat §1020.11.B.2).

Analysis of legal groundwater availability provides estimates of the maximum allowable permitted amount of groundwater, by OCWP planning basin, based upon OWRB groundwater basin legal availability as of April 2024 and the remaining amount available for permitting currently and after meeting projected demands in 2075. Figure 22 provides the results of the groundwater legal availability analysis with the 2075 demands applied. All 82 OCWP planning basins are expected to have groundwater legally available for appropriation in 2075.

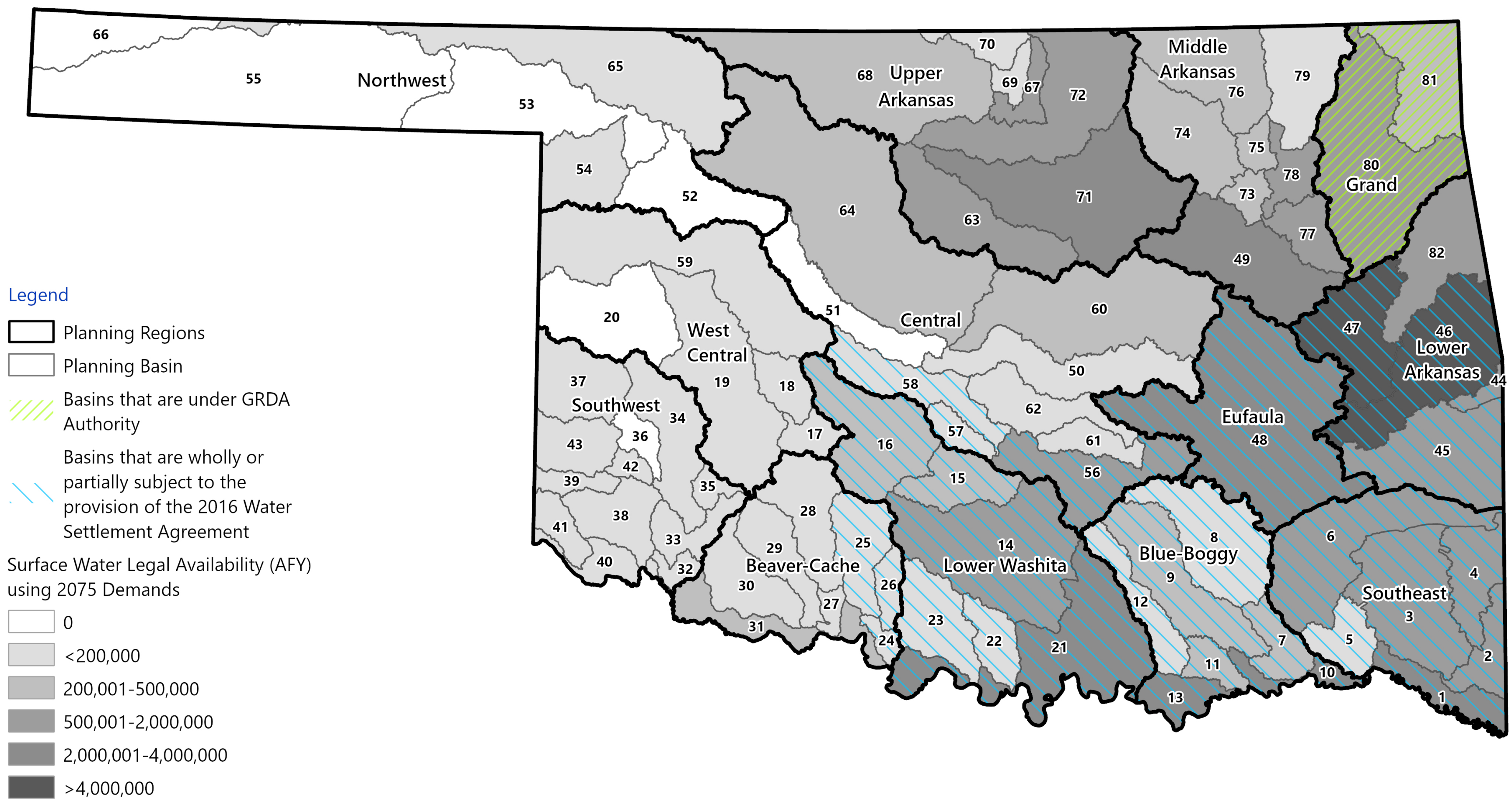


Figure 21 Projected Permit Availability of Surface Water in 2075

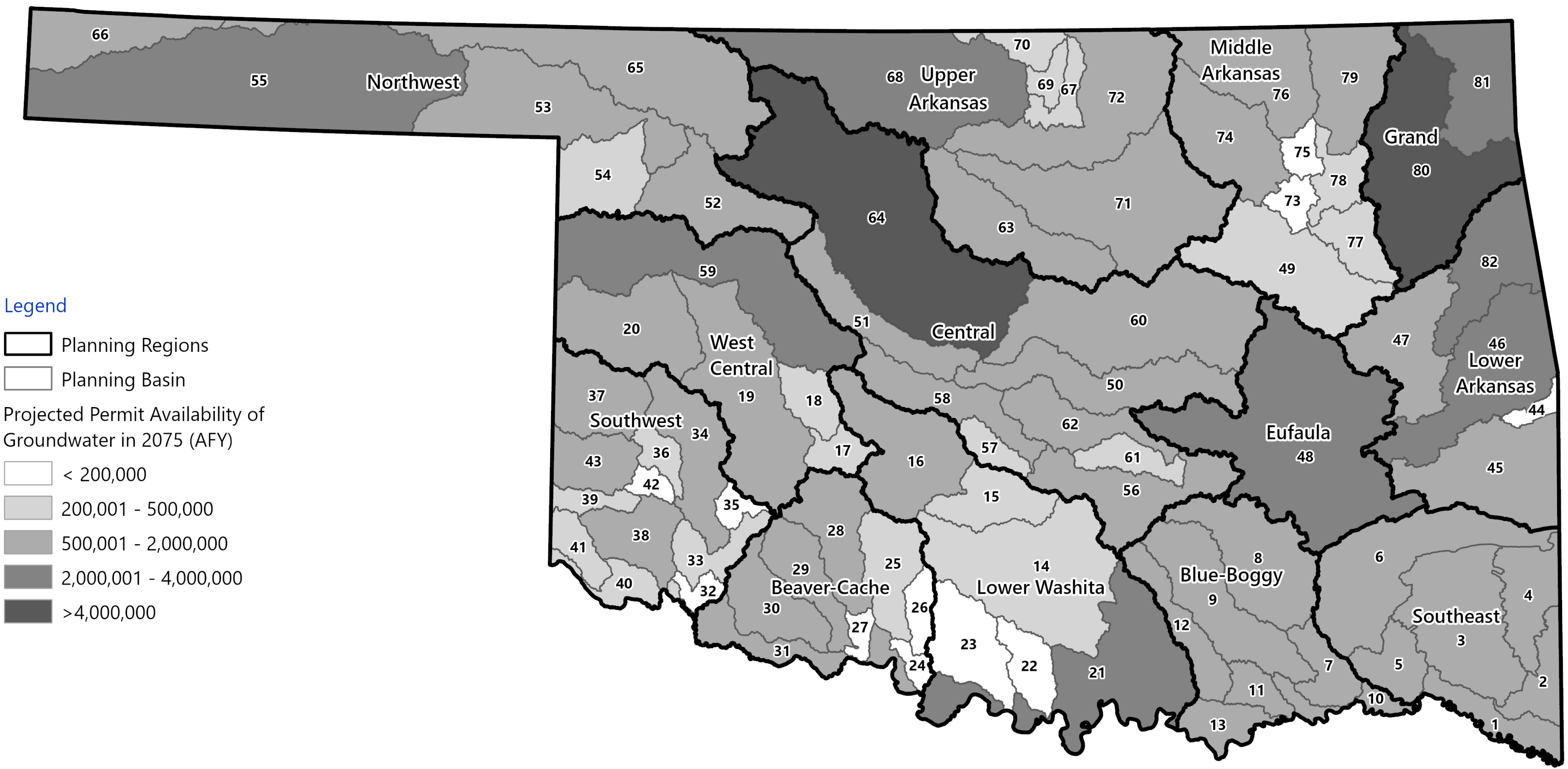


Figure 22 Projected Permit Availability of Groundwater in 2075

3.4 Water Quality

The Water Assessments, Trends, and Environmental Research (WATER) Division of the OWRB has published interactive and summary water quality data for groundwater, lakes, and streams for each of the 13 OCWP planning regions, available at OWRB's Water Planning website (https://oklahoma.gov/owrb/water-planning.html).

3.5 Water Management Strategies

The primary objective of this evaluation was to assess the efficacy of various WMS at avoiding or reducing the anticipated magnitude and/or frequency of water supply shortages forecasted in the 2025 OCWP planning basins through 2075. A WMS is defined as a water supply source or strategy that could be used to help meet future water demands. The effectiveness of a given WMS will be unique to each basin, considering the surface water, AGW, and BGW resources present in the basin, hydrologic conditions and their variability, the nature and extent of current and projected use of those resources, the water demand sectors prevalent in the basin, and several other factors. A more detailed explanation of the methodology and data sources used for these analyses is contained in the *Water Management Strategy Assessment* report and on the 2025 OCWP Effectiveness in Meeting Future Water Demands Dashboard (https://oklahoma.gov/owrb/water-planning.html).

The assessment considered seven high-level categories of WMS.

Demand Management: Demand Management refers to the potential to reduce water demands and alleviate gaps or depletions by implementing conservation or drought management measures. It is a vitally important tool that can be implemented either temporarily or permanently to decrease demand. This strategy is specific to non-agriculture uses. Examples include water utility-driven conservation programs, industrial conservation, water loss control, and drought management measures.

Agriculture Options: Agriculture Options are water conservation and efficiency tools specifically for the CI and LS sectors. Examples include irrigation system improvements, soil moisture probes, meters, electrified pumps, operational changes, growing less water intensive crops, reuse of tailwater, and using municipal recycled water for agriculture purposes.

Water Transfers: Water Transfers refer to obtaining either surface water or groundwater resources from sources or suppliers in another basin (within 100 miles) and conveying the supply to where it is needed. Examples include water purchases, imports (inter-basin transfers), water provider collaboration, interconnections, and regionalization across planning basin borders.

Increase Reliance on Surface Water: There are various means of increasing surface water resources, but the applicability is highly dependent upon location. Examples of increased reliance on surface water include constructing new reservoirs, conveying or allocating water from existing reservoirs, expanding existing reservoirs, treating brackish surface water to suitable standards, and diverting additional stream water from within the basin.

Increase Reliance on Groundwater: Site-specific information on the suitability of aquifers for supply should be considered. Examples of increased reliance on groundwater include drilling additional wells, treating brackish groundwater to suitable standards, and developing managed aquifer recharge and recovery wells from within the basin.

Stormwater Capture and Use: Stormwater Capture and Use refers to collecting and beneficially using water that does not infiltrate after a precipitation event. Large volumes of water supply can be generated in urban settings where impervious cover (pavement, buildings) is typical. Most municipalities have infrastructure in place to divert stormwater to nearby bodies of water. However, this water could potentially be stored, treated, and used for potable or non-potable uses.

Water Reuse: Water Reuse refers to reclaiming water from various sources and then treating and utilizing it again for beneficial purposes (e.g., irrigation, potable water supply, groundwater recharge, etc.). The most common source of reclaimed water is treated municipal wastewater, but industrial facilities can also recycle water. Water reuse examples include non-potable reuse (e.g., landscape irrigation, industrial uses), indirect potable reuse (discharging highly treated recycled water into an environmental buffer prior to it being recaptured for use as a water supply), direct potable reuse (purified recycled water used to directly augment potable water in a public water system).

Effectiveness scores were determined for each WMS category for each basin using a four-step process.

1. Assessment of the projected water supply shortage magnitude
2. Assignment of an intermediate effectiveness score
3. Scoring of each independent WMS by basin
4. Combined final score

The general approach was to define critical shortage thresholds, assign an effectiveness score for the subject WMS category, then identify whether WMS is effective for basins with water supply shortages greater than 20 percent of 2075 demand. The analysis was conducted at the basin level, and while the categories and scoring are generalized, specific projects for individual water users will be needed. This basin-level identification does not supersede local planning, and site-specific conditions may lead to exceptions in the viability of WMS categories.

At the conclusion of Steps 1 through 3, each WMS was scored with one of the following effectiveness narratives for its potential in addressing the projected water shortage in the subject basin. The least-viable possible score was selected. Note that more specific ratings are offered for increased reliance on groundwater and surface water, as those "traditional" sources are currently the primary source of supply for all basins. Thus, these WMS scores reflect the gap analysis for those two traditional sources.

- **Effective at Meeting Future Demands:** Strategy is expected to meet projected water needs. Demand Management and Agriculture Options may be effective in addressing 2075 shortages that are less than 20 percent of demands.
- **Potentially Effective with Local Variability:** Strategy may address some future shortages, but effectiveness varies across basin.
- **Effective When Paired with Demand Management and Agriculture Options:** Can reduce smaller shortages when combined with Demand Management and/or Agriculture Options.
- **Partially Effective – Shortages Remain:** Strategy meets part of future demand, but 2075 shortages exceed estimated water savings that Demand Management and/or Agriculture Options alone may achieve.
- **May Increase Shortages – Use with Other Strategies:** Strategy could worsen shortages and requires additional WMS to meet future needs.
- **Ineffective at Meeting Future Demands:** Strategy is unlikely to reduce projected shortages.
- **No Shortage or Needs Met by Other Strategies:** Basin has no projected 2075 shortage; or future needs can be met with existing or traditional WMS.

Figures 23 through 29 present the final scores for each WMS by basin. The need and effectiveness of WMS are unique to each basin and align with the types of water resources available and the projected challenges in meeting future water demands in the subject basin.

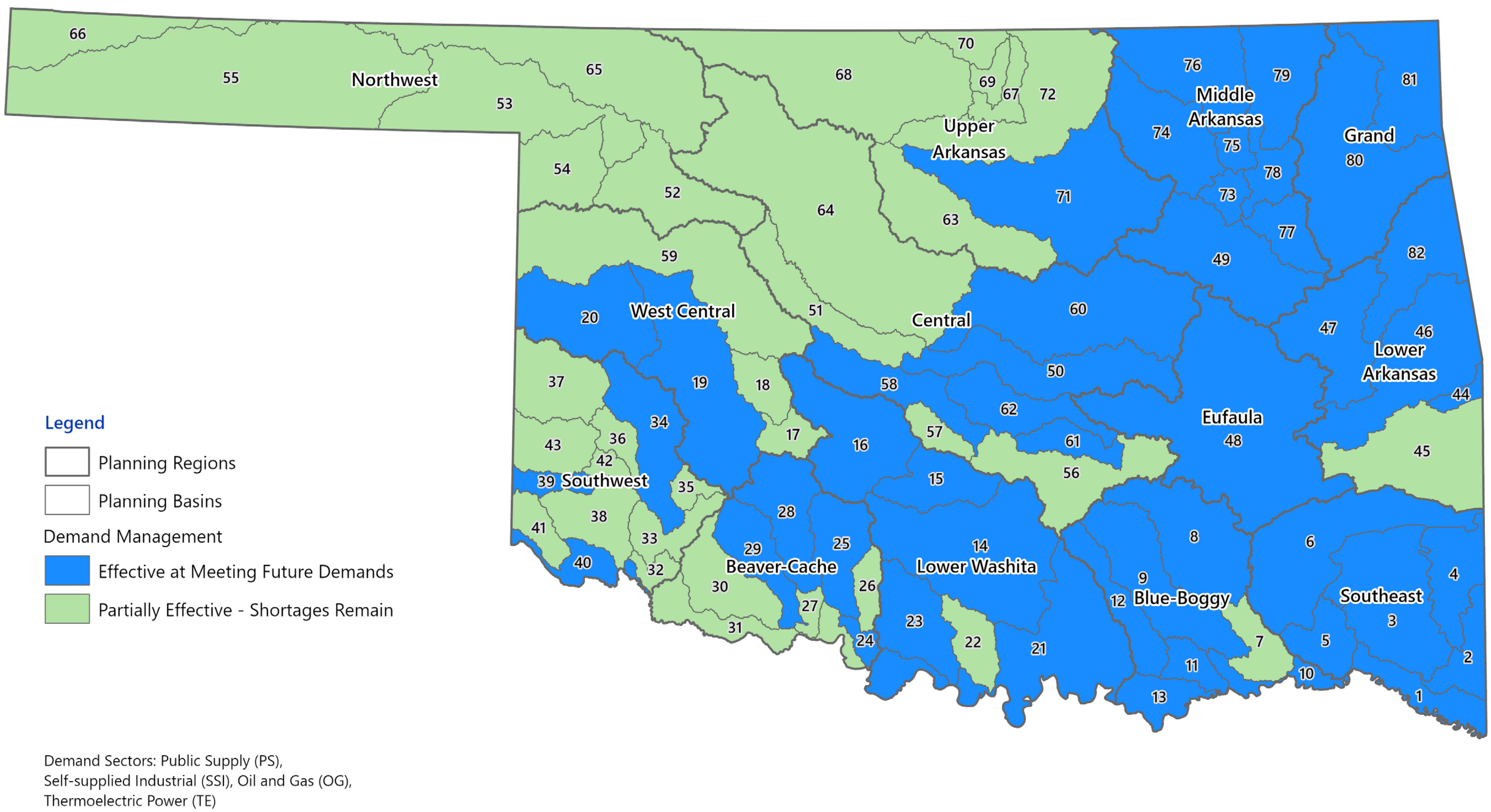


Figure 23 Demand Management Effectiveness Scores

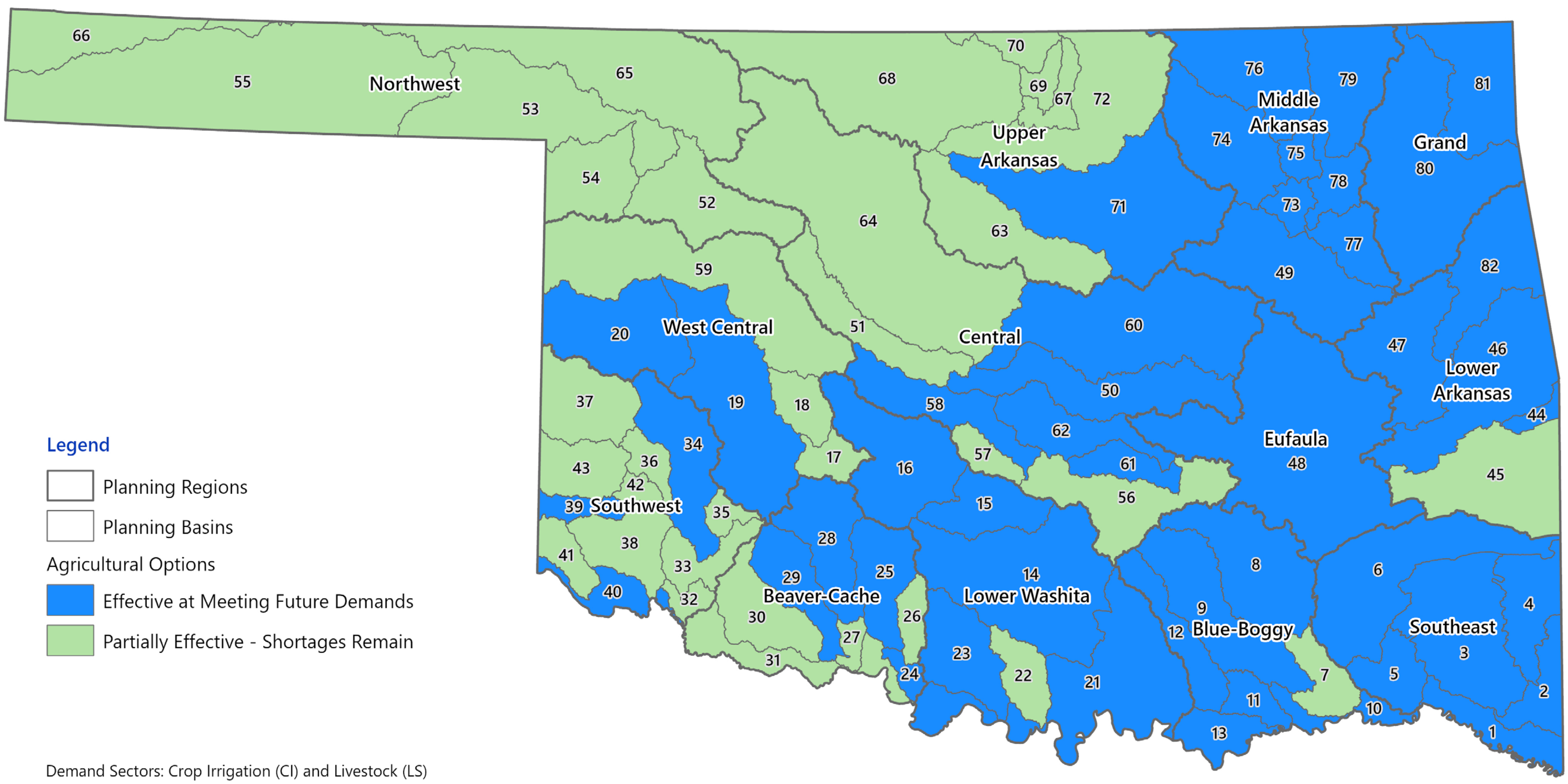
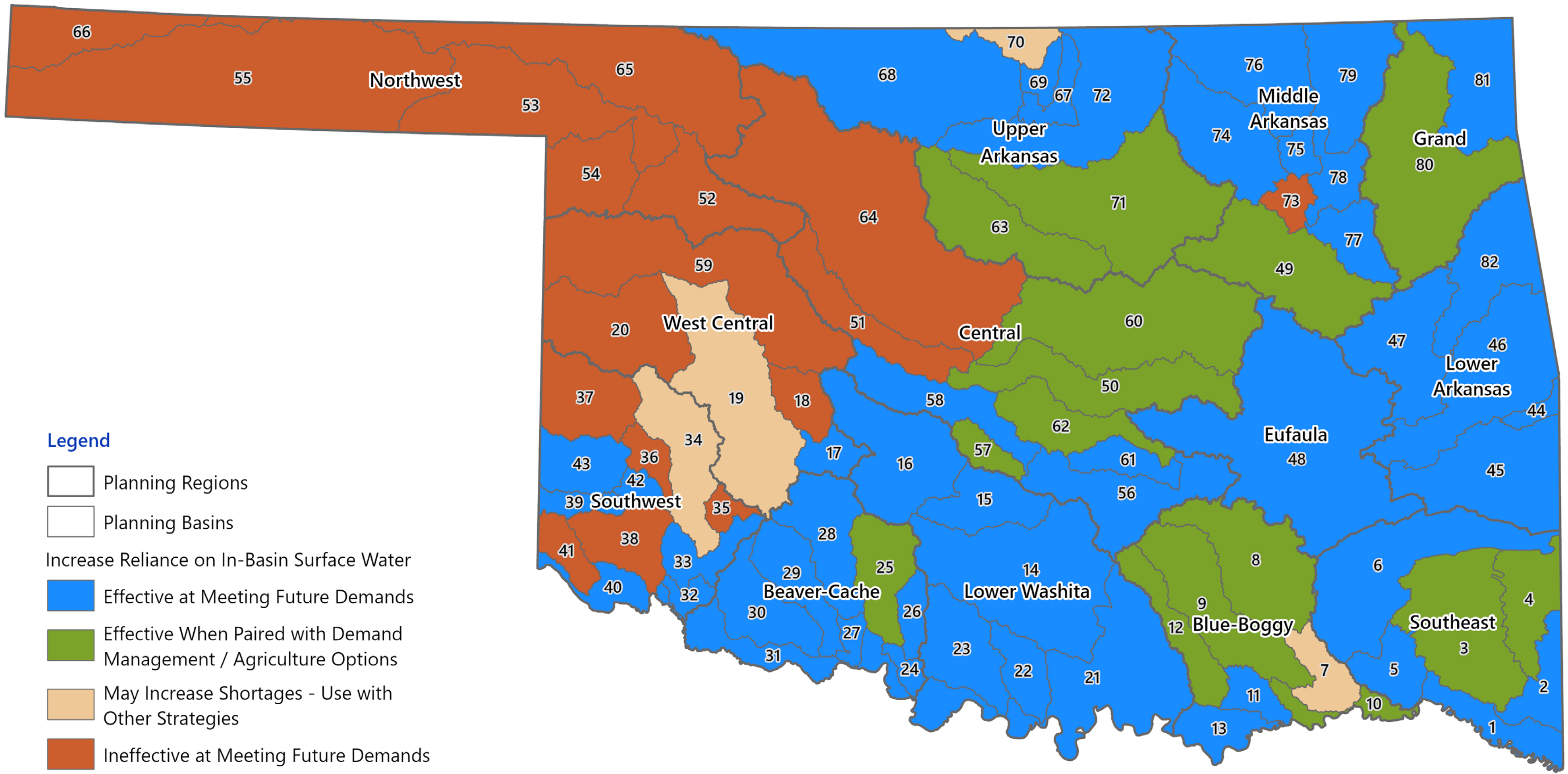


Figure 24 Agriculture Options Effectiveness Scores



Demand Sectors: Public Supply (PS), Crop Irrigation (CI), Thermoelectric Power (TE), Self-supplied Industrial (SSI), Livestock (LS), and Oil and Gas (OG)

Figure 25 Increase Reliance on In-Basin Surface Water Effectiveness Scores

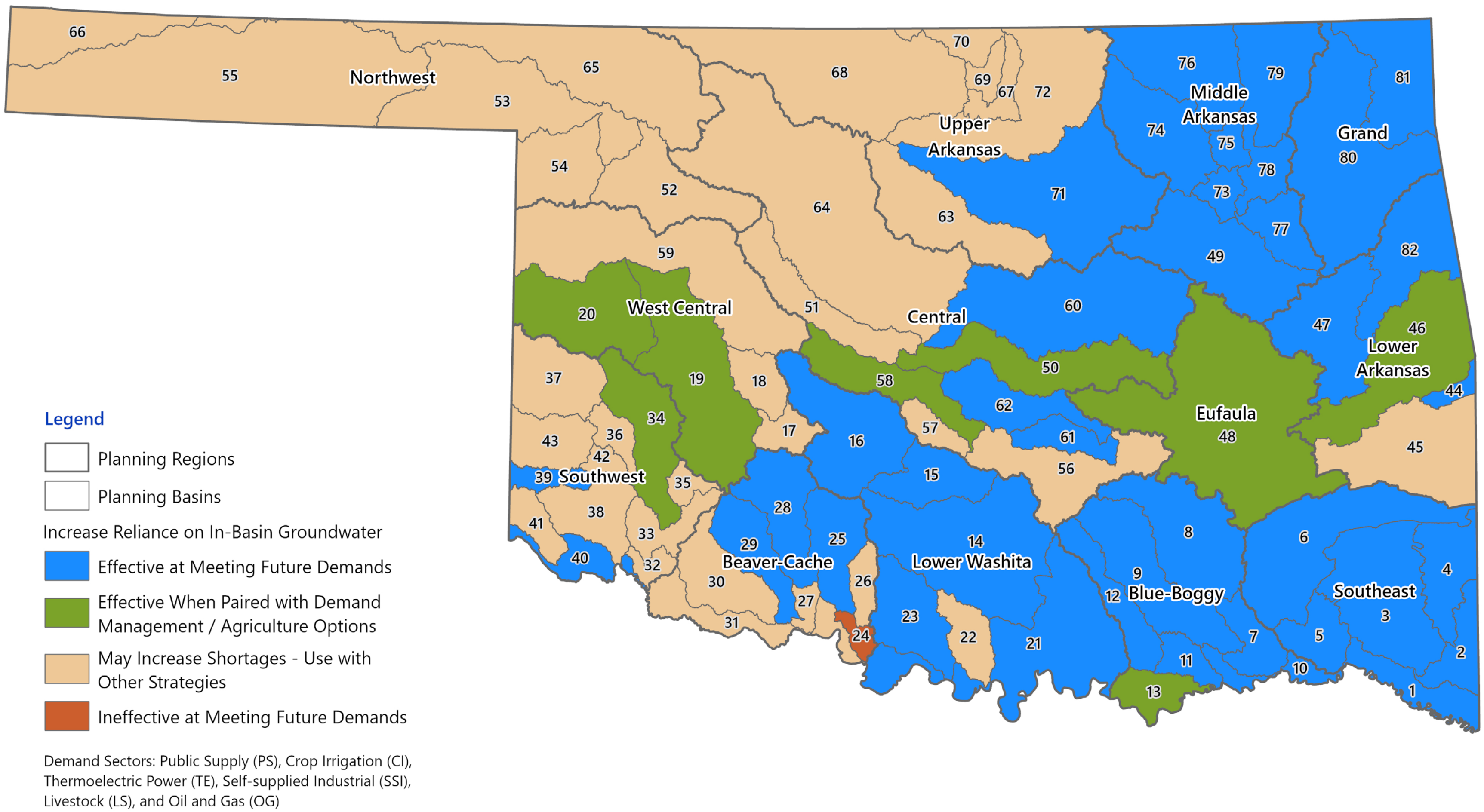
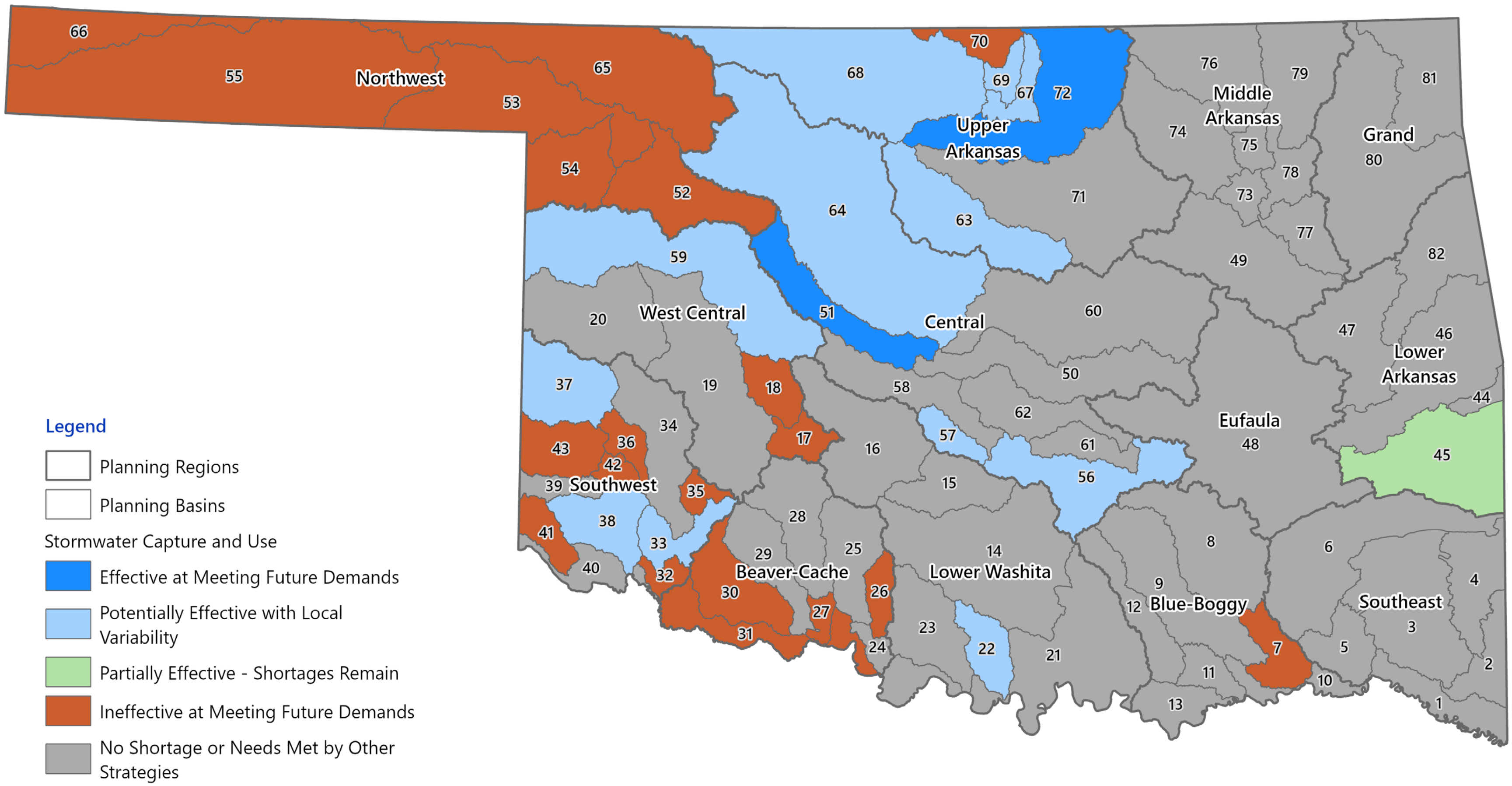


Figure 26 Increase Reliance on In-Basin Groundwater Effectiveness Scores



Demand Sectors: Public Supply (PS),
Self-supplied Industrial (SSI)

Figure 27 Stormwater Capture and Use Effectiveness Scores

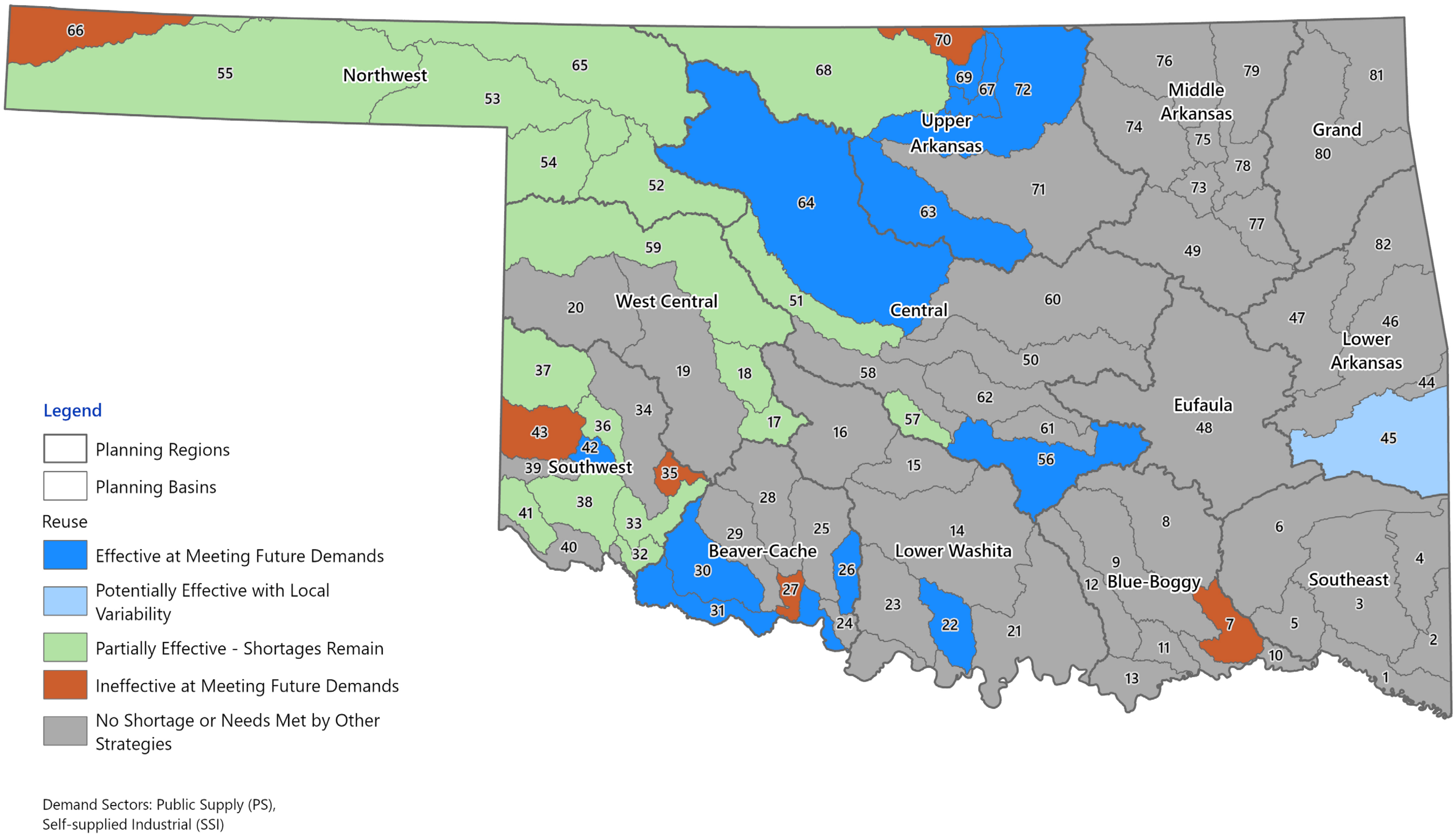
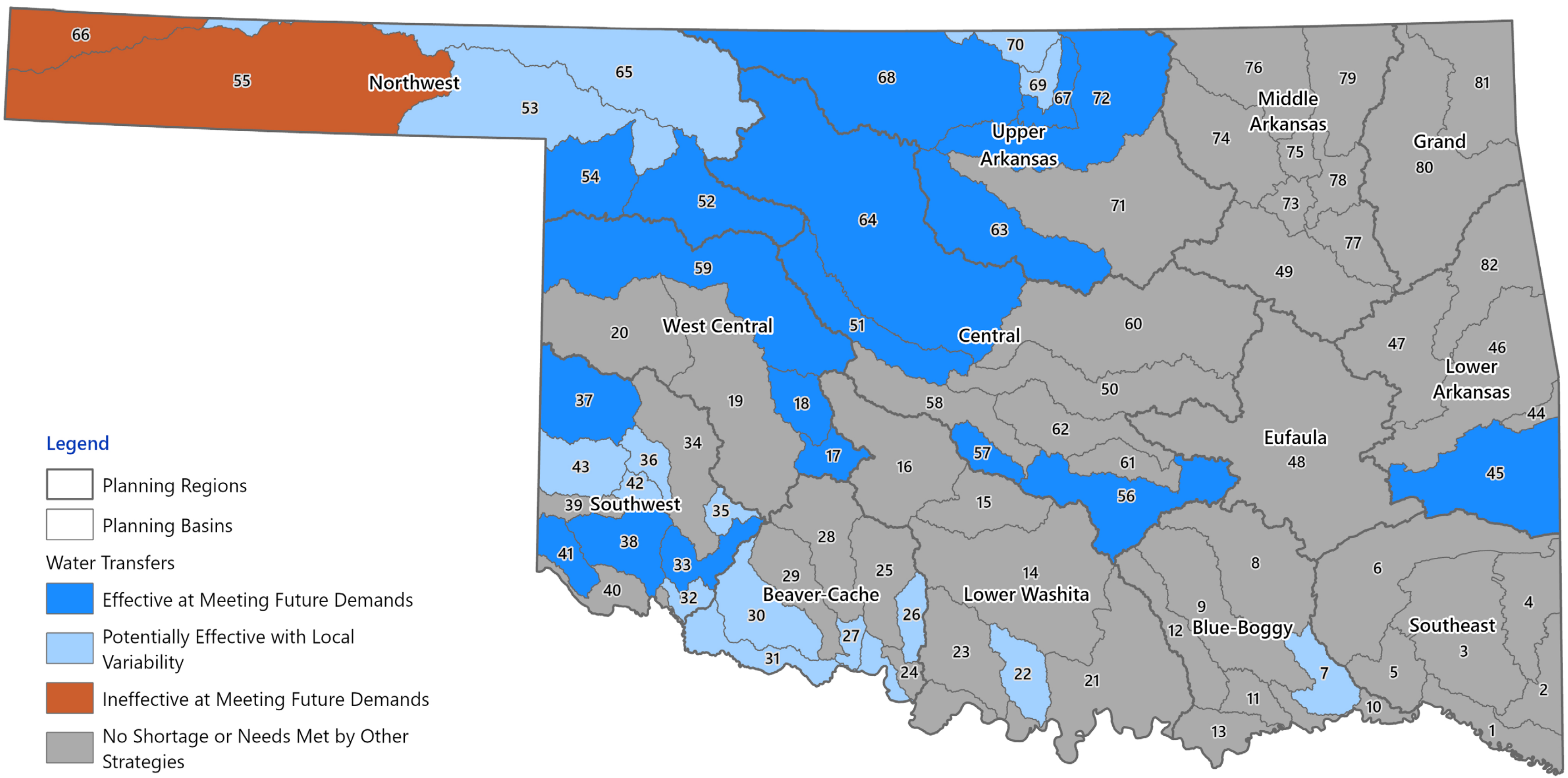


Figure 28 Water Reuse Effectiveness Scores



Demand Sectors: Public Supply (PS), Crop Irrigation (CI), Thermoelectric Power (TE), Self-supplied Industrial (SSI), Livestock (LS), and Oil and Gas (OG)

Figure 29 Water Transfers Effectiveness Scores

3.6 Reservoir Viability

The reservoir viability analysis consists of two elements: an evaluation of previously identified new reservoir sites for potential development, and identification of federal reservoirs as candidates for future storage reallocation studies.

3.6.1 Evaluation of Previously Identified Reservoir Sites

The 2025 OCWP Update reviewed the sites for new reservoirs previously prioritized in the *2012 Reservoir Viability Study* ("Category 3 and Category 4" sites as defined and identified in Guernsey 2012). While the 2025 effort did not identify new sites, evaluate existing reservoirs, or revisit earlier studies, it focused on the steps needed to advance the previously identified priority sites toward implementation. A new or updated evaluation process will still be required to determine whether additional potential reservoir locations—beyond those already identified—should be considered in the future.

Developing new reservoirs is typically a complicated and lengthy process. Additional evaluation is required to determine, at a minimum, permitting requirements, environmental impacts, property ownership (including potential land acquisition), site geology investigations, construction cost estimates, and funding options. The following new reservoir sites were identified as potential priorities for future detailed study based on 2025 OCWP updated projections of water supply shortages in the vicinity of each site.

- Weatherford Reservoir, also known as the Geary Project and Minco Project, in Custer, Canadian, and Grady counties
- Oakwood Reservoir in Dewey County
- Hydro Reservoir, also known as the Geary Project and Minco Project, in Blaine, Custer, and Dewey counties
- Forgan Reservoir in Beaver County
- Englewood Reservoir in Beaver County
- Port Lake in Washita County
- Centerpoint Lake in Pottawatomie County
- Wellston Lake in Lincoln County
- Fallis Lake in Lincoln County
- Welty Lake in Creek County
- Nuyaka Reservoir in Okmulgee County

The 2025 OCWP identified the following future steps for further evaluation of these potential reservoir sites.

- Assess permitting needs and potential challenges (including a permit application to OWRB to Construct or Modify a Dam and associated environmental and floodplain permits).
- Consider additional sites including off-channel reservoir sites.
- Consider modifying existing reservoirs to provide additional capacity.
- Update cost estimates.
- Evaluate funding options.
- Complete desktop studies including evaluation of environmental impacts, property ownership, site geology, location relative to surface water availability and water demands.
- Based on the above, complete preliminary site investigations.

3.6.2 Identification of Federal Reservoirs for Potential Future Reallocation Studies

The following federal reservoirs were identified as potential priorities for future studies to evaluate using unallocated or reallocated storage for water supply.

- Broken Bow Lake in McCurtain County
- Denison Dam, Lake Texoma, in Cooke, Marshall, and Bryan counties

Next steps may include a reallocation request, an evaluation of permitting requirements, and assessing water quality impacts.

3.7 Infrastructure Needs

3.7.1 Near-Term Infrastructure Needs

OWRB compiled near-term wastewater, water supply, 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 state flood plan projects in the database were identified by public water suppliers.

Project information was gathered from public water suppliers and utilities, priority project lists from the Oklahoma Department of Environmental Quality, Intended Use Plan from OWRB, unfunded American Rescue Plan Act projects, responses to the US Environmental Protection Agency's Drinking Water Infrastructure Needs Survey and Clean Watersheds Needs Survey, and other sources. The survey compiled responses received between 2020 and 2024. Nearly 400 unique water suppliers are reflected in the survey, encompassing water, wastewater, and flood plan projects. Table 6 summarizes the more than $24 billion of identified water, wastewater, and stormwater/floodwater projects by OCWP planning region.

Table 6 Near-Term Infrastructure Needs(1)(2)

Region	Drinking Water Project Needs Survey Near-Term Cost	Wastewater Project Needs Survey Near-Term Cost	State Flood Plan Project Needs Survey Near-Term Cost
Beaver-Cache	$677	$691	$0
Blue-Boggy	$436	$392	$0
Central	$5,281	$1,100	$152
Eufaula	$122	$235	$33
Grand	$295	$231	$0
Lower Arkansas	$410	$419	$5
Lower Washita	$870	$415	$24
Middle Arkansas	$4,070	$1,400	$463
Northwest	$362	$302	$0
Southeast	$388	$383	$0
Southwest	$645	$593	$13

Region	Drinking Water Project Needs Survey Near-Term Cost	Wastewater Project Needs Survey Near-Term Cost	State Flood Plan Project Needs Survey Near-Term Cost
Upper Arkansas	$2,637	$386	$19
West Central	$393	$273	$0.4
TOTAL	**$16,585**	**$6,819**	**$709**

Notes:
(1) Accessed August 12, 2025, OWRB Activities and Infrastructure Needs by Legislative District.
(2) Costs in millions of 2024 dollars.

3.7.2 Drinking Water Costs

For drinking water, costs were projected for the next 20 years for public suppliers. These projected costs represent the nearly 900 public water suppliers in Oklahoma. While it is difficult to anticipate all the changes that may occur within this extended timeframe, it is beneficial to evaluate an order-of-magnitude estimate as it allows for better understanding of the potential support and funding assistance required to meet the drinking water needs. Estimated costs include rehabilitation costs for existing water infrastructure and new water infrastructure for growth and regulatory compliance. Construction costs, which include engineering and design, purchase of materials and equipment, labor, and final inspection were considered in this evaluation. Operation and maintenance costs were not considered. Further details on the methodology used to develop these costs are outlined in Appendix E. 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.
- Large systems serve more than 100,000 people.

Figure 30 provides a cost breakdown by system size.

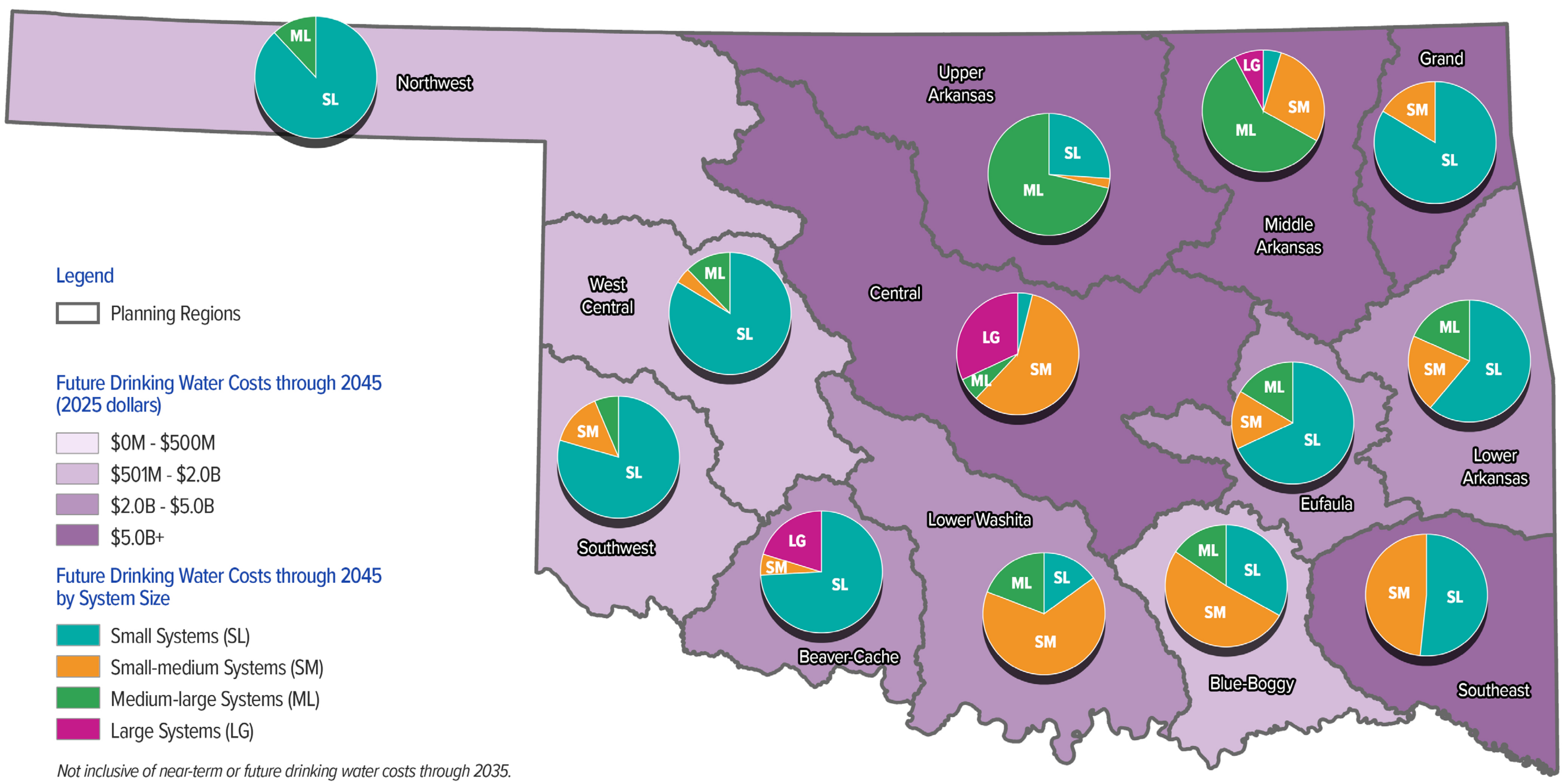


Figure 30 Projected Regional Drinking Water Infrastructure Costs through 2045 by System Size

A similar breakdown by project type is captured in Table 7 using the following project type categories.

- **Distribution and Transmission Category:** Includes the cost to transport all raw and finished water.
- **Source Category:** Includes individual project costs for dams and reservoirs if they are provided by one of the sampled systems.
- **Storage Category:** Includes all finished water storage and onsite raw water storage.
- **Treatment Category:** Includes all infrastructure to treat raw surface water or groundwater.

Table 7 Projected Regional Drinking Water Infrastructure Costs(1) through 2045 by Project Type

OCWP Region	Project Type	2026-2035(2)	2036-2045(3)	Total
Beaver-Cache	Distribution and Transmission	$1,965	$2,167	$4,132
	Source	$40	$0	$40
	Storage	$8	$8	$15
	Treatment	$260	$16	$276
	Beaver-Cache Subtotal	**$2,273**	**$2,191**	**$4,463**
Blue-Boggy	Distribution and Transmission	$1,348	$804	$2,152
	Source	$-	$7	$7
	Storage	$16	$3	$18
	Treatment	$395	$46	$441
	Blue-Boggy Subtotal	**$1,758**	**$861**	**$2,619**
Central	Distribution and Transmission	$7,496	$72,210	$79,706
	Source	$372	$429	$801
	Storage	$112	$73	$185
	Treatment	$1,714	$552	$2,266
	Central Subtotal	**$9,694**	**$73,263**	**$82,957**
Eufaula	Distribution and Transmission	$1,222	$2,150	$3,372
	Source	$73	$-	$73
	Storage	$6	$32	$39
	Treatment	$133	$338	$471
	Eufaula Subtotal	**$1,435**	**$2,520**	**$3,955**
Grand	Distribution and Transmission	$1,006	$8,450	$9,456
	Source	$171	$-	$171
	Storage	$637	$-	$637
	Treatment	$40	$233	$273
	Grand Subtotal	**$1,853**	**$8,683**	**$10,535**
Lower Arkansas	Distribution and Transmission	$669	$3,504	$4,173
	Source	$-	$22	$22
	Storage	$-	$20	$20
	Treatment	$-	$399	$399
	Lower Arkansas Subtotal	**$669**	**$3,944**	**$4,613**

OCWP Region	Project Type	2026-2035(2)	2036-2045(3)	Total
Lower Washita	Distribution and Transmission	$2,057	$3,244	$5,301
	Source	$79	$0	$79
	Storage	$120	$10	$130
	Treatment	$245	$280	$525
	Lower Washita Subtotal	**$2,501**	**$3,534**	**$6,035**
Middle Arkansas	Distribution and Transmission	$3,549	$5,463	$9,012
	Source	$1,097	$61	$1,159
	Storage	$105	$45	$150
	Treatment	$609	$742	$1,350
	Middle Arkansas Subtotal	**$5,360**	**$6,311**	**$11,671**
Northwest	Distribution and Transmission	$1,145	$735	$1,881
	Source	$42	$-	$42
	Storage	$-	$6	$6
	Treatment	$123	$-	$123
	Northwest Subtotal	**$1,311**	**$741**	**$2,052**
Southeast	Distribution and Transmission	$3,692	$7,413	$11,105
	Source	$-	$-	$-
	Storage	$222	$3	$225
	Treatment	$221	$28	$249
	Southeast Subtotal	**$4,136**	**$7,444**	**$11,579**
Southwest	Distribution and Transmission	$1,626	$1,012	$2,637
	Source	$20	$39	$59
	Storage	$6	$4	$10
	Treatment	$170	$3	$172
	Southwest Subtotal	**$1,822**	**$1,057**	**$2,879**
Upper Arkansas	Distribution and Transmission	$1,350	$5,535	$6,886
	Source	$1	$-	$1
	Storage	$99	$71	$169
	Treatment	$782	$-	$782
	Upper Arkansas Subtotal	**$2,232**	**$5,606**	**$7,838**
West Central	Distribution and Transmission	$743	$1,465	$2,209
	Source	$0	$1	$1
	Storage	$9	$2	$10
	Treatment	$229	$4	$233
	West Central Subtotal	**$981**	**$1,471**	**$2,452**

Notes:
(1) All costs are presented in millions of 2025 dollars.
(2) Not inclusive of near-term costs.
(3) Not inclusive of near-term or future drinking water costs through 2035.

SECTION 4 SUMMARY OF 2025 OCWP RESOURCES

One of the fundamental goals for the 2025 OCWP was to provide accessible deliverables. With this in mind, the OCWP deliverables can be accessed in a variety of formats and detail levels. Figure 31 illustrates the types of OCWP deliverables available with each described below. All deliverables will be available on OWRB's water planning website (https://oklahoma.gov/owrb/water-planning.html).

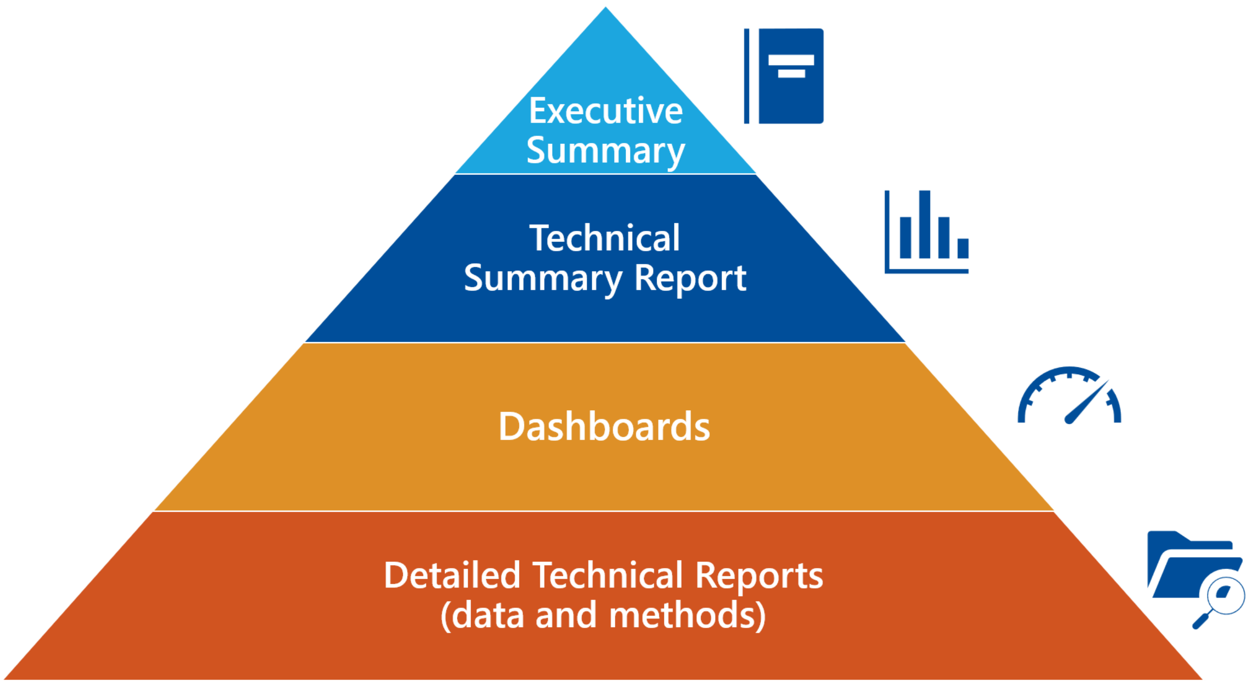


Figure 31 2025 OCWP Types of Deliverables

Executive Summary: This infographic style report presents the statewide policy and recommendations that came out of years of extensive data collection, technical evaluations, and targeted stakeholder engagement including input from government officials, local communities, water utilities, industry representatives, state and federal agencies, tribal nations, and concerned citizens. Policies and recommendations can be found within the report.

Technical Summary Report: This report provides a high-level summary of the many statewide water assessment technical tasks. It provides more detail than the 2025 OCWP Executive Summary and focuses on statewide and region findings while capturing key assumptions and brief methodology descriptions.

- Region Fact Sheets: These fact sheets summarize technical study findings and stakeholder input on policy needs on a regional level. Each Region Fact Sheet includes information on a region's population, water demand, physical water shortages, legal water availability, surface and groundwater resources, water infrastructure needs, water quality evaluations, and region-specific recommendations.
- Basin Fact Sheets: These fact sheets summarize technical study findings on a basin level. Each Basin Fact Sheet provides projections through 2075 regarding the basin's population, water demand, physical water shortages, legal water availability, and a summary of the effectiveness of a range of WMS.

Dashboards: The following dashboards were developed to allow users to explore OCWP data at the statewide, region, and basin levels.

- Water Demand: This dashboard includes population projections and baseline water demand projections. The data can be viewed based on water source (surface water, AGW, and BGW) and demand sector (O&G, PS, SSD, CI, TE, LS, and SSI) for five planning periods beginning with 2020 through 2075.
- Water Supply: This dashboard presents baseline physical water supply (surface water, AGW, and BGW) and legal water supply (surface water and groundwater). It also includes information on interbasin water transfers that are factored into physical and legal supply analysis.
- Water Shortages: This dashboard utilizes baseline demands and physical supply to estimate future planning year shortages at the OCWP planning basin level. Information on this dashboard is broken down by supply source (surface water, AGW, and BGW) for five planning periods from 2020 through 2075.
- Effectiveness in Meeting Future Water Demands: This dashboard presents the results of the water management strategy evaluation, which assessed the efficacy of various strategies at mitigating anticipated baseline water demand shortages through 2075. Results are presented at the basin level for each of the seven WMS categories.
- Drinking Water Infrastructure Needs: This dashboard presents the near-term drinking water project needs collected via a survey from 2020 to 2024, and future drinking water costs projected through 2035 and 2045. Results are presented at the regional level for various infrastructure types and drinking water suppliers.
- Water Quality: These dashboards present overall regional water quality summary, detailed groundwater, lakes, and streams data, as well as water quality related recommendations.

Detailed Technical Reports: These reports are the most detailed description of the OCWP technical analysis. The following detailed technical reports are available.

- Water Demand Forecast
- Physical Water Supply Availability
- Legal Availability Analysis
- Water Management Strategy Assessment
- Water Quality Assessment

SECTION 5 REFERENCES

Carollo. 2023. 2025 OCWP Oklahoma Water Reuse Action Plan Final Report, https://oklahoma.gov/owrb/water-planning.html.

Carollo. 2026. 2025 OCWP Legal Availability Analysis Final Report, https://oklahoma.gov/owrb/water-planning.html.

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Carollo. 2026. 2025 OCWP Stakeholder Engagement Final Report, https://oklahoma.gov/owrb/water-planning.html.

Carollo. 2026. 2025 OCWP Water Demand Forecast Final Report, https://oklahoma.gov/owrb/water-planning.html.

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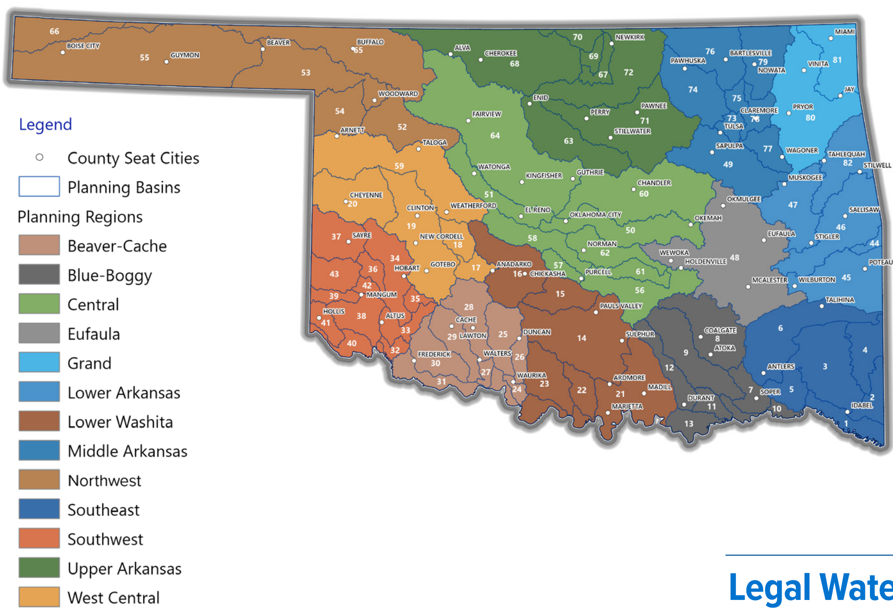
APPENDIX A REGION AND BASIN FACT SHEETS

Guide to Region and Basin Fact Sheets

The OCWP evaluates water resources in each of the 82 Basins that are aggregated into 13 Regions, recognizing the diversity of water supply issues and solutions across the state. A fact sheet has been developed for each region and each basin. These fact sheets summarize technical study findings and stakeholder input on policy needs. Each **Region Fact Sheet** includes information on a region's population, water demand, physical water shortages, legal water availability, surface and groundwater resources, water infrastructure needs, water quality evaluations, and region-specific recommendations. The **Basin Fact Sheet** provides projections through 2075 regarding the basin's population, water demand, physical water shortages, legal water availability, and a summary of the effectiveness of a range of water management strategies. These fact sheets provide a detailed picture of the water future in each basin and each region.

Statewide Map



Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

To quantify physical surface water gaps and groundwater storage depletions through 2075, use of existing surface water and groundwater supplies in each basin was assumed to continue in current proportions, while out-of-basin supplies will be used up to currently-permitted amounts. The maximum magnitude of shortages based on the hydrologic record is projected for all planning years through 2075, and the frequency (probability) of a shortage occurring is estimated for 2075 demand conditions. Frequent shortages with large magnitudes may be indicative of the greatest need to implement alternative water management strategies.

Population

How is the population expected to change in the future?

Population projections are based on demographic data from the 2020 United States Census and population trends developed by the Oklahoma Department of Commerce.

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

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 demand often correspond to changes in population, agriculture, industry, or other economic activity. Demands were projected through 2075 for seven distinct consumptive water demand sectors: public supply (PS), self-supplied industrial (SSI), oil & gas (OG), thermoelectric power (TE), crop irrigation (CI), livestock, and self-supplied domestic (SSD).

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Legal Water Availability WM WSS

Will there be water available for permitting after meeting 2075 demands?

The surface water permit availability analysis followed OWRB's general methodology for the evaluation of surface water available for appropriation that is applied whenever a stream water permit application is reviewed. Interstate compact inflows were included for 10 basins on Oklahoma's borders which receive water from neighboring states and compact-required outflows from 17 basins along the Red River or Arkansas River which are subject to interstate compact requirements for those rivers. In-basin reserves were included in the total set-asides per basin (not just for inter-basin transfers). Permitting of surface water in portions or all of the Southeast, Blue-Boggy, Lower Washita, Beaver-Cache, Central, Eufaula, and Lower Arkansas Regions is subject to the provisions of the 2016 Water Settlement Agreement. Surface water in the Grand Region is administered by the Grand River Dam Authority.

The owner of the land owns the groundwater beneath the surface and may develop the water for beneficial use subject to reasonable regulation by the State. Analysis of legal groundwater availability utilizes estimates of the maximum allowable permitted amount of groundwater along with the total amount currently permitted (as regular, prior right, and temporary permits) and the remaining amount available for permitting after meeting projected demands in 2075.

OKLAHOMA Water Resources Board

Guide to Region and Basin Fact Sheets

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Reliable water supplies must be physically available (wet water available at the time and place it is 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. Water management strategies were identified that could mitigate the potential for shortages or otherwise be implemented to manage water resources.

Water Management Strategy Definitions

- **Demand Management** refers to the potential to reduce water demands and alleviate gaps or depletions by implementing conservation or drought management measures. It is a vitally important tool that can be implemented either temporarily or permanently to decrease demand. This strategy is specific to non-agriculture uses. Examples include water utility-driven conservation programs, industrial conservation, water loss control, and drought management measures.
- **Agriculture Options** are water conservation and efficiency tools specifically for the irrigated cropland and livestock production sectors. Examples include irrigation system improvements, soil moisture probes, meters, electrified pumps, operational changes, growing less water intensive crops, reuse of tailwater, and using municipal recycled water for agriculture purposes.
- **Increased Reliance on In-basin Surface water** is any water resource found above ground, such as a lake, river, reservoir, or stream. There are various means of increasing surface water resources, but the applicability is highly dependent upon location. Examples of increased reliance on surface water include constructing new reservoirs, conveying or allocating water from existing reservoirs, expanding existing reservoirs, treating brackish surface water to suitable standards, and diverting additional stream water.
- **Increase Reliance on In-basin Groundwater** refers to any water resource that is found underground in saturated zones. Site-specific information on the suitability of aquifers for supply should be considered. Examples of increased reliance on groundwater include drilling additional wells, treating brackish groundwater to suitable standards, and developing managed aquifer recharge and recovery wells.
- **Stormwater Capture and Use** refers to collecting and beneficially using water that does not infiltrate after a precipitation event. Large volumes can be generated in urban settings where impervious cover is typical. Most municipalities have infrastructure in place to divert stormwater to nearby bodies of water. However, this water could potentially be stored, treated, and used for potable or non-potable uses.
- **Water Reuse** refers to the reclamation of water from various sources and then treated and utilized again for beneficial purposes (e.g., irrigation, potable water supply, groundwater recharge, etc.). Typically, the most common source of reclaimed water is treated municipal wastewater. Examples include indirect potable reuse, non-potable reuse, direct potable reuse.
- **Water Transfers** describe the strategy of obtaining either surface or groundwater resources from an outsourced local supplier or region and conveying the supply to where it is needed. Examples include water purchases, out-of-basin transfers, water provider collaboration, interconnections, and regionalization.

Water Management Strategy Ratings

Effective at Meeting Future Demands:

Strategy is expected to meet projected water needs. Demand Management and Agriculture Options may be effective in addressing 2075 shortages that are less than 20 percent of demands.

Potentially Effective with Local Variability:

Strategy may address some future shortages, but effectiveness varies across basin.

Effective When Paired with Demand Management / Agriculture Options:

Can reduce smaller shortages when combined with Demand Management and/or Agriculture Options.

Partially Effective – Shortages Remain:

Strategy meets part of future demand, but 2075 shortages exceed estimated water savings that Demand Management and/or Agriculture Options alone may achieve.

May Increase Shortages – Use with Other Strategies:

Strategy could worsen shortages and requires additional WMS to meet future needs.

Ineffective at Meeting Future Demands:

Strategy is unlikely to reduce projected shortages.

No Shortage or Needs Met by Other Strategies:

Basin has no projected 2075 shortage; or future needs can be met with existing or traditional WMS.

OCWP Statewide Recommendations are designed to address current and anticipated water supply challenges and 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

Learn more about these recommendations by reading the 2025 OCWP Executive Summary, found on the OWRB Planning Page: oklahoma.gov/owrb/water-planning.html

Southeast Planning Region

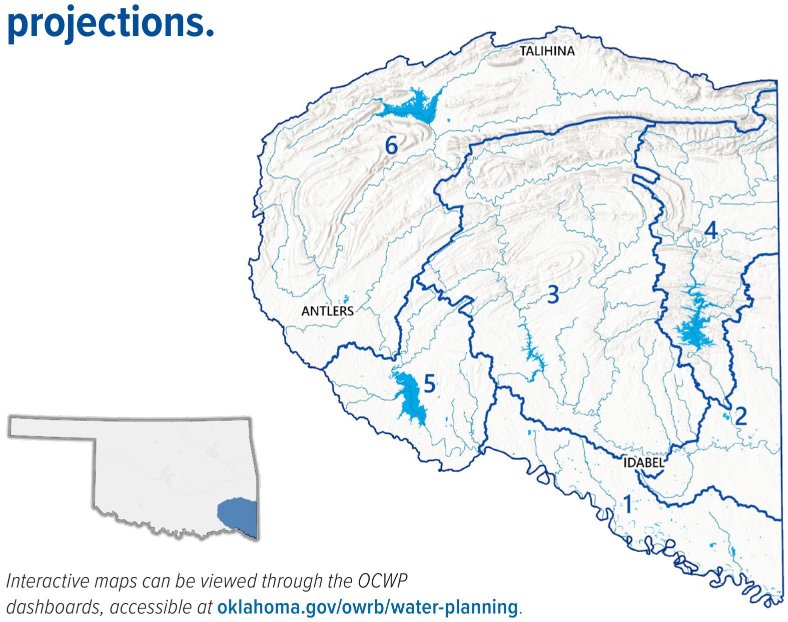
Summary

- Southeast Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 16,869 acre-feet per year (28%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Southeast Region basins. Permitting of surface water in portions or all of each of the Southeast Region basins is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Southeast Region stakeholders expressed the need to consider instream flow (nonconsumptive use), additional demand/supply studies for rapid growth areas, conjunctive management, interstate compacts on groundwater, provide education on land management, soil health, best management practices, and the value of water, and metering all water uses.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Southeast Region represents 2% of the state's 2075 projected population and 4% 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 Southeast 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). WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors) in some basins. WSS WDI

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

OKLAHOMA Water Resources Board

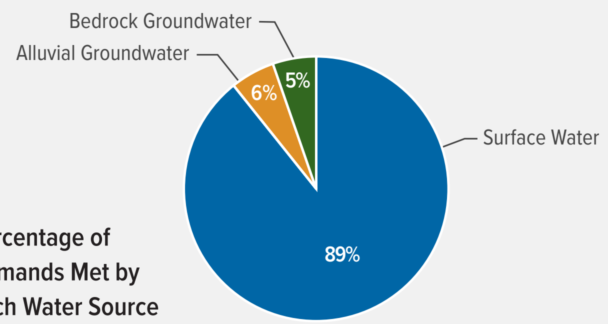
Population

2020	2030	2035	2045	2060	2075
67,427	71,449	71,346	72,079	74,404	75,977

Water Demand Projections

Water demands (withdrawals) are projected to increase by 28% between 2020 and 2075.

The Southeast Region's largest demand sector is Self-supplied Industrial, representing 66% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 15% 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 Southeast Region, Self-supplied Domestic, Self-supplied Industrial, Crop Irrigation, Public Supply, and Thermoelectric Power demands will increase while Livestock demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	578	626	630	646	682	711
Self-supplied Industrial	40,273	39,258	40,410	42,933	47,466	51,521
Crop Irrigation	4,095	6,248	6,285	6,359	6,472	6,577
Livestock	3,711	3,769	3,809	3,768	3,691	3,637
Oil & Gas	282	282	282	282	282	282
Public Supply	9,171	10,059	10,197	10,586	11,359	12,002
Thermoelectric Power	3,159	3,211	3,350	2,642	2,967	3,410
Total	**61,270**	**63,453**	**64,963**	**67,216**	**72,919**	**78,139**

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

Physical Water Shortages WIW 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 Southeast 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
1	-	11	520	1,644	2,656	13%
2	-	5	25	48	64	11%
3	70	92	145	193	333	13%
4	22	24	26	43	64	8%
5	-	-	-	-	-	0%
6	4	5	5	5	5	11%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
1	-	-	-	-	-	0%
2	-	-	-	1	1	6%
3	-	-	-	-	-	No AGW Demand
4	-	-	-	-	-	No AGW Demand
5	-	-	-	-	-	0%
6	-	-	-	-	-	No AGW Demand

AFY = acre-feet per year

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
1	14	23	24	26	27
2	1	1	1	1	1
3	1	1	1	1	2
4	88	92	100	114	127
5	-	-	-	-	-
6	2	1	1	1	-

AFY = acre-feet per year

Mountain Fork of the Little River

Legal Water Availability WM WSS

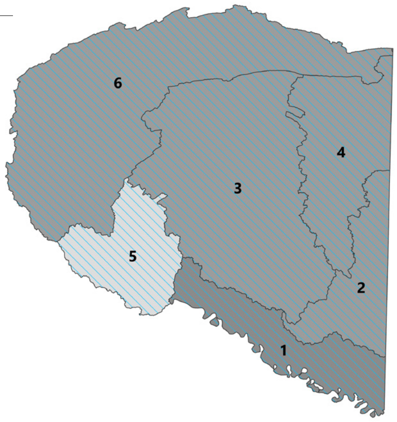
Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Southeast Region. Permitting of surface water in portions or all of Southeast Region basins is subject to provisions of the 2016 Water Settlement Agreement.

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

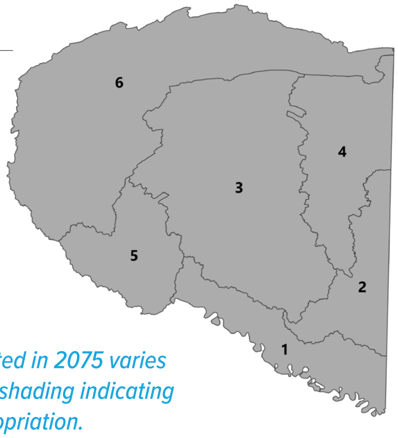


Groundwater Legal Availability

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)
Pine Creek Lake	60,475
Broken Bow Lake	47,606
Hugo Lake	0
Carl Albert Lake	---
Sardis Lake	34,457

--- 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)
Antlers	Bedrock	Major	2.1
Broken Bow	Bedrock	Minor	temporary 2.0
Haworth Isolated Terrace	Alluvial	Minor	1.0
Holly Creek	Bedrock	Minor	temporary 2.0
Kiamichi	Bedrock	Minor	temporary 2.0
Little River	Alluvial	Minor	1.0
Pennsylvanian	Bedrock	Minor	temporary 2.0
Pine Mountain	Bedrock	Minor	temporary 2.0
Potato Hills	Bedrock	Minor	temporary 2.0
Red River Reach 4	Alluvium and Terrace	Major	temporary 2.0
Woodbine	Bedrock	Minor	temporary 2.0

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: Groundwater from the major aquifers of the Antlers and Red River experiences elevated concentrations of nitrate, total dissolved solids, and salinity.

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. Lakes in this area are classified as eutrophic or hypereutrophic, indicating high productivity and potential water quality concerns. These conditions contribute to a heightened risk of harmful algal blooms (HABs), increased water treatment costs, taste and odor issues, and diminished recreational value—impacting both recreational and water supply beneficial uses.

Streams: Rivers and streams are impacted by increased development and flow alteration, which leads to sedimentation, increased runoff, and increased water demand. Streamflow and tourism are intrinsically important.

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)
$388M	**$383M**	**$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	$13M	$780M	$3.85B
Small-Medium	$87M	$3.36B	$3.59B
Medium-Large	N/A	N/A	N/A
Large	N/A	N/A	N/A
Non-Public suppliers	$288M	N/A	N/A
Total	**$388M**	**$4.14B**	**$7.44B**

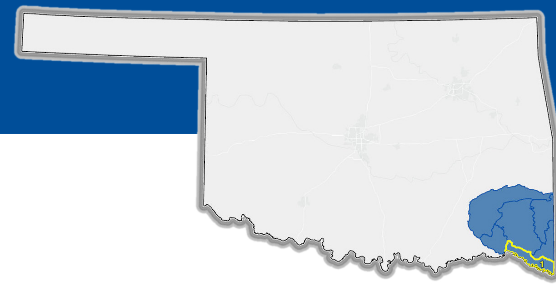
M = million; B = billion; N/A = not applicable

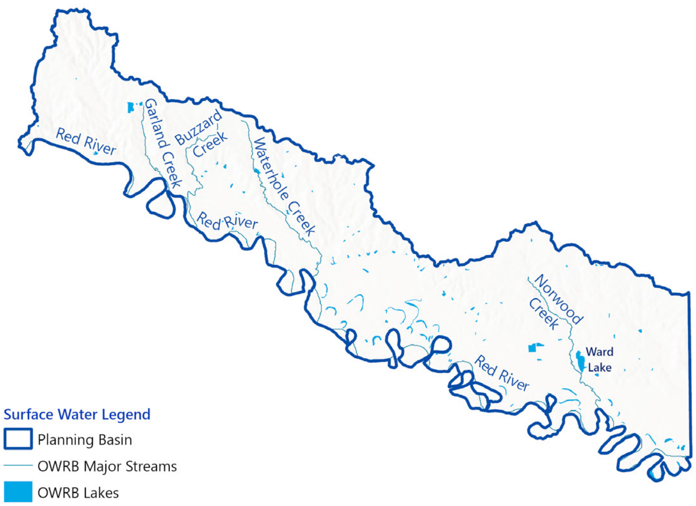
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

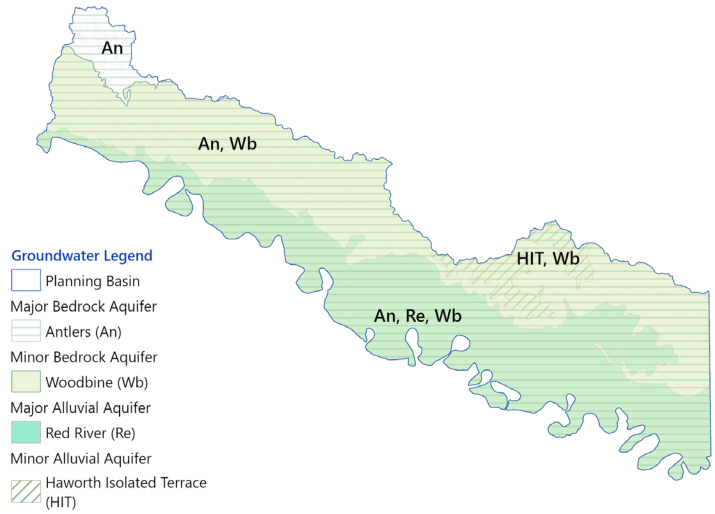
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 1

Red River Mainstem (to Kiamichi River) / Southeast Region







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

SUMMARY

- Basin 1 - Red River Mainstem (To Kiamichi River) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 16,328 acre-feet per year (35%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 1 as early as 2035 and will continue through 2075.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 1 as early as 2030 and will continue through 2075.
- Basin 1 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 1 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

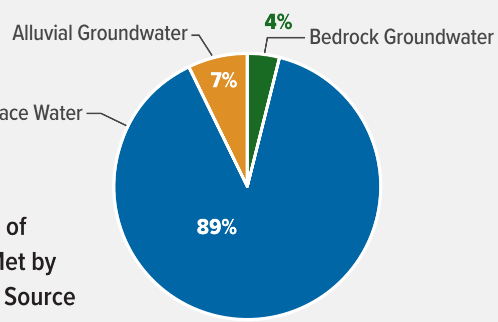
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
6,742	7,611	7,796	8,221	9,009	9,701

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 1 accounts for approximately 82% of the overall water demands of the Southeast Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	36	39	40	41	44	46
Self-supplied Industrial	40,273	39,258	40,410	42,933	47,466	51,521
Crop Irrigation	3,337	5,176	5,179	5,187	5,198	5,208
Livestock	415	426	432	429	422	418
Oil & Gas	40	40	40	40	40	40
Public Supply	2,159	2,464	2,536	2,694	2,979	3,233
Thermoelectric Power	824	1,554	1,797	2,087	2,493	2,946
Total	**47,084**	**48,957**	**50,433**	**53,411**	**58,641**	**63,411**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	11	520	1,644	2,656	13%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	14	23	24	26	27	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,379,400	Yes	No	1,312,330

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

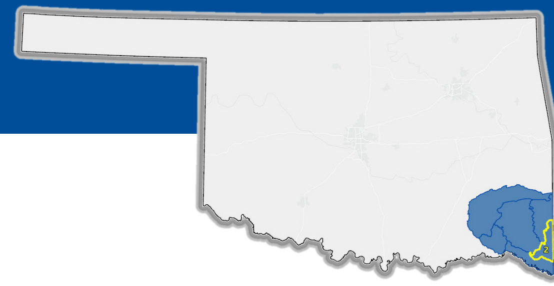
Water Management Category	Demand Sector	Basin 1 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

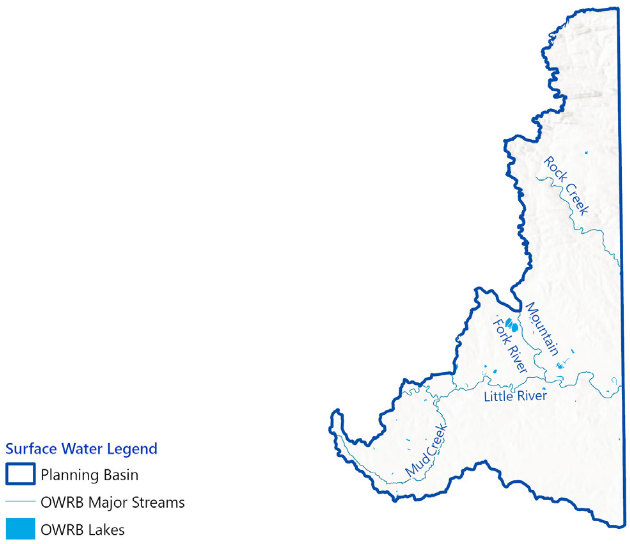
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 2

Little River (McCurtain County) - 1 / Southeast Region





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

SUMMARY

- Basin 2 - Little River (McCurtain County) - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 729 acre-feet per year (40%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 2 as early as 2035 and will continue to through 2075.
- Physical alluvial groundwater depletions are projected in Basin 2 as early as 2060 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 2 as early as 2030 and will continue through 2075.
- Basin 2 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 2 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

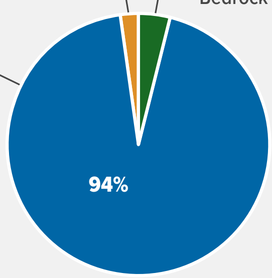
2020	2030	2035	2045	2060	2075
5,700	6,503	6,694	7,112	7,863	8,534

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 2 accounts for approximately 3% of the overall water demands of the Southeast Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	54	62	64	68	75	81
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	116	181	181	181	181	181
Livestock	344	356	362	360	355	352
Oil & Gas	37	37	37	37	37	37
Public Supply	1,267	1,445	1,487	1,580	1,747	1,896
Thermoelectric Power	-	-	-	-	-	-
Total	**1,818**	**2,081**	**2,130**	**2,225**	**2,394**	**2,547**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	5	25	48	64	11%
Alluvial Groundwater Depletion	-	-	-	1	1	6%
Bedrock Groundwater Depletion	1	1	1	1	1	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,609,900	Yes	No	710,870

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

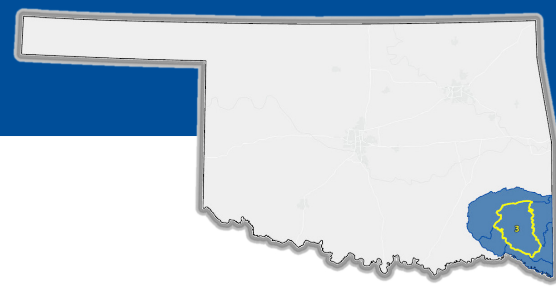
Water Management Category	Demand Sector	Basin 2 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

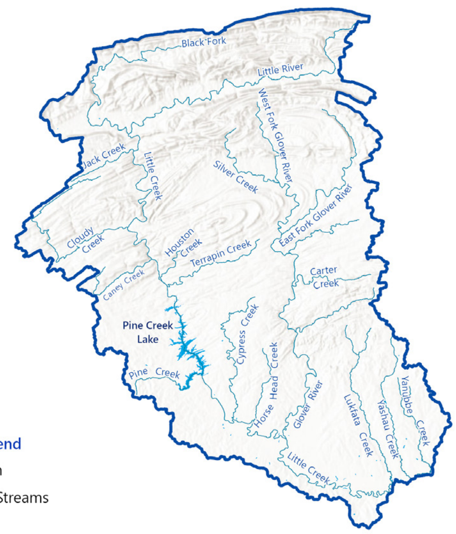
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 3

Little River (McCurtain County) - 2 / Southeast Region





Surface Water Legend
Planning Basin
OWRB Major Streams
OWRB Lakes

Groundwater Legend
Planning Basin
Major Bedrock Aquifer
Antlers (An)
Minor Bedrock Aquifer
Broken Bow (BB)
Holly Creek (HC)
Kiamichi (Ki)
Pine Mountain (PM)
Woodbine (Wb)
Minor Alluvial Aquifer
Little River (Li)

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

SUMMARY

- Basin 3 - Little River (McCurtain County) - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,723 acre-feet per year (37%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 3 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 3 as early as 2030 and will continue through 2075.
- Basin 3 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 3 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

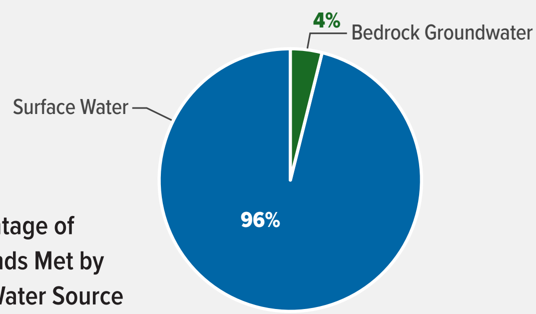
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
17,981	19,656	19,896	20,589	21,976	23,136

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 3 accounts for approximately 8% of the overall water demands of the Southeast Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	205	228	232	242	262	280
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	213	332	332	332	332	332
Livestock	1,014	1,039	1,053	1,044	1,026	1,014
Oil & Gas	88	88	88	88	88	88
Public Supply	3,079	3,513	3,616	3,842	4,247	4,610
Thermoelectric Power	-	-	-	-	-	-
Total	**4,600**	**5,200**	**5,320**	**5,548**	**5,956**	**6,324**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	70	92	145	193	333	13%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	1	1	1	1	2	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,089,300	Yes	No	1,829,310

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

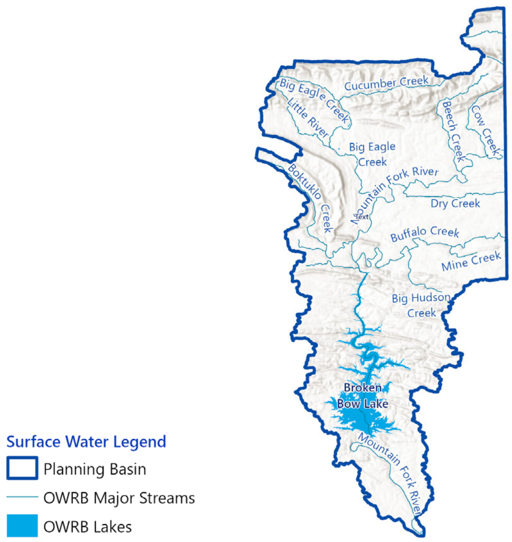
Water Management Category	Demand Sector	Basin 3 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

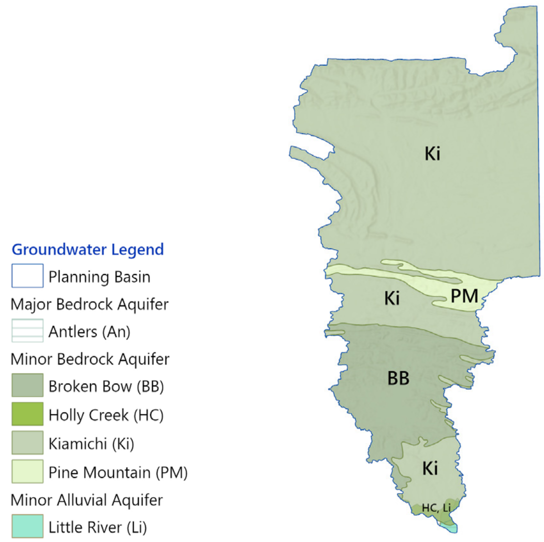
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 4

Little River (McCurtain County) - 3 / Southeast Region





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

SUMMARY

- Basin 4 - Little River (McCurtain County) - 3 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 254 acre-feet per year (23%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 4 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 4 as early as 2030 and will continue through 2075.
- Basin 4 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 4 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

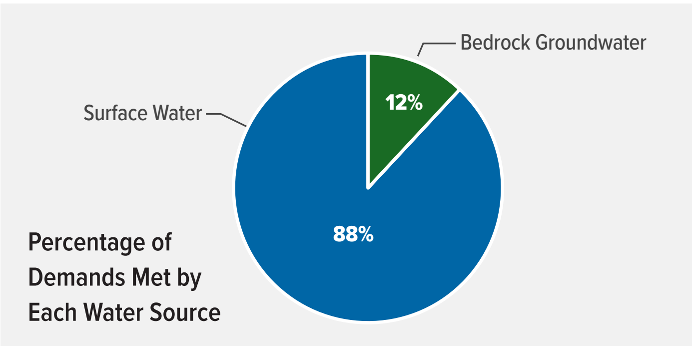
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
11,061	12,051	12,172	12,523	13,216	13,824

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 4 accounts for approximately 2% of the overall water demands of the Southeast Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	110	126	129	137	152	165
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	112	174	174	174	174	174
Livestock	599	622	632	630	622	618
Oil & Gas	42	42	42	42	42	42
Public Supply	239	272	280	298	329	357
Thermoelectric Power	-	-	-	-	-	-
Total	**1,102**	**1,236**	**1,258**	**1,281**	**1,319**	**1,356**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	22	24	26	43	64	8%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	88	92	100	114	127	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
529,500	Yes	No	744,470

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

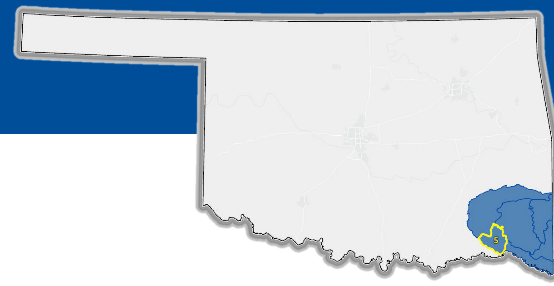
Water Management Category	Demand Sector	Basin 4 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

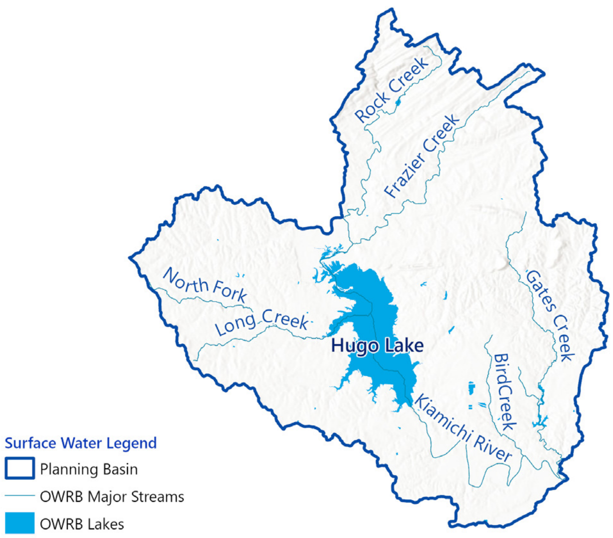
In addition to the water management strategies, water users need:

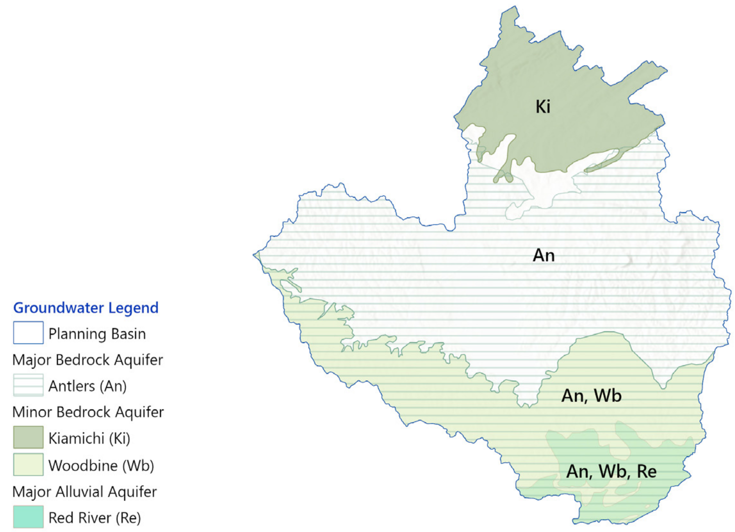
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 5

Kiamichi River - 1 / Southeast Region







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

SUMMARY

- Basin 5 - Kiamichi River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 1,828 acre-feet per year (42%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- No bedrock groundwater depletions are projected.
- Basin 5 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 5 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

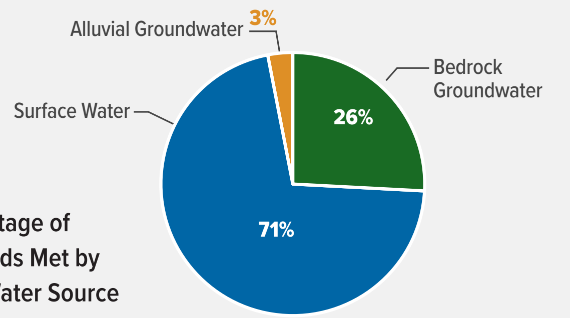
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
5,786	5,797	5,600	5,358	5,146	4,838

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 5 accounts for approximately 3% of the overall water demands of the Southeast Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	114	115	111	106	102	96
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	316	378	411	478	580	675
Livestock	403	391	391	381	366	354
Oil & Gas	2	2	2	2	2	2
Public Supply	1,179	1,152	1,110	1,058	1,003	930
Thermoelectric Power	2,335	1,657	1,554	555	474	464
Total	**4,349**	**3,695**	**3,578**	**2,579**	**2,528**	**2,521**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	-	-	-	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
32,200	Yes	No	691,320

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

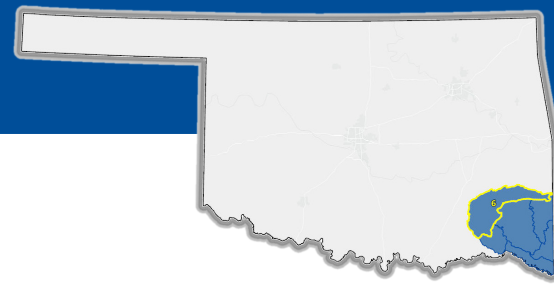
Water Management Category	Demand Sector	Basin 5 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

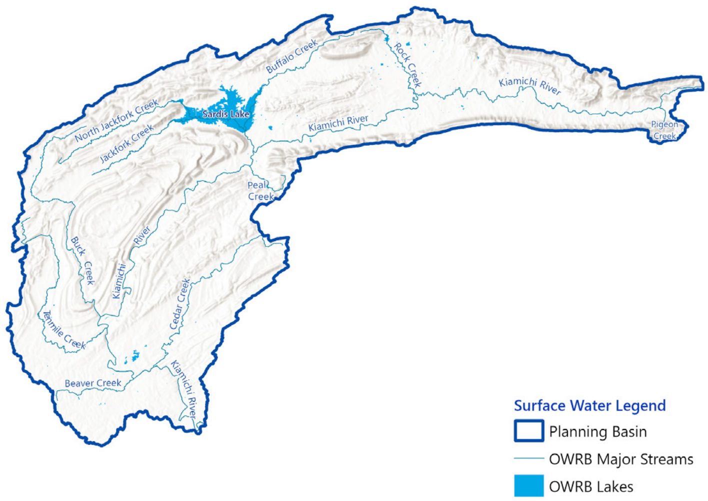
In addition to the water management strategies, water users need:

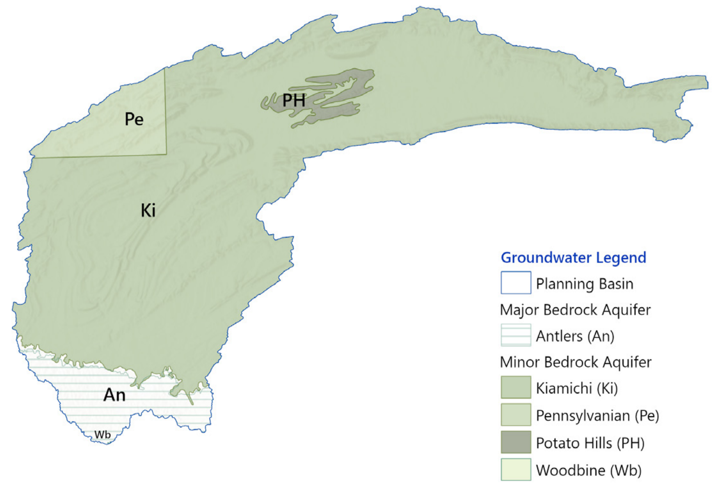
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 6

Kiamichi River - 2 / Southeast Region







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

SUMMARY

- Basin 6 - Kiamichi River - 2 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to decrease by 336 acre-feet per year (15%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 6 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 6 as early as 2030 and will diminish by 2075.
- Basin 6 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 6 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

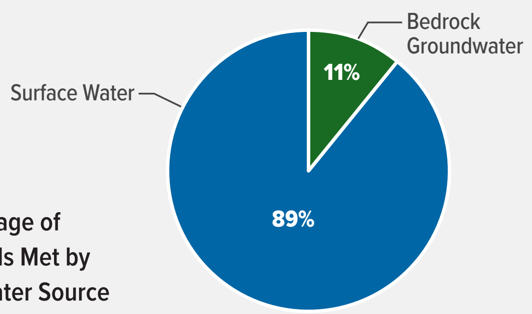
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
20,157	19,831	19,188	18,276	17,194	15,944

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 6 accounts for approximately 3% of the overall water demands of the Southeast Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	59	57	55	51	48	43
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1	8	8	8	8	8
Livestock	935	934	939	924	900	881
Oil & Gas	73	73	73	73	73	73
Public Supply	1,248	1,214	1,169	1,114	1,053	975
Thermoelectric Power	-	-	-	-	-	-
Total	**2,316**	**2,285**	**2,243**	**2,171**	**2,081**	**1,979**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	4	5	5	5	5	11%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	2	1	1	1	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,095,000	Yes	No	1,942,860

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 6 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Blue-Boggy Planning Region

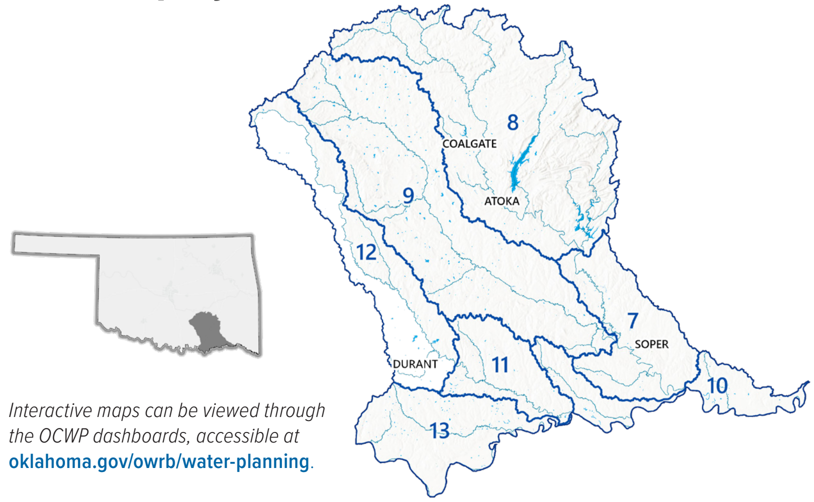
Summary

- Blue-Boggy Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 13,836 acre-feet per year (38%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Blue-Boggy Region basins. Permitting of surface water in portions or all of the Blue-Boggy Region basins is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Blue-Boggy Region stakeholders expressed the need to consider instream flow (nonconsumptive use), additional demand/supply studies for rapid growth areas, and conjunctive management.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Blue-Boggy 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 Blue-Boggy 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
- Continue/increase reliance on in-basin groundwater (all sectors) in some basins. WSS WDI
- For some basins where existing and traditional strategies are unable to meet future demands, 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

OKLAHOMA Water Resources Board

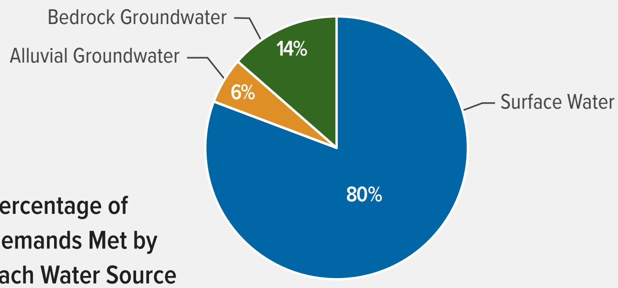
Population

2020	2030	2035	2045	2060	2075
98,821	103,190	103,741	105,994	111,264	115,444

Water Demand Projections

Water demands (withdrawals) are projected to increase by 38% between 2020 and 2075.

The Blue-Boggy Region's largest demand sector is Crop Irrigation, representing 51% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 29% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Blue-Boggy Region, Self-supplied Domestic, Crop Irrigation, Public Supply, and Thermoelectric Power demands will increase, while Self-supplied Industrial and Livestock demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,011	1,066	1,075	1,104	1,168	1,221
Self-supplied Industrial	126	123	119	113	104	94
Crop Irrigation	15,874	19,445	20,771	23,429	25,098	25,953
Livestock	4,272	4,171	4,173	4,089	3,976	3,890
Oil & Gas	1,126	1,126	1,126	1,126	1,126	1,126
Public Supply	11,070	11,874	12,104	12,675	13,757	14,726
Thermoelectric Power	3,392	2,304	2,186	2,817	3,287	3,696
Total	**36,870**	**40,109**	**41,553**	**45,352**	**48,516**	**50,706**

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

Physical Water Shortages WIW 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 Blue-Boggy 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
7	9	26	59	119	158	4%
8	47	2	160	269	378	10%
9	312	318	328	354	395	15%
10	-	2	7	107	265	3%
11	-	-	-	-	-	0%
12	-	31	99	247	667	6%
13	-	-	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
7	-	1	1	2	3	4%
8	-	-	3	3	3	10%
9	-	-	-	-	-	No AGW Demand
10	-	-	-	-	-	0%
11	-	-	-	-	-	No AGW Demand
12	-	-	-	-	-	No AGW Demand
13	-	-	-	-	-	0%

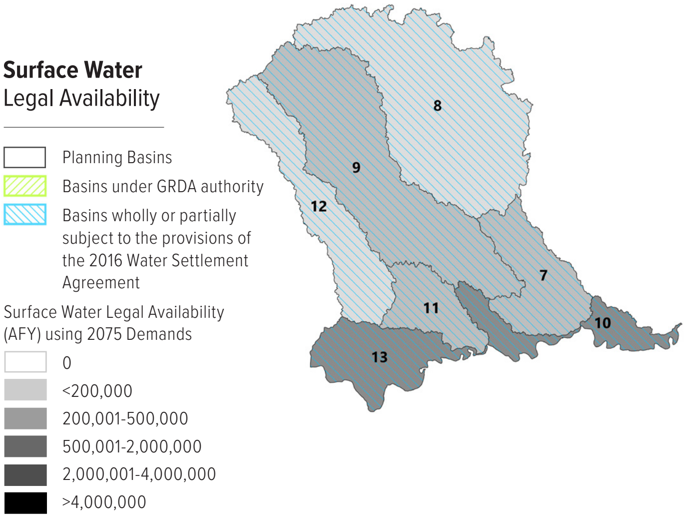
AFY = acre-feet per year

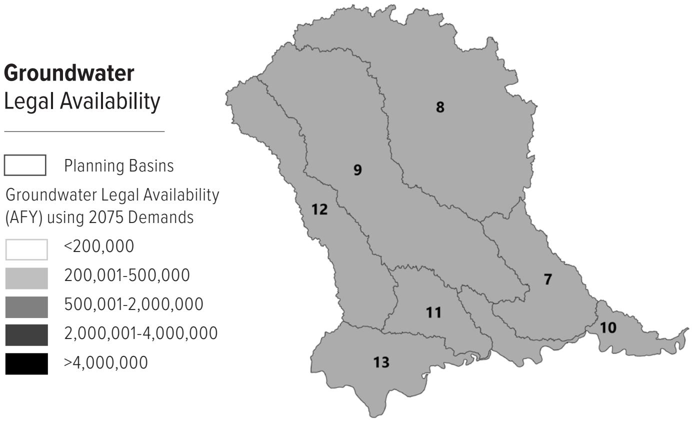
BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
7	1	1	-	-	-
8	3	3	1	-	-
9	13	13	13	12	11
10	3	2	2	2	3
11	2	2	2	2	2
12	12	12	12	12	13
13	74	108	176	207	209

AFY = acre-feet per year

Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Blue-Boggy Region. Permitting of surface water in portions or all of Blue-Boggy Region basins is subject to provisions of the 2016 Water Settlement Agreement.





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)
Albany Lake	0
Atoka	0
Coalgate	No Known Yield
McGee Creek	7,192

--- 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)
Antlers	Bedrock	Major	2.1
Arbuckle-Simpson	Bedrock	Major	0.2
Ashland Isolated Terrace	Alluvial	Minor	temporary 2.0
East-Central Oklahoma	Bedrock	Minor	temporary 2.0
Kiamichi	Bedrock	Minor	temporary 2.0
Pennsylvanian	Bedrock	Minor	temporary 2.0
Red River Reach 3	Alluvium and Terrace	Major	temporary 2.0
Red River Reach 4	Alluvium and Terrace	Major	temporary 2.0
Woodbine	Bedrock	Minor	temporary 2.0

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: Groundwater from the major aquifers such as the Arbuckle-Simpson, Antlers, and Red River shows water quality concerns over nitrate, total dissolved solids, and salinity concentrations. The lack of seasonal data, especially in sensitive karst systems, makes it difficult to track changes in water quality over time.

Groundwater from the major aquifers such as the Arbuckle-Simpson, Antlers, and Red River experiences elevated nitrate, total dissolved solids, and salinity levels.

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. Lakes in this area are classified as mesotrophic to eutrophic, reflecting their moderate to high nutrient concentrations and biological productivity.

Streams: Rivers and streams are impacted by flow alteration, sedimentation, and riparian loss concerns. 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)
$436M	**$392M**	**$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	$52M	$1.59B	$285M
Small-Medium	$47M	$3M	$443M
Medium-Large	$0M	$161M	$133M
Large	N/A	N/A	N/A
Non-Public suppliers	$336M	N/A	N/A
Total	**$436M**	**$1.76B**	**$861M**

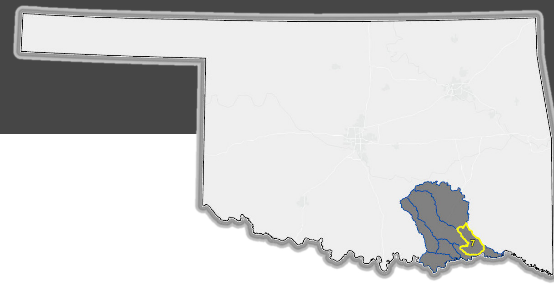
M = million; B = billion; N/A = not applicable

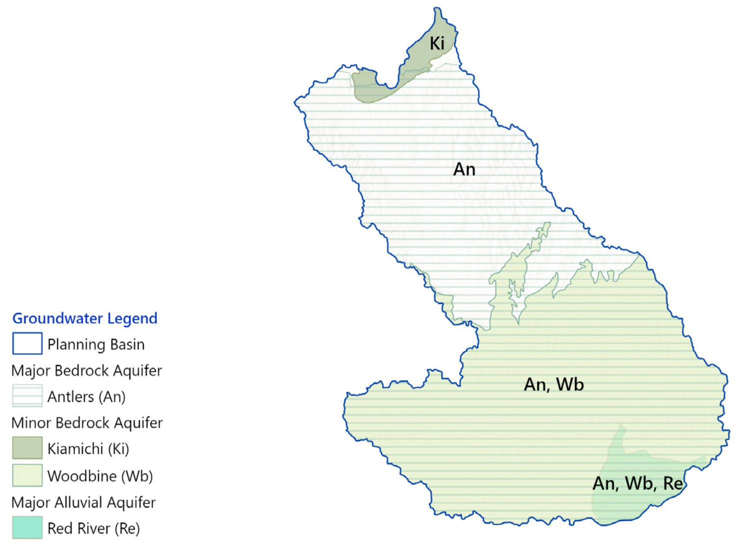
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

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

BASIN 7

Muddy Boggy River - 1 / Blue-Boggy Region





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

SUMMARY

- Basin 7 - Muddy Boggy River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 201 acre-feet per year (25%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 7 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 7 as early as 2035 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 7 as early as 2030 and will diminish by 2045.
- Basin 7 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 7 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI
  - Water transfers (all sectors). WM WSS

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

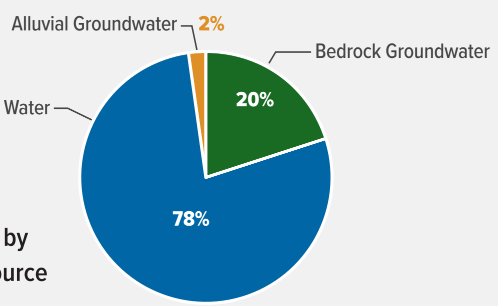
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
5,726	5,668	5,481	5,235	4,996	4,673

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 7 accounts for approximately 2% of the overall water demands of the Blue-Boggy Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	93	93	90	86	82	77
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	279	344	366	412	482	546
Livestock	408	396	396	385	371	358
Oil & Gas	11	11	11	11	11	11
Public Supply	10	10	9	9	9	8
Thermoelectric Power	-	-	-	-	-	-
Total	**801**	**854**	**872**	**904**	**955**	**1,002**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	9	26	59	119	158	4%
Alluvial Groundwater Depletion	-	1	1	2	3	4%
Bedrock Groundwater Depletion	1	1	-	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
260,200	Yes	No	755,520

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

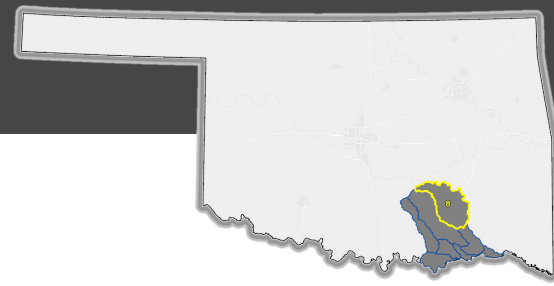
Water Management Category	Demand Sector	Basin 7 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	May Increase Shortages - Use with Other Strategies
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Ineffective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

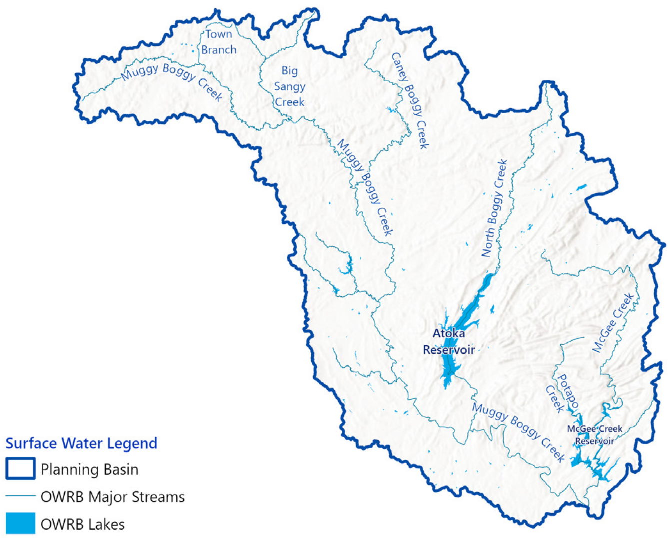
In addition to the water management strategies, water users need:

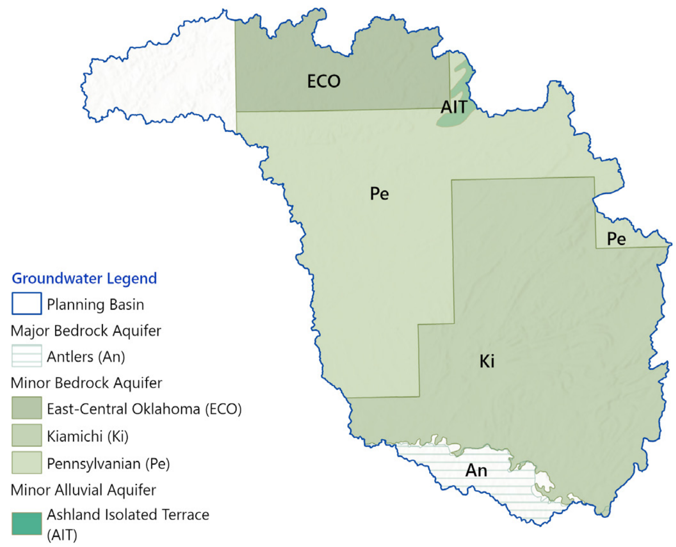
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 8

Muddy Boggy River - 2 / Blue-Boggy Region







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

SUMMARY

- Basin 8 - Muddy Boggy River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 422 acre-feet per year (5%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 8 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 8 as early as 2045 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 8 as early as 2030 and will diminish by 2060.
- Basin 8 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 8 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

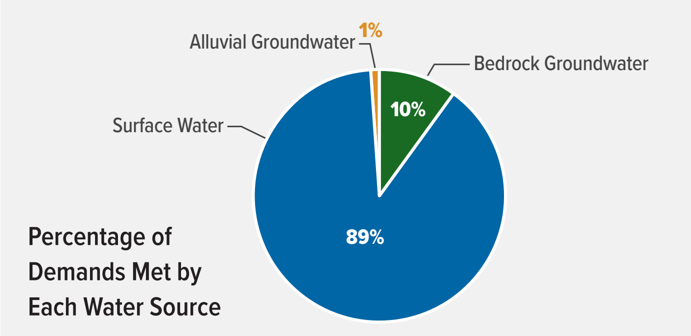
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
19,344	18,697	18,256	17,556	16,808	15,813

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 8 accounts for approximately 16% of the overall water demands of the Blue-Boggy Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	94	91	88	84	79	73
Self-supplied Industrial	126	123	119	113	104	94
Crop Irrigation	264	858	896	976	976	976
Livestock	1,355	1,336	1,342	1,327	1,310	1,302
Oil & Gas	726	726	726	726	726	726
Public Supply	1,770	1,684	1,630	1,532	1,417	1,281
Thermoelectric Power	3,392	2,304	2,186	2,817	3,287	3,696
Total	**7,726**	**7,122**	**6,986**	**7,575**	**7,899**	**8,148**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	47	2	160	269	378	10%
Alluvial Groundwater Depletion	-	-	3	3	3	10%
Bedrock Groundwater Depletion	3	3	1	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
63,100	Yes	No	1,341,090

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

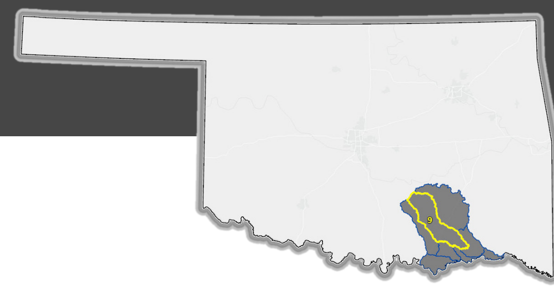
Water Management Category	Demand Sector	Basin 8 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

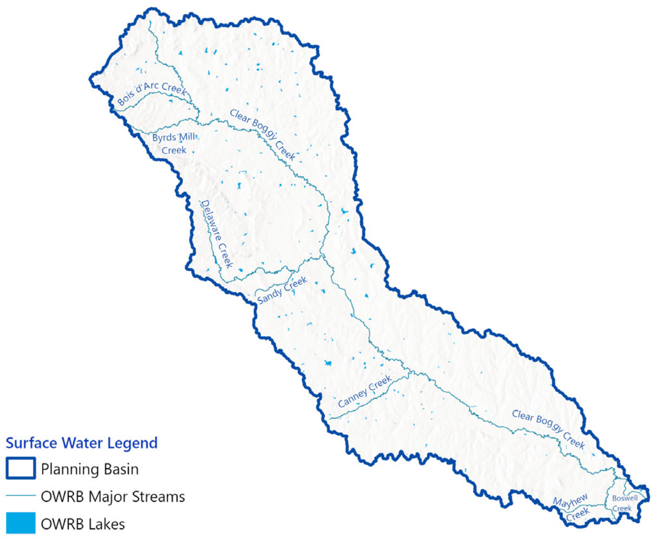
In addition to the water management strategies, water users need:

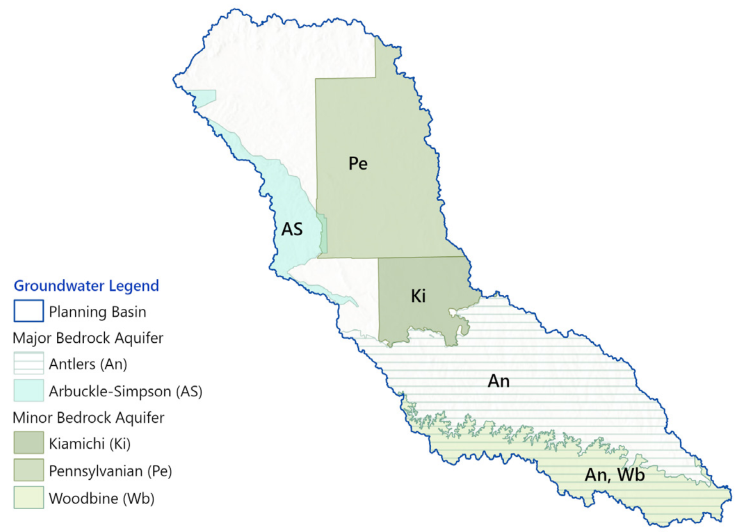
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 9

Clear Boggy Creek / Blue-Boggy Region







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

SUMMARY

- Basin 9 - Clear Boggy Creek demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 867 acre-feet per year (24%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 9 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 9 as early as 2030 and will continue through 2075.
- Basin 9 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 9 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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OKLAHOMA Water Resources Board

Population

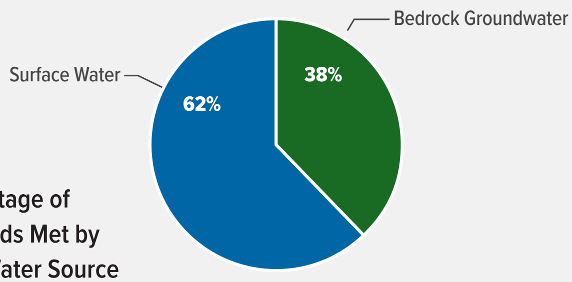
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
25,031	25,577	25,484	25,519	25,985	26,202

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 9 accounts for approximately 9% of the overall water demands of the Blue-Boggy Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	269	281	282	287	299	308
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	939	1,483	1,544	1,668	1,756	1,818
Livestock	1,069	1,042	1,042	1,019	988	965
Oil & Gas	312	312	312	312	312	312
Public Supply	1,093	1,122	1,118	1,119	1,138	1,147
Thermoelectric Power	-	-	-	-	-	-
Total	**3,682**	**4,240**	**4,298**	**4,404**	**4,493**	**4,549**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	312	318	328	354	395	15%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	13	13	13	12	11	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
447,600	Yes	No	1,121,350

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

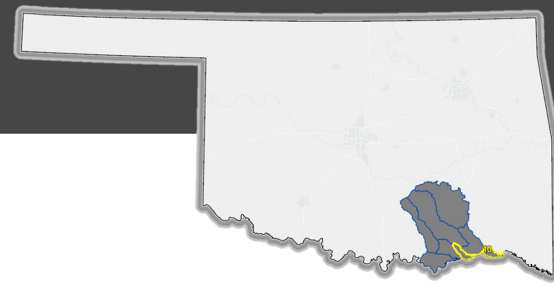
Water Management Category	Demand Sector	Basin 9 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

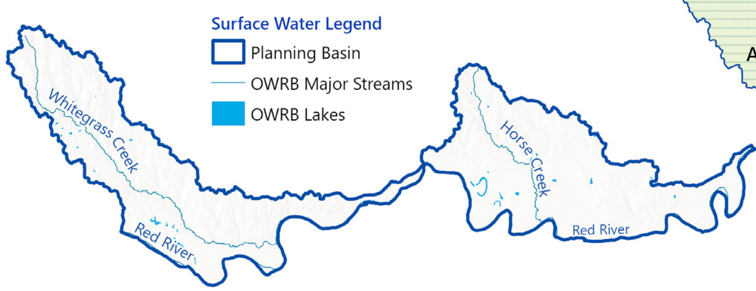
In addition to the water management strategies, water users need:

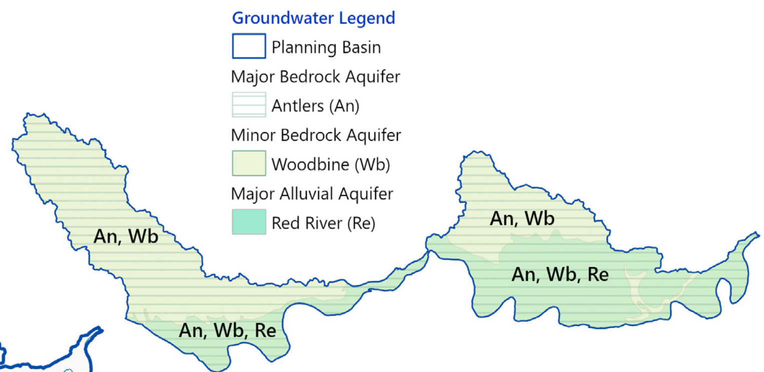
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 10

Red River Mainstem (To Blue River) / Blue-Boggy Region







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

SUMMARY

- Basin 10 - Red River Mainstem (To Blue River) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,028 acre-feet per year (72%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 10 as early as 2035 and will continue through 2075.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 10 as early as 2030 and will continue through 2075.
- Basin 10 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 10 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA
Water Resources Board

Population

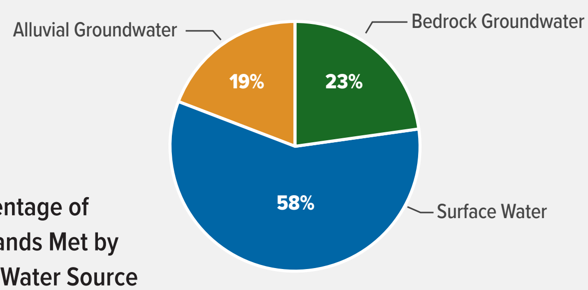
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
5,811	6,173	6,199	6,358	6,739	7,044

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 10 accounts for approximately 5% of the overall water demands of the Blue-Boggy Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	96	102	103	107	115	121
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,009	1,201	1,302	1,508	1,793	2,046
Livestock	280	271	271	264	254	245
Oil & Gas	1	1	1	1	1	1
Public Supply	47	48	47	47	47	47
Thermoelectric Power	-	-	-	-	-	-
Total	**1,431**	**1,623**	**1,724**	**1,926**	**2,209**	**2,460**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	2	7	107	265	3%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	3	2	2	2	3	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,138,400	Yes	No	686,240

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

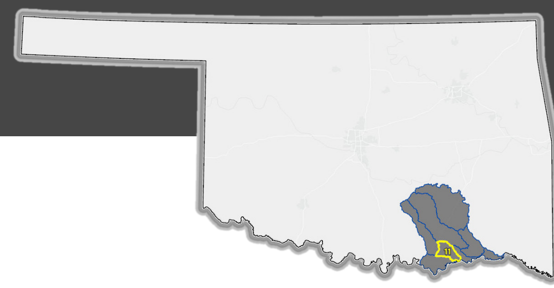
Water Management Category	Demand Sector	Basin 10 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

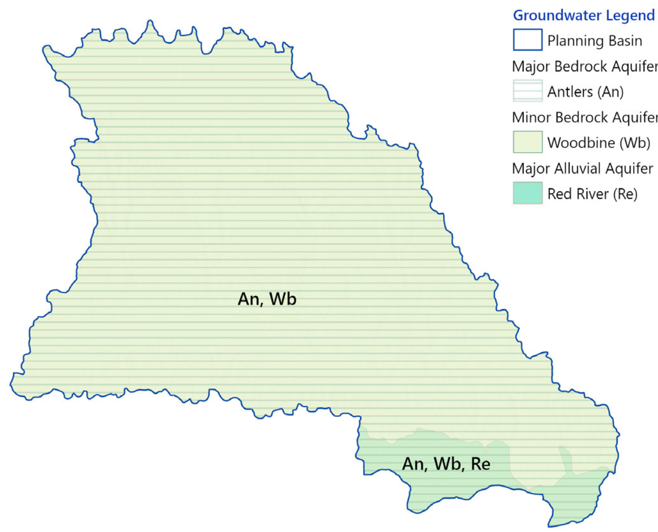
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 11

Blue River - 1 / Blue-Boggy Region





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

SUMMARY

- Basin 11 - Blue River - 1 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 390 acre-feet per year (36%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 11 as early as 2030 and will continue through 2075.
- Basin 11 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 11 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OKLAHOMA Water Resources Board

Population

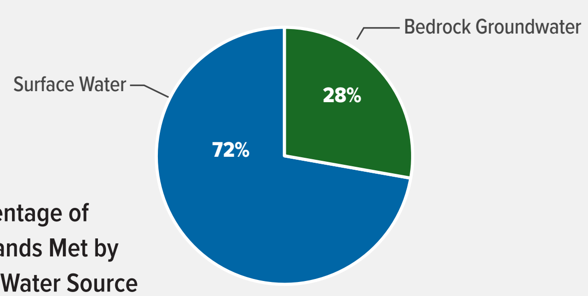
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
10,726	11,932	12,347	13,297	14,964	16,521

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 11 accounts for approximately 3% of the overall water demands of the Blue-Boggy Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	161	179	186	200	225	248
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	157	182	194	219	230	230
Livestock	278	270	269	262	252	244
Oil & Gas	3	3	3	3	3	3
Public Supply	490	545	564	608	684	755
Thermoelectric Power	-	-	-	-	-	-
Total	**1,089**	**1,179**	**1,216**	**1,291**	**1,393**	**1,479**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	2	2	2	2	2	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
270,800	Yes	No	596,030

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

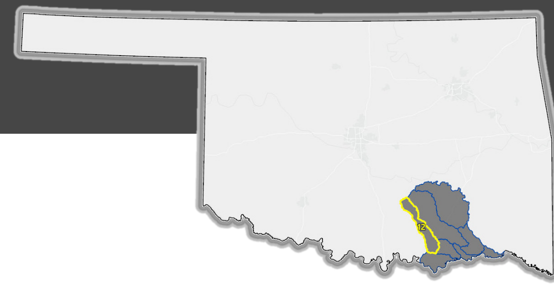
Water Management Category	Demand Sector	Basin 11 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

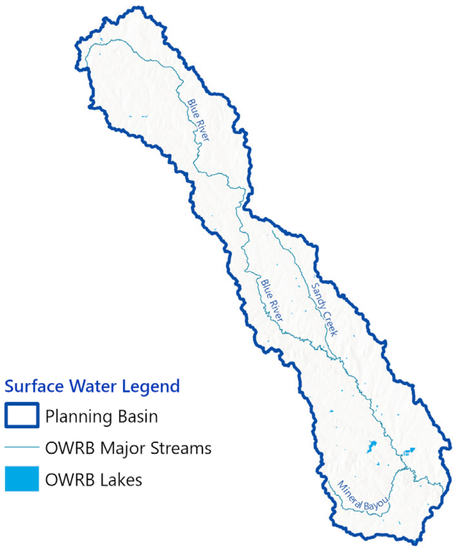
In addition to the water management strategies, water users need:

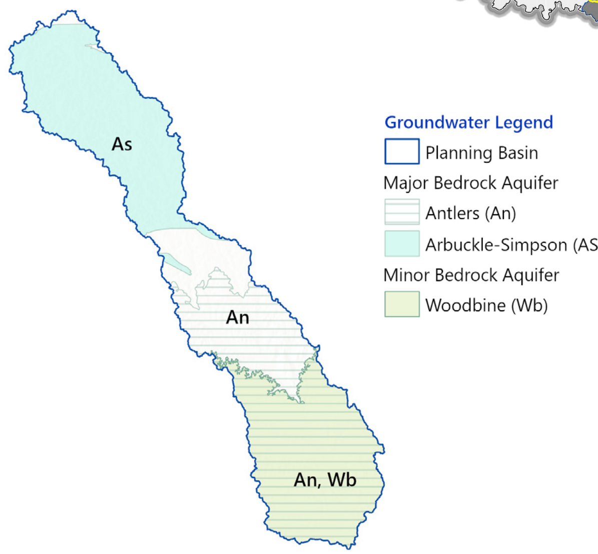
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 12

Blue River - 2 / Blue-Boggy Region







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

SUMMARY

- Basin 12 - Blue River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 3,944 acre-feet per year (57%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 12 as early as 2035 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 12 as early as 2030 and will continue through 2075.
- Basin 12 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 12 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OKLAHOMA Water Resources Board

Population

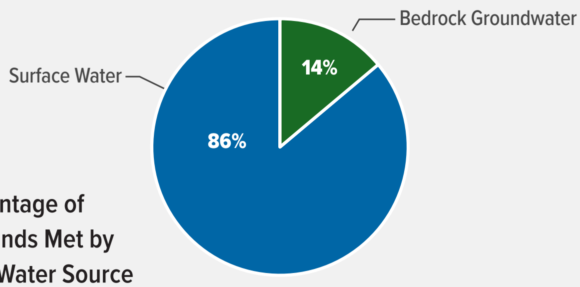
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
16,214	17,378	17,593	18,232	19,495	20,595

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 12 accounts for approximately 21% of the overall water demands of the Blue-Boggy Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	205	216	218	225	238	249
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	479	611	688	874	1,202	1,678
Livestock	468	455	454	442	426	413
Oil & Gas	70	70	70	70	70	70
Public Supply	5,676	6,259	6,452	6,901	7,694	8,431
Thermoelectric Power	-	-	-	-	-	-
Total	**6,898**	**7,609**	**7,881**	**8,511**	**9,630**	**10,842**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	31	99	247	667	6%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	12	12	12	12	13	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
177,500	Yes	No	575,920

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

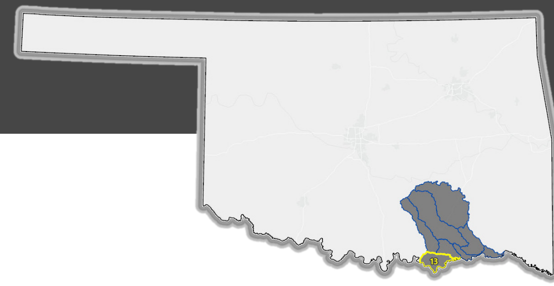
Water Management Category	Demand Sector	Basin 12 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

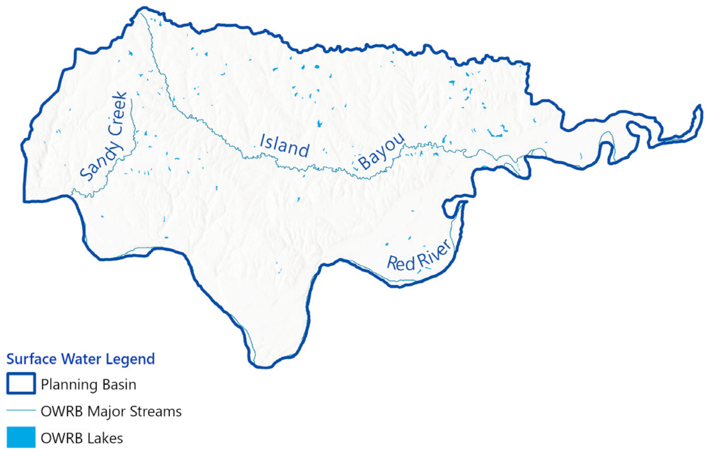
In addition to the water management strategies, water users need:

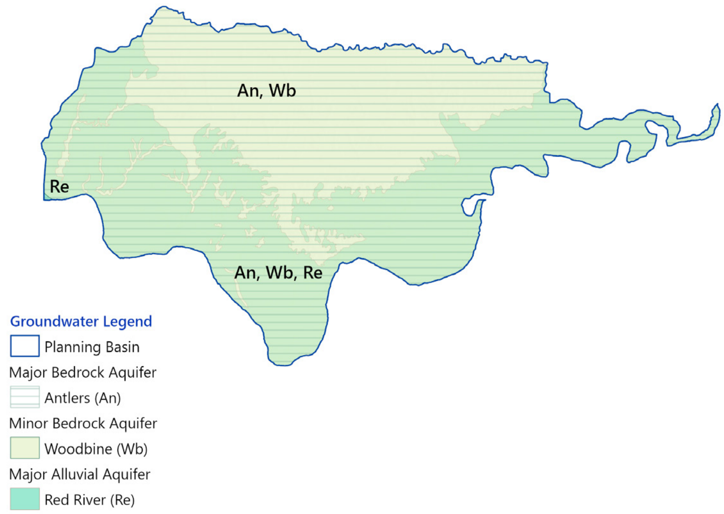
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 13

Red River Mainstem (To Washita) / Blue-Boggy Region







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

SUMMARY

- Basin 13 - Red River Mainstem (To Washita) demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 6,983 acre-feet per year (46%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 13 as early as 2030 and will continue through 2075.
- Basin 13 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 13 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

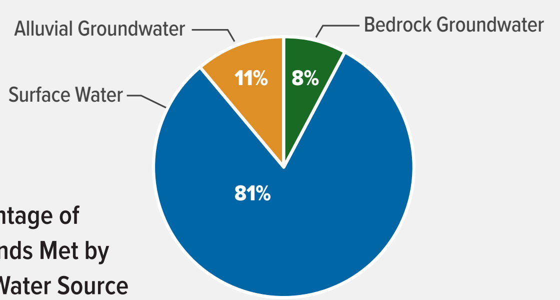
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
15,969	17,765	18,381	19,797	22,277	24,596

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 13 accounts for approximately 44% of the overall water demands of the Blue-Boggy Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	93	104	107	116	130	144
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	12,748	14,766	15,781	17,772	18,660	18,660
Livestock	414	401	400	390	375	363
Oil & Gas	4	4	4	4	4	4
Public Supply	1,984	2,207	2,284	2,460	2,768	3,056
Thermoelectric Power	-	-	-	-	-	-
Total	**15,243**	**17,482**	**18,576**	**20,742**	**21,937**	**22,226**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	74	108	176	207	209	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,053,000	Yes	No	1,073,690

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 13 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Lower Washita
Planning Region

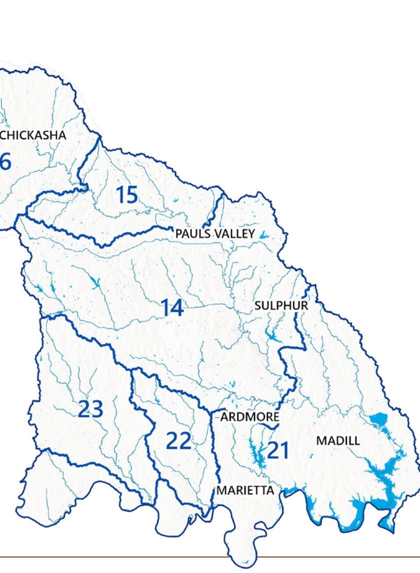
Summary

- Lower Washita Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 2,965 acre-feet per year (5%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Lower Washita Region basins. Permitting of surface water in portions or all of each of the Lower Washita Region basins is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Lower Washita 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 Lower Washita Region represents 5% of the state's 2075 projected population and 3% 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 Lower Washita 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
- Continue/increase reliance on in-basin groundwater (all sectors) in some basins. WSS WDI
- For some basins where existing and traditional strategies are unable to meet future demands, stormwater capture and use (PS, SSI), 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

OKLAHOMA Water Resources Board

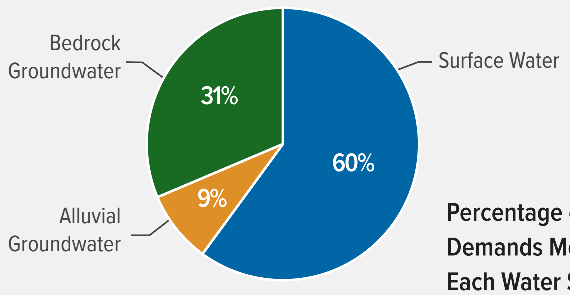
Population

2020	2030	2035	2045	2060	2075
226,688	231,991	230,809	229,131	229,989	230,157

Water Demand Projections

Water demands (withdrawals) are projected to increase by 5% between 2020 and 2075.

The Lower Washita Region's largest demand sector is Public Supply, representing 53% of the region's 2075 water demands. The second largest demand sector is Crop Irrigation, representing 20% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	3,425	3,484	3,459	3,414	3,371	3,347
Self-supplied Industrial	31	31	31	31	31	31
Crop Irrigation	10,501	11,806	11,806	11,923	12,390	13,156
Livestock	8,248	8,030	8,010	7,818	7,551	7,330
Oil & Gas	6,639	6,639	6,639	6,639	6,639	6,639
Public Supply	33,172	34,153	34,076	33,966	34,319	34,476
Thermoelectric Power	-	-	-	-	-	-
Total	**62,015**	**64,141**	**64,021**	**63,791**	**64,300**	**64,980**

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

Physical Water Shortages WIW 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 Lower Washita 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
14	24	6	1	1	1	1%
15	2	-	-	-	-	0%
16	2	1	-	-	-	0%
21	-	-	-	-	-	0%
22	24	28	25	46	55	6%
23	18	17	10	4	-	8%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
14	7	7	-	-	-	0%
15	-	-	-	-	-	0%
16	-	-	-	-	-	0%
21	-	-	-	-	-	0%
22	9	9	9	9	9	6%
23	-	-	-	-	-	No AGW Demand

AFY = acre-feet per year

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
14	47	47	45	41	36
15	43	35	28	27	29
16	87	87	60	23	7
21	25	26	25	24	24
22	10	10	10	9	8
23	19	18	16	12	10

AFY = acre-feet per year

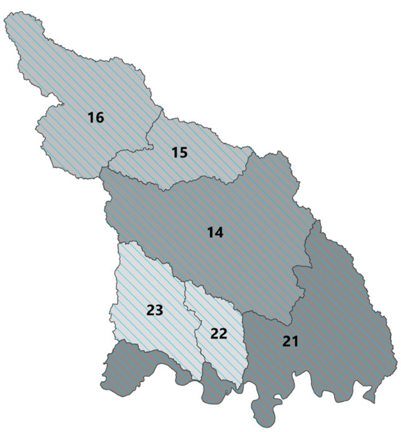
Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Lower Washita Region basins. Permitting of surface water in portions or all of Lower Washita Region basins 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

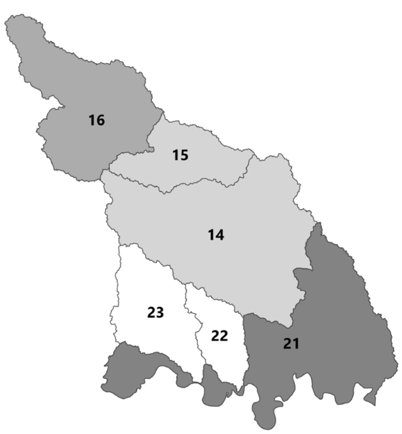
Surface Water Legal Availability (AFY) using 2075 Demands
0
<200,000
200,001-500,000
500,001-2,000,000
2,000,001-4,000,000
>4,000,000



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)
Arbuckle	0
Clear Creek	---
Duncan	---
Elmore City Lake	0
Fuqua	2,182
Humphreys	0
Jean Neustadt	883
Pauls Valley	---
RC Longmire	0
Rock Creek Reservoir	0
Taylor	---
Wiley Post Memorial	0
Chickasha	---
Murray	0
Texoma	50,091
Healdton	1,527

--- 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)
Antlers	Bedrock	Major	2.1
Arbuckle-Simpson	Bedrock	Major	0.2
Canadian River	Alluvial	Major	temporary 2.0
El Reno	Bedrock	Minor	temporary 2.0
Gerty Sand	Alluvial	Major	0.65
Marietta	Bedrock	Minor	temporary 2.0
Red River Reach 2	Alluvium and Terrace	Major	temporary 2.0
Red River Reach 3	Alluvium and Terrace	Major	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Texoma	Bedrock	Minor	temporary 2.0
Washita River Reach 3	Alluvium and Terrace	Major	1.5
Washita River Reach 4	Alluvium and Terrace	Major	1.0
Woodbine	Bedrock	Minor	temporary 2.0

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: Groundwater from the major aquifers such as the Arbuckle-Simpson, Antlers, and Rush Springs has an assortment of water quality concerns involving elevated nitrate, total dissolved solids, and salinity concentrations. The lack of seasonal data, especially in sensitive karst systems, makes 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. Fifteen out of eighteen lakes in the region are impacted by elevated nutrient levels and are classified as eutrophic. Excess nutrients and productivity increase the risk of harmful algal blooms (HABs), which contribute to higher water treatment costs, taste and odor issues, and reduced recreational value—ultimately affecting both water supply and recreational uses.

Streams: Rivers and streams are impacted by erosion, drought-flood cycling, increased sedimentation, and increased nutrient concentrations. These factors contribute to poor aesthetics, habitat degradation, water insecurity, 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)
$870M	**$415M**	**$24M**

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	$60M	$742M	$534M
Small-Medium	$297M	$1.06B	$2.33B
Medium-Large	$212M	$697M	$674M
Large	N/A	N/A	N/A
Non-Public suppliers	$300M	N/A	N/A
Total	**$870M**	**$2.50B**	**$3.53B**

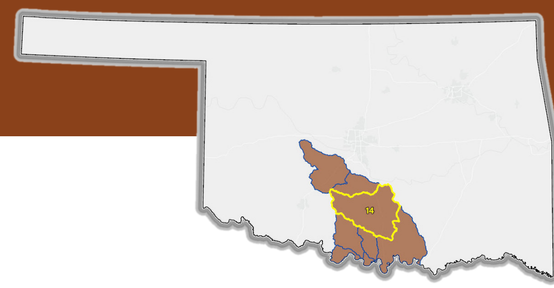
M = million; B = billion; N/A = not applicable

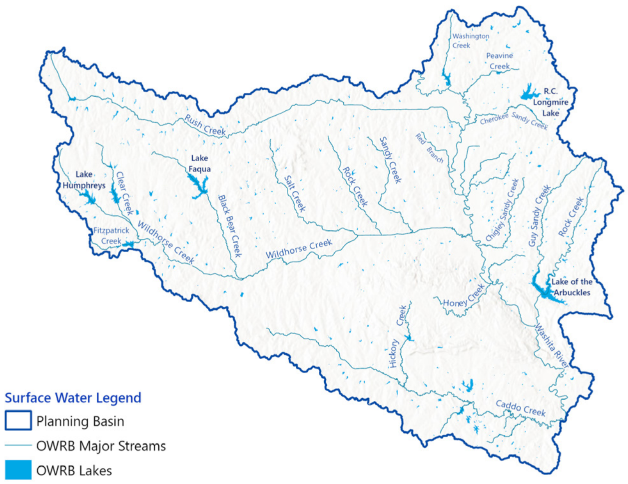
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

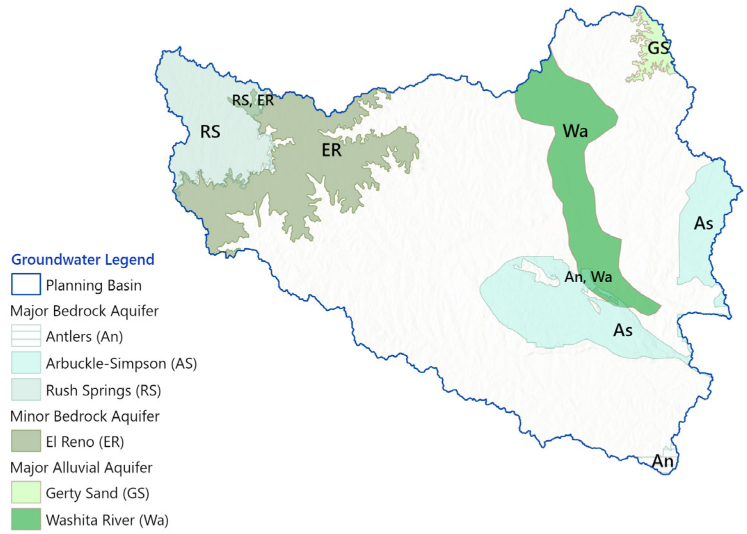
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 14

Lower Washita / Lower Washita Region







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

SUMMARY

- Basin 14 - Lower Washita demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 510 acre-feet per year (2%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 14 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 14 as early as 2030 and will diminish by 2045.
- Physical bedrock groundwater depletions are projected in Basin 14 as early as 2030 and will continue through 2075.
- Basin 14 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 14 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

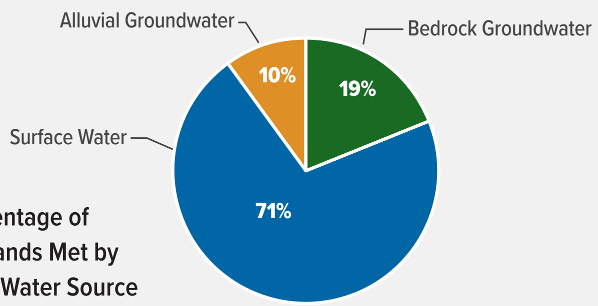
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
78,767	80,608	80,190	79,379	79,376	78,970

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 14 accounts for approximately 37% of the overall water demands of the Lower Washita Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,178	1,208	1,198	1,180	1,169	1,158
Self-supplied Industrial	31	31	31	31	31	31
Crop Irrigation	660	873	860	849	844	843
Livestock	2,387	2,320	2,313	2,254	2,172	2,101
Oil & Gas	2,431	2,431	2,431	2,431	2,431	2,431
Public Supply	17,031	17,522	17,495	17,437	17,599	17,664
Thermoelectric Power	-	-	-	-	-	-
Total	**23,719**	**24,384**	**24,328**	**24,182**	**24,245**	**24,229**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	24	6	1	1	1	1%
Alluvial Groundwater Depletion	7	7	-	-	-	0%
Bedrock Groundwater Depletion	47	47	45	41	36	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
884,500	Yes	No	471,270

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

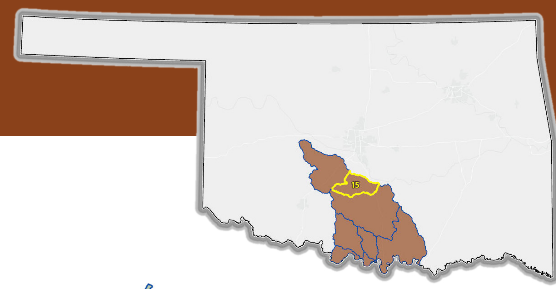
Water Management Category	Demand Sector	Basin 14 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

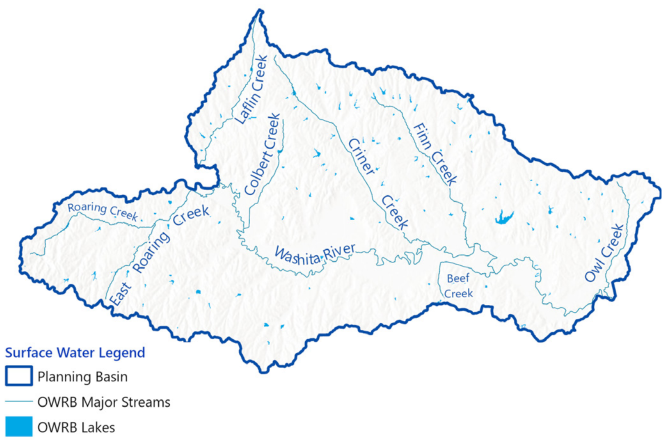
In addition to the water management strategies, water users need:

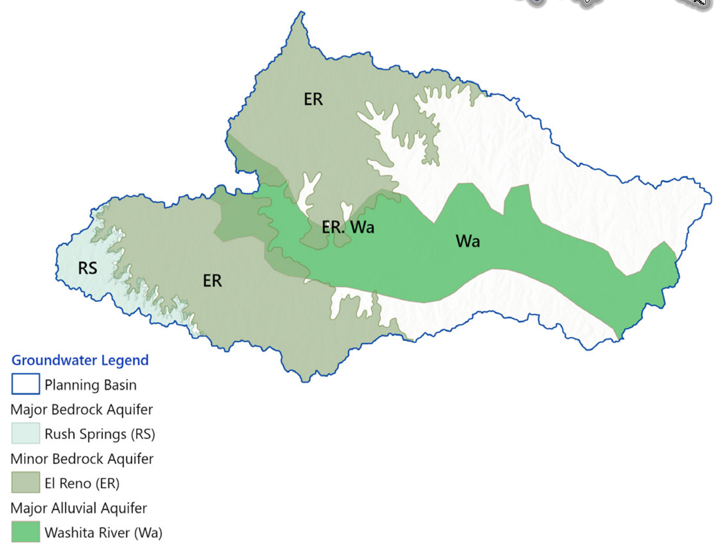
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 15

Middle Washita - 1 / Lower Washita Region







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

SUMMARY

- Basin 15 - Middle Washita - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 42 acre-feet per year (1%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 15 as early as 2030 and will dimish by 2035.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 15 as early as 2030 and will continue through 2075.
- Basin 15 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 15 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

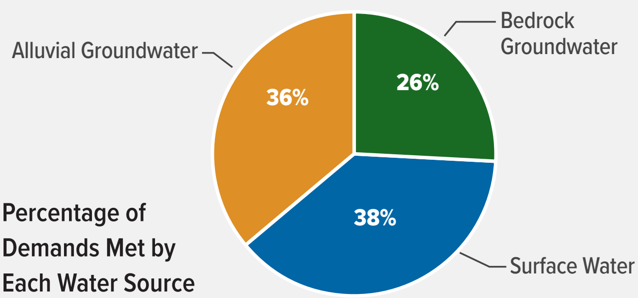
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
28,002	28,656	28,750	29,181	30,014	30,989

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 15 accounts for approximately 5% of the overall water demands of the Lower Washita Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,016	1,028	1,029	1,033	1,043	1,062
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	225	251	223	197	187	185
Livestock	851	829	826	806	778	755
Oil & Gas	953	953	953	953	953	953
Public Supply	304	323	324	328	341	352
Thermoelectric Power	-	-	-	-	-	-
Total	**3,348**	**3,385**	**3,355**	**3,318**	**3,302**	**3,307**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	2	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	43	35	28	27	29	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
460,600	Yes	No	366,240

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

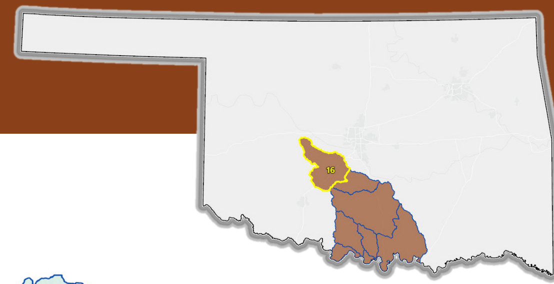
Water Management Category	Demand Sector	Basin 15 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

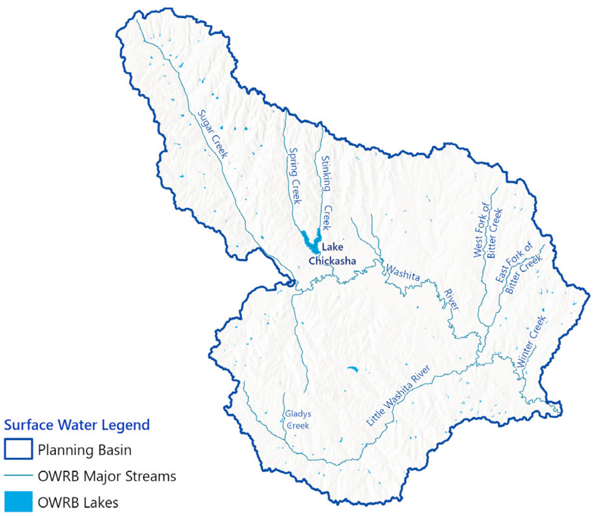
In addition to the water management strategies, water users need:

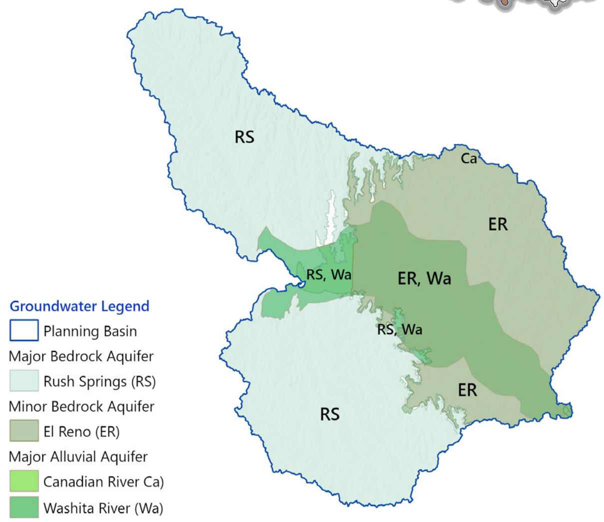
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 16

Middle Washita - 2 / Lower Washita Region







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

SUMMARY

- Basin 16 - Middle Washita - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 674 acre-feet per year (4%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 16 as early as 2030 and will dimish by 2045.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 16 as early as 2030 and will continue through 2075.
- Basin 16 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 16 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

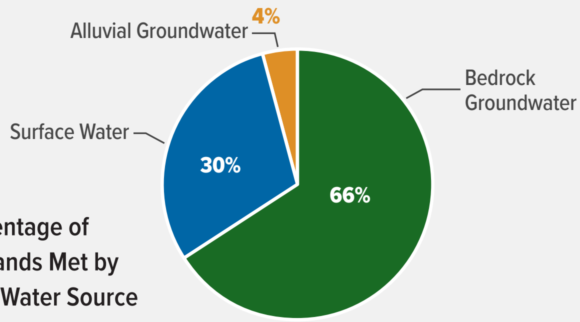
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
44,146	44,616	44,112	42,983	41,435	40,323

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 16 accounts for approximately 24% of the overall water demands of the Lower Washita Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,081	1,094	1,081	1,050	1,007	975
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	8,081	8,113	8,087	8,013	8,001	8,015
Livestock	2,077	2,034	2,030	1,990	1,936	1,895
Oil & Gas	1,852	1,852	1,852	1,852	1,852	1,852
Public Supply	3,175	3,298	3,234	3,128	2,975	2,855
Thermoelectric Power	-	-	-	-	-	-
Total	**16,266**	**16,393**	**16,283**	**16,034**	**15,771**	**15,592**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	2	1	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	87	87	60	23	7	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
332,800	Yes	No	1,472,260

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

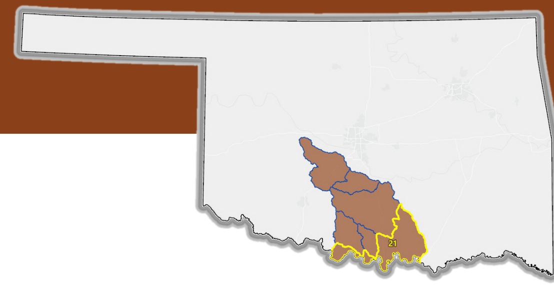
Water Management Category	Demand Sector	Basin 16 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

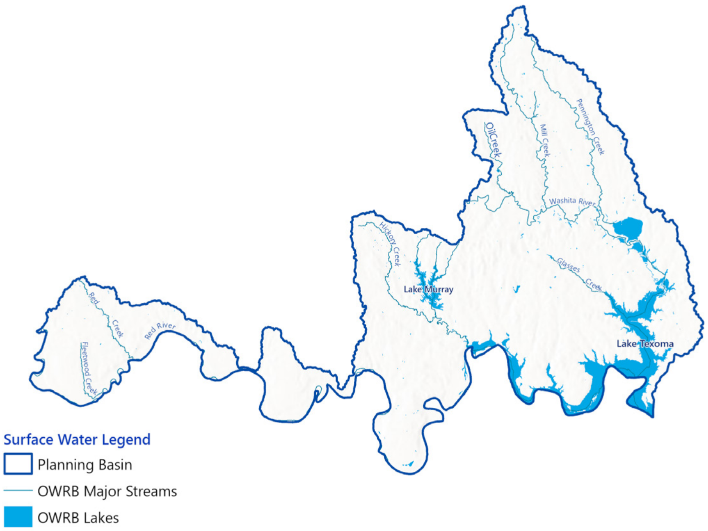
In addition to the water management strategies, water users need:

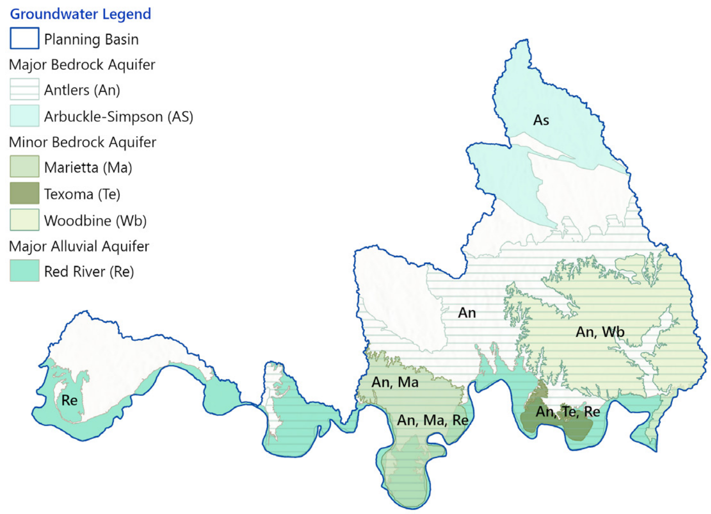
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 21

Red River Mainstem (To Walnut Bayou) / Lower Washita Region







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

SUMMARY

- Basin 21 - Red River Mainstem (To Walnut Bayou) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 2,834 acre-feet per year (22%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 21 by 2075.
- Basin 21 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 21 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

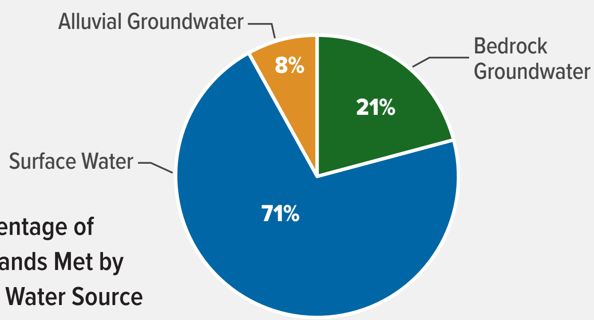
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
45,012	47,083	46,921	47,095	48,589	49,572

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 21 accounts for approximately 24% of the overall water demands of the Lower Washita Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	85	90	991	92	97	100
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,423	2,110	2,178	2,406	2,899	3,655
Livestock	1,702	1,652	1,649	1,607	1,548	1,499
Oil & Gas	577	577	577	577	577	577
Public Supply	8,855	9,133	9,142	9,193	9,470	9,646
Thermoelectric Power	-	-	-	-	-	-
Total	**12,643**	**13,563**	**13,637**	**13,876**	**14,591**	**15,477**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	25	26	25	24	24	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,023,100	Yes	No	2,320,700

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

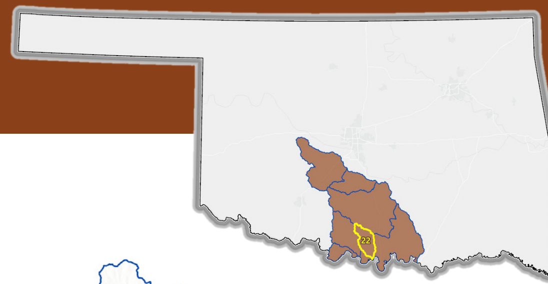
Water Management Category	Demand Sector	Basin 21 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

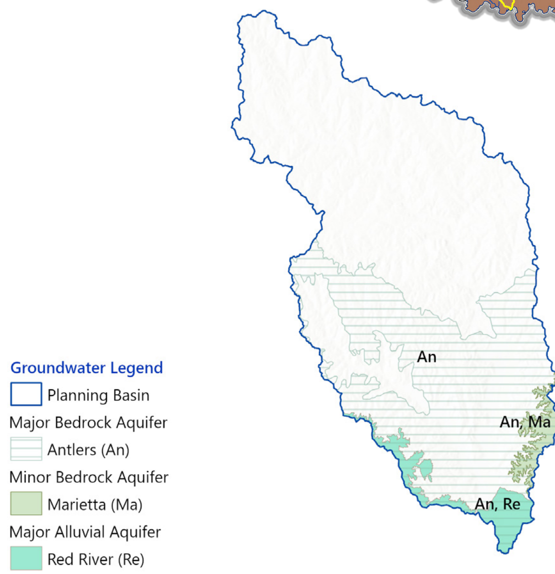
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 22

Walnut Bayou / Lower Washita Region





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

SUMMARY

- Basin 22 - Walnut Bayou demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 393 acre-feet per year (9%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 22 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 22 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 22 as early as 2030 and will continue through 2075.
- Basin 22 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 22 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

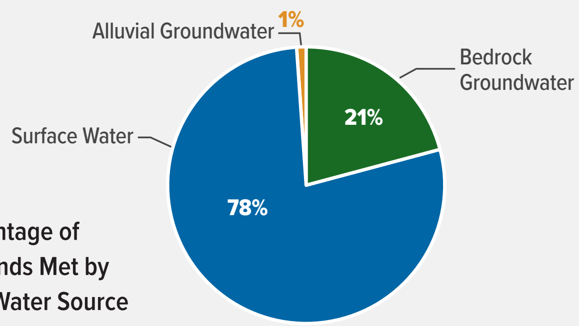
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
14,528	14,884	15,002	15,212	15,810	16,239

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 22 accounts for approximately 8% of the overall water demands of the Lower Washita Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	5	6	6	6	7	7
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	87	353	353	353	353	353
Livestock	311	302	302	294	284	275
Oil & Gas	536	536	536	536	536	536
Public Supply	3,683	3,750	3,757	3,758	3,817	3,844
Thermoelectric Power	-	-	-	-	-	-
Total	**4,622**	**4,947**	**4,954**	**4,947**	**4,996**	**5,016**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	24	28	25	46	55	6%
Alluvial Groundwater Depletion	9	9	9	9	9	6%
Bedrock Groundwater Depletion	10	10	10	9	8	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
92,600	Yes	No	184,480

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

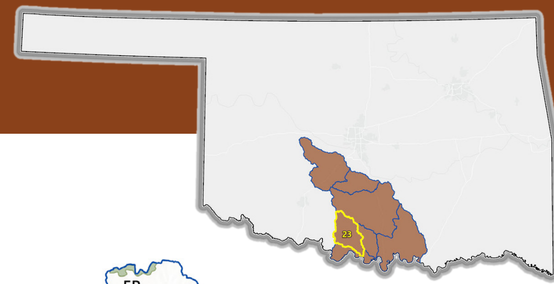
Water Management Category	Demand Sector	Basin 22 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

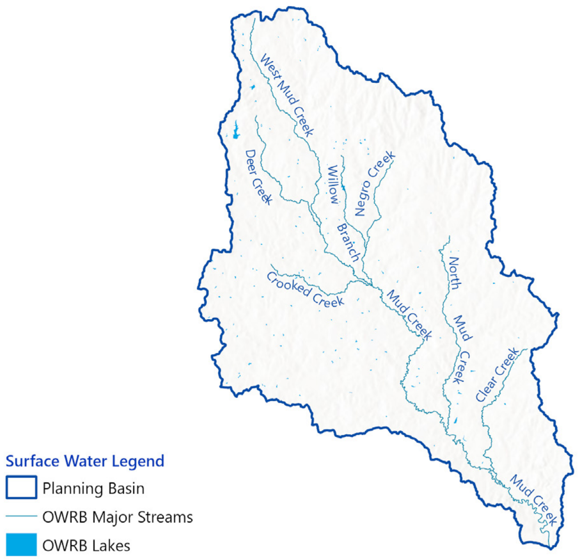
In addition to the water management strategies, water users need:

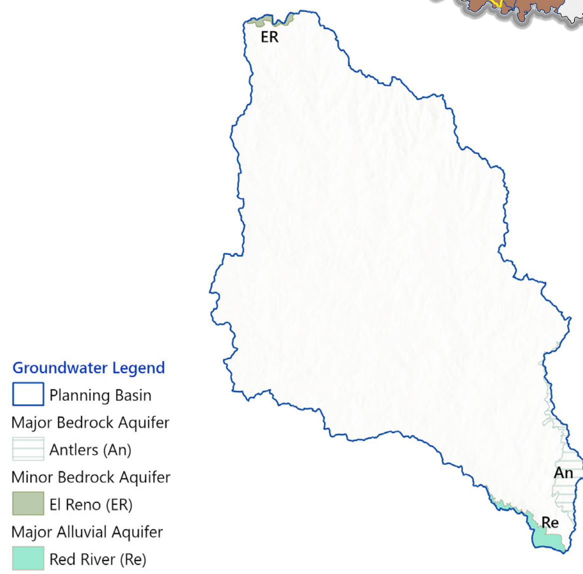
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 23

Mud Creek / Lower Washita Region







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

SUMMARY

- Basin 23 - Mud Creek demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 57 acre-feet per year (4%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 23 as early as 2030 and will diminish by 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 23 as early as 2030 and will continue through 2075.
- Basin 23 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 23 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

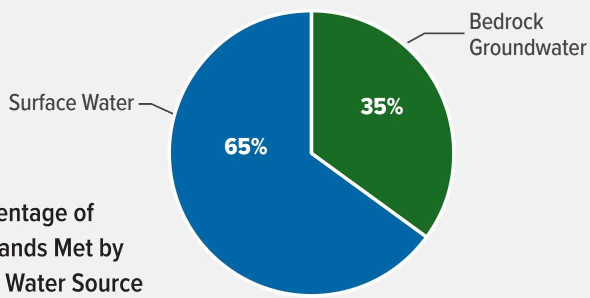
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
16,233	16,144	15,834	15,281	14,765	14,064

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 23 accounts for approximately 2% of the overall water demands of the Lower Washita Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	59	57	56	52	49	44
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	24	106	106	106	106	106
Livestock	919	892	890	867	833	806
Oil & Gas	589	289	289	289	289	289
Public Supply	125	126	124	121	119	115
Thermoelectric Power	-	-	-	-	-	-
Total	**1,417**	**1,470**	**1,464**	**1,434**	**1,395**	**1,359**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	18	17	10	4	-	8%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	19	18	16	12	10	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
170,400	Yes	No	19,290

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 23 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

West Central Planning Region

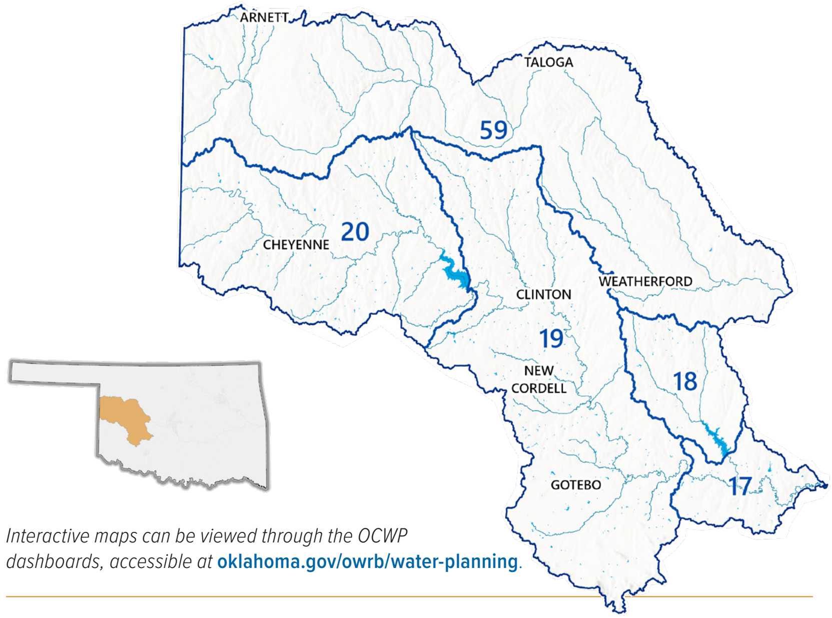
Summary

- West Central Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 26,586 acre-feet per year (21%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water is projected to remain legally available for permitting through 2075 in all West Central Region basins except Basin 20. Groundwater is legally available for permitting in all West Central Region basins.
- In addition to the Statewide Recommendations, West Central 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 West Central Region represents 2% of the state's 2075 projected population and 7% 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 West Central 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). WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI
- In some basins, where existing and traditional strategies are unable to meet future demands, stormwater capture and use (PS, SSI), water transfers (all sectors), and water reuse (PS, SSI) 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

OKLAHOMA Water Resources Board

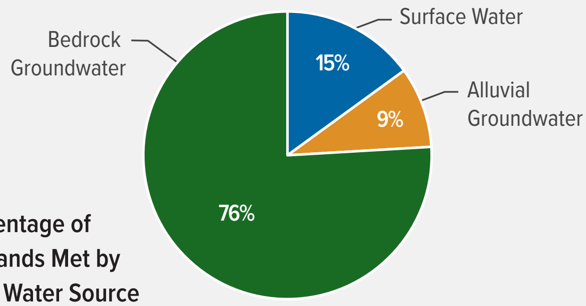
Population

2020	2030	2035	2045	2060	2075
65,516	68,882	69,850	71,952	77,668	81,670

Water Demand Projections

Water demands (withdrawals) are projected to increase by 21% between 2020 and 2075.

The West Central Region's largest demand sector is Crop Irrigation, representing 84% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 9% 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 West Central Region, Self-supplied Domestic, Crop Irrigation, Public Supply, and Thermoelectric Power demands will increase while Livestock 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	773	816	811	808	824	832
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	104,300	115,339	117,158	119,953	124,287	128,547
Livestock	6,043	5,892	5,891	5,764	5,587	5,450
Oil & Gas	3,058	3,058	3,058	3,058	3,058	3,058
Public Supply	11,672	12,261	12,441	12,813	13,773	14,451
Thermoelectric Power	1,042	708	671	865	1,010	1,135
Total	**126,887**	**138,073**	**140,032**	**143,262**	**148,539**	**153,473**

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

Physical Water Shortages WIW 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 West Central 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
17	-	-	-	-	-	0%
18	-	-	-	-	-	0%
19	405	435	470	548	601	8%
20	112	111	100	89	80	18%
59	147	200	286	482	632	52%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
17	-	-	-	--	-	0%
18	-	-	-	-	-	No AGW Demand
19	238	243	249	261	270	8%
20	524	524	526	531	534	46%
59	397	538	822	1,298	1,831	59%

AFY = acre-feet per year

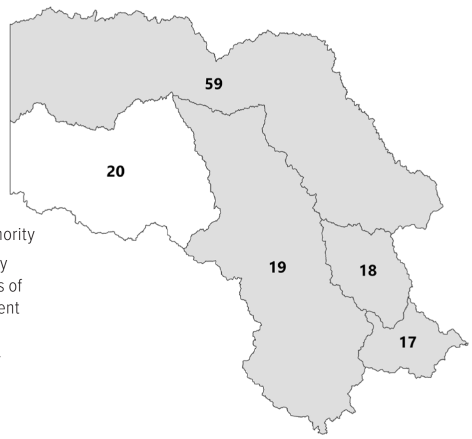
BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
17	1,783	1,821	1,828	1,828	1,829
18	30,235	30,551	30,539	30,522	30,508
19	139	138	134	129	125
20	35	35	34	33	31
59	6,879	7,633	9,142	11,938	14,868

AFY = acre-feet per year

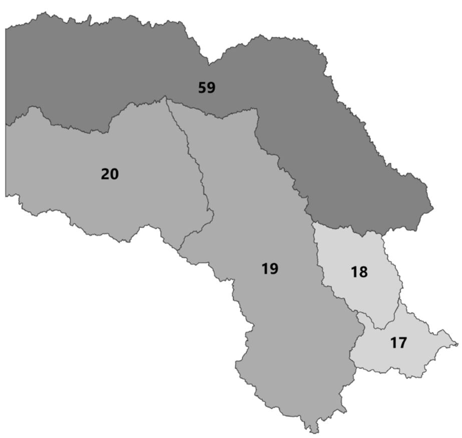
Legal Water Availability WM WSS

Surface water is projected to remain legally available for permitting through 2075 in all of the basins within the West Central Region except Basin 20. Groundwater is legally available for permitting in all of the West Central Region basins.

Surface Water
Legal Availability



Groundwater
Legal Availability



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

Fort Cobb Reservoir

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)
Crowder	---
Fort Cobb	0
Clinton	---
Dead Warrior	---
Foss	366

--- 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
Canadian River	Alluvial	Major	temporary 2.0
Elk City	Bedrock	Major	1.0
Hennessey-Garber	Bedrock	Minor	1.6
Ogallala Northwest	Bedrock	Major	1.4
Ogallala Roger Mills	Bedrock	Major	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Southwestern Oklahoma	Bedrock	Minor	temporary 2.0
Washita River Reach 1	Alluvial and Terrace	Major	2.0
Washita River Reach 3	Alluvial and Terrace	Major	1.5
Western Oklahoma	Bedrock	Minor	temporary 2.0

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: Groundwater comes from an assortment of major bedrock and alluvial aquifers. Elevated nitrate levels are a concern, especially in the Rush Springs aquifer.

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. Lakes in this area are classified as eutrophic or hypereutrophic, indicating high productivity and potential water quality concerns. These conditions contribute to a heightened risk of harmful algal blooms (HABs), increased water treatment costs, taste and odor issues, and diminished recreational value—impacting both recreational and water supply beneficial uses.

Streams: Rivers and streams are impacted by erosion, high mineral concentrations, drought-flood cycling, increased sedimentation, and increased nutrient concentrations. These factors contribute to habitat degradation, water insecurity, 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)
$393M	**$273M**	**$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	$48M	$856M	$1.23B
Small-Medium	$67M	$117M	$60M
Medium-Large	$37M	$8.1M	$178M
Large	N/A	N/A	N/A
Non-Public suppliers	$240M	N/A	N/A
Total	**$393M**	**$981M**	**$1.47B**

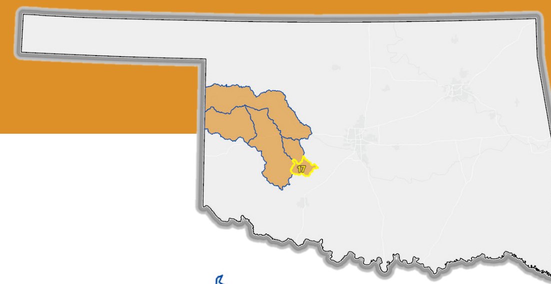
M = million; B = billion; N/A = not applicable

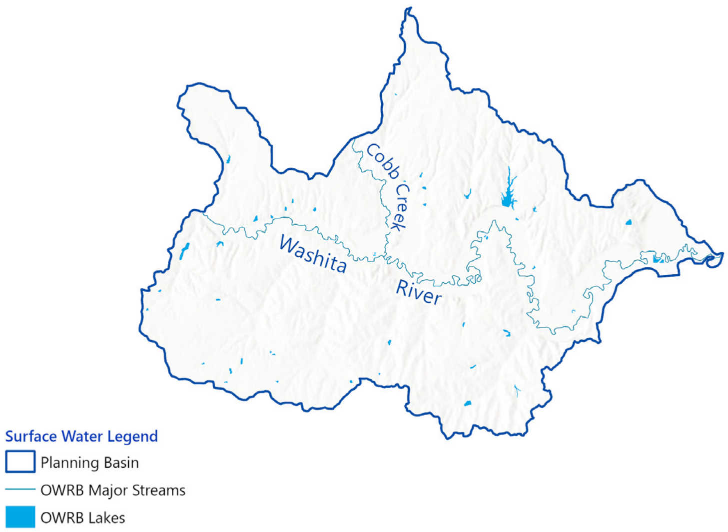
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

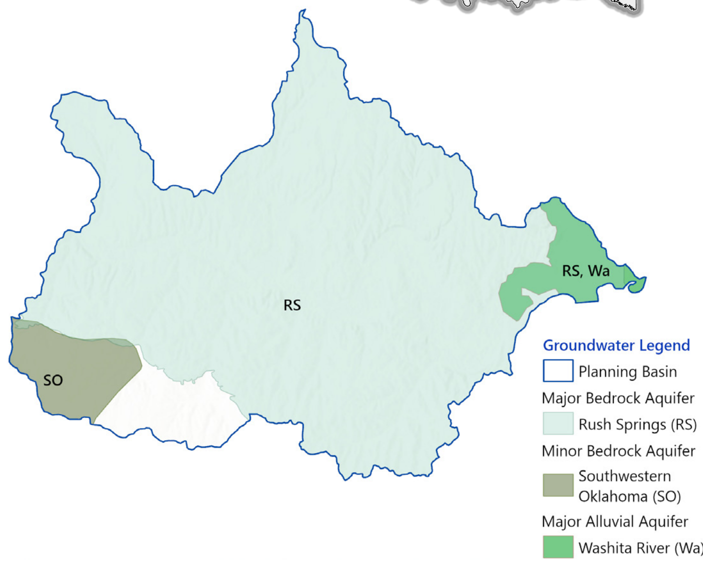
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 17

Upper Washita - 1 / West Central Region







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

SUMMARY

- Basin 17 - Upper Washita - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 482 acre-feet per year (4%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 17 as early as 2030 and will continue through 2075.
- Basin 17 is projected to have surface water available for appropriation through 2075.
- Basin 17 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

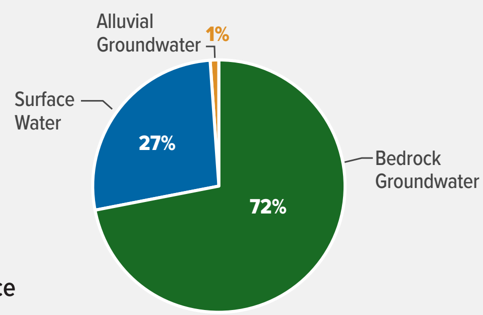
2020	2030	2035	2045	2060	2075
4,760	5,042	4,925	4,761	4,524	4,332

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 17 accounts for approximately 7% of the overall water demands of the West Central Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	44	47	46	44	42	40
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	8,560	8,965	9,041	9,041	9,041	9,041
Livestock	314	309	310	307	302	299
Oil & Gas	62	62	62	62	62	62
Public Supply	821	869	849	821	780	747
Thermoelectric Power	1,042	708	671	865	1,010	1,135
Total	**10,843**	**10,960**	**10,979**	**11,140**	**11,236**	**11,325**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	1,783	1,821	1,828	1,828	1,829	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
136,200	No	No	251,520

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

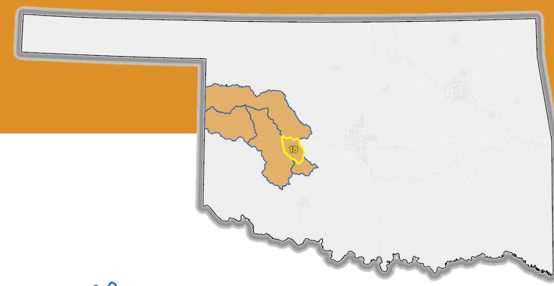
Water Management Category	Demand Sector	Basin 17 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

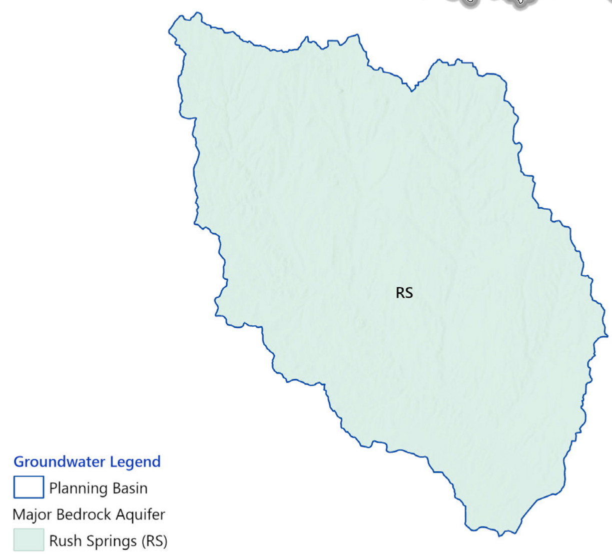
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 18

Upper Washita - 2 / West Central Region





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

SUMMARY

- Basin 18 - Upper Washita - 2 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 2,663 acre-feet per year (6%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 18 as early as 2030 and will continue through 2075.
- Basin 18 is projected to have surface water available for appropriation through 2075.
- Basin 18 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

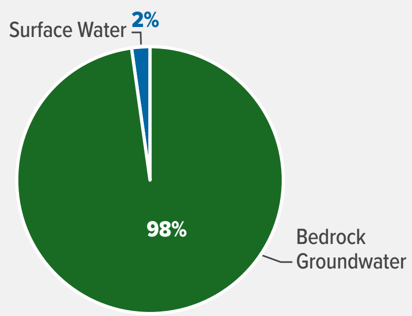
2020	2030	2035	2045	2060	2075
5,603	5,849	5,726	5,542	5,292	5,071

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 18 accounts for approximately 29% of the overall water demands of the West Central Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	243	257	251	243	231	221
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	40,548	43,053	43,380	43,380	43,380	43,380
Livestock	432	423	424	417	407	401
Oil & Gas	69	69	69	69	69	69
Public Supply	436	426	414	390	356	321
Thermoelectric Power	-	-	-	-	-	-
Total	**41,727**	**44,228**	**44,538**	**44,498**	**44,442**	**44,391**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	30,235	30,551	30,539	30,522	30,508	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
20,000	No	No	240,310

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

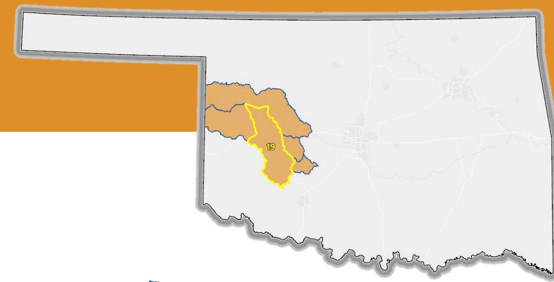
Water Management Category	Demand Sector	Basin 18 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

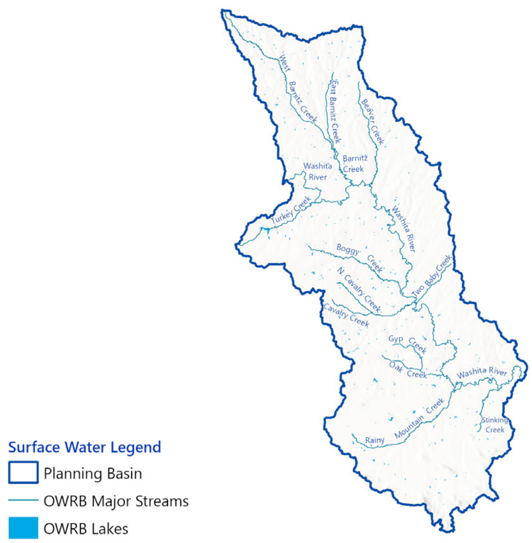
In addition to the water management strategies, water users need:

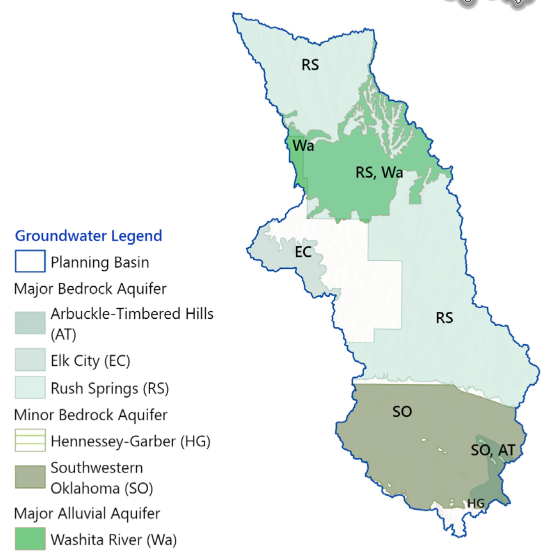
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 19

Upper Washita - 3 / West Central Region







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

SUMMARY

- Basin 19 - Upper Washita - 3 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 4,334 acre-feet per year (16%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 19 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 19 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 19 as early as 2030 and will continue through 2075.
- Basin 19 is projected to have surface water available for appropriation through 2075.
- Basin 19 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

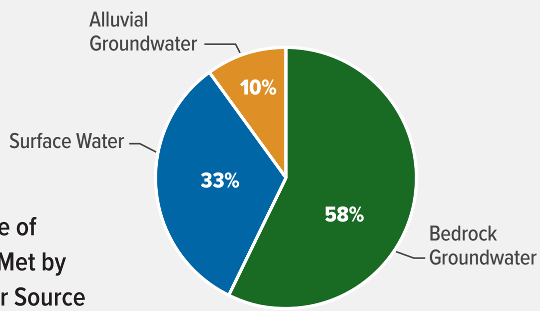
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
26,044	26,890	27,253	27,941	29,912	31,188

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 19 accounts for approximately 20% of the overall water demands of the West Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	66	68	67	66	66	66
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	17,600	20,624	20,670	20,714	20,745	20,776
Livestock	2,039	1,978	1,974	1,922	1,847	1,786
Oil & Gas	399	399	399	399	399	399
Public Supply	6,170	6,403	6,509	6,708	7,229	7,583
Thermoelectric Power	-	-	-	-	-	-
Total	**26,274**	**29,471**	**29,619**	**29,809**	**30,286**	**30,608**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	405	435	470	548	601	8%
Alluvial Groundwater Depletion	238	243	249	261	270	8%
Bedrock Groundwater Depletion	139	138	134	129	125	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
93,700	No	No	1,651,020

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

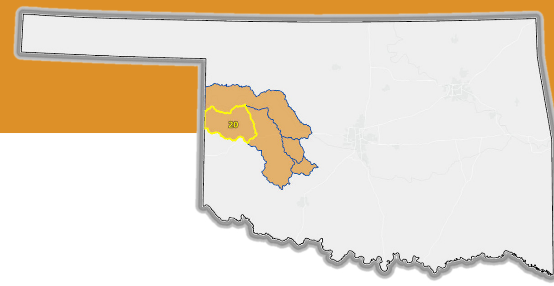
Water Management Category	Demand Sector	Basin 19 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	May Increase Shortages - Use with Other Strategies
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

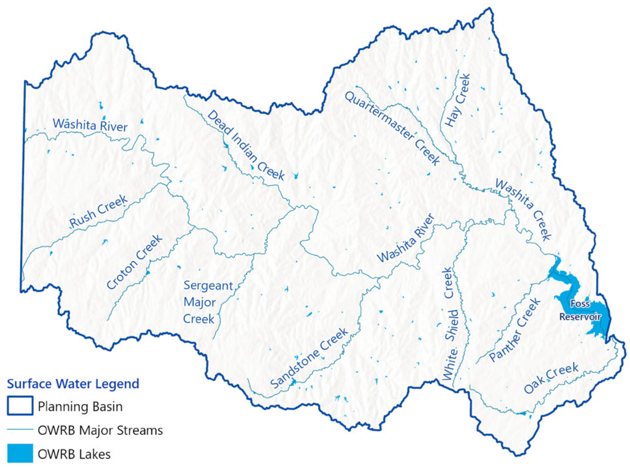
In addition to the water management strategies, water users need:

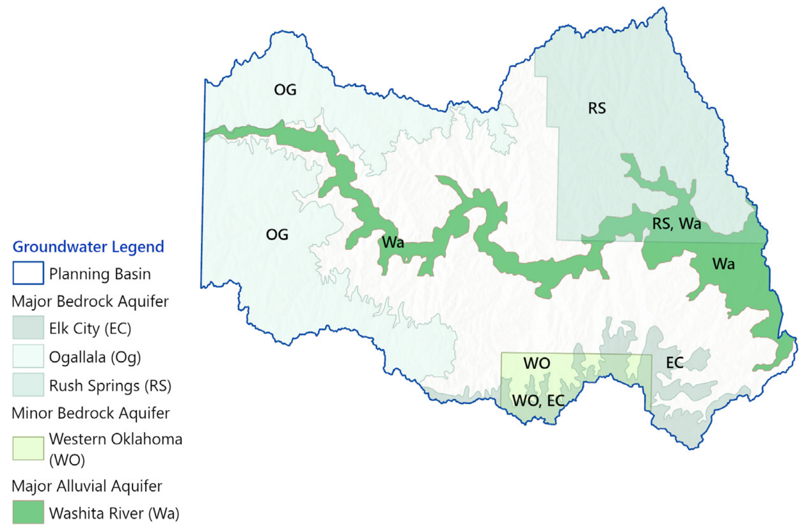
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 20

Washita Headwaters / West Central Region







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

SUMMARY

- Basin 20 - Washita Headwaters demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to increase by 1,115 acre-feet per year (11%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 20 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 20 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 20 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 20 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

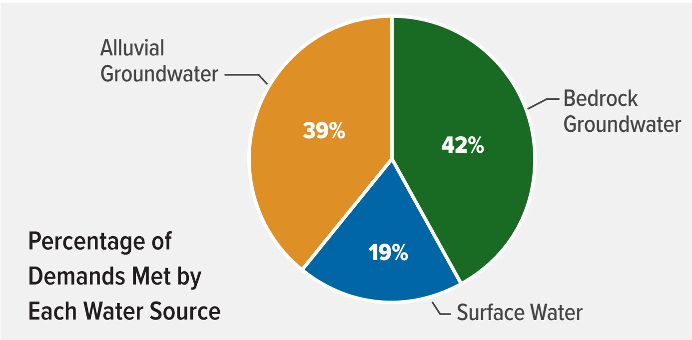
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
9,650	10,288	10,577	11,162	12,501	13,499

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 20 accounts for approximately 8% of the overall water demands of the West Central Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	76	80	80	80	84	85
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	8,901	10,102	10,103	10,103	10,103	10,103
Livestock	1,005	975	973	947	909	878
Oil & Gas	385	385	385	385	385	385
Public Supply	164	175	175	177	187	194
Thermoelectric Power	-	-	-	-	-	-
Total	**10,531**	**11,718**	**11,716**	**11,693**	**11,668**	**11,646**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	112	111	100	89	80	18%
Alluvial Groundwater Depletion	524	524	526	531	534	46%
Bedrock Groundwater Depletion	35	35	34	33	31	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	672,210

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

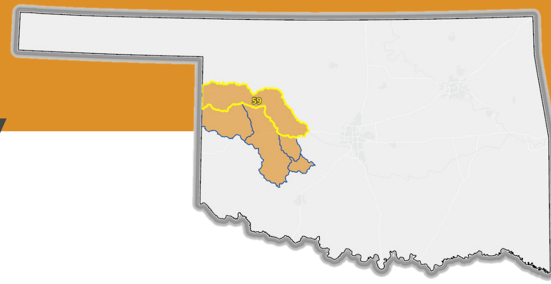
Water Management Category	Demand Sector	Basin 20 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

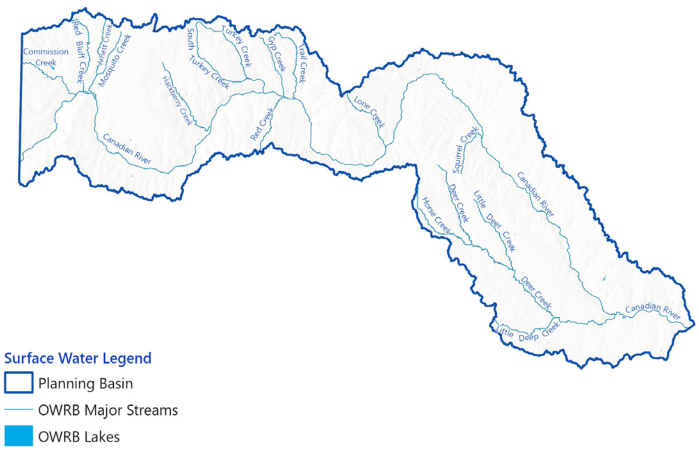
In addition to the water management strategies, water users need:

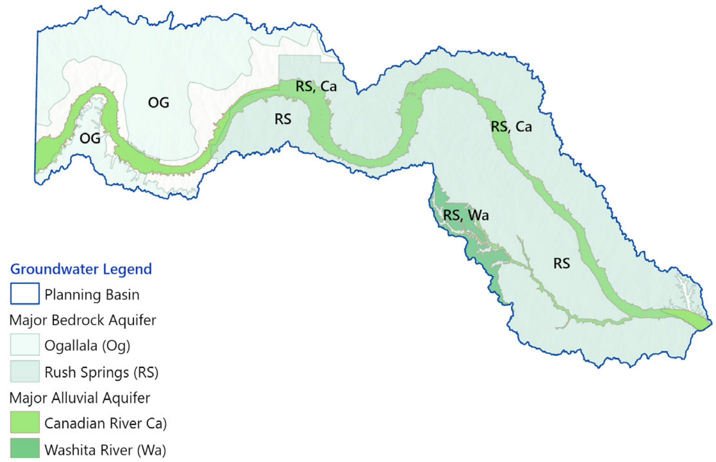
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 59

Upper Canadian River / West Central Region







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

SUMMARY

- Basin 59 - Upper Canadian River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 17,991 acre-feet per year (48%) between 2020 and 2075
- Physical surface water gaps are projected in Basin 59 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 59 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 59 as early as 2030 and will continue through 2075.
- Basin 59 is projected to have surface water available for appropriation through 2075.
- Basin 59 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

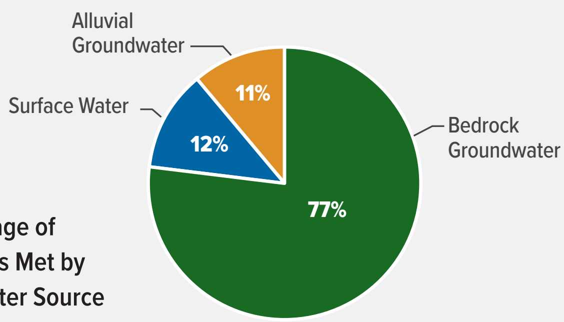
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
19,459	20,813	21,369	22,546	25,439	27,580

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 59 accounts for approximately 36% of the overall water demands of the West Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	343	364	367	374	402	420
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	28,692	32,594	33,965	36,716	41,018	45,248
Livestock	2,252	2,206	2,210	2,172	2,122	2,086
Oil & Gas	2144	2144	2144	2144	2144	2144
Public Supply	4,081	4,388	4,495	4,717	5,221	5,606
Thermoelectric Power	-	-	-	-	-	-
Total	**37,512**	**41,696**	**43,180**	**46,123**	**50,906**	**55,503**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	147	200	286	482	632	52%
Alluvial Groundwater Depletion	397	538	822	1,298	1,831	59%
Bedrock Groundwater Depletion	6,879	7,633	9,142	11,938	14,868	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
64,200	No	No	2,280,990

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 59 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Beaver-Cache Planning Region

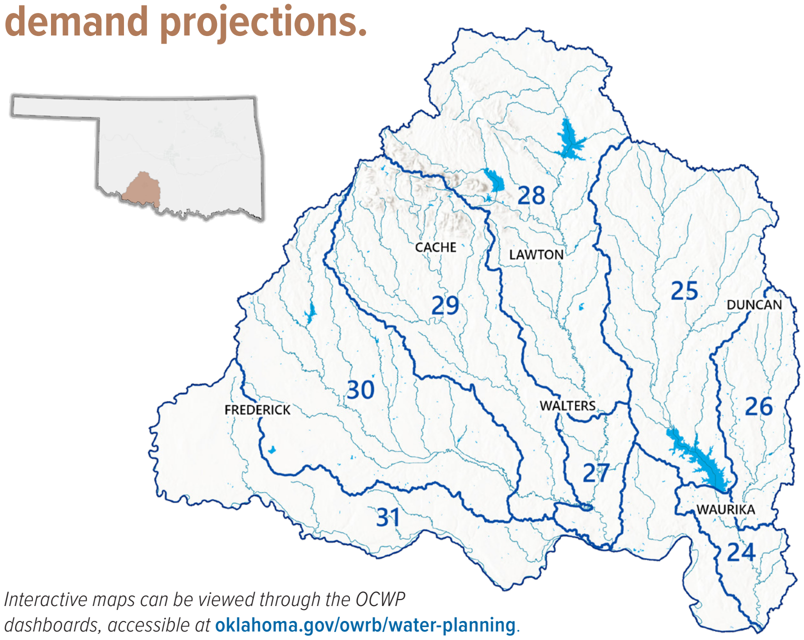
Summary

- 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

OKLAHOMA Water Resources Board

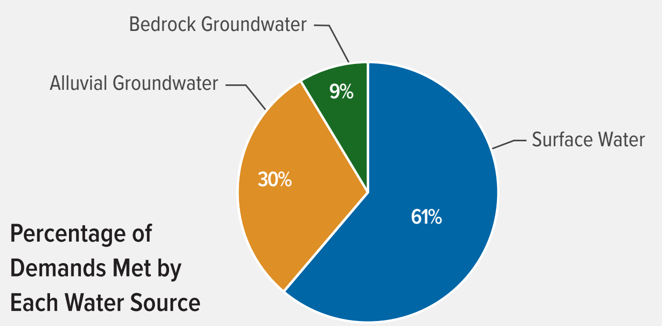
Population

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 Thermoelectric 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
Thermoelectric 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 WIW 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
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	Average Magnitude (AFY)				
24	No BGW Demand				
25	5	3	1	-	-
26	388	383	374	363	351
27	113	107	96	80	64
28	6	3	-	-	-
29	1	-	-	-	-
30	312	310	305	300	294
31	314	313	313	312	311

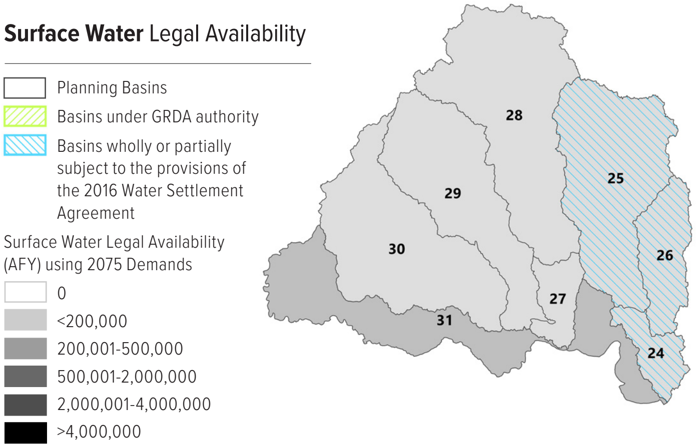
AFY = acre-feet per year

Lake Lawtonka

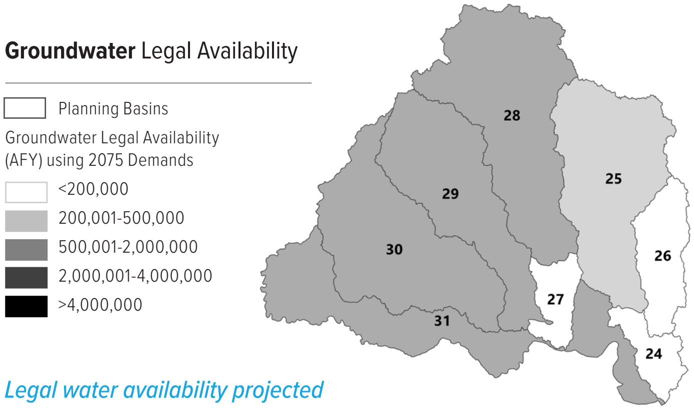
Legal Water Availability WM WSS

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



Groundwater Legal Availability



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**

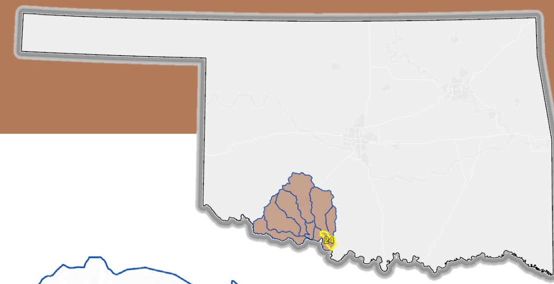
M = million; B = billion; N/A = not applicable

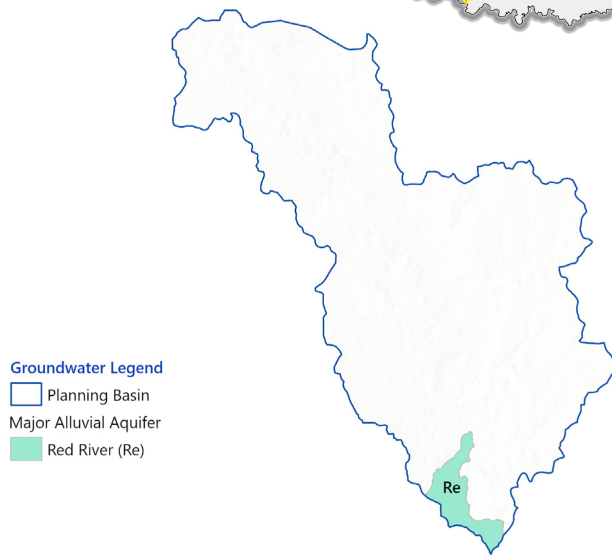
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

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

BASIN 24

Beaver Creek - 1 / Beaver Cache Region





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

SUMMARY

- Basin 24 - Beaver Creek -1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 24 acre-feet per year (6%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- There are no bedrock groundwater demands in this basin.
- Basin 24 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 24 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

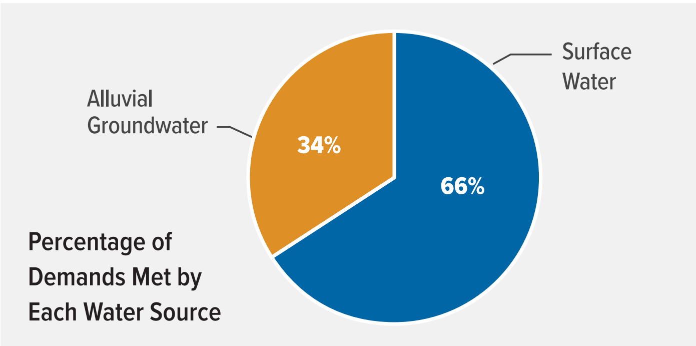
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
733	785	760	728	688	643

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 24 accounts for approximately 1% of the overall water demands of the Beaver Cache Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	0	0	0	0	0	0
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	5	75	75	75	75	75
Livestock	178	173	173	168	161	156
Oil & Gas	5	5	5	5	5	5
Public Supply	187	200	194	186	176	164
Thermoelectric Power	-	-	-	-	-	-
Total	**376**	**453**	**446**	**434**	**417**	**400**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	-	-	-	-	-	No BGW Demand

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
147,600	Yes	No	2,180

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

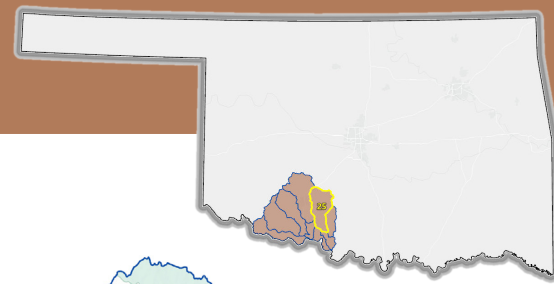
Water Management Category	Demand Sector	Basin 24 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Ineffective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

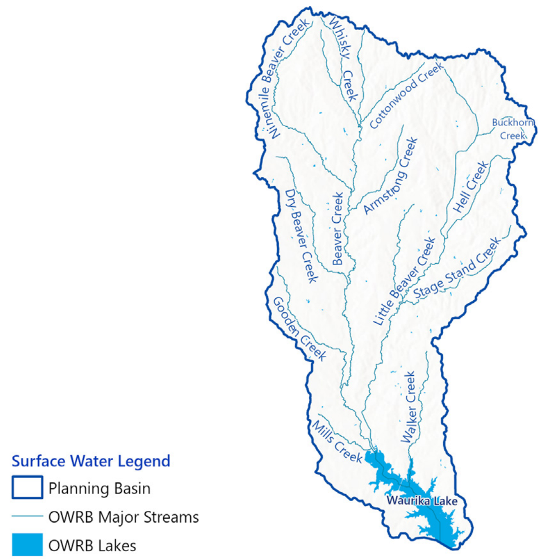
In addition to the water management strategies, water users need:

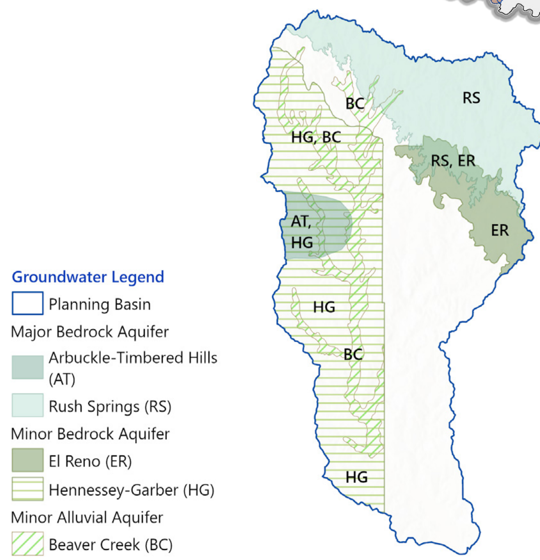
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 25

Beaver Creek - 2 / Beaver Cache Region







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

SUMMARY

- Basin 25 - Beaver Creek - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 145 acre-feet per year (3%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 25 as early as 2030 and will continue through 2075.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 25 as early as 2030 and will diminish by 2075.
- Basin 25 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 25 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

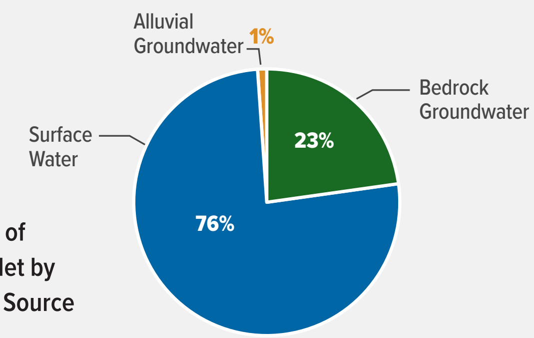
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
36,244	34,909	33,918	31,843	29,133	26,342

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 25 accounts for approximately 11% of the overall water demands of the Beaver Cache Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	233	230	226	217	204	193
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,520	1,966	1,957	1,975	2,034	2,092
Livestock	736	715	713	695	669	647
Oil & Gas	282	282	282	282	282	282
Public Supply	2,236	2,152	2,090	1,965	1,815	1,648
Thermoelectric Power	-	-	-	-	-	-
Total	**5,008**	**5,345**	**5,268**	**5,134**	**5,004**	**4,863**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	374	360	333	317	292	24%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	5	3	1	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
103,900	Yes	No	465,610

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

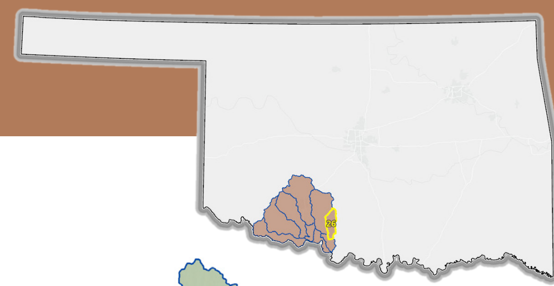
Water Management Category	Demand Sector	Basin 25 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management / Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

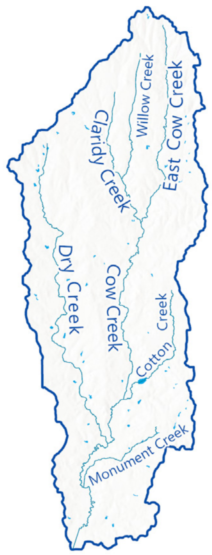
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 26

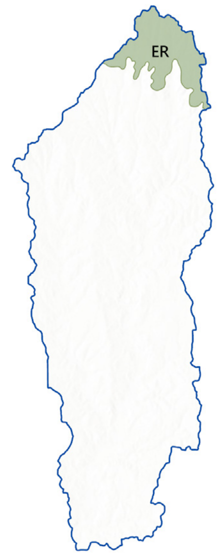
Beaver Creek - 3 / Beaver Cache Region





Surface Water Legend

- Planning Basin
- OWRB Major Streams
- OWRB Lakes



Groundwater Legend

- Planning Basin

Minor Bedrock Aquifer

- El Reno (ER)

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

SUMMARY

- Basin 26 - Beaver Creek - 3 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 168 acre-feet per year (15%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 26 as early as 2030 and will continue through 2075.
- Basin 26 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 26 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

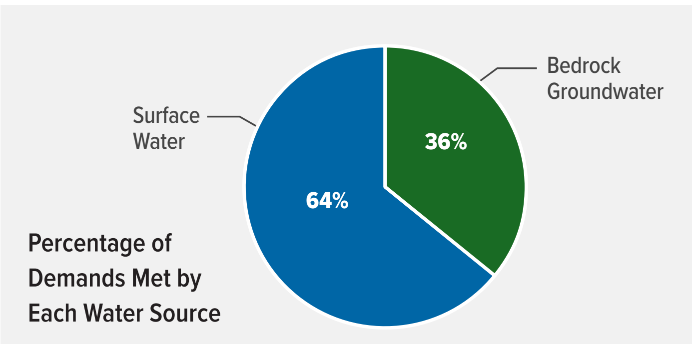
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
7,428	7,189	6,979	6,578	6,126	5,588

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 26 accounts for approximately 2% of the overall water demands of the Beaver Cache Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	15	14	14	13	12	11
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	77	116	116	116	116	116
Livestock	262	254	254	247	238	230
Oil & Gas	99	99	99	99	99	99
Public Supply	688	665	646	609	567	517
Thermoelectric Power	-	-	-	-	-	-
Total	**1,140**	**1,149**	**1,128**	**1,084**	**1,031**	**973**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	388	383	374	363	351	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
52,800	Yes	No	14,140

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

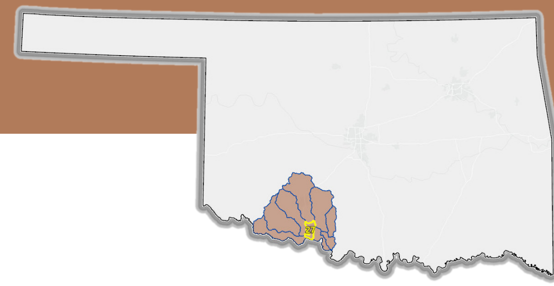
Water Management Category	Demand Sector	Basin 26 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

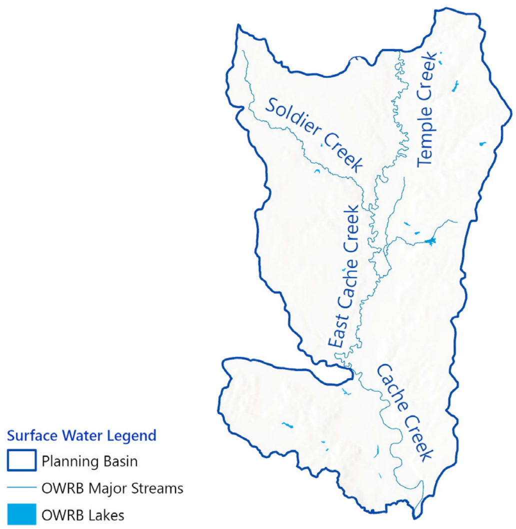
In addition to the water management strategies, water users need:

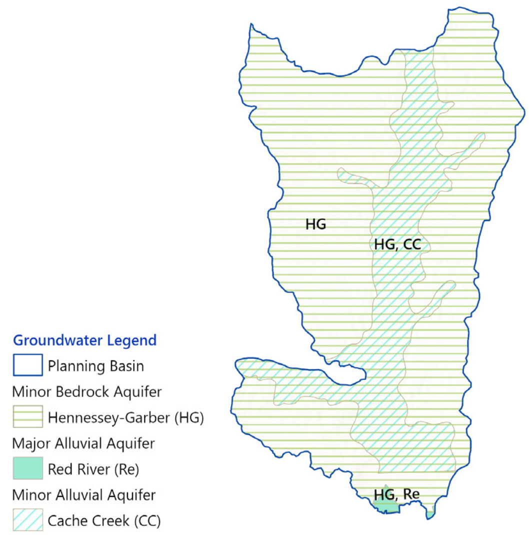
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 27

Cache Creek - 1 / Beaver Cache Region







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

SUMMARY

- Basin 27 - Cache Creek - 1 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to decrease by 141 acre-feet per year (32%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 27 as early as 2030 and will continue through 2075.
- Basin 27 is projected to have surface water available for appropriation through 2075.
- Basin 27 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

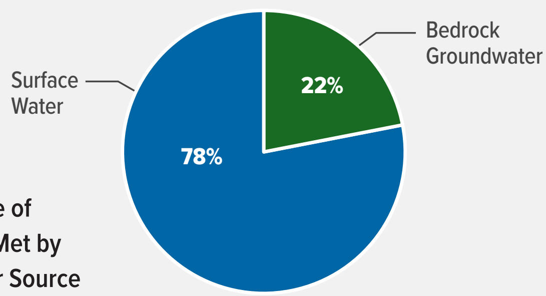
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
914	828	745	619	443	254

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 27 accounts for approximately 1% of the overall water demands of the Beaver Cache Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	0	0	0	0	0	0
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	82	103	103	103	103	103
Livestock	160	155	155	151	145	140
Oil & Gas	2	2	2	2	2	2
Public Supply	195	177	159	132	95	54
Thermoelectric Power	-	-	-	-	-	-
Total	**439**	**437**	**419**	**388**	**344**	**299**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	113	107	96	80	64	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
174,100	No	No	127,360

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

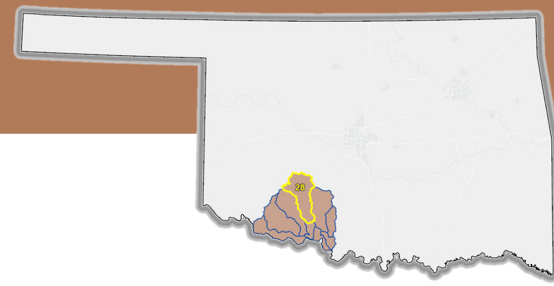
Water Management Category	Demand Sector	Basin 27 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Ineffective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

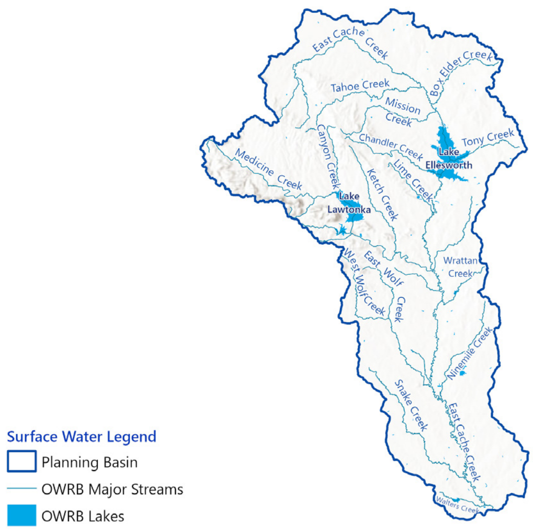
In addition to the water management strategies, water users need:

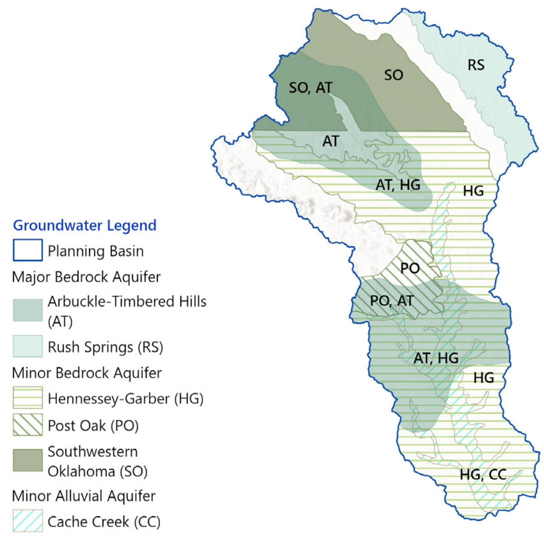
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 28

Cache Creek - 2 / Beaver Cache Region







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

SUMMARY

- Basin 28 - Cache Creek - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 5,154 acre-feet per year (23%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 28 as early as 2030 and will diminish by 2045.
- Basin 28 is projected to have surface water available for appropriation through 2075.
- Basin 28 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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OKLAHOMA Water Resources Board

Population

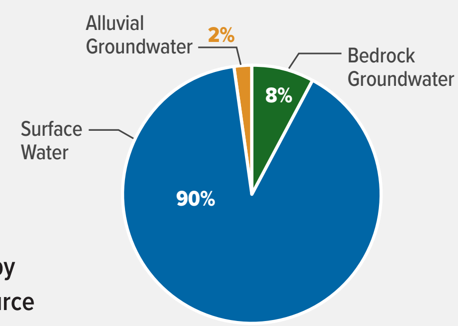
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
53,142	51,403	49,934	46,833	42,596	38,409

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 28 accounts for approximately 40% of the overall water demands of the Beaver Cache Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	170	16	160	151	138	125
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	964	1,106	1,175	1,310	1,504	1,671
Livestock	799	779	778	762	738	720
Oil & Gas	56	56	56	56	56	56
Public Supply	19,985	19,236	18,677	17,482	15,852	14,231
Thermoelectric Power	187	127	120	155	181	204
Total	**22,160**	**21,468**	**20,966**	**19,915**	**18,468**	**17,006**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	6	3	-	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
113,700	No	No	968,680

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

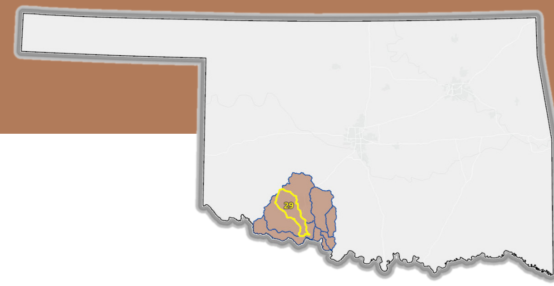
Water Management Category	Demand Sector	Basin 28 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

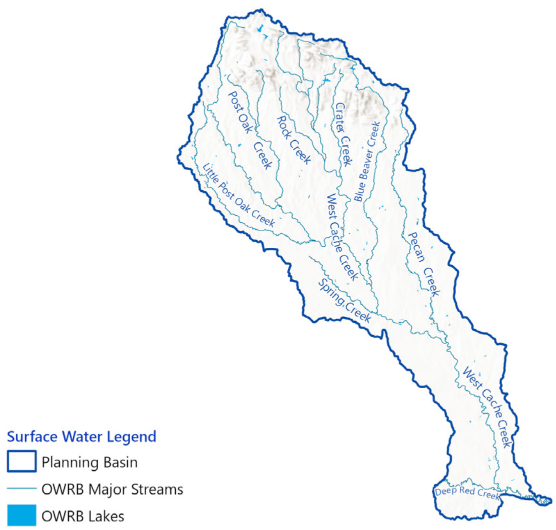
In addition to the water management strategies, water users need:

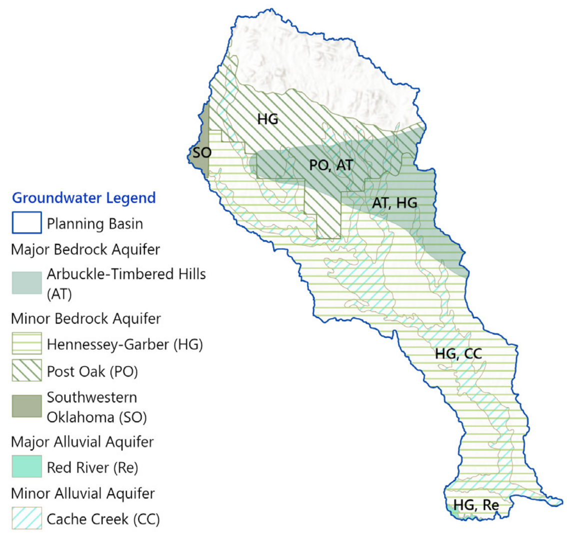
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 29

Deep Red Creek and West Cache Creek - 1 / Beaver Cache Region







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

SUMMARY

- Basin 29 - Deep Red Creek and West Cache Creek - 1 demands are supplied by a combination of surface water and groundwater supplies.
- Water demand (withdrawal) is projected to decrease by 622 acre-feet per year (22%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 29 as early as 2030 and will diminish by 2035.
- Physical bedrock groundwater depletions are projected in Basin 29 as early as 2030 and will diminish by 2035.
- Basin 29 is projected to have surface water available for appropriation through 2075.
- Basin 29 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

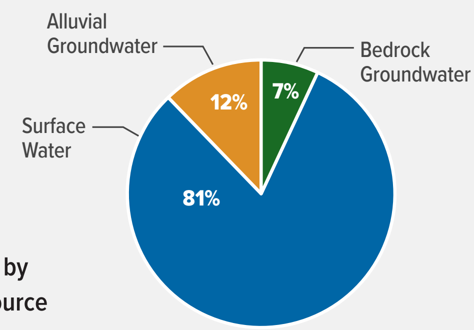
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
41,993	40,283	39,074	36,498	32,984	29,472

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 29 accounts for approximately 5% of the overall water demands of the Beaver Cache Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	86	82	80	75	68	61
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	185	221	234	261	300	333
Livestock	564	547	546	531	511	494
Oil & Gas	6	6	6	6	6	6
Public Supply	1,988	1,897	1,828	1,691	1,504	1,314
Thermoelectric Power	-	-	-	-	-	-
Total	**2,829**	**2,754**	**2,694**	**2,565**	**2,389**	**2,208**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	3	-	-	-	-	0%
Bedrock Groundwater Depletion	1	-	-	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
167,600	No	No	589,630

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

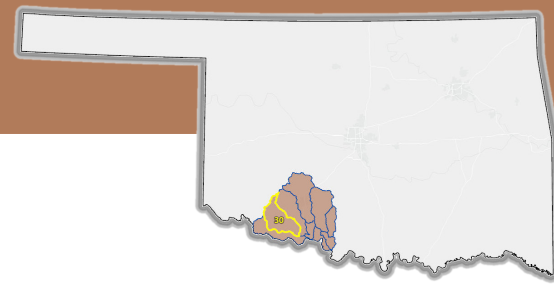
Water Management Category	Demand Sector	Basin 29 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

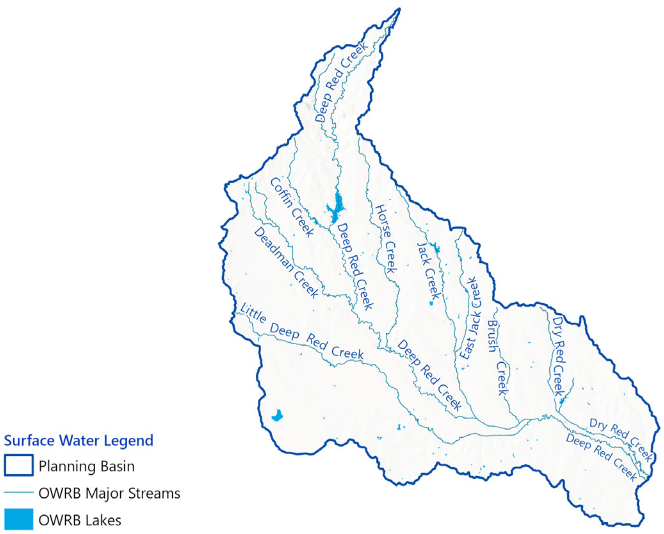
In addition to the water management strategies, water users need:

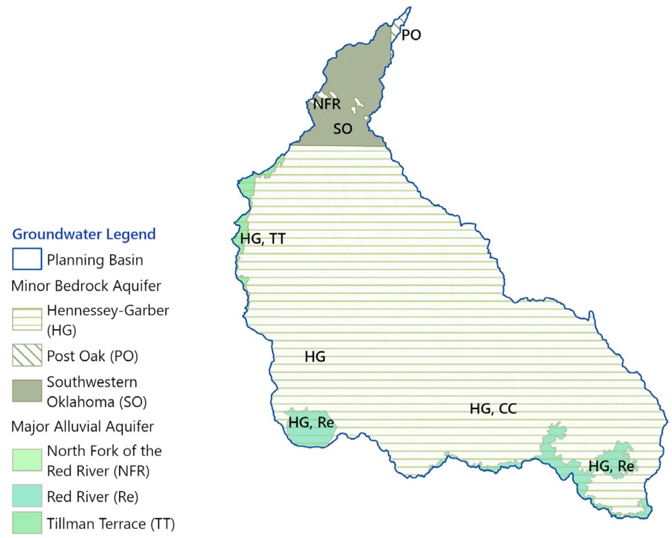
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 30

Deep Red Creek and West Cache Creek - 2 / Beaver Cache Region







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

SUMMARY

- Basin 30 - Deep Red Creek and West Cache Creek - 2 demands are supplied by a combination of surface water, groundwater, and supplies.
- Water demand (withdrawal) is projected to decrease by 472 acre-feet per year (10%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 30 as early as 2030 and will diminish by 2045.
- Physical alluvial groundwater depletions are projected in Basin 30 as early as 2030 and will diminish by 2045.
- Physical bedrock groundwater depletions are projected in Basin 30 as early as 2030 and will continue through 2075.
- Basin 30 is projected to have surface water available for appropriation through 2075.
- Basin 30 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

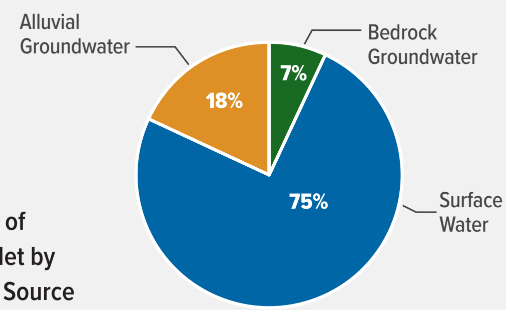
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
6,794	6,522	6,218	5,635	4,887	4,110

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 30 accounts for approximately 10% of the overall water demands of the Beaver Cache Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	8	8	8	7	6	5
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	2,617	2,669	2,669	2,669	2,669	2,669
Livestock	739	718	713	693	664	640
Oil & Gas	46	46	46	46	46	46
Public Supply	1,137	1,108	1,060	960	838	714
Thermoelectric Power	-	-	-	-	-	-
Total	**4,547**	**4,550**	**4,496**	**4,375**	**4,225**	**4,075**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	16	6	-	-	-	0%
Alluvial Groundwater Depletion	8	7	-	-	-	0%
Bedrock Groundwater Depletion	312	310	305	300	294	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
63,700	No	No	717,720

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

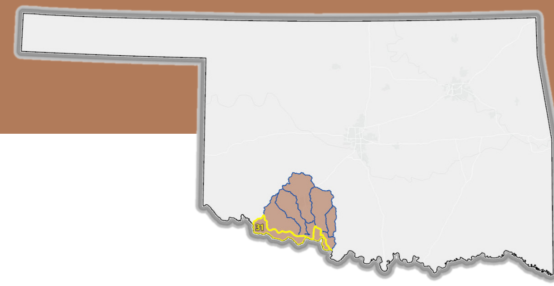
Water Management Category	Demand Sector	Basin 30 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

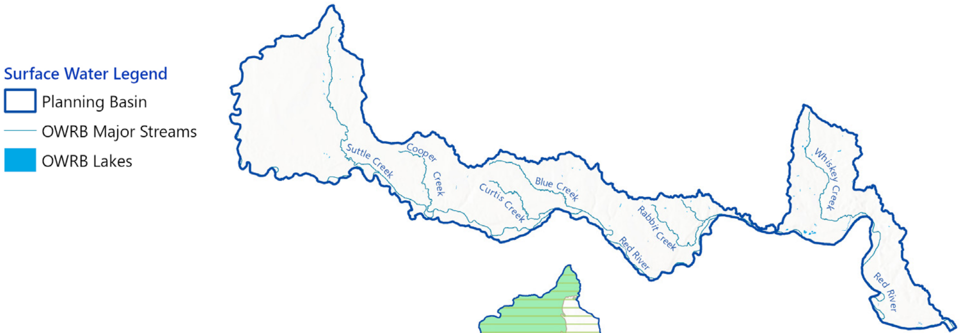
In addition to the water management strategies, water users need:

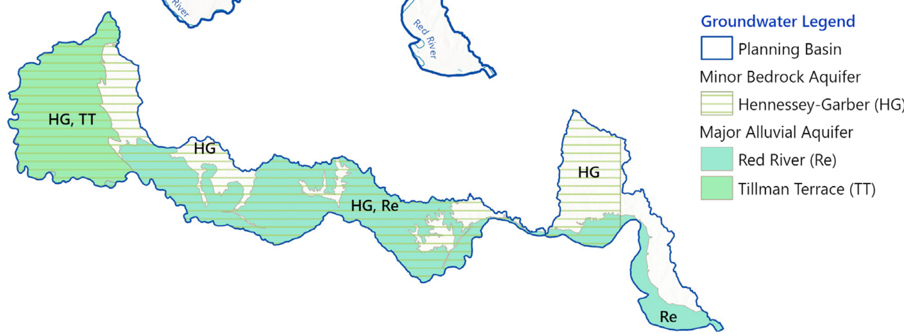
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 31

Red River Mainstem (To North Fork of Red) / Beaver Cache Region







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

SUMMARY

- Basin 31 - Red River Mainstem (To North Fork of Red) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 430 acre-feet per year (3%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 31 as early as 2030 and will continue through 2075.
- Basin 31 is projected to have surface water available for appropriation through 2075.
- Basin 31 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

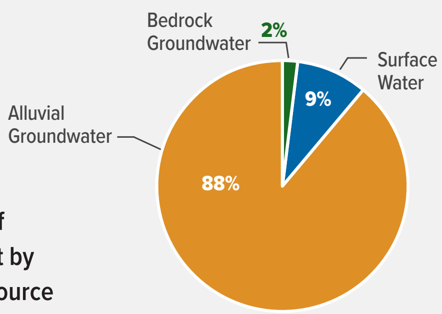
2020	2030	2035	2045	2060	2075
4,032	3,875	3,643	3,236	2,710	2,155

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 31 accounts for approximately 30% of the overall water demands of the Beaver Cache Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	20	19	18	16	13	11
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	11,066	11,304	11,304	11,304	11,304	11,304
Livestock	675	656	652	634	608	586
Oil & Gas	35	35	35	35	35	35
Public Supply	1,375	1,330	1,263	1,133	973	806
Thermoelectric Power	-	-	-	-	-	-
Total	**13,171**	**13,344**	**13,273**	**13,122**	**12,933**	**12,741**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	314	313	313	312	311	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
406,600	No	No	864,290

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 31 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Southwest Planning Region

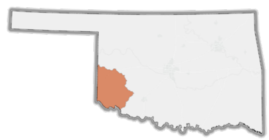
Summary

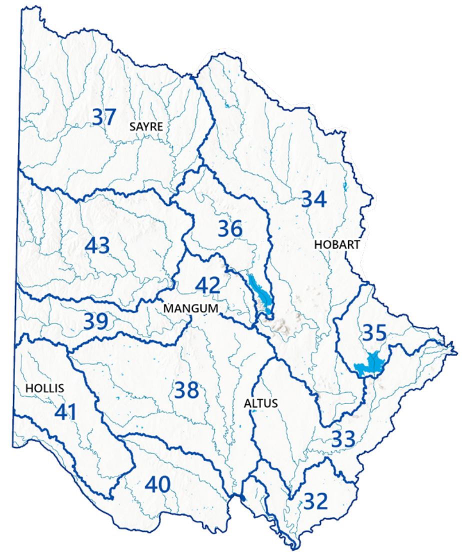
- Southwest Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,698 acre-feet per year (1%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water is projected to remain legally available for permitting through 2075 in all of the Southwest Region basins except Basin 36. Groundwater is legally available for permitting in all Southwest Region basins.
- In addition to the Statewide Recommendations, Southwest Region stakeholders expressed the need to consider conjunctive water management, reforming crop insurance, investing in irrigation districts, metering for all water uses, incentivizing removal of invasive species, supporting regionalization, expanding the Master Irrigators program and developing broader education program about best production/ irrigation practices.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Southwest Region represents 1% of the state's 2075 projected population and 11% 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 Southwest 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) for some basins. WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors) for some basins. WSS WDI
- For some basins where existing and traditional strategies are unable to meet future demands, stormwater capture and use (PS, SSI), 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

OKLAHOMA Water Resources Board

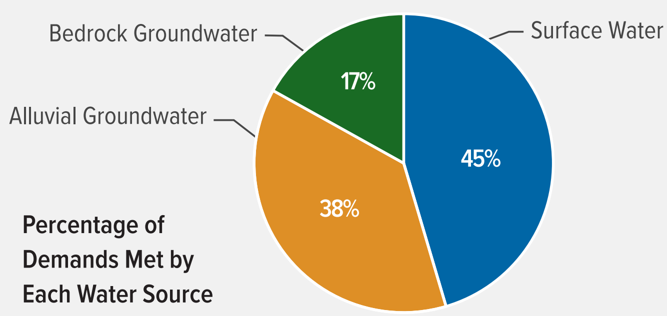
Population

2020	2030	2035	2045	2060	2075
65,515	62,671	60,795	57,436	53,058	47,919

Water Demand Projections

Water demands (withdrawals) are projected to increase by 1% between 2020 and 2075.

The Southwest Region's largest demand sector is Crop Irrigation, representing 94% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 5% 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 Southwest Region, Crop Irrigation demands will increase while Self-supplied Domestic, Self-supplied Industrial, Livestock, and Public Supply demands will decrease between 2020 and 2075. There are no Thermoelectric Power demands. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	588	582	584	579	591	587
Self-supplied Industrial	140	136	127	113	91	68
Crop Irrigation	229,624	235,974	236,408	236,643	236,664	236,664
Livestock	3,348	3,248	3,239	3,151	3,030	2,923
Oil & Gas	264	264	264	264	264	264
Public Supply	16,525	15,753	15,225	14,320	13,087	11,679
Thermoelectric Power	-	-	-	-	-	-
Total	**250,488**	**255,958**	**255,847**	**255,071**	**253,726**	**252,186**

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

Physical Water Shortages WIW 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 Southwest 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
32	-	-	-	-	-	0%
33	2	2	1	-	-	0%
34	187	249	315	310	303	31%
35	-	-	-	-	-	0%
36	3	5	7	7	7	92%
37	18	21	19	15	12	27%
38	810	813	803	803	793	97%
39	-	-	-	-	-	0%
40	-	-	-	-	-	0%
41	7	7	5	3	1	38%
42	-	-	-	-	-	0%
43	-	5	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
32	202	202	202	151	54	4%
33	226	248	125	56	3	1%
34	137	151	163	164	157	34%
35	-	-	-	-	-	No AGW Demand
36	370	445	498	503	504	97%
37	559	616	613	652	657	56%
38	74	68	68	49	41	1%
39	83	88	88	88	88	51%
40	-	-	-	-	-	0%
41	77	79	78	78	78	86%
42	49	55	55	55	55	1%
43	-	-	-	-	-	0%

AFY = acre-feet per year

Physical Water Shortages Cont.

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	Average Magnitude (AFY)				
32	294	294	294	293	293
33	2,556	2,560	2,562	2,556	2,548
34	27	27	19	23	14
35	207	213	221	221	221
36	287	290	291	291	291
37	4,277	4,309	4,307	4,319	4,320
38	6,479	6,484	6,473	6,458	6,447
39	1	1	1	1	1
40	93	94	93	91	90
41	39,051	39,076	39,049	39,004	38,966
42	403	403	402	400	397
43	149	150	149	150	149

AFY = acre-feet per year

Elm Fork of the Red River

Legal Water Availability WM WSS

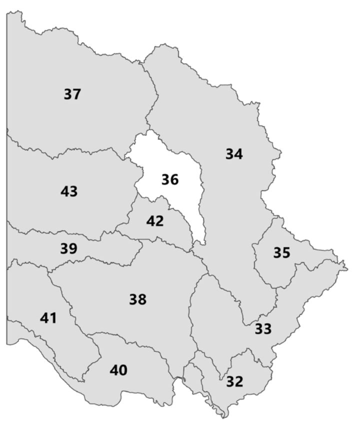
Surface water is projected to remain legally available for permitting through 2075 in all of the basins within the Southwest Region except Basin 36. Groundwater is legally available for permitting in all of the Southwest Region basins.

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

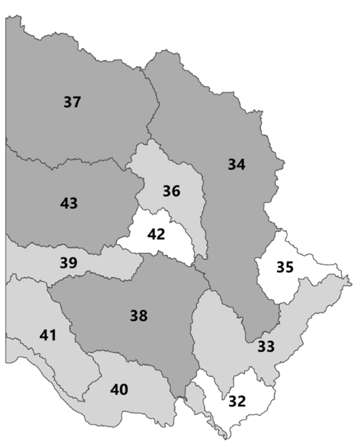


Groundwater Legal Availability

- 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)
Altus City	0
Elk City	0
Tom Steed	0
Lugert-Altus	0

--- 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)
Blaine	Bedrock	Major	temporary 2.0
Elk City	Bedrock	Major	1.0
Hennessey-Garber	Bedrock	Minor	1.6
North Fork of the Red River	Alluvial	Major	1.0
Ogallala Roger Mills	Bedrock	Major	temporary 2.0
Post Oak	Bedrock	Minor	2.0
Red River Reach 1	Alluvium and Terrace	Major	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Salt Fork of Red River	Alluvium and Terrace	Major	temporary 2.0
Southwestern Oklahoma	Bedrock	Minor	temporary 2.0
Tillman Terrace	Alluvial	Major	1.0
Western Oklahoma	Bedrock	Minor	temporary 2.0

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: Raising salinity and a lack of seasonal data, especially in sensitive karst systems, make it difficult to track groundwater quality over time. Major aquifers in the region suffer from elevated levels of nitrates, sulfate, total dissolved solids, and salinity.

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. Lakes in this area are classified as eutrophic or hypereutrophic, indicating high productivity and potential water quality concerns. These conditions contribute to a heightened risk of harmful algal blooms (HABs), increased water treatment costs, taste and odor issues, and diminished recreational value—impacting both recreational and water supply beneficial uses.

Streams: Rivers and streams are impacted by erosion, high mineral concentrations, drought-flood cycling, increased sedimentation, and increased nutrient concentrations. These factors contribute to habitat degradation, water insecurity, 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)
$645M	$593M	$13M

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	$38M	$1.3M	$841M
Small-Medium	$15M	$93M	$149M
Medium-Large	$6.2M	$397M	$66M
Large	N/A	N/A	N/A
Non-Public suppliers	$586M	N/A	N/A
Total	**$645M**	**$1.82B**	**$1.06B**

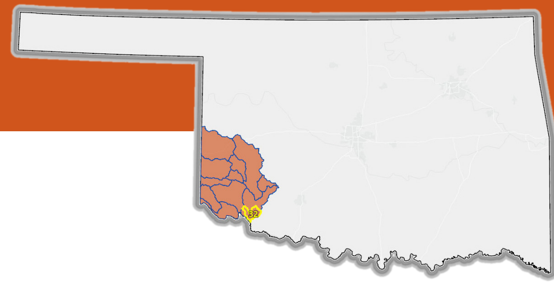
M = million; B = billion; N/A = not applicable

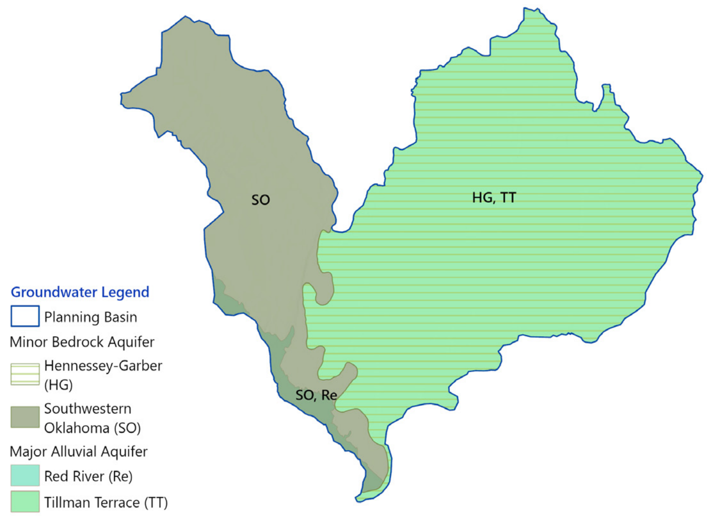
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

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

BASIN 32

Lower North Fork Red River - 1 / Southwest Region





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

SUMMARY

- Basin 32 - Lower North Fork Red River - 1 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 222 acre-feet per year (1%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 32 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 32 as early as 2030 and will continue through 2075.
- Basin 32 is projected to have surface water available for appropriation through 2075.
- Basin 32 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

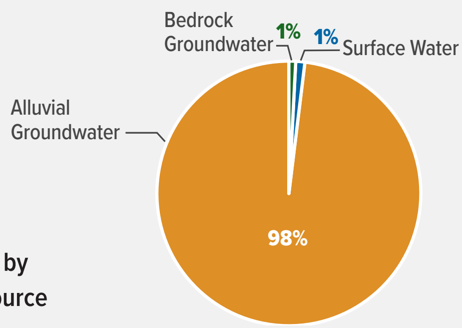
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
1,795	1,670	1,576	1,409	1,172	928

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 32 accounts for approximately 8% of the overall water demands of the Southwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	6	6	6	5	4	4
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	19,151	19,532	19,532	19,532	19,532	19,532
Livestock	119	116	115	112	107	103
Oil & Gas	10	10	10	10	10	10
Public Supply	376	367	351	317	277	236
Thermoelectric Power	-	-	-	-	-	-
Total	**19,663**	**20,031**	**20,014**	**19,976**	**19,931**	**19,885**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	202	202	202	151	54	4%
Bedrock Groundwater Depletion	294	294	294	293	293	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
75,800	No	No	165,810

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

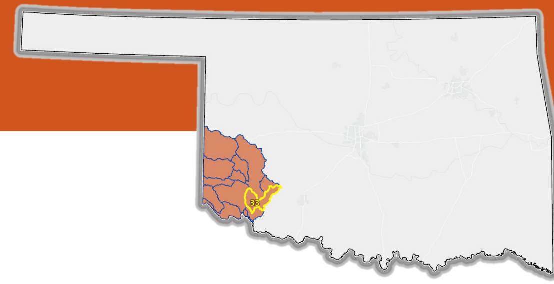
Water Management Category	Demand Sector	Basin 32 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Potentially Effective with Local Variability

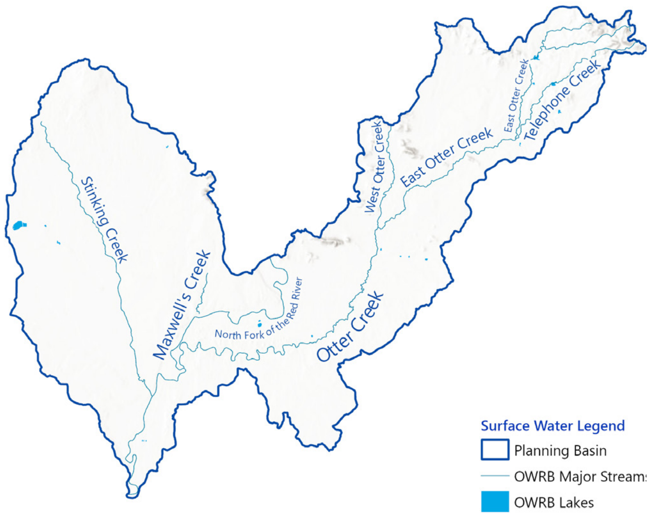
In addition to the water management strategies, water users need:

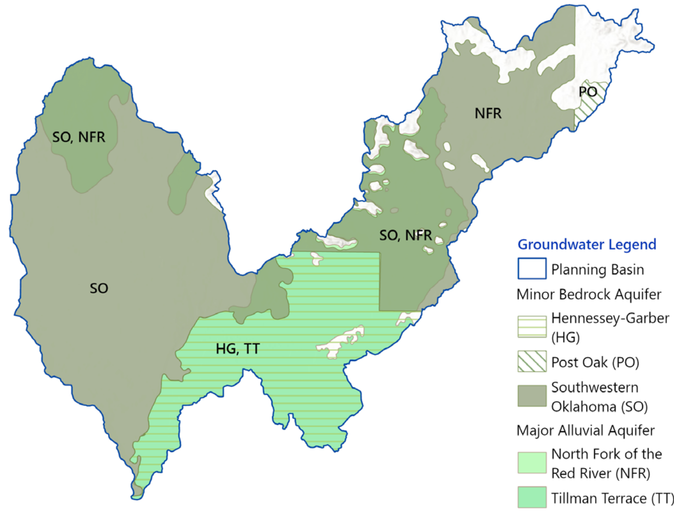
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 33

Lower North Fork Red River - 2 / Southwest Region







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

SUMMARY

- Basin 33 - Lower North Fork Red River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 1,960 acre-feet per year (5%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 33 as early as 2030 and will diminish by 2060.
- Physical alluvial groundwater depletions are projected in Basin 33 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 33 as early as 2030 and will continue through 2075.
- Basin 33 is projected to have surface water available for appropriation through 2075.
- Basin 33 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

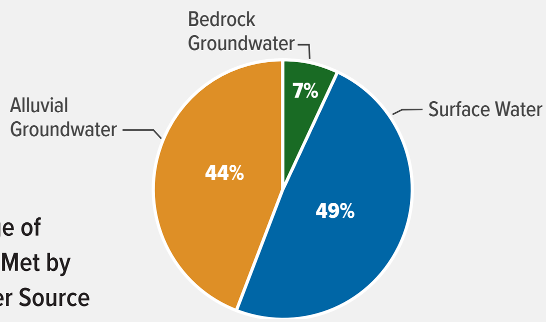
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
7,599	7,046	6,676	6,035	5,099	4,128

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 33 accounts for approximately 14% of the overall water demands of the Southwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	16	15	15	14	12	11
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	32,297	32,969	33,016	33,071	33,076	33,076
Livestock	269	261	260	253	243	234
Oil & Gas	18	18	18	18	18	18
Public Supply	5,023	4,554	4,266	3,794	3,072	2,324
Thermoelectric Power	-	-	-	-	-	-
Total	**37,623**	**37,816**	**37,575**	**37,149**	**36,421**	**35,663**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	2	2	1	-	-	0%
Alluvial Groundwater Depletion	226	248	125	56	3	1%
Bedrock Groundwater Depletion	2,556	2,560	2,562	2,556	2,548	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
62,700	No	No	419,010

1. If yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

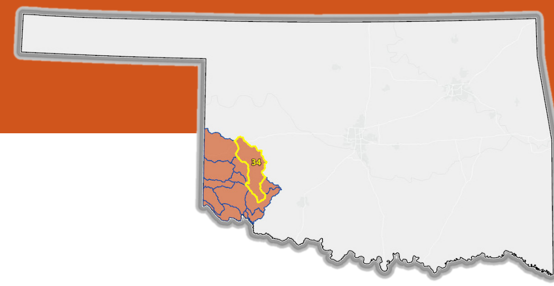
WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 33 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

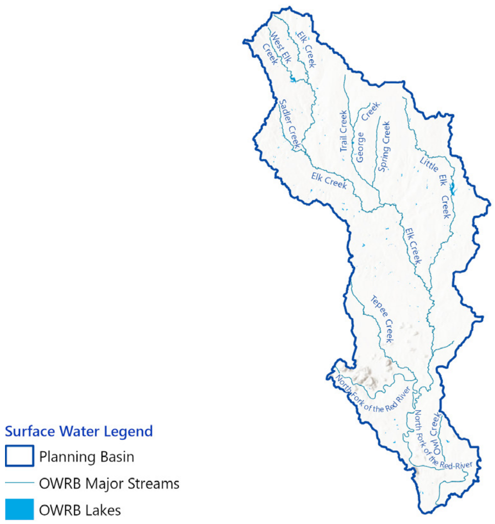
In addition to the water management strategies, water users need:

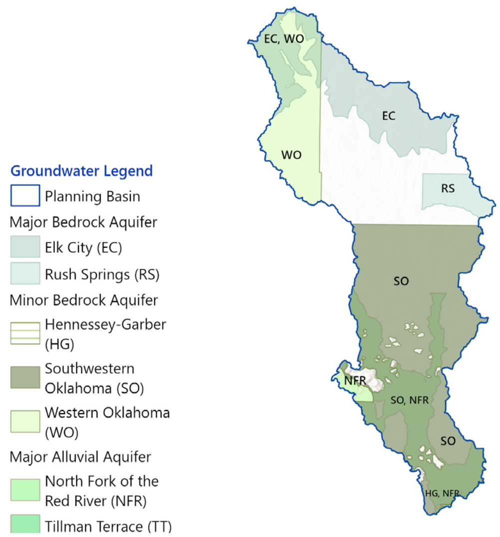
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 34



Lower North Fork Red River - 3 / Southwest Region





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

SUMMARY

- Basin 34 - Lower North Fork Red River - 3 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 531 acre-feet per year (5%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 34 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 34 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 34 as early as 2030 and will continue through 2075.
- Basin 34 is projected to have surface water available for appropriation through 2075.
- Basin 34 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

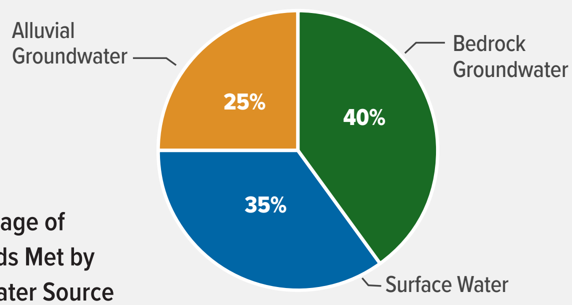
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
10,788	10,395	10,132	9,607	8,984	8,227

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 34 accounts for approximately 5% of the overall water demands of the Southwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	8	7	7	7	6	5
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	6,702	7,331	7,439	7,553	7,564	7,564
Livestock	830	805	803	781	751	725
Oil & Gas	53	53	53	53	53	53
Public Supply	3,255	3,199	3,185	3,121	3,109	3,031
Thermoelectric Power	-	-	-	-	-	-
Total	**10,848**	**11,394**	**11,488**	**11,516**	**11,483**	**11,379**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	187	249	315	310	303	31%
Alluvial Groundwater Depletion	137	151	163	164	157	34%
Bedrock Groundwater Depletion	27	27	19	23	14	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
20,000	No	No	804,980

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

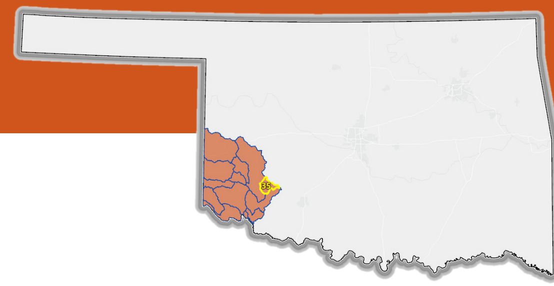
Water Management Category	Demand Sector	Basin 34 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	May Increase Shortages - Use with Other Strategies
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management / Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

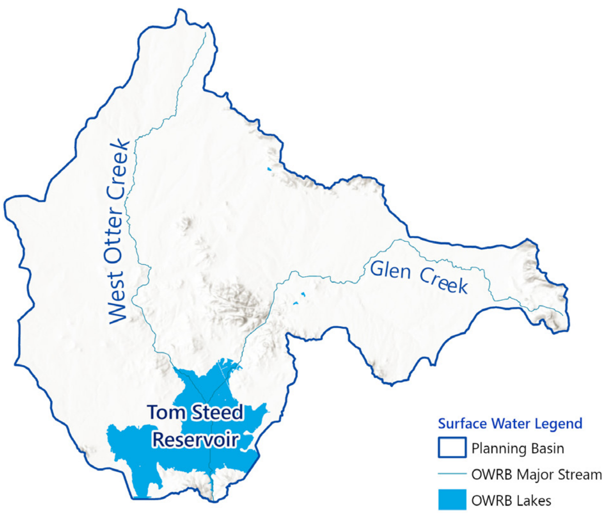
In addition to the water management strategies, water users need:

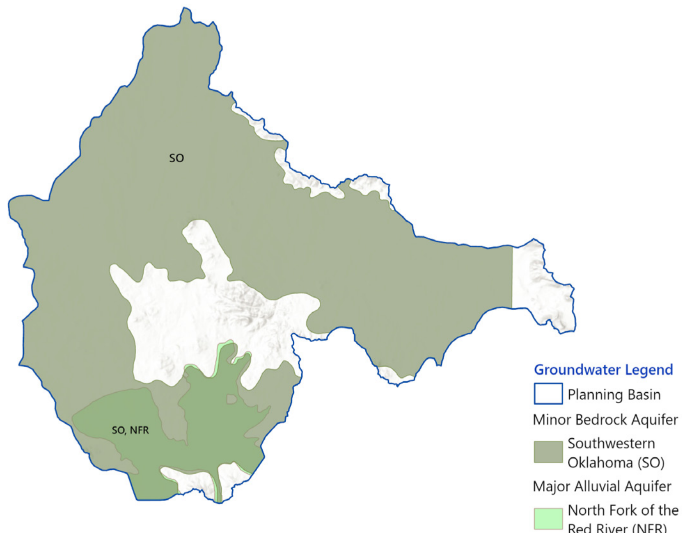
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 35

Lower North Fork Red River - 4 / Southwest Region







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

SUMMARY

- Basin 35 - Lower North Fork Red River - 4 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 6 acre-feet per year (2%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 35 as early as 2030 and will continue through 2075.
- Basin 35 is projected to have surface water available for appropriation through 2075.
- Basin 35 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water transfers (all sectors). WM WSS

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

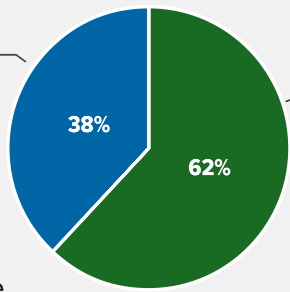
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
1,422	1,379	1,333	1,248	1,146	1,029

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 35 accounts for approximately 0% of the overall water demands of the Southwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	4	4	4	4	3	3
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	185	204	210	218	219	219
Livestock	112	108	108	105	101	98
Oil & Gas	4	4	4	4	4	4
Public Supply	46	45	43	41	37	34
Thermoelectric Power	-	-	-	-	-	-
Total	**352**	**365**	**370**	**372**	**365**	**357**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	207	213	221	221	221	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
500	No	No	130,190

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

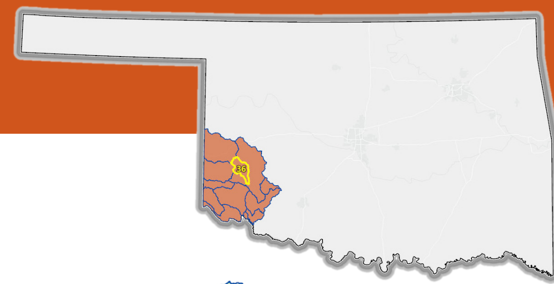
Water Management Category	Demand Sector	Basin 35 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Ineffective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

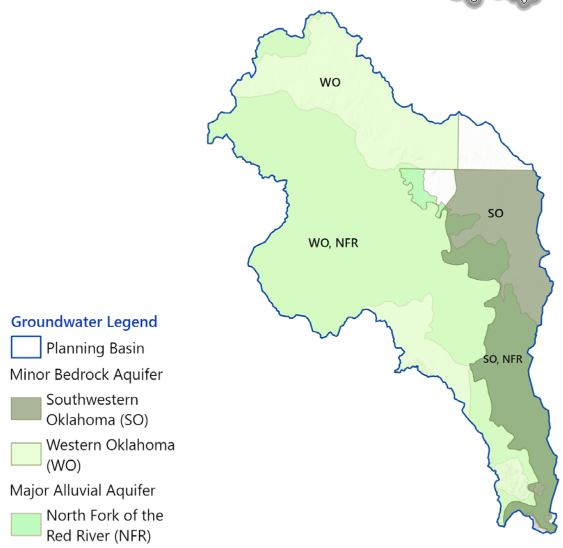
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 36

Upper North Fork Red River - 1 / Southwest Region





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

SUMMARY

- Basin 36 - Upper North Fork Red River - 1 demands are supplied by a combination of surface water, groundwater, and supplies.
- Water demand (withdrawal) is projected to increase by 501 acre-feet per year (6%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 36 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 36 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 36 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 36 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

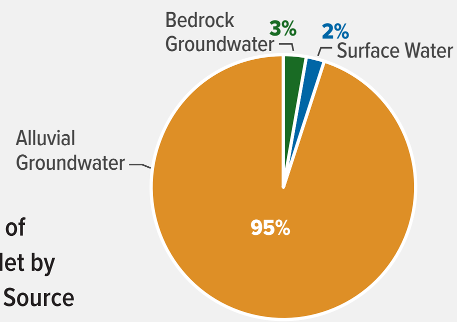
2020	2030	2035	2045	2060	2075
2,505	2,485	2,463	2,424	2,410	2,348

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 36 accounts for approximately 3% of the overall water demands of the Southwest Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	2	2	2	2	2	2
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	7,921	9,317	8,398	8,457	8,462	8,462
Livestock	145	141	141	137	132	127
Oil & Gas	10	10	10	10	10	10
Public Supply	245	247	241	239	232	224
Thermoelectric Power	-	-	-	-	-	-
Total	**8,323**	**8,716**	**8,792**	**8,844**	**8,837**	**8,824**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	3	5	7	7	7	92%
Alluvial Groundwater Depletion	370	445	498	503	504	97%
Bedrock Groundwater Depletion	287	290	291	291	291	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	276,750

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

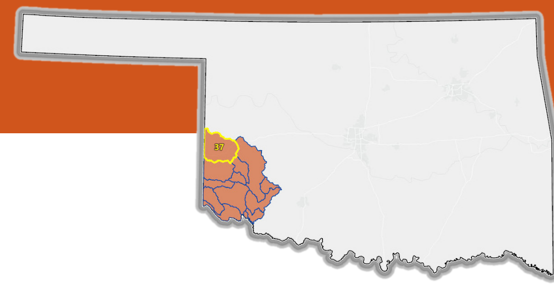
Water Management Category	Demand Sector	Basin 36 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Potentially Effective with Local Variability

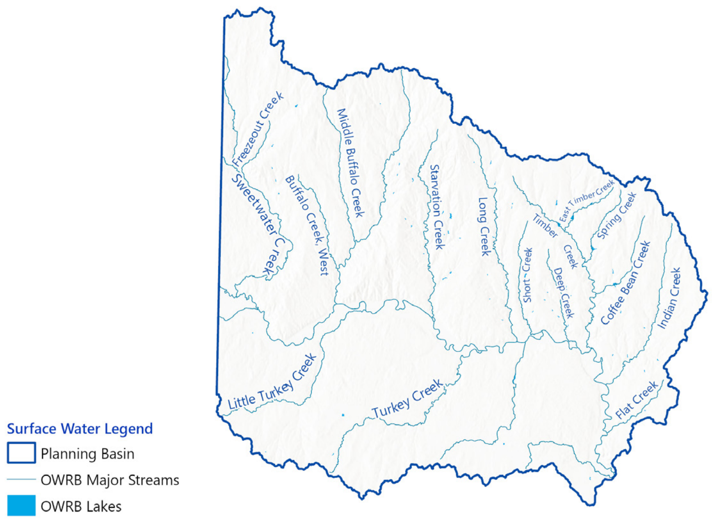
In addition to the water management strategies, water users need:

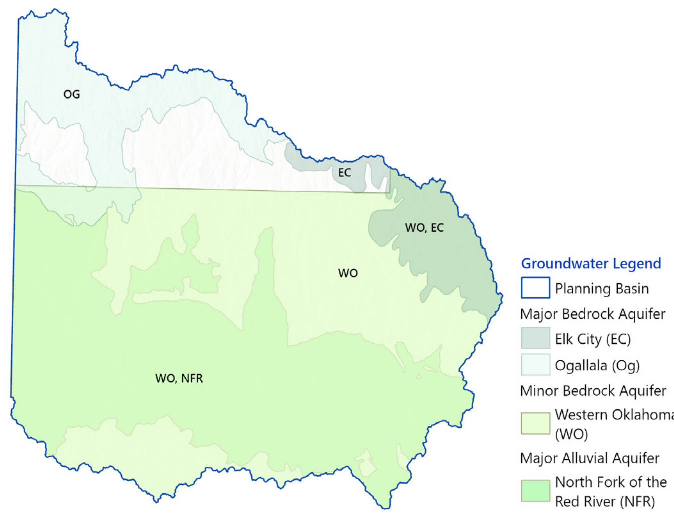
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 37

Upper North Fork Red River - 2 / Southwest Region







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

SUMMARY

- Basin 37 - Upper North Fork Red River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 1,092 acre-feet per year (4%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 37 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 37 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 37 as early as 2030 and will continue through 2075.
- Basin 37 is projected to have surface water available for appropriation through 2075.
- Basin 37 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

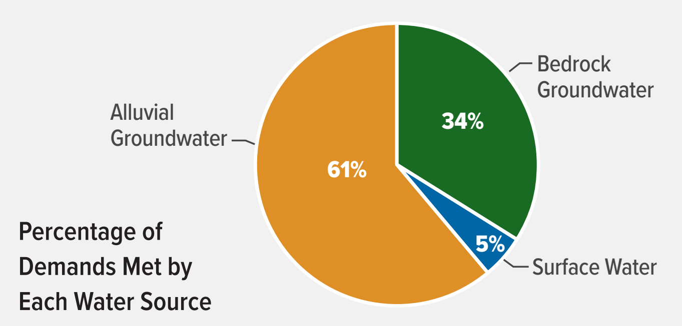
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
13,610	13,506	13,592	13,551	13,938	13,972

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 37 accounts for approximately 10% of the overall water demands of the Southwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	350	348	350	349	359	360
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	21,492	22,446	22,537	22,537	22,537	22,537
Livestock	518	503	501	488	469	453
Oil & Gas	119	119	119	119	119	119
Public Supply	2,767	2,770	2,782	2,776	2,857	2,870
Thermoelectric Power	-	-	-	-	-	-
Total	**25,247**	**26,186**	**26,290**	**26,269**	**26,341**	**26,339**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	18	21	19	15	12	27%
Alluvial Groundwater Depletion	559	616	613	652	657	56%
Bedrock Groundwater Depletion	4,277	4,309	4,307	4,319	4,320	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
35,300	No	Yes	865,010

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

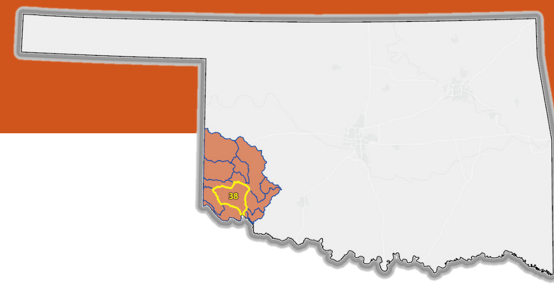
Water Management Category	Demand Sector	Basin 37 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

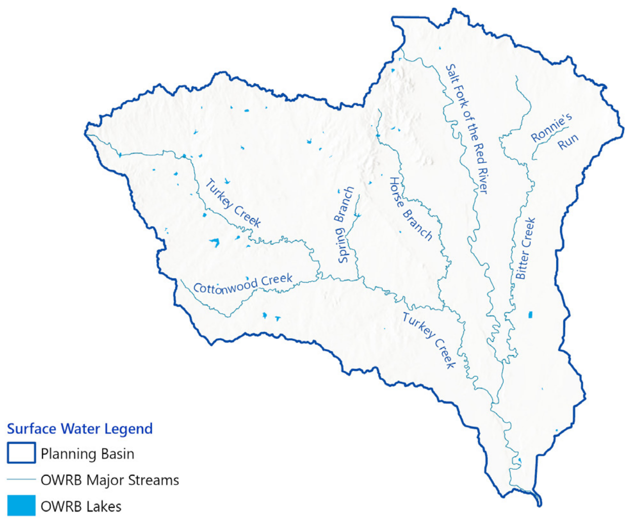
In addition to the water management strategies, water users need:

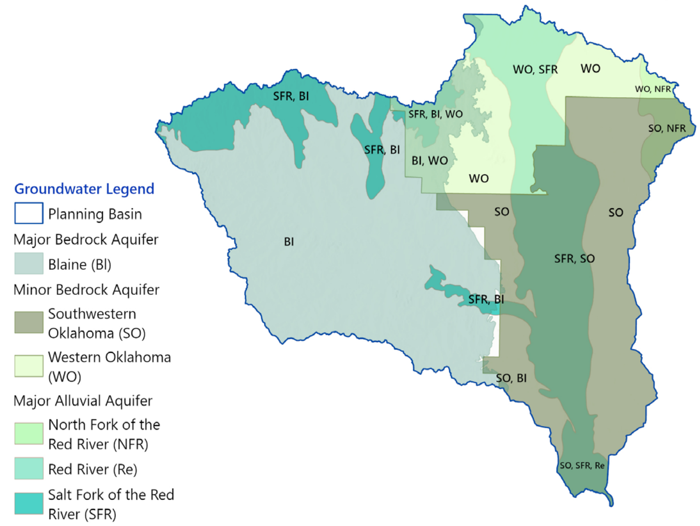
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 38

Salt Fork Red River - 1 / Southwest Region







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

SUMMARY

- Basin 38 - Salt Fork Red River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 67 acre-feet per year (0%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 38 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 38 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 38 as early as 2030 and will continue through 2075.
- Basin 38 is projected to have surface water available for appropriation through 2075.
- Basin 38 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

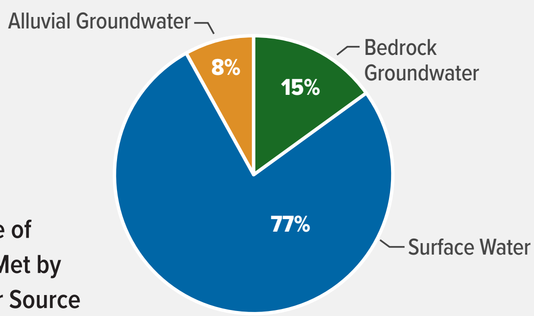
2020	2030	2035	2045	2060	2075
10,708	9,856	9,286	8,382	6,966	5,504

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 38 accounts for approximately 33% of the overall water demands of the Southwest Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	5	5	5	5	4	4
Self-supplied Industrial	140	136	127	113	91	68
Crop Irrigation	78,893	80,230	80,252	80,252	80,252	80,252
Livestock	356	345	344	335	323	311
Oil & Gas	14	14	14	14	14	14
Public Supply	2,691	2,471	2,327	2,101	1,748	1,381
Thermoelectric Power	-	-	-	-	-	-
Total	**82,098**	**83,202**	**83,070**	**82,820**	**82,433**	**82,031**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	810	813	803	803	793	97%
Alluvial Groundwater Depletion	74	68	68	49	41	1%
Bedrock Groundwater Depletion	6,479	6,484	6,473	6,458	6,447	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
63,300	No	No	870,520

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

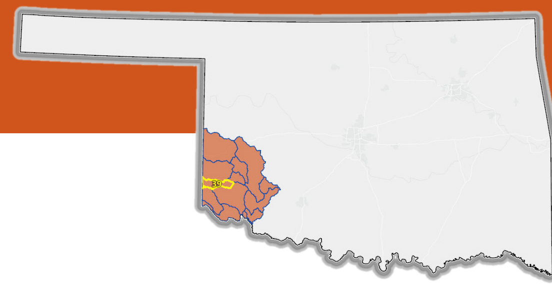
Water Management Category	Demand Sector	Basin 38 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

In addition to the water management strategies, water users need:

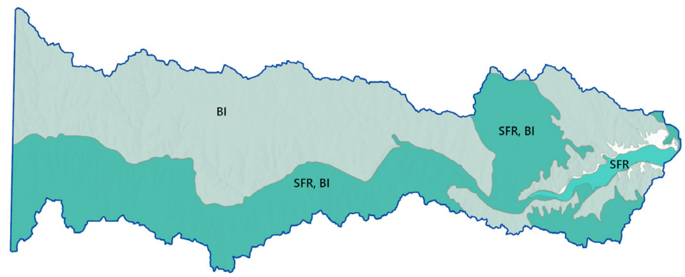
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 39

Salt Fork Red River - 2 / Southwest Region



Surface Water Legend
- Planning Basin
- OWRB Major Streams
- OWRB Lakes



Groundwater Legend
- Planning Basin

Major Bedrock Aquifer
- Blaine (BI)

Major Alluvial Aquifer
- Salt Fork of the Red River (SFR)

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

SUMMARY

- Basin 39 - Salt Fork Red River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 77 acre-feet per year (3%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 39 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 39 as early as 2030 and will continue through 2075.
- Basin 39 is projected to have surface water available for appropriation through 2075.
- Basin 39 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

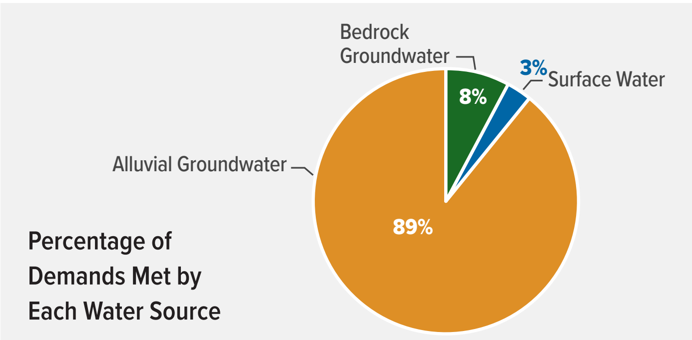
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
1,052	1,060	1,028	984	900	822

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 39 accounts for approximately 1% of the overall water demands of the Southwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	3	3	3	3	3	3
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	2,790	2,888	2,895	2,895	2,895	2,895
Livestock	161	156	156	152	146	141
Oil & Gas	1	1	1	1	1	1
Public Supply	85	86	84	83	81	78
Thermoelectric Power	-	-	-	-	-	-
Total	**3,040**	**3,134**	**3,139**	**3,133**	**3,125**	**3,117**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	83	88	88	88	88	51%
Bedrock Groundwater Depletion	1	1	1	1	1	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
32,300	No	No	392,070

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

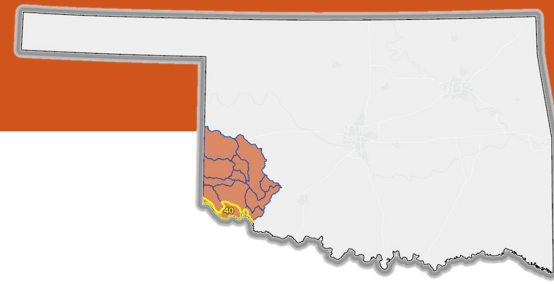
Water Management Category	Demand Sector	Basin 39 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

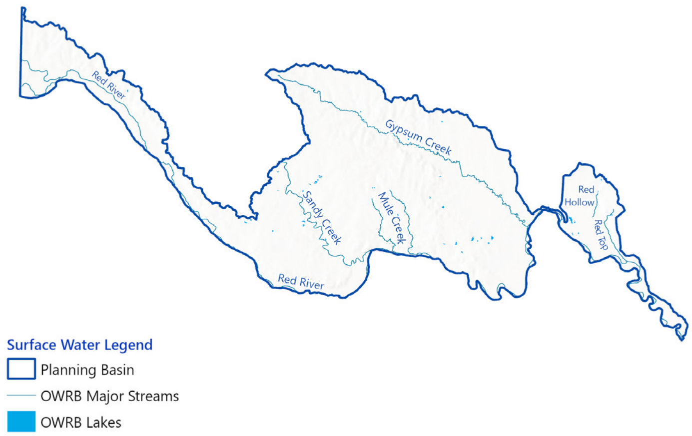
In addition to the water management strategies, water users need:

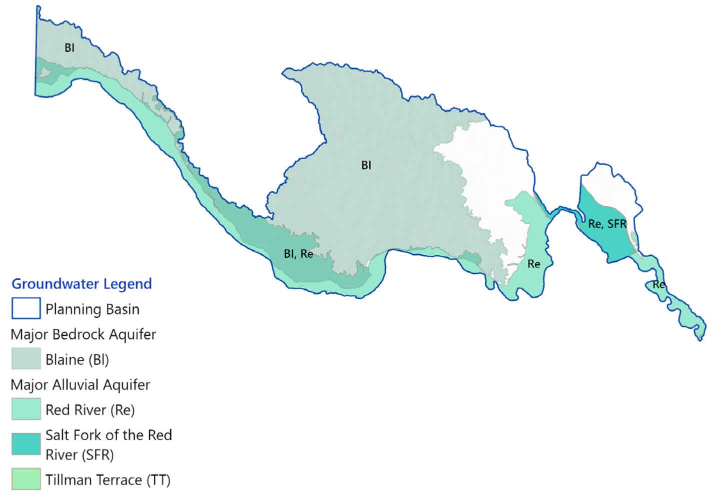
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 40

Prairie Dog Town Fork Red River - 1 / Southwest Region







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

SUMMARY

- Basin 40 - Prairie Dog Town Fork Red River - 1 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to decrease by 85 acre-feet per year (1%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 40 as early as 2030 and will continue through 2075.
- Basin 40 is projected to have surface water available for appropriation through 2075.
- Basin 40 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

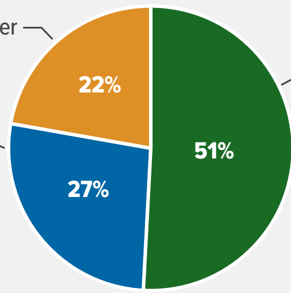
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
7,538	6,833	6,397	5,683	4,581	3,446

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 40 accounts for approximately 2% of the overall water demands of the Southwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	3	2	2	2	2	1
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	5,685	5,814	5,816	5,816	5,816	5,816
Livestock	169	164	164	159	153	148
Oil & Gas	11	11	11	11	11	11
Public Supply	353	319	299	265	213	160
Thermoelectric Power	-	-	-	-	-	-
Total	**6,221**	**6,311**	**6,292**	**6,254**	**6,196**	**6,137**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	93	94	93	91	90	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
97,800	No	No	430,930

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

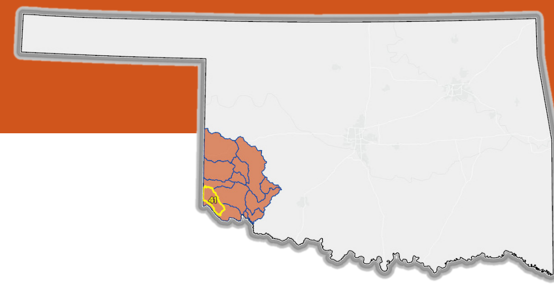
Water Management Category	Demand Sector	Basin 40 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

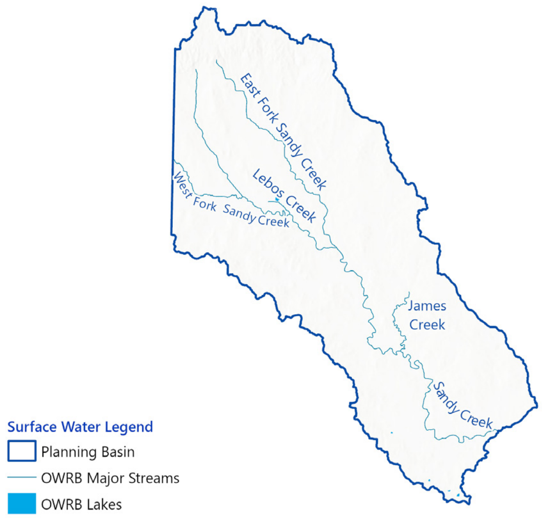
In addition to the water management strategies, water users need:

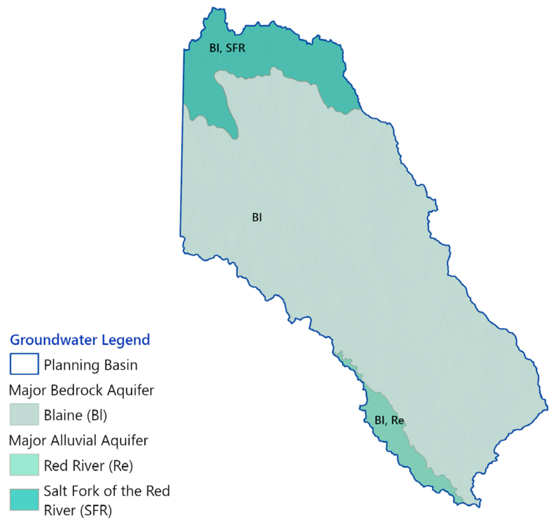
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 41

Prairie Dog Town Fork Red River - 2 / Southwest Region







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

SUMMARY

- Basin 41 - Prairie Dog Town Fork Red River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 1,312 acre-feet per year (3%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 41 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 41 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 41 as early as 2030 and will continue through 2075.
- Basin 41 is projected to have surface water available for appropriation through 2075.
- Basin 41 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

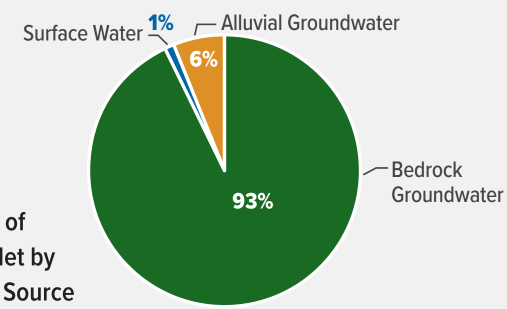
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
1,613	1,564	1,490	1,356	1,129	922

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 41 accounts for approximately 21% of the overall water demands of the Southwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	0	0	0	0	0	0
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	49,974	51,531	51,575	51,575	51,575	51,575
Livestock	254	246	246	239	230	221
Oil & Gas	3	3	3	3	3	3
Public Supply	709	714	686	632	535	453
Thermoelectric Power	-	-	-	-	-	-
Total	**50,940**	**52,494**	**52,510**	**52,449**	**52,342**	**52,252**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	7	7	5	3	1	38%
Alluvial Groundwater Depletion	77	79	78	78	78	86%
Bedrock Groundwater Depletion	39,051	39,076	39,049	39,004	38,966	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
10,600	No	No	260,520

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

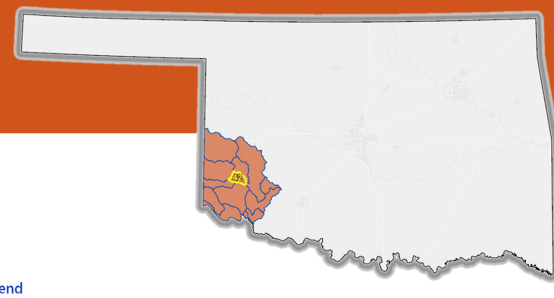
Water Management Category	Demand Sector	Basin 41 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

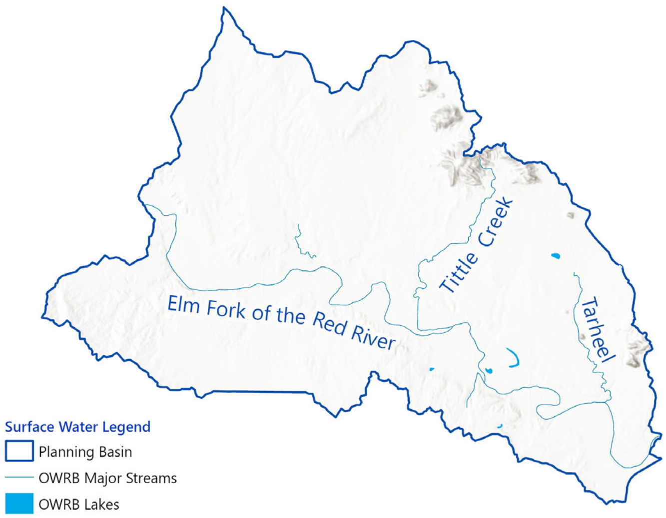
In addition to the water management strategies, water users need:

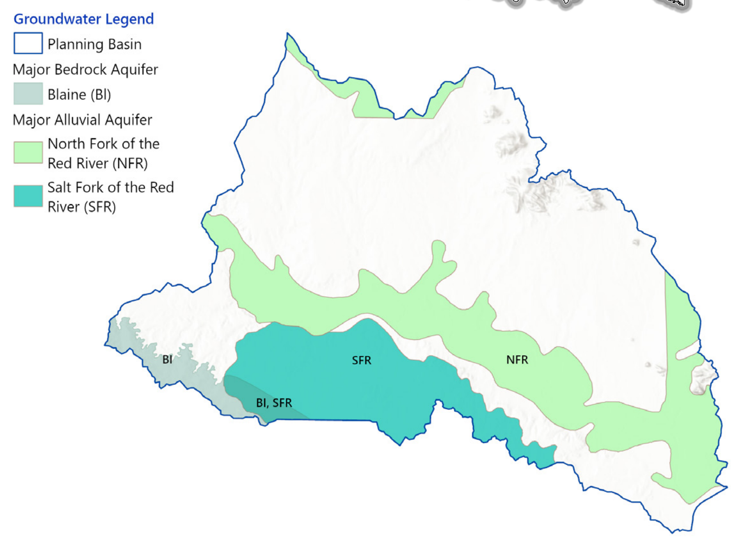
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 42

Elm Fork Red River - 1 / Southwest Region







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

SUMMARY

- Basin 42 - Elm Fork Red River - 1 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 88 acre-feet per year (2%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 42 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 42 as early as 2030 and will continue through 2075.
- Basin 42 is projected to have surface water available for appropriation through 2075.
- Basin 42 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

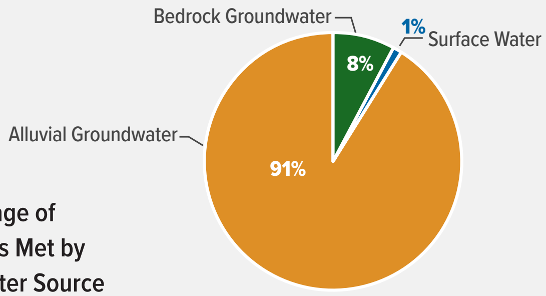
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
941	949	928	919	894	859

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 42 accounts for approximately 2% of the overall water demands of the Southwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	4	4	4	4	4	4
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	4,078	4,240	4,260	4,260	4,260	4,260
Livestock	71	69	69	67	65	63
Oil & Gas	-	-	-	-	-	-
Public Supply	972	980	958	949	923	887
Thermoelectric Power	-	-	-	-	-	-
Total	**5,125**	**5,294**	**5,291**	**5,280**	**5,251**	**5,213**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	49	55	55	55	55	1%
Bedrock Groundwater Depletion	403	403	402	400	397	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
31,100	No	No	173,560

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

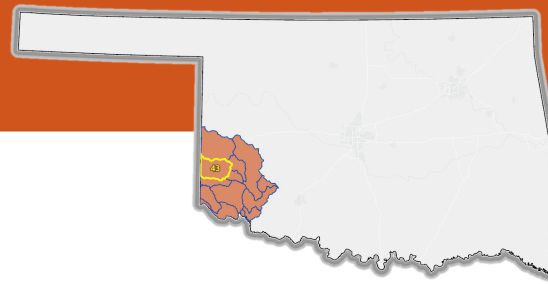
WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 42 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

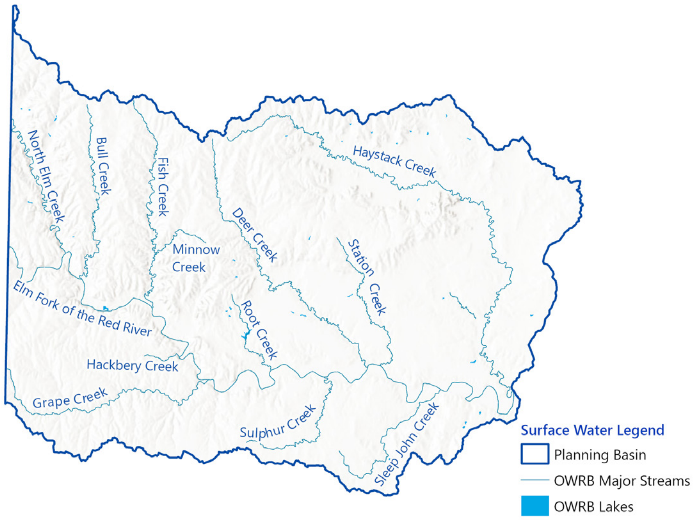
In addition to the water management strategies, water users need:

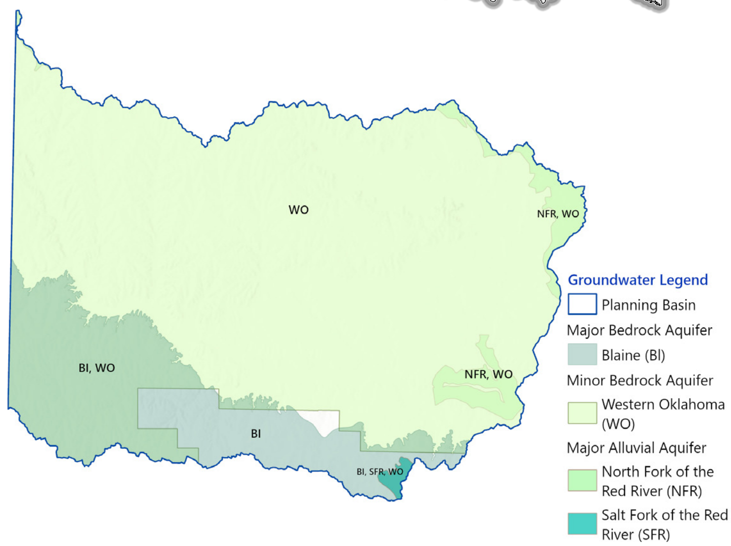
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 43



Elm Fork Red River - 2 / Southwest Region





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

SUMMARY

- Basin 43 - Elm Fork Red River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to decrease by 19 acre-feet per year (2%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 43 as early as 2035 and will diminish by 2045.
- Physical bedrock groundwater depletions are projected in Basin 43 as early as 2030 and will continue through 2075.
- Basin 43 is projected to have surface water available for appropriation through 2075.
- Basin 43 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

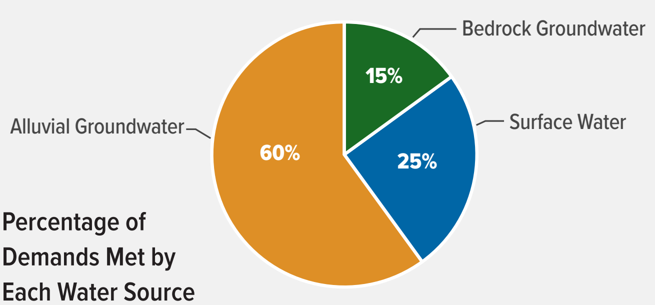
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
5,944	5,928	5,894	5,838	5,839	5,734

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 43 accounts for less than 1% of the overall water demands of the Southwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	187	185	186	186	191	191
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	456	474	477	477	477	477
Livestock	342	332	331	322	310	299
Oil & Gas	21	21	21	21	21	21
Public Supply	2	2	2	2	3	3
Thermoelectric Power	-	-	-	-	-	-
Total	**1,009**	**1,015**	**1,017**	**1,008**	**1,001**	**990**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	5	-	-	-	0%
Bedrock Groundwater Depletion	149	150	149	150	149	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
25,300	No	No	671,430

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 43 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Ineffective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Lower Arkansas Planning Region

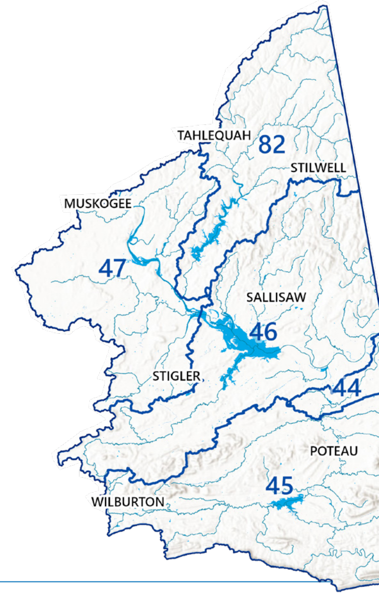
Summary

- Lower Arkansas Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 11,790 acre-feet per year (12%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Lower Arkansas Region basins. Permitting of surface water in portions or all of Basins 44, 45, 46, and 47 is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Lower Arkansas Region stakeholders expressed the need to invest in regionalization, instream (or nonconsumptive) flow, and non-point source mitigation (source water protection).

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Lower Arkansas Region represents 4% of the state's 2075 projected population and 5% 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 Lower Arkansas 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). WSS WDI
- Continue/increase reliance on in-basin groundwater (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

OKLAHOMA Water Resources Board

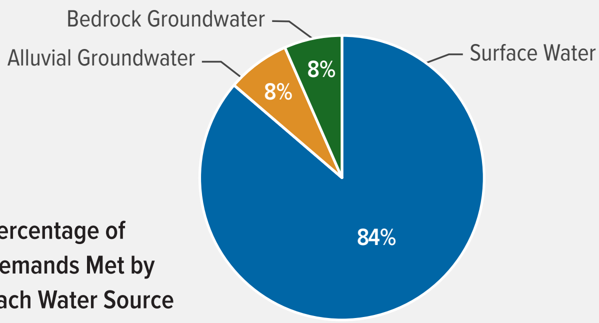
Population

2020	2030	2035	2045	2060	2075
191,218	196,144	191,682	184,455	176,006	167,783

Water Demand Projections

Water demands (withdrawals) are projected to increase by 12% between 2020 and 2075.

The Lower Arkansas Region's largest demand sector is Crop Irrigation, representing 42% of the region's 2075 water demands. The second largest demand sector is Public Supply, representing 29% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Lower Arkansas Region, Crop Irrigation and Thermoelectric Power demands will increase while Self-supplied Domestic, Self-supplied Industrial, Livestock, and Public Supply demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	2,139	2,284	2,245	2,182	2,119	2,066
Self-supplied Industrial	12,517	12,201	11,870	11,285	10,598	9,827
Crop Irrigation	27,359	33,148	37,771	42,011	44,700	44,700
Livestock	6,554	6,642	6,707	6,631	6,493	6,396
Oil & Gas	196	196	196	196	196	196
Public Supply	37,521	37,851	36,852	35,203	33,190	31,145
Thermoelectric Power	8,112	8,180	8,580	8,879	10,301	11,858
Total	**94,397**	**100,501**	**104,221**	**106,387**	**107,597**	**106,187**

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

Physical Water Shortages WIW 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 while out-of-basin supplies will be used up to permit amounts or projected demands, whichever is less.

The Lower Arkansas Region is projected to experience bedrock groundwater depletions (where water use exceeds 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.. No shortage is expected for surface water and alluvial groundwater.

SURFACE WATER GAP	2030	2035	2045	2060	2075	2075
Basin			**Magnitude (AFY)**			**Frequency**
44	-	-	-	--	-	0%
45	-	-	-	-	-	0%
46	1	37	-	293	421	1%
47	29	-	40	325	640	11%
82	-	-	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin			**Magnitude (AFY)**			**Frequency**
44	-	-	-	--	-	No AGW Demand
45	-	-	-	-	-	No AGW Demand
46	4	32	-	578	581	1%
47	4	-	-	-	22	1%
82	-	-	-	-	-	No AGW Demand

AFY = acre-feet per year

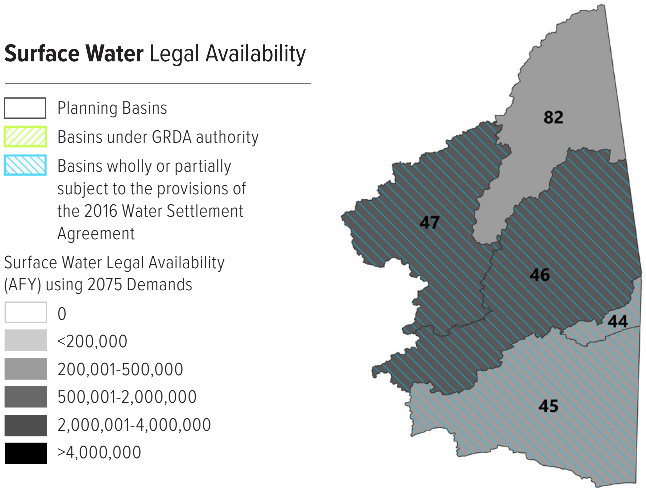
BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin			**Magnitude (AFY)**		
44	-	-	-	-	-
45	1,528	1,737	1,848	1,837	1,829
46	11	11	11	5	18
47	8	7	4	1	2
82	13	13	13	13	15

AFY = acre-feet per year

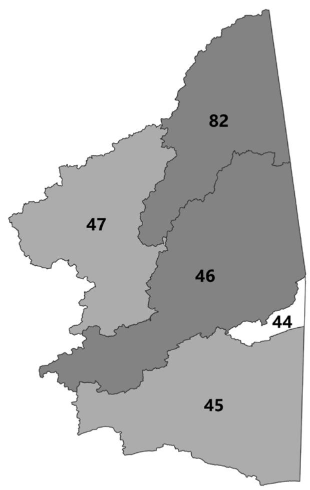
Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Lower Arkansas Region basins. Permitting of surface water in portions or all of Basins 44, 45, 46, and 47 is subject to provisions of the 2016 Water Settlement Agreement.

Surface Water Legal Availability



Groundwater Legal Availability



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


Lake Tenkiller

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)
New Spiro	---
Lloyd Church	0
Wayne Wallace	---
Wister	0
Brushy	No Known Yield
John Wells	---
Robert S Kerr	No Known Yield
Stilwell City	---
Greenleaf Lake	0
Webbers Falls	No Known Yield
Tenkiller Ferry	0

--- 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)
Arkansas River	Alluvial	Major	temporary 2.0
Boone	Bedrock	Minor	temporary 2.0
Kiamichi	Bedrock	Minor	temporary 2.0
Northeastern Oklahoma Pennsylvanian	Bedrock	Minor	temporary 2.0
Pennsylvanian	Bedrock	Minor	temporary 2.0
Roubidoux	Bedrock	Major	temporary 2.0

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: The Roubidoux Aquifer, the main groundwater source for the Lower Arkansas region, has elevated total dissolved solids and salinity, while the Arkansas River alluvial aquifer shows some iron concerns.

Lakes: Water quality in this region is impacted by elevated levels of nutrients and chlorophyll-a—factors that directly affect both recreational and water supply uses. Lakes in this area are classified as eutrophic approaching hypereutrophic, reflecting their moderate to high nutrient concentrations and biological productivity.

Streams: Rivers and streams are impacted by flow alteration, agricultural and urban runoff, sedimentation, and riparian loss concerns. These factors contribute to poor aesthetics, recreational value loss, habitat degradation, high nutrient concentrations, and increased treatment costs. This region contains many of the state's designated scenic rivers.

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)
$410M	**$419M**	**$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	$55M	$71M	$2.4B
Small-Medium	$39M	$312M	$817M
Medium-Large	$76M	$287M	$713M
Large	N/A	N/A	N/A
Non-Public suppliers	$240M	N/A	N/A
Total	**$410M**	**$669M**	**$3.94B**

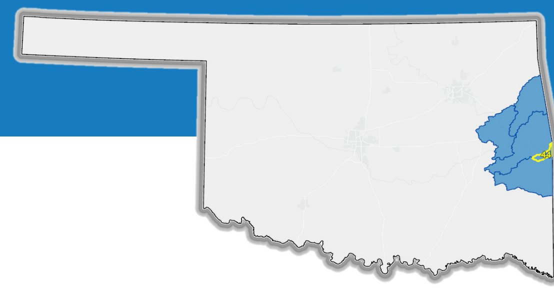
M = million; B = billion; N/A = not applicable

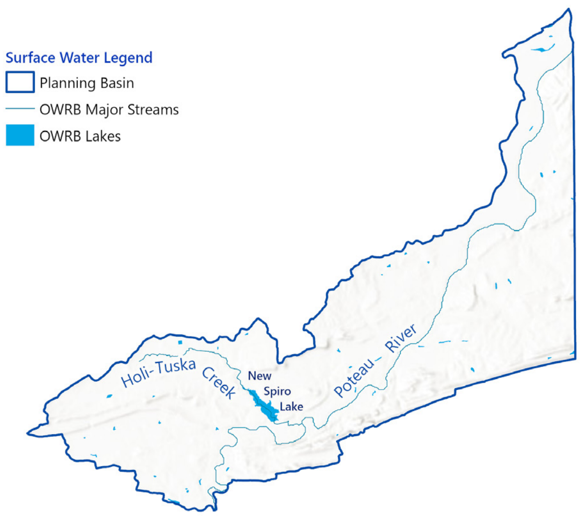
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

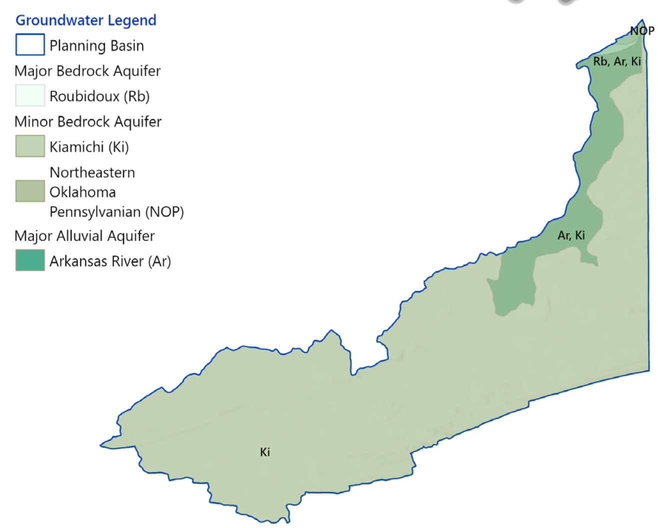
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 44

Poteau River - 1 / Lower Arkansas Region







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

SUMMARY

- Basin 44 - Poteau River - 1 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to decrease by 442 acre-feet per year (9%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- No bedrock groundwater depletions are projected.
- Basin 44 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 44 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

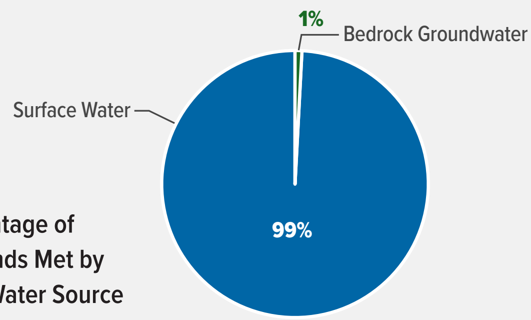
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
2,935	2,982	2,919	2,836	2,727	2,622

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 44 accounts for approximately 4% of the overall water demands of the Lower Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	0	0	0	0	0	0
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	899	1,297	1,549	1,692	1,692	1,692
Livestock	132	138	141	140	139	138
Oil & Gas	0	0	0	0	0	0
Public Supply	3,004	3,052	2,987	2,902	2,792	2,685
Thermoelectric Power	1,151	816	766	273	234	229
Total	**5,186**	**5,304**	**5,443**	**5,008**	**4,857**	**4,744**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	-	-	-	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,185,400	Yes	No	146,720

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

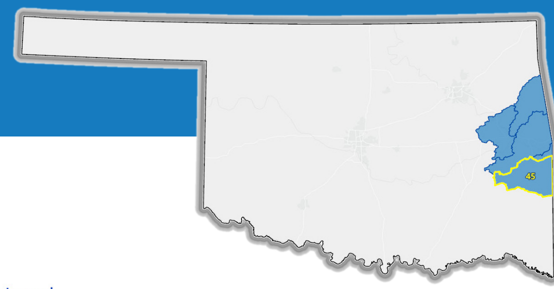
Water Management Category	Demand Sector	Basin 44 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

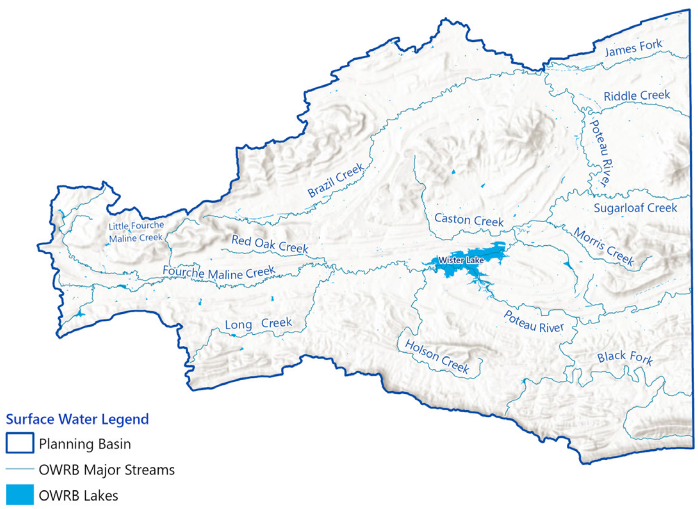
In addition to the water management strategies, water users need:

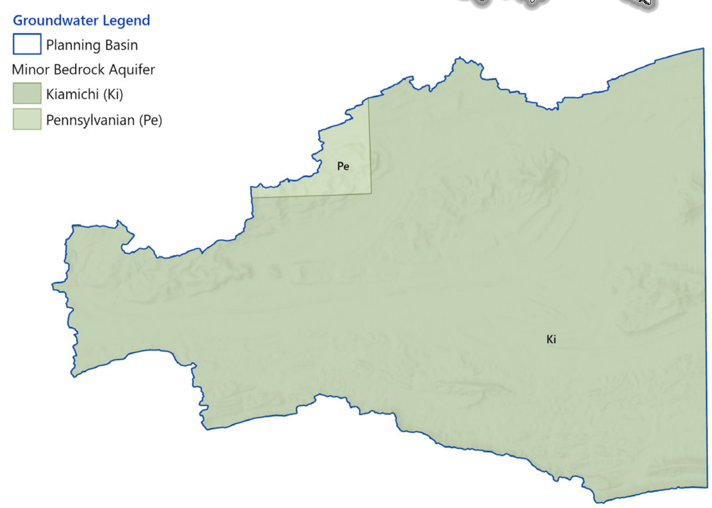
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 45

Poteau River - 2 / Lower Arkansas Region







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

SUMMARY

- Basin 45 - Poteau River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 662 acre-feet per year (6%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 45 as early as 2030 and will continue through 2075.
- Basin 45 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 45 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

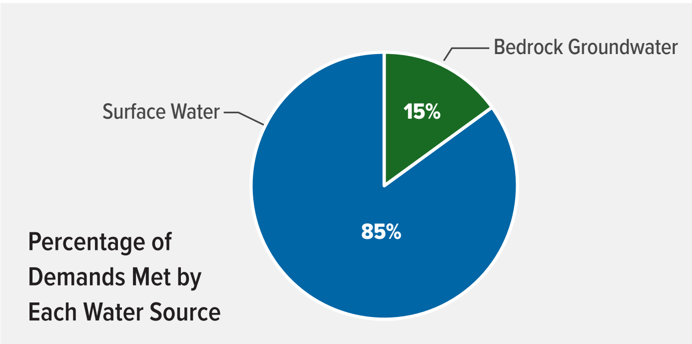
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
31,871	32,240	31,419	30,195	28,628	27,075

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 45 accounts for approximately 12% of the overall water demands of the Lower Arkansas Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	85	89	87	83	77	71
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,932	2,943	3,476	3,779	3,779	3,779
Livestock	1,542	1,590	1,614	1,605	1,581	1,568
Oil & Gas	26	26	26	26	26	26
Public Supply	8,165	8,256	8,048	7,744	7,354	6,967
Thermoelectric Power	-	-	-	-	-	-
Total	**11,749**	**12,903**	**13,251**	**13,236**	**12,816**	**12,411**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	1,528	1,737	1,848	1,837	1,829	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,120,900	Yes	No	1,675,570

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

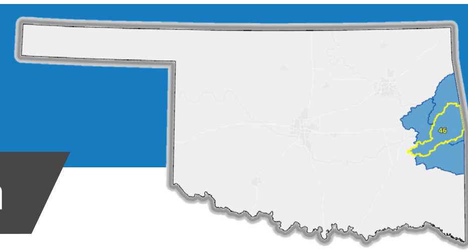
WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 45 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Partially Effective - Shortages Remain
Reuse	PS, SSI	Potentially Effective with Local Variability
Water Transfers	All sectors	Effective at Meeting Future Demands

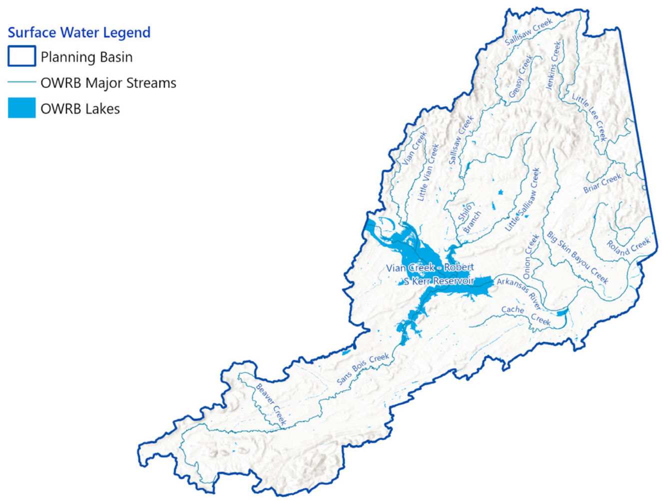
In addition to the water management strategies, water users need:

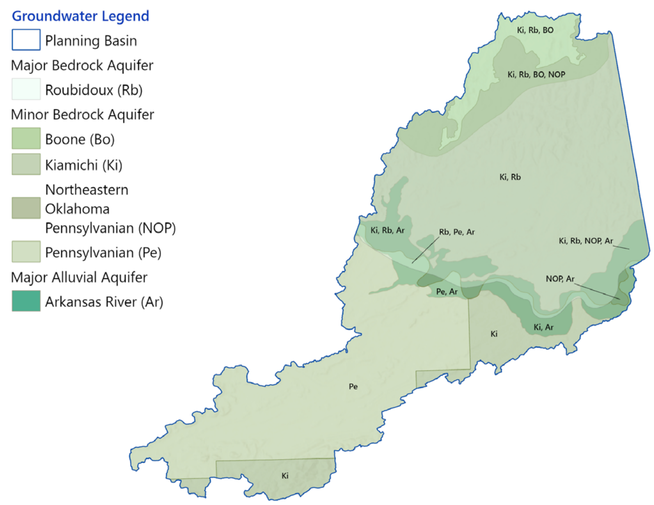
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 46



Lower Arkansas River - 1 / Lower Arkansas Region





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

SUMMARY

- Basin 46 - Lower Arkansas River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 5,603 acre-feet per year (27%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 46 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 46 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 46 as early as 2030 and will continue through 2075.
- Basin 46 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 46 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

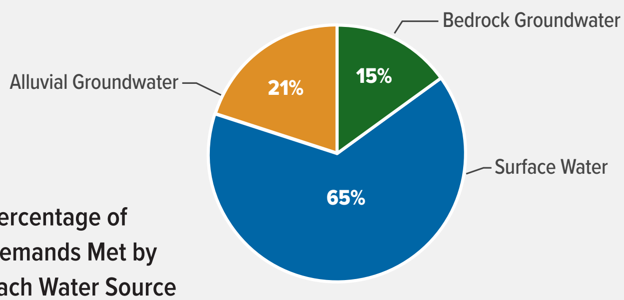
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
53,780	55,690	54,270	51,679	48,182	45,264

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 46 accounts for approximately 25% of the overall water demands of the Lower Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	605	650	636	610	575	548
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	11,621	14,178	16,905	18,452	18,452	18,452
Livestock	2,002	2,021	2,039	2,014	1,970	1,939
Oil & Gas	109	109	109	109	109	109
Public Supply	6,737	6,928	6,751	6,433	5,995	5,630
Thermoelectric Power	-	-	-	-	-	-
Total	**21,074**	**23,886**	**26,439**	**27,617**	**27,100**	**26,677**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	1	37	-	293	421	1%
Alluvial Groundwater Depletion	4	32	-	578	581	1%
Bedrock Groundwater Depletion	21	24	26	21	18	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
9,248,400	Yes	No	3,261,080

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

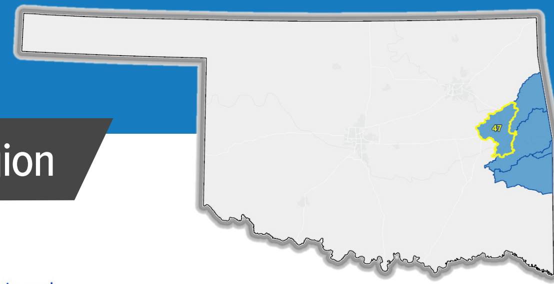
Water Management Category	Demand Sector	Basin 46 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management / Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

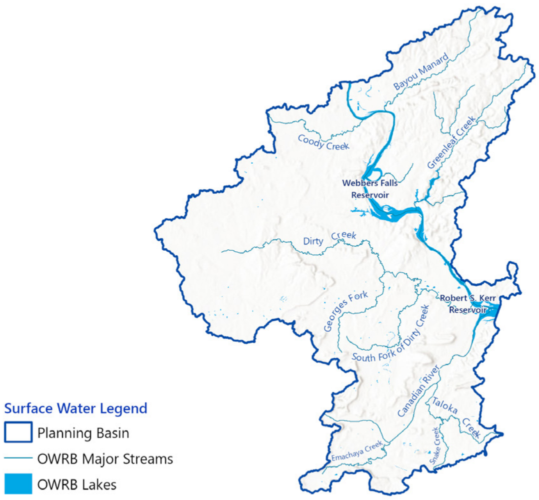
In addition to the water management strategies, water users need:

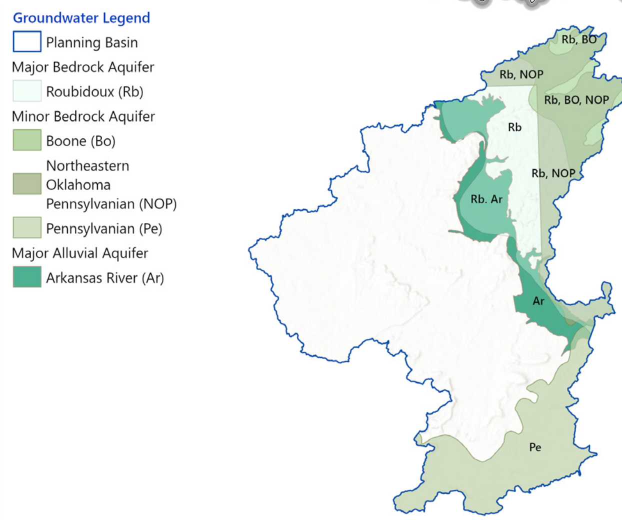
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 47

Lower Arkansas River - 2 / Lower Arkansas Region







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

SUMMARY

- Basin 47 - Lower Arkansas River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 6,594 acre-feet per year (13%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 47 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 47 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 47 as early as 2030 and will continue through 2075.
- Basin 47 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 47 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

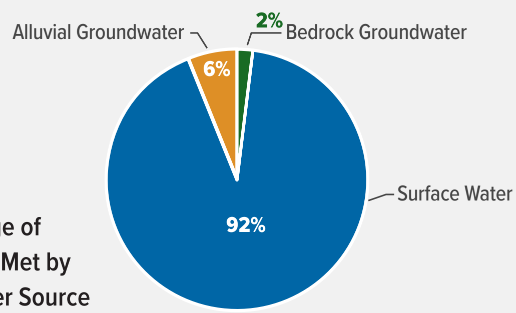
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
60,128	59,932	58,402	55,893	53,121	49,912

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 47 accounts for approximately 53% of the overall water demands of the Lower Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	307	316	312	306	301	294
Self-supplied Industrial	12,505	12,190	11,859	11,274	10,588	9,818
Crop Irrigation	12,136	14,374	15,486	17,733	20,423	20,423
Livestock	1,231	1,211	1,213	1,188	1,150	1,120
Oil & Gas	61	61	61	61	61	61
Public Supply	16,695	16,462	15,980	15,162	14,224	13,145
Thermoelectric Power	6,962	7,363	7,814	8,606	10,068	11,629
Total	**49,896**	**51,976**	**52,724**	**54,329**	**56,813**	**56,489**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	29	-	40	325	640	11%
Alluvial Groundwater Depletion	4	-	-	-	22	1%
Bedrock Groundwater Depletion	4	4	4	3	2	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
8,712,500	Yes	No	894,470

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

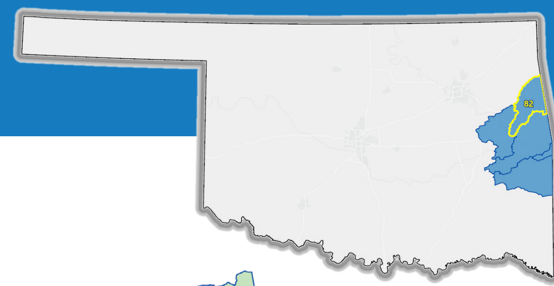
Water Management Category	Demand Sector	Basin 47 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

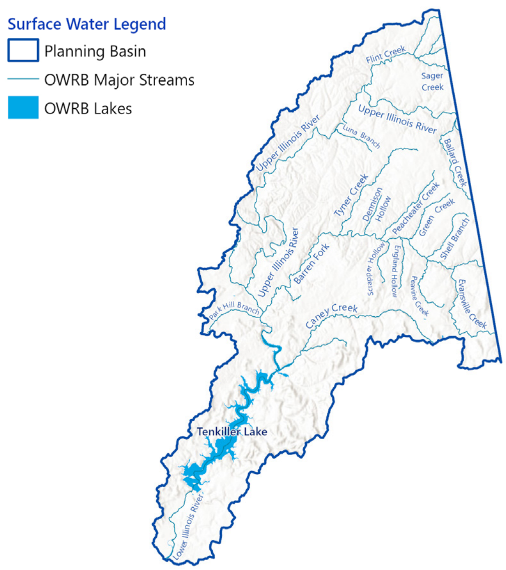
In addition to the water management strategies, water users need:

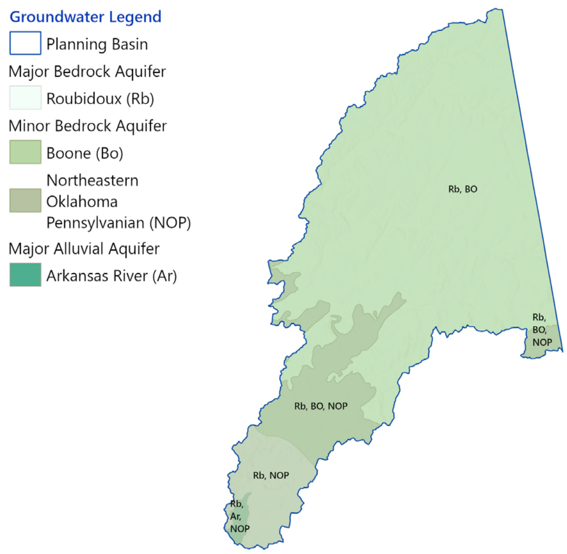
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 82

Illinois River / Lower Arkansas Region







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

SUMMARY

- Basin 82 - Illinois River demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to decrease by 627 acre-feet per year (10%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 82 as early as 2030 and will continue through 2075.
- Basin 82 is projected to have surface water available for appropriation through 2075.
- Basin 82 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

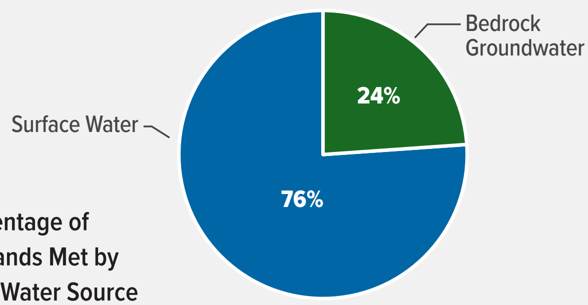
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
42,504	45,300	44,672	43,852	43,348	42,910

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 82 accounts for approximately 6% of the overall water demands of the Lower Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,143	1,228	1,210	1,184	1,167	1,153
Self-supplied Industrial	12	12	11	11	10	9
Crop Irrigation	772	356	355	355	355	355
Livestock	1,647	1,682	1,701	1,684	1,653	1,630
Oil & Gas	-	-	-	-	-	-
Public Supply	2,919	3,154	3,086	2,962	2,826	2,718
Thermoelectric Power	-	-	-	-	-	-
Total	**6,492**	**6,431**	**6,364**	**6,196**	**6,011**	**5,865**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	17	17	16	16	15	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
613,800	No	No	2,498,650

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 82 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Eufaula
Planning Region

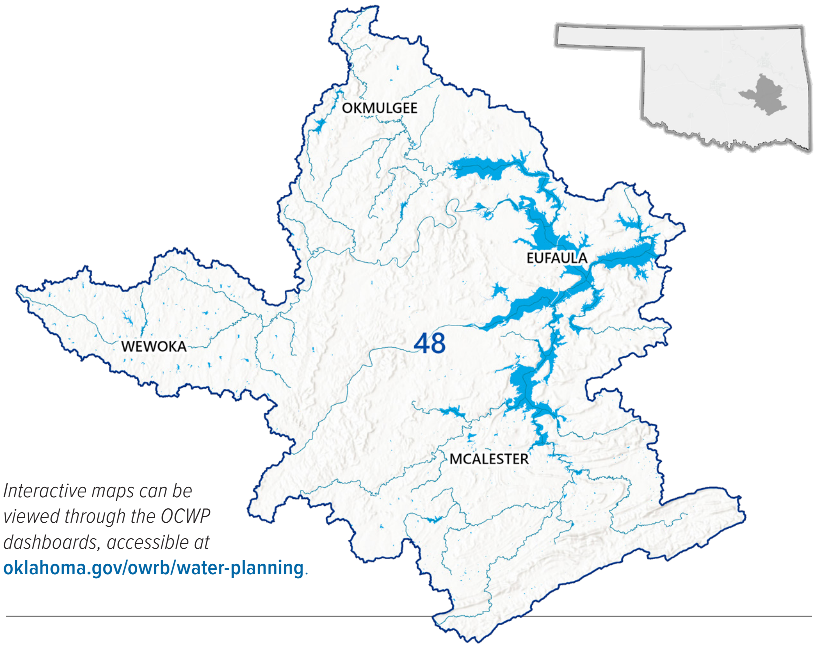
Summary

- Eufaula Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 1,400 acre-feet per year (7%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in the Eufaula Region basin. Permitting of surface water in the Eufaula Region is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Eufaula Region stakeholders expressed the need to consider investing in regionalization, instream (or nonconsumptive) flow, and non-point source mitigation (source water protection).

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Eufaula Region represents 2% of the state's 2075 projected population and less than 1% 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 Eufaula 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). WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

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

OKLAHOMA Water Resources Board

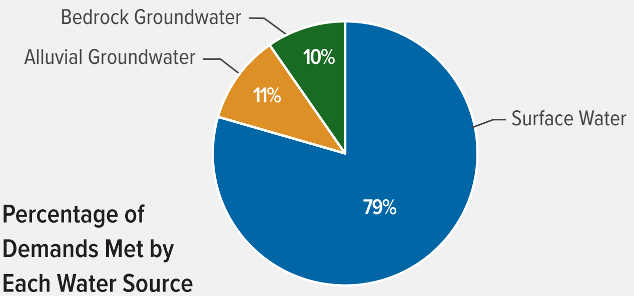
Population

2020	2030	2035	2045	2060	2075
94,591	92,014	88,990	84,482	79,850	73,627

Water Demand Projections

Water demands (withdrawals) are projected to decrease by 7% between 2020 and 2075.

The Eufaula Region's largest demand sector is Public Supply, representing 54% of the region's 2075 water demands. The second largest demand sector is Livestock, representing 20% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	180	182	177	169	161	151
Self-supplied Industrial	536	523	506	482	457	421
Crop Irrigation	688	1,733	1,949	2,408	2,408	2,408
Livestock	3,964	3,917	3,933	3,897	3,853	3,833
Oil & Gas	2,081	2,081	2,081	2,081	2,081	2,081
Public Supply	13,457	13,167	12,765	12,133	11,468	10,612
Thermoelectric Power	-	-	-	-	-	-
Total	**20,906**	**21,602**	**21,410**	**21,170**	**20,427**	**19,506**

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

Physical Water Shortages WIW 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 Eufaula Region is projected to experience surface water gaps (where demand exceeds supplies) and groundwater depletions (where water use exceeds rate of recharge), as detailed in thetables 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
48	**26**	**56**	**245**	**300**	**503**	4%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
48	**98**	**97**	**219**	**221**	**224**	6%

AFY = acre-feet per year

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
48	**20**	**9**	**5**	**2**	**-**

AFY = acre-feet per year

Lake Eufaula

Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in the Eufaula Region basin. Permitting of surface water in portions or all of the Eufaula Region basin 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 provision 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)
Dripping Springs	0
Eufaula	33,352
Henryetta	---
McAlester	0
Okmulgee	---
Sportsman	---
Talawanda #2	---
Weleetka	---
Wewoka	---

--- 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)
Ashland Isolated Terrace	Alluvial	Minor	temporary 2.0
Canadian River	Alluvial	Major	temporary 2.0
East-Central Oklahoma	Bedrock	Minor	temporary 2.0
Garber-Wellington	Bedrock	Major	2.0
Kiamichi	Bedrock	Minor	temporary 2.0
North Canadian River	Alluvial	Major	1.0
Pennsylvanian	Bedrock	Minor	temporary 2.0
Vamoosa-Ada	Bedrock	Major	2.0

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: Groundwater from the major aquifers, such as the North Canadian River alluvial aquifer, demonstrates elevated nitrate, sulfate, and salinity concerns as it connects to Eufaula Lake.

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. Most lakes in the area are classified as mesotrophic to eutrophic with moderate to high levels of nutrients. These conditions contribute to a heightened risk of harmful algal blooms (HABs), increased water treatment costs, taste and odor issues, and diminished recreational value—impacting both recreational and water supply beneficial uses.

Streams: Water quality of Lake Eufaula is heavily influenced by urbanization, sedimentation, and riparian loss concerns in its large watershed. These factors contribute to poor aesthetics, habitat degradation, increased nutrients, tourism concerns, 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)
$122M	**$235M**	**$33M**

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	$22M	$939M	$1.72B
Small-Medium	$32M	$338M	$390M
Medium-Large	$21M	$157M	$411M
Large	N/A	N/A	N/A
Non-Public suppliers	$48M	N/A	N/A
Total	**$122M**	**$1.43B**	**$2.52B**

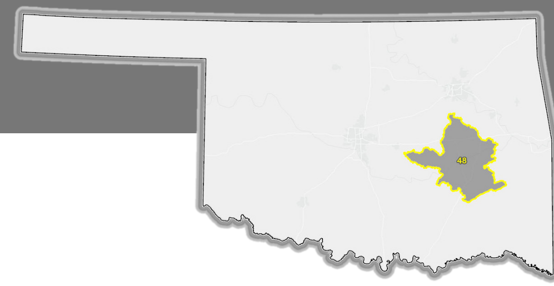
M = million; B = billion; N/A = not applicable

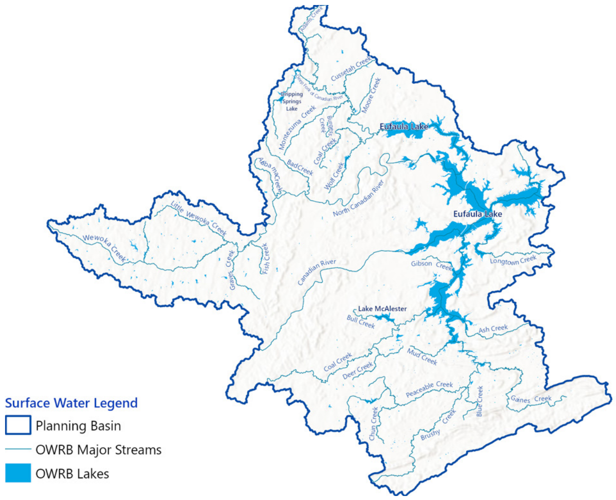
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

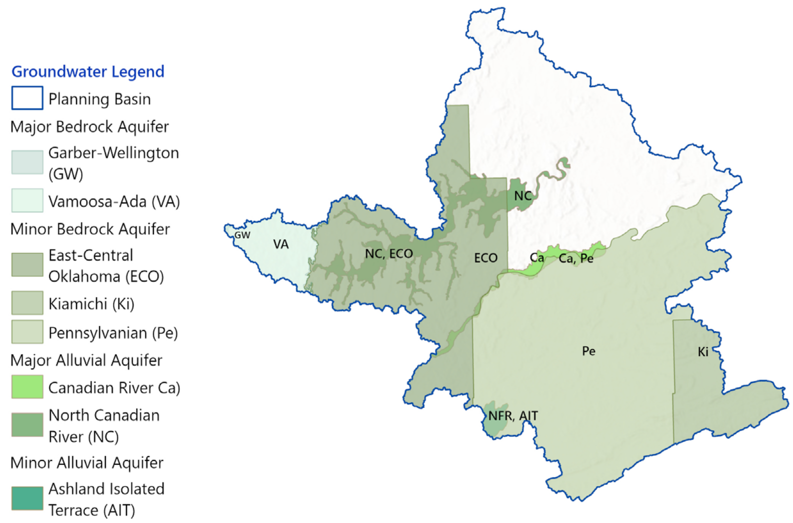
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 48

Canadian River (To North Canadian River) / Eufaula Region







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

SUMMARY

- Basin 48 - Canadian River (To North Canadian River) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 1,400 acre-feet per year (7%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 48 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 48 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 48 as early as 2030 and will diminish by 2075.
- Basin 48 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 48 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

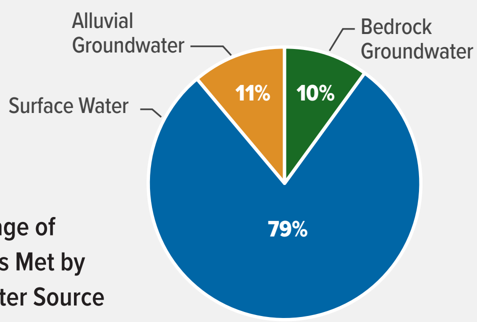
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
94,591	92,014	88,990	84,482	79,850	73,627

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 48 accounts for 100% of the water demands of the Eufaula Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	180	182	177	169	161	151
Self-supplied Industrial	536	523	506	482	457	421
Crop Irrigation	688	1,733	1,949	2,408	2,408	2,408
Livestock	3,964	3,917	3,933	3,897	3,853	3,833
Oil & Gas	2,081	2,081	2,081	2,081	2,081	2,081
Public Supply	13,457	13,167	12,765	12,133	11,468	10,612
Thermoelectric Power	-	-	-	-	-	-
Total	**20,906**	**21,602**	**21,410**	**21,170**	**20,427**	**19,506**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	26	56	245	300	503	4%
Alluvial Groundwater Depletion	98	97	219	221	224	6%
Bedrock Groundwater Depletion	20	9	5	2	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,751,000	Yes	No	3,102,060

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 48 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management / Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Middle Arkansas Planning Region

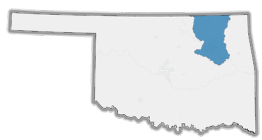
Summary

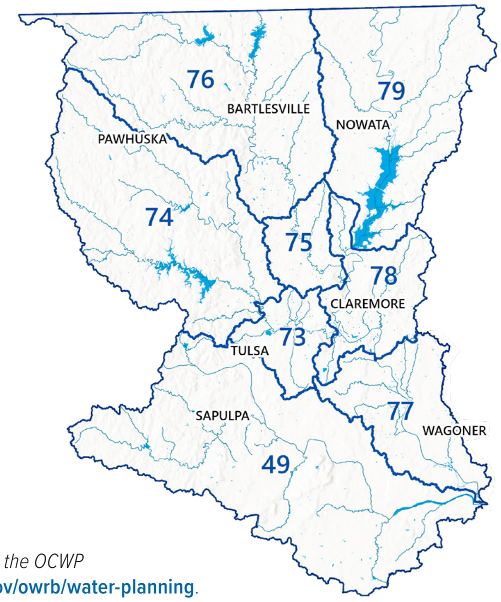
- Middle Arkansas Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 40,035 acre-feet per year (18%) between 2020 and 2075.
- Physical water shortages are projected for surface water and bedrock groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Middle Arkansas Region basins.
- In addition to the Statewide Recommendations, Middle Arkansas Region stakeholders expressed the need to invest in regionalization, instream (or nonconsumptive) flow, non-point source mitigation (source water protection), new technology to improve water quality, and the need to meter all uses.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Middle Arkansas Region represents 24% of the state's 2075 projected population and 12% 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 Middle Arkansas 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
- Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

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

OKLAHOMA Water Resources Board

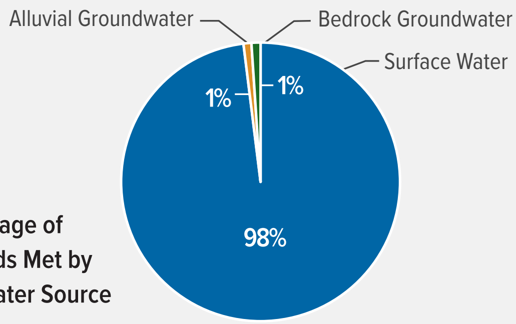
Population

2020	2030	2035	2045	2060	2075
958,031	977,711	991,818	1,023,012	1,079,442	1,127,580

Water Demand Projections

Water demands (withdrawals) are projected to increase by 18% between 2020 and 2075.

The Middle Arkansas Region's largest demand sector is Public Supply, representing 88% of the region's 2075 water demands. The second largest demand sector is Thermoelectric Power, representing 6% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Middle Arkansas Region, Self-supplied Domestic, Self-supplied Industrial, Crop Irrigation, Public Supply, and Thermoelectric Power demands will increase while Livestock demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	2,999	3,041	3,052	3,072	3,128	3,174
Self-supplied Industrial	590	575	582	595	617	638
Crop Irrigation	7,640	8,101	8,183	8,350	8,550	8,550
Livestock	5,396	5,247	5,239	5,109	4,923	4,773
Oil & Gas	401	401	401	401	401	401
Public Supply	190,150	194,107	197,198	204,079	216,354	226,800
Thermoelectric Power	11,825	9,206	9,103	11,087	12,949	14,698
Total	**219,000**	**220,678**	**223,759**	**232,694**	**246,922**	**259,035**

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

Physical Water Shortages WIW 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 Middle Arkansas Region is projected to experience surface water gaps (where demand exceeds supplies) and bedrock groundwater depletions (where water use exceeds 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
49	204	645	2,647	6,013	9,628	93%
73	89	398	1,727	3,629	5,362	80%
74	125	132	141	173	219	6%
75	2	10	26	84	126	13%
76	-	2	15	47	117	97%
77	18	32	132	266	547	86%
78	8	12	13	222	546	21%
79	10	3	1	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
49	-	-	-	-	-	0%
73	-	-	-	-	-	No AGW Demand
74	-	-	-	-	-	No AGW Demand
75	-	-	-	-	-	No AGW Demand
76	-	-	-	-	-	No AGW Demand
77	-	-	-	-	-	0%
78	-	-	-	-	-	No AGW Demand
79	-	-	-	-	-	No AGW Demand

AFY = acre-feet per year

Physical Water Shortages Cont.

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	Average Magnitude (AFY)				
49	-	-	-	-	-
73	177	180	186	197	206
74	8	3	2	1	-
75	142	143	145	148	151
76	7	5	3	2	2
77	No BGW Demand				
78	321	324	328	334	341
79	3	3	3	4	3

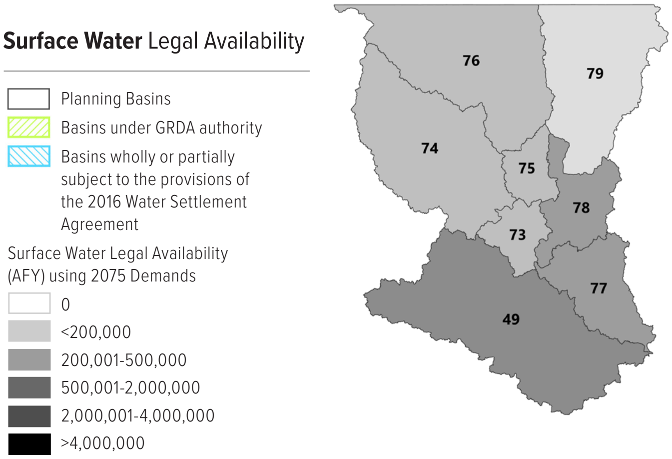
AFY = acre-feet per year


Arkansas River near Tulsa

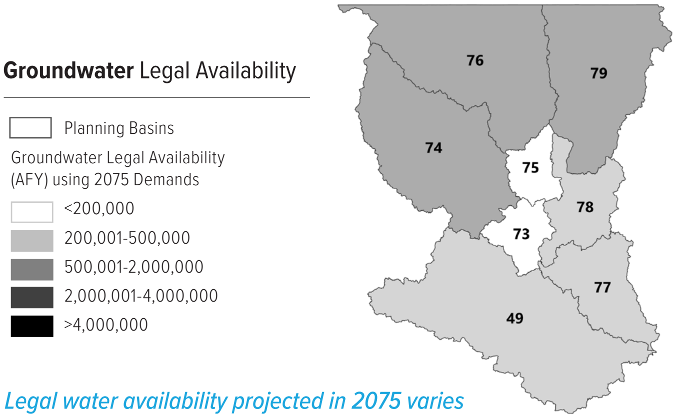
Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Middle Arkansas Region.

Surface Water Legal Availability



Groundwater Legal Availability



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)
Bixhoma	---
Heyburn	0
Sahoma	---
Sand Springs Lake	0
Shell	---
Birch	560
Bluestem	---
Hominy Municipal	---
Pawhuska	---
Skiatook	0
Waxhoma	---
Copan	20
Hudson	---
Hulah	2
Claremore	---
Oologah	0

--- 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)
Arkansas River	Alluvial	Major	temporary 2.0
Cherokee Group	Bedrock	Minor	temporary 2.0
North-Central Oklahoma	Bedrock	Minor	temporary 2.0
Northeastern Oklahoma Pennsylvanian	Bedrock	Minor	temporary 2.0
Roubidoux	Bedrock	Major	temporary 2.0
Vamoosa-Ada	Bedrock	Major	2.0
Verdigris River Groundwater Basin	Alluvial	Minor	temporary 2.0

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: Groundwater from the major aquifers of the Vamossa-Ada and Arkansas River experiences elevated concentrations of nitrate, total dissolved solids, and salinity.

Lakes: Water quality in this region is impacted by elevated levels of nutrients and chlorophyll-a—factors that directly affect both recreational and water supply uses. Lakes in this area are classified as eutrophic to hypereutrophic, reflecting their moderate to high nutrient concentrations and biological productivity.

Streams: Rivers and streams are impacted by urbanization, modification/impoundment, flow alteration, and agricultural runoff, leading to riparian loss, increased sedimentation, and increased nutrient concentrations. These factors contribute to increased dredging, treatment costs, and flooding risk, as well as habitat degradation or loss.

General: These water bodies are impacted by excess nutrients, sedimentation, and harmful algal blooms (HABs), which reduce water quality and reservoir health. Municipal and industrial demands continue to place pressure on the region's water systems, while silt accumulation further limits storage capacity. Strategic nutrient management, erosion control, and watershed protection are essential to sustaining water availability and quality in the long term.

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)
$4.07B	**$1.40B**	**$463M**

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	$42M	$2.11B	$307M
Small-Medium	$129M	$533M	$1.79B
Medium-Large	$136M	$1.24B	$3.72B
Large	$3.38B	$1.48B	$487M
Non-Public suppliers	$384M	N/A	N/A
Total	**$4.07B**	**$5.36B**	**$6.31B**

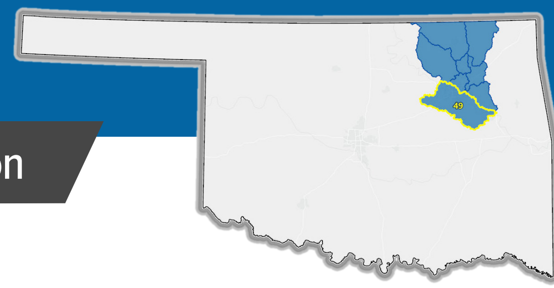
M = million; B = billion; N/A = not applicable

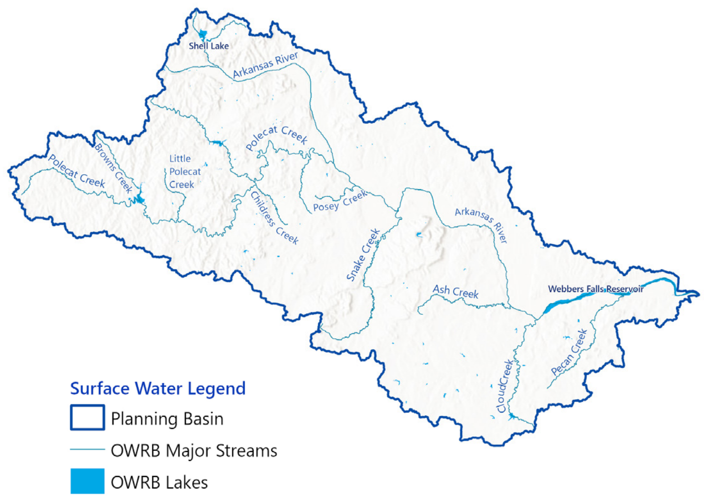
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

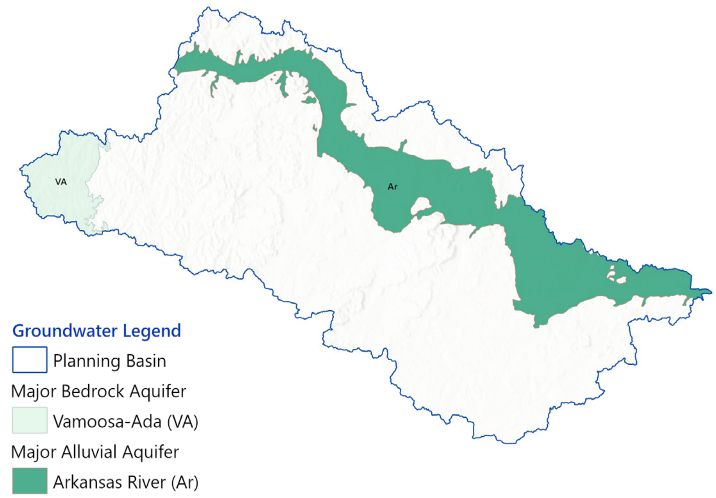
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 49

Middle Arkansas River / Middle Arkansas Region







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

SUMMARY

- Basin 49 - Middle Arkansas River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 21,765 acre-feet per year (19%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 49 as early as 2030 and will continue through 2075.
- No alluvial groundwater depletions are projected.
- No bedrock groundwater depletions are projected.
- Basin 49 is projected to have surface water available for appropriation through 2075.
- Basin 49 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

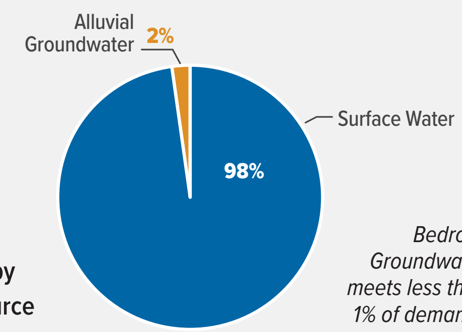
2020	2030	2035	2045	2060	2075
453,971	463,929	471,316	488,114	518,169	543,640

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 49 accounts for approximately 52% of the overall water demands of the Middle Arkansas Region.

Percentage of Demands Met by Each Water Source



Bedrock Groundwater meets less than 1% of demands

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	845	862	872	895	937	973
Self-supplied Industrial	182	177	181	189	203	215
Crop Irrigation	1,118	1,169	1,222	1,330	1,459	1,459
Livestock	1,010	984	983	960	927	901
Oil & Gas	169	169	169	169	169	169
Public Supply	103,876	106,084	107,802	111,749	118,816	124,758
Thermoelectric Power	4,940	3,379	3,213	4,136	4,827	5,430
Total	**112,140**	**112,824**	**114,442**	**119,427**	**127,337**	**133,905**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	204	645	2,647	6,013	9,628	93%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	-	-	-	-	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,615,400	No	No	370,250

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

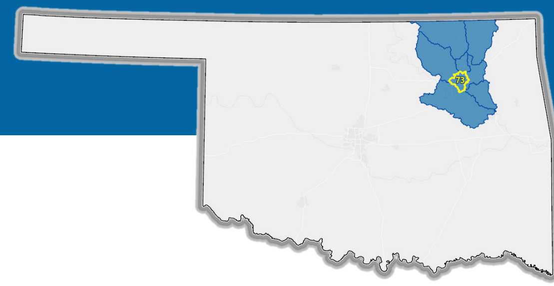
Water Management Category	Demand Sector	Basin 49 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

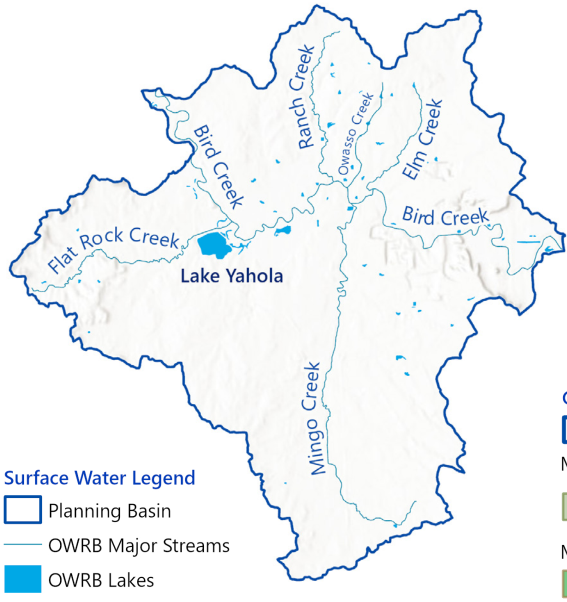
In addition to the water management strategies, water users need:

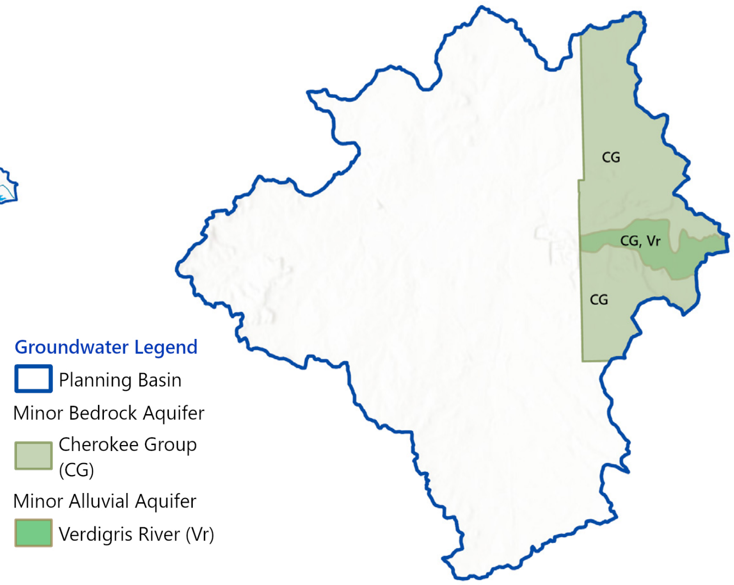
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 73

Bird Creek - 1 / Middle Arkansas Region







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

SUMMARY

- Basin 73 - Bird Creek - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 10,566 acre-feet per year (23%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 73 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 73 as early as 2030 and will continue through 2075.
- Basin 73 is projected to have surface water available for appropriation through 2075.
- Basin 73 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

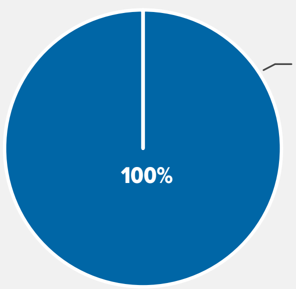
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
162,214	166,011	169,327	176,767	189,653	200,671

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 73 accounts for approximately 22% of the overall water demands of the Middle Arkansas Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	174	177	180	186	197	206
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	22	20	20	20	20	20
Livestock	97	94	94	92	89	87
Oil & Gas	15	15	15	15	15	15
Public Supply	46,055	47,100	48,014	50,047	53,577	56,600
Thermoelectric Power	-	-	-	-	-	-
Total	**46,361**	**47,406**	**48,322**	**50,360**	**53,897**	**56,927**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	89	398	1,727	3,629	5,362	80%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	177	180	186	197	206	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
408,600	No	No	47,950

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

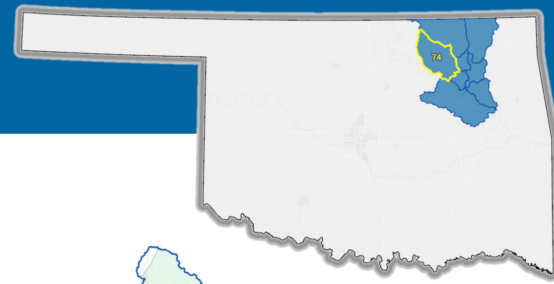
Water Management Category	Demand Sector	Basin 73 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

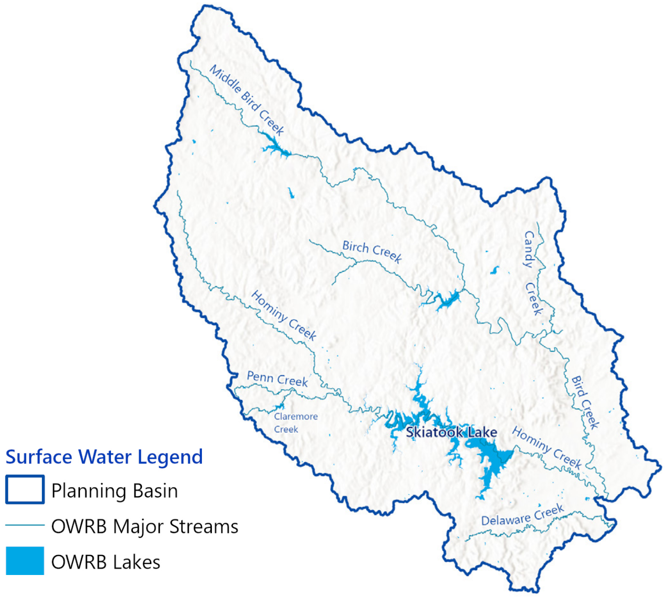
In addition to the water management strategies, water users need:

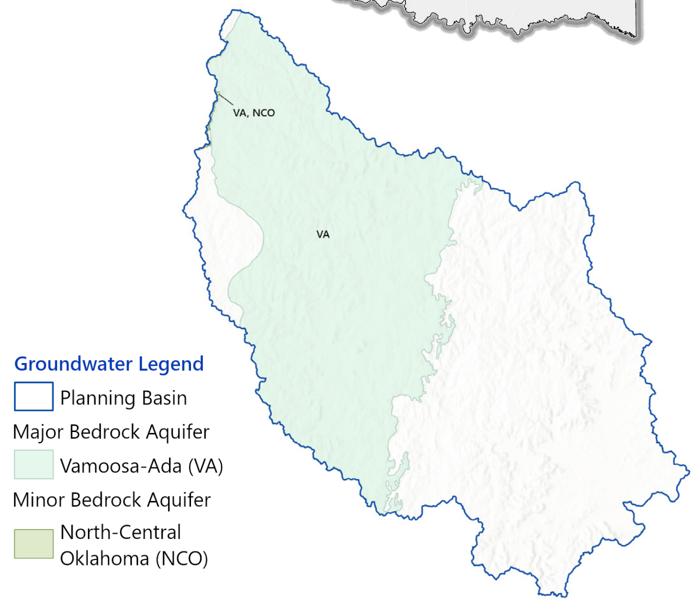
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 74

Bird Creek - 2 / Middle Arkansas Region







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

SUMMARY

- Basin 74 - Bird Creek - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 519 acre-feet per year (7%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 74 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 74 as early as 2030 and will diminish by 2075.
- Basin 74 is projected to have surface water available for appropriation through 2075.
- Basin 74 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

How is the population expected to change in the future?

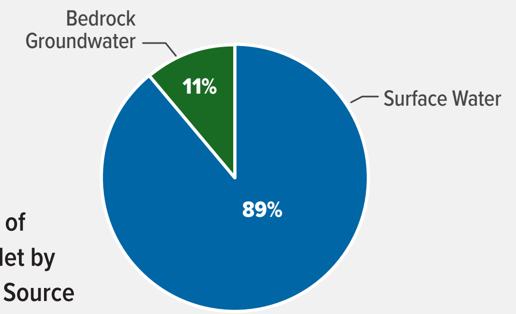
2020	2030	2035	2045	2060	2075
77,500	78,917	79,733	81,619	85,293	88,320

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 74 accounts for approximately 3% of the overall water demands of the Middle Arkansas Region.

Percentage of Demands Met by Each Water Source



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	451	455	450	441	431	421
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	453	712	712	712	712	712
Livestock	769	747	745	726	699	676
Oil & Gas	29	29	29	29	29	29
Public Supply	5,634	5,720	5,739	5,787	5,917	6,018
Thermoelectric Power	-	-	-	-	-	-
Total	**7,337**	**7,661**	**7,675**	**7,694**	**7,787**	**7,855**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	125	132	141	173	219	6%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	8	3	2	1	-	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
349,400	No	No	574,700

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

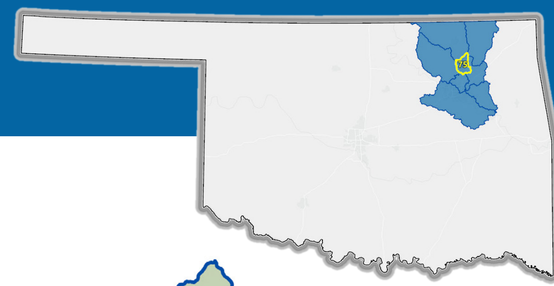
Water Management Category	Demand Sector	Basin 74 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

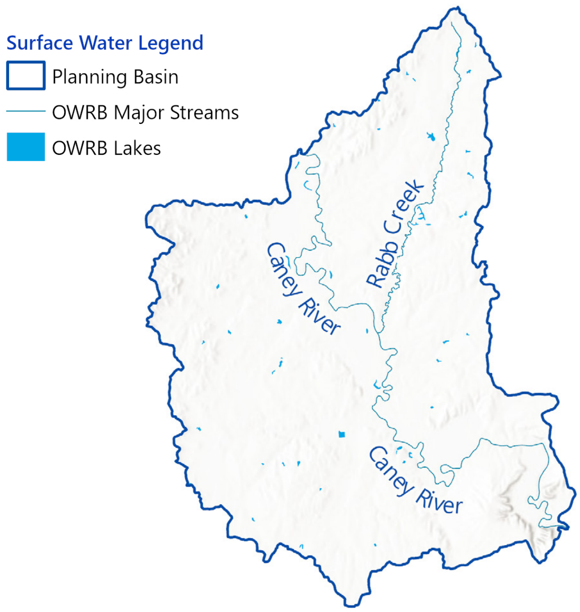
In addition to the water management strategies, water users need:

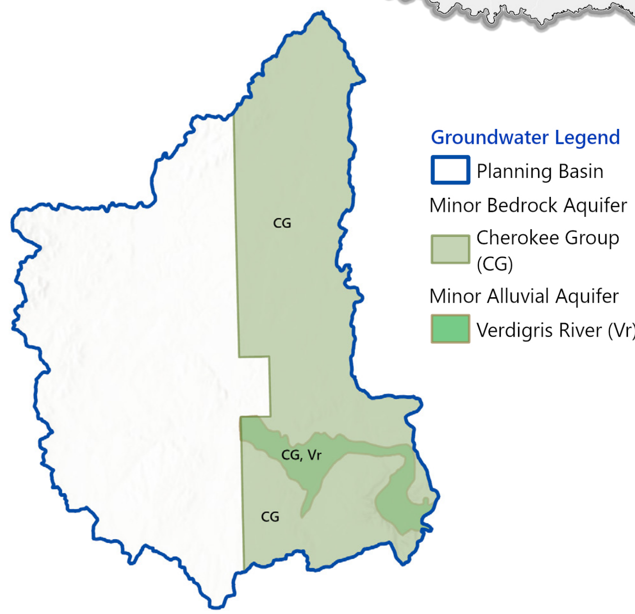
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 75

Caney River - 1 / Middle Arkansas Region







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

SUMMARY

- Basin 75 - Caney River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,138 acre-feet per year (22%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 75 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 75 as early as 2030 and will continue through 2075.
- Basin 75 is projected to have surface water available for appropriation through 2075.
- Basin 75 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

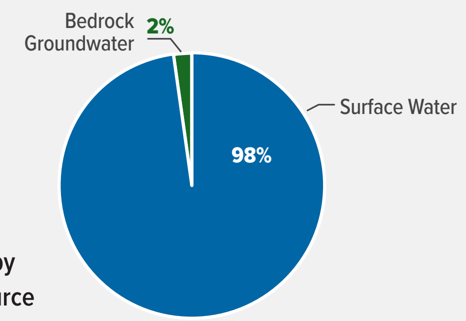
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
65,299	66,538	67,695	70,229	74,717	78,527

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 75 accounts for approximately 2% of the overall water demands of the Middle Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	142	142	143	145	148	151
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	125	141	141	141	141	141
Livestock	174	169	169	165	159	154
Oil & Gas	15	15	15	15	15	15
Public Supply	4,824	4,934	5,031	5,250	5,631	5,955
Thermoelectric Power	-	-	-	-	-	-
Total	**5,279**	**5,402**	**5,500**	**5,716**	**6,094**	**6,417**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	2	10	26	84	126	13%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	142	143	145	148	151	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
405,000	No	No	108,260

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

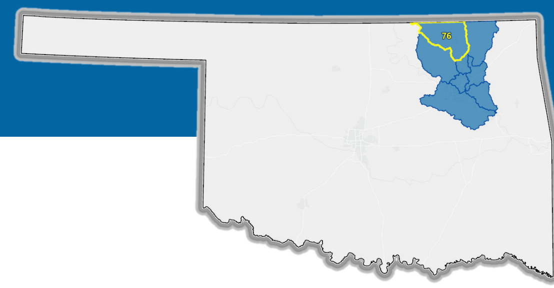
Water Management Category	Demand Sector	Basin 75 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

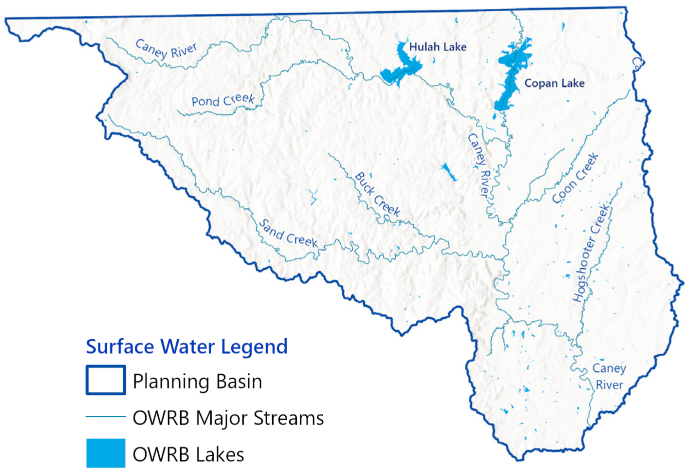
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 76

Caney River - 2 / Middle Arkansas Region





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

SUMMARY

- Basin 76 - Caney River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 156 acre-feet per year (3%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 76 as early as 2035 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 76 as early as 2030 and will continue through 2075.
- Basin 76 is projected to have surface water available for appropriation through 2075.
- Basin 76 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

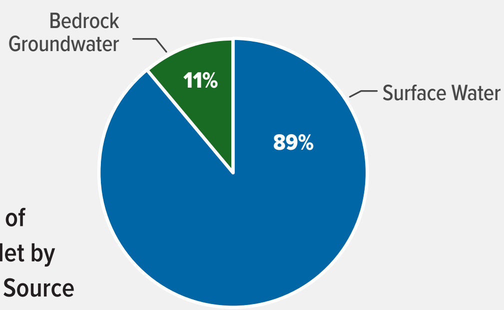
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
58,141	58,236	58,106	58,135	59,326	59,699

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 76 accounts for approximately 2% of the overall water demands of the Middle Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	527	530	525	517	512	503
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	-	-	-	-	-	-
Livestock	1,073	1,041	1,039	1,012	974	943
Oil & Gas	97	97	97	97	97	97
Public Supply	4,386	4,386	4,394	4,441	4,609	4,696
Thermoelectric Power	-	-	-	-	-	-
Total	**6,084**	**6,055**	**6,056**	**6,067**	**6,192**	**6,240**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	2	15	47	117	97%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	7	5	3	2	2	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
370,900	No	No	572,190

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

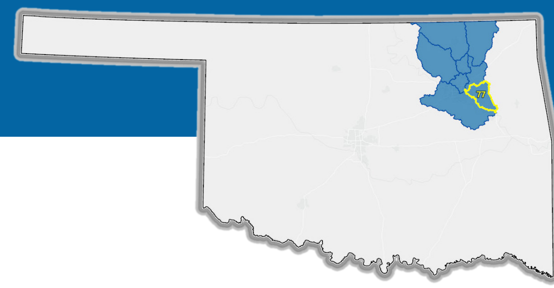
WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 76 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

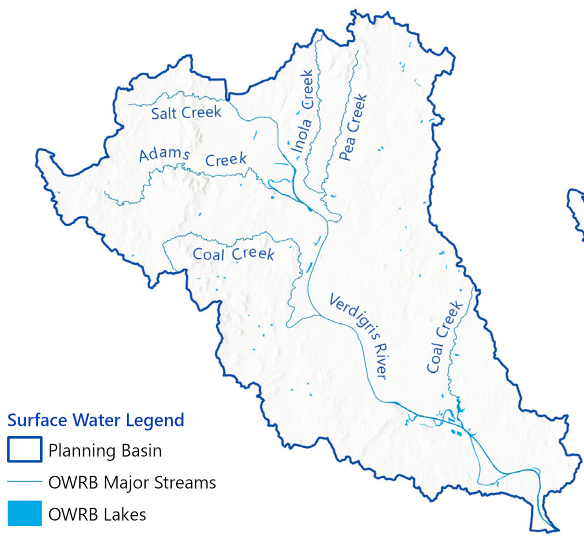
In addition to the water management strategies, water users need:

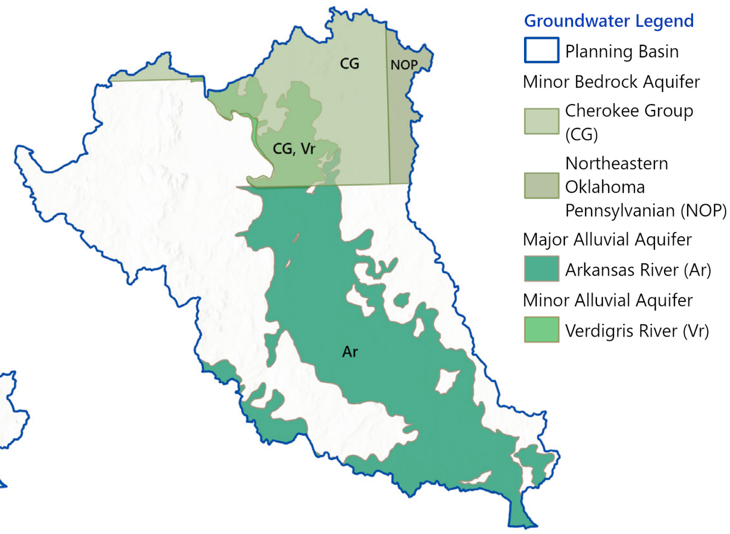
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 77



Verdigris River (To Oologah Dam) - 1
Middle Arkansas Region





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

SUMMARY

- Basin 77 - Verdigris River (To Oologah Dam) - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 2,368 acre-feet per year (12%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 77 as early as 2030 and will continue through 2075.
- No alluvial groundwater depletions are projected.
- There are no bedrock groundwater demands in this basin.
- Basin 77 is projected to have surface water available for appropriation through 2075.
- Basin 77 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

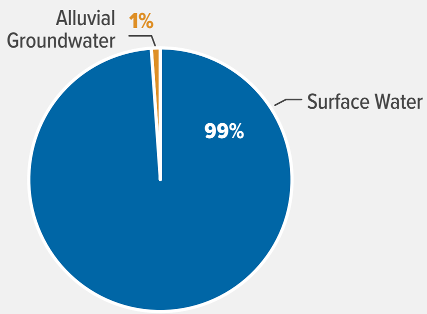
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
58,112	60,199	61,185	62,886	65,358	68,204

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 77 accounts for approximately 9% of the overall water demands of the Middle Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	174	180	183	188	194	202
Self-supplied Industrial	408	397	401	406	414	423
Crop Irrigation	5,704	5,813	5,842	5,901	5,972	5,972
Livestock	382	372	371	362	349	339
Oil & Gas	30	30	30	30	30	30
Public Supply	9,685	9,940	10,103	10,414	10,916	11,410
Thermoelectric Power	4,178	2,839	2,693	3,471	4,050	4,553
Total	**20,562**	**19,571**	**19,624**	**20,772**	**21,925**	**22,929**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	18	32	132	266	547	86%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	-	-	-	-	-	No BGW Demands

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,153,100	No	No	281,640

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

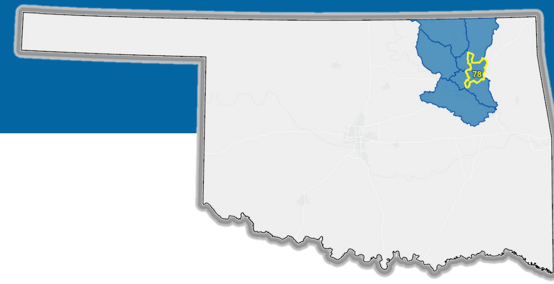
Water Management Category	Demand Sector	Basin 77 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

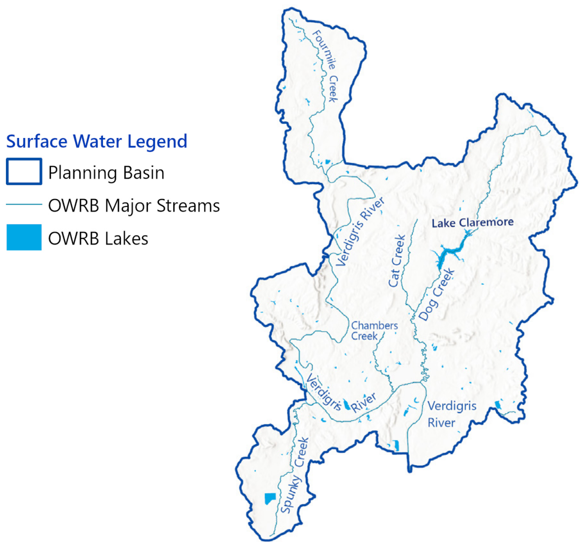
In addition to the water management strategies, water users need:

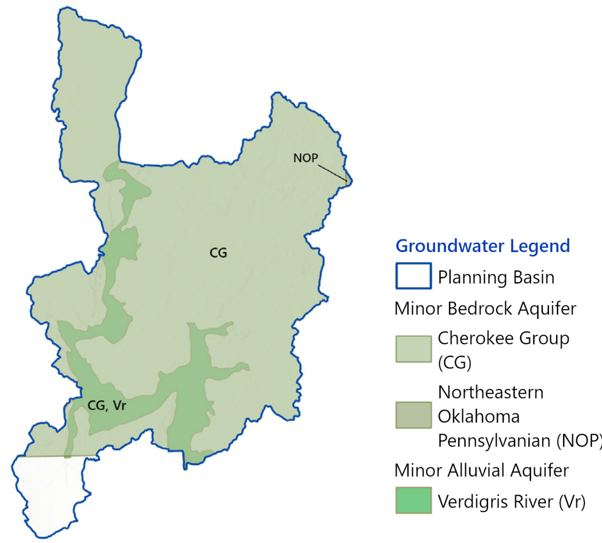
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 78

Verdigris River (To Oologah Dam) - 2
Middle Arkansas Region







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

SUMMARY

- Basin 78 - Verdigris River (To Oologah Dam) - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 3,707 acre-feet per year (20%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 78 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 78 as early as 2030 and will continue through 2075.
- Basin 78 is projected to have surface water available for appropriation through 2075.
- Basin 78 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

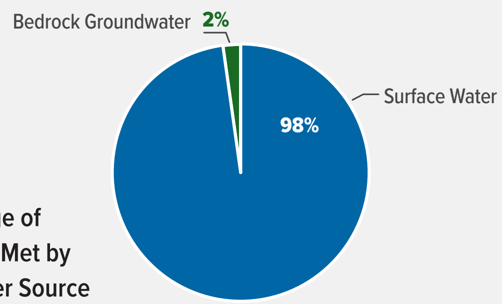
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
52,030	52,506	53,156	54,143	55,828	57,483

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 78 accounts for approximately 8% of the overall water demands of the Middle Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	319	321	324	328	334	341
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	218	247	247	247	247	247
Livestock	439	427	427	416	402	389
Oil & Gas	7	7	7	7	7	7
Public Supply	14,506	14,666	14,858	15,168	15,695	16,205
Thermoelectric Power	2,707	2,988	3,197	3,481	4,073	4,714
Total	**18,196**	**18,657**	**19,060**	**19,647**	**20,758**	**21,903**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	8	12	13	222	546	21%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	321	324	328	334	341	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,062,000	No	No	459,600

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

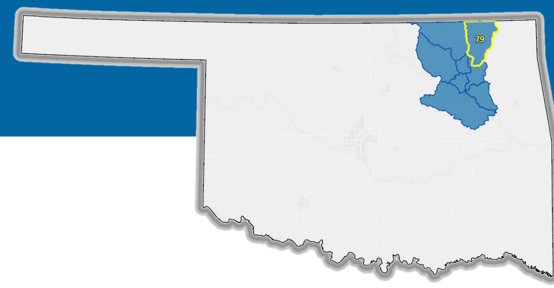
WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 78 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

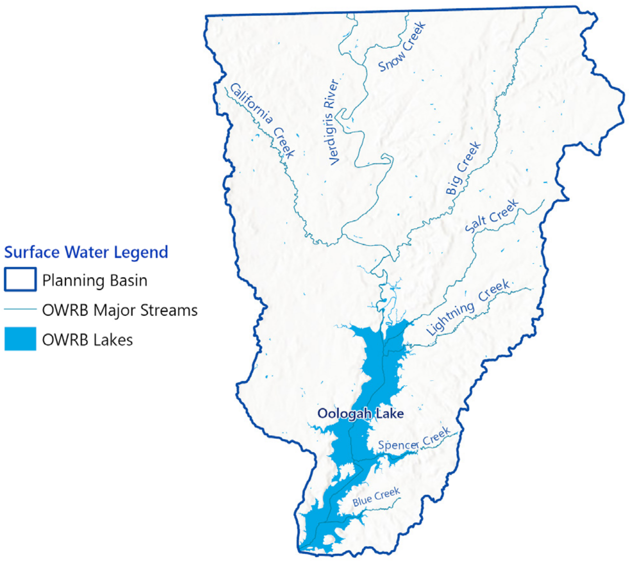
In addition to the water management strategies, water users need:

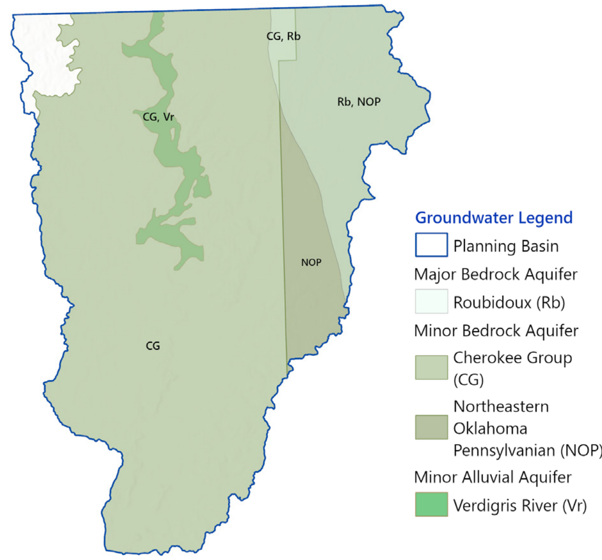
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 79



Verdigris River (To Kansas State Line)
Middle Arkansas Region





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

SUMMARY

- Basin 79 - Verdigris River (To Kansas State Line) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 182 acre-feet per year (6%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 79 as early as 2030 and will diminish by 2060.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 79 as early as 2030 and will continue through 2075.
- Basin 79 is projected to have surface water available for appropriation through 2075.
- Basin 79 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

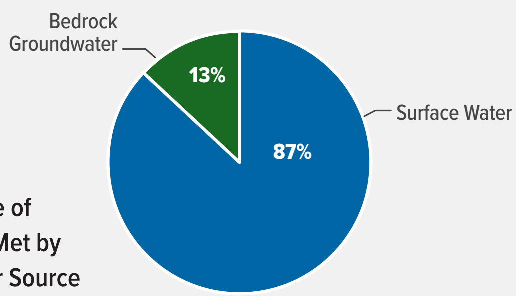
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
30,764	31,375	31,300	31,119	31,098	31,036

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 79 accounts for approximately 1% of the overall water demands of the Middle Arkansas Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	366	374	374	373	375	376
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	-	-	-	-	-	-
Livestock	1,452	1,413	1,410	1,375	1,324	1,283
Oil & Gas	40	40	40	40	40	40
Public Supply	1,183	1,276	1,256	1,222	1,192	1,159
Thermoelectric Power	-	-	-	-	-	-
Total	**3,040**	**3,102**	**3,080**	**3,010**	**2,931**	**2,858**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	10	9	1	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	3	3	3	4	3	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
136,700	No	No	1,260,170

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 79 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Central Planning Region

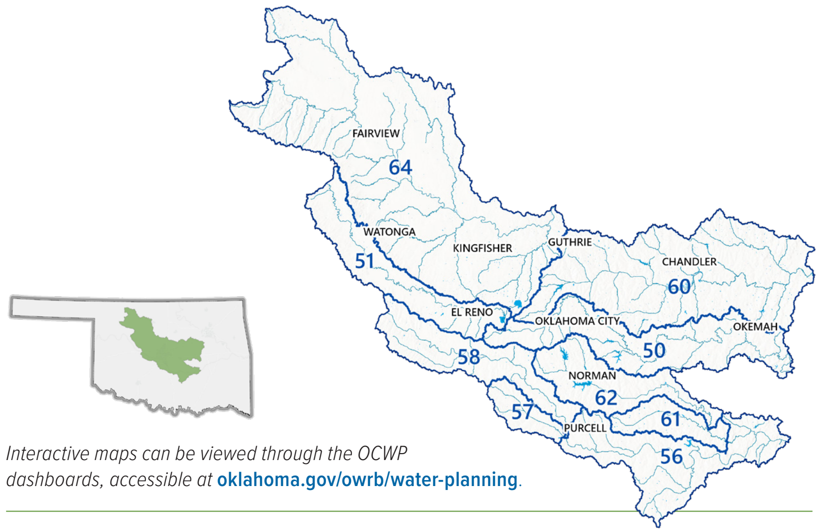
Summary

- Central Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 115,803 acre-feet per year (36%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the Central Region basins except Basin 51. Permitting of surface water in portions or all of Basins 56, 57, and 58 is subject to provisions of the 2016 Water Settlement Agreement.
- In addition to the Statewide Recommendations, Central Region stakeholders expressed the need to consider investing in regionalization, invasive species removal, and studies that support all water use and economic sectors.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Central Region represents 46% of the state's 2075 projected population and 20% 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 Central 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
- Continue/increase reliance on in-basin groundwater (all sectors) in some basins. WSS WDI
- For basins where existing and traditional strategies are unable to meet future demands, stormwater capture and use (PS, SSI), 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

OKLAHOMA Water Resources Board

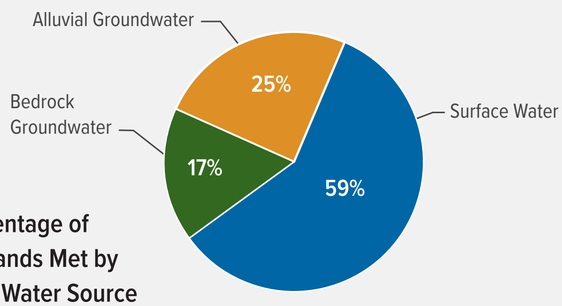
Population

2020	2030	2035	2045	2060	2075
1,537,408	1,628,904	1,62,995	1,801,176	2,014,743	2,198,527

Water Demand Projections

Water demands (withdrawals) are projected to increase by 36% between 2020 and 2075.

The Central Region's largest demand sector is Public Supply, representing 64 percent of the region's 2075 water demands. The second-largest demand sector is Crop Irrigation at 21 percent of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Central Region, Self-supplied Domestic, Crop Irrigation, Public Supply, and Thermoelectric Power demands will increase while Self-supplied Industrial and Livestock demands will decrease between now and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	16,990	17,844	18,228	19,109	20,682	22,080
Self-supplied Industrial	5,274	5,141	5,097	4,963	4,766	4,636
Crop Irrigation	61,551	74,339	76,676	81,330	86,928	92,537
Livestock	12,814	12,577	12,595	12,404	12,144	11,966
Oil & Gas	16,341	16,341	16,341	16,341	16,341	16,341
Public Supply	196,035	207,982	214,691	229,035	254,387	276,483
Thermoelectric Power	8,614	5,853	5,552	7,150	8,342	9,379
Total	**317,619**	**340,077**	**349,181**	**370,332**	**403,592**	**433,422**

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

Physical Water Shortages WIW 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 Central 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
50	1,060	1,728	3,133	5,681	11,377	83%
51	157	241	414	655	834	83%
56	134	175	306	272	270	25%
57	110	109	109	108	109	28%
58	49	92	197	441	689	97%
60	996	1,641	3,015	5,503	8,015	85%
61	3	4	6	11	15	17%
62	232	381	705	1,409	2,394	83%
64	393	684	1,422	2,782	4,590	89%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
50	10	15	98	183	312	14%
51	1,120	1,768	3,089	5,179	6,959	92%
56	369	495	799	827	852	23%
57	7	9	20	38	60	35%
58	1	3	178	493	774	15%
60	-	-	-	-	-	No AGW Demand
61	-	-	-	-	-	No AGW Demand
62	-	-	-	-	-	No AGW Demand
64	5,966	6,926	8,800	11,482	14,248	34%

AFY = acre-feet per year

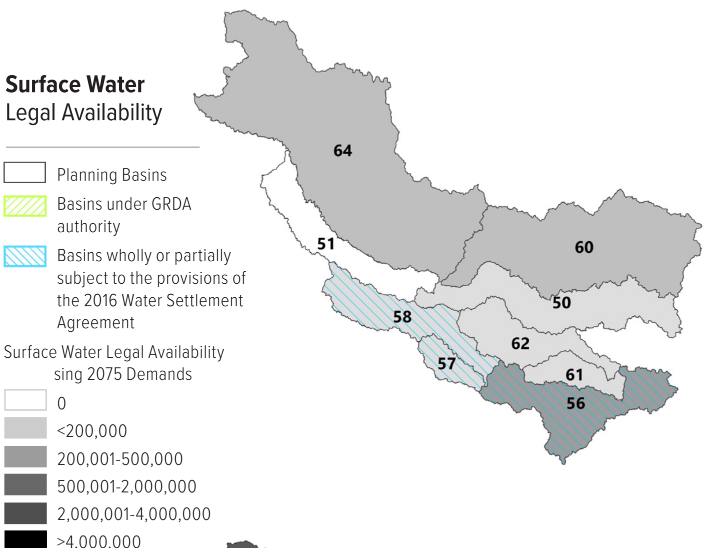
Physical Water Shortages Cont.

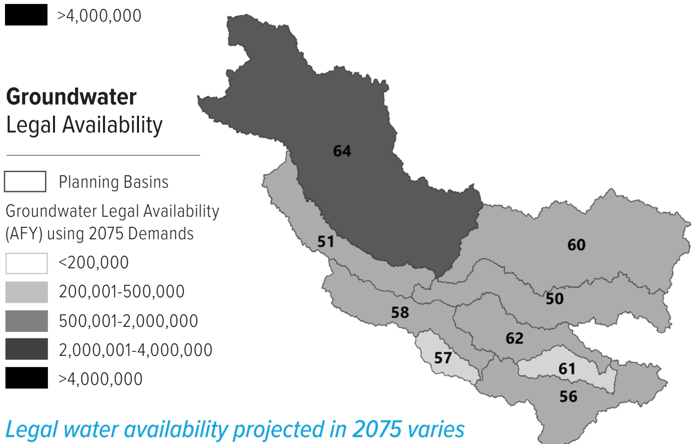
BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	Average Magnitude (AFY)				
50	96	99	105	117	127
51	1,314	1,426	1,668	2,058	2,390
56	3	3	4	4	4
57	1,432	1,439	1,465	1,510	1,564
58	557	611	825	1,319	1,749
60	60	59	101	141	176
61	12	13	12	12	12
62	60	61	64	67	71
64	3,206	3,380	3,706	4,260	4,864

AFY = acre-feet per year

Legal Water Availability WM WSS

Surface water is projected to remain legally available for permitting through 2075 in all of the basins within the Central Region except Basin 51. Groundwater is legally available for permitting in all of the Central Region basins. Permitting of surface water in portions or all of Basins 56, 57, and 58 is subject to provisions of the 2016 Water Settlement Agreement.





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

Lake Overholser

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)
Shawnee Twin Lakes	0
Tecumseh	---
Wes Watkins	---
Wetumka	---
El Reno	---
Overholser	0
Holdenville	---
Konawa	---
Purcell	---
Arcadia	0
Bell Cow	414
Chandler	---
Meeker	0
Prague City	0
Sparks Lake	0
Stroud	199
Stanley Draper	---
Thunderbird	0
Guthrie	---
Hefner	---
Liberty	---

--- 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-Simpson	Bedrock	Major	0.2
Canadian River	Alluvial	Major	temporary 2.0
Cimarron River	Alluvial	Major	temporary 2.0
East-Central Oklahoma	Bedrock	Minor	temporary 2.0
El Reno	Bedrock	Minor	temporary 2.0
Enid Isolated Terrace	Alluvial	Major	0.5
Fairview Isolated Terrace	Alluvial	Minor	temporary 2.0
Garber-Wellington	Bedrock	Major	2.0
Gerty Sand	Alluvial	Major	0.65
Isabella Isolated Terrace	Alluvial	Minor	temporary 2.0
Loyal Isolated Terrace	Alluvial	Minor	temporary 2.0
North Canadian River	Alluvial	Major	1.0
North-Central Oklahoma	Bedrock	Minor	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0
Vamoosa-Ada	Bedrock	Major	2.0

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: Groundwater from major aquifers such as the Garber-Wellington and Ada-Vamoosa experiences shallow nitrate and salinity concerns, with deeper heavy metal concentrations.

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. Lakes in this area are classified as eutrophic approaching hypereutrophic, reflecting their high nutrient concentrations and biological productivity.

Streams: Rivers and streams are impacted by urbanization, 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, increased treatment costs, and increased flooding risk.

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)
$5.28B	**$1.1B**	**$152M**

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	$115M	$4.12B	$2.88B
Small-Medium	$365M	$785M	$42.6B
Medium-Large	$1.75B	$950M	$4.54B
Large	$2.62B	$850M	$23.3B
Non-Public suppliers	$434M	N/A	N/A
Total	**$5.28B**	**$9.69B**	**$73.3B**

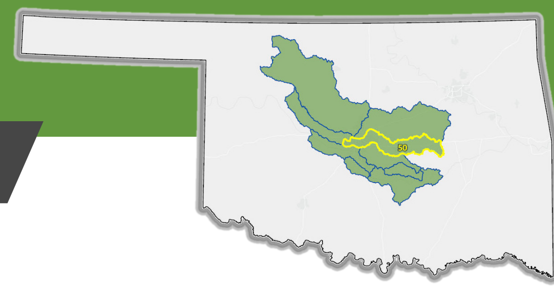
M = million; B = billion; N/A = not applicable

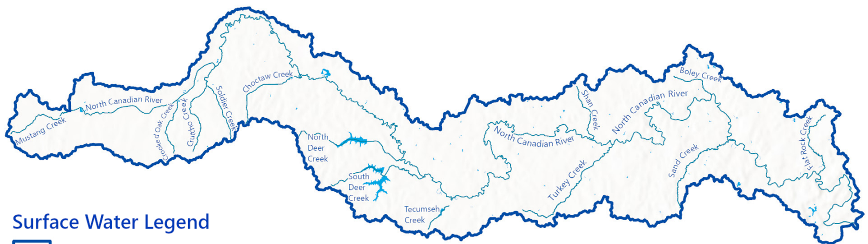
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

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

BASIN 50

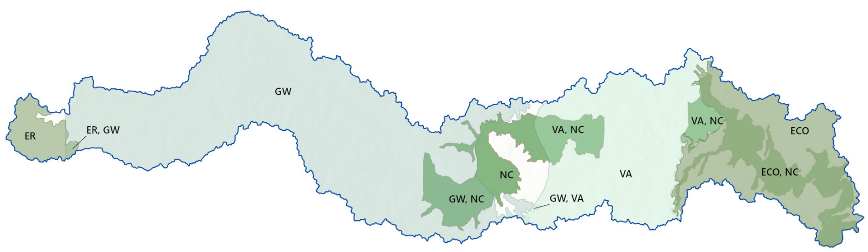
Lower North Canadian River / Central Region





Surface Water Legend

- Planning Basin
- OWRB Major Streams
- OWRB Lakes



Groundwater Legend

- Planning Basin

Major Bedrock Aquifer

- Garber-Wellington (GW)
- Vamoosa-Ada (VA)

Minor Bedrock Aquifer

- East-Central Oklahoma (ECO)
- El Reno (ER)

Major Alluvial Aquifer

- North Canadian River (NC)

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

SUMMARY

- Basin 50 - Lower North Canadian River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 30,749 acre-feet per year (42%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 50 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 50 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 50 as early as 2030 and will continue through 2075.
- Basin 50 is projected to have surface water available for appropriation through 2075.
- Basin 50 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

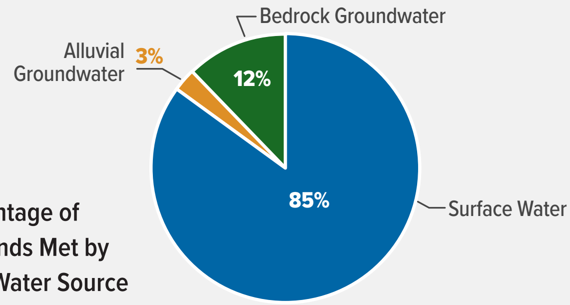
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
374,448	399,941	413,265	441,403	490,456	533,627

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 50 accounts for approximately 24% of the overall water demands of the Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	3,830	4,070	4,187	4,434	4,865	5,245
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	662	1,334	1,336	1,340	1,341	1,342
Livestock	927	906	605	889	864	846
Oil & Gas	569	569	569	569	569	569
Public Supply	64,672	69,209	71,624	76,687	85,452	93,200
Thermoelectric Power	2,299	1,562	1,481	1,909	2,228	2,505
Total	**72,958**	**77,650**	**80,103**	**85,828**	**95,319**	**103,707**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	1,060	1,728	3,133	5,681	11,377	83%
Alluvial Groundwater Depletion	10	15	98	183	312	14%
Bedrock Groundwater Depletion	96	99	105	117	127	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
127,300	No	No	1,307,400

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

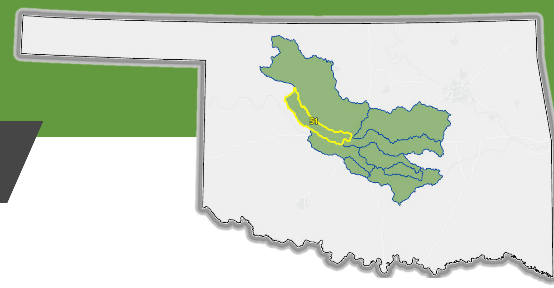
Water Management Category	Demand Sector	Basin 50 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

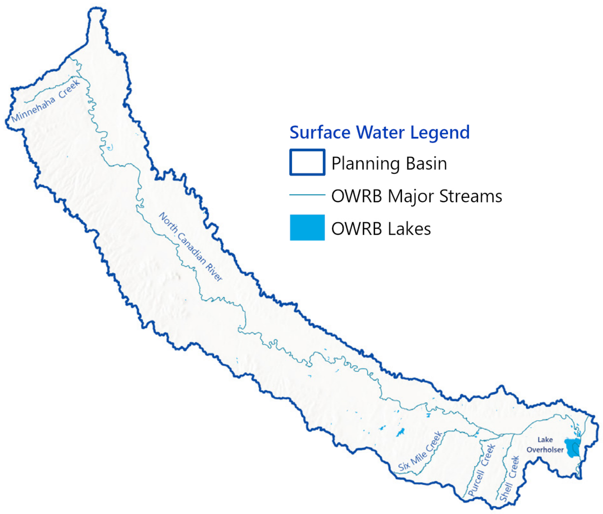
In addition to the water management strategies, water users need:

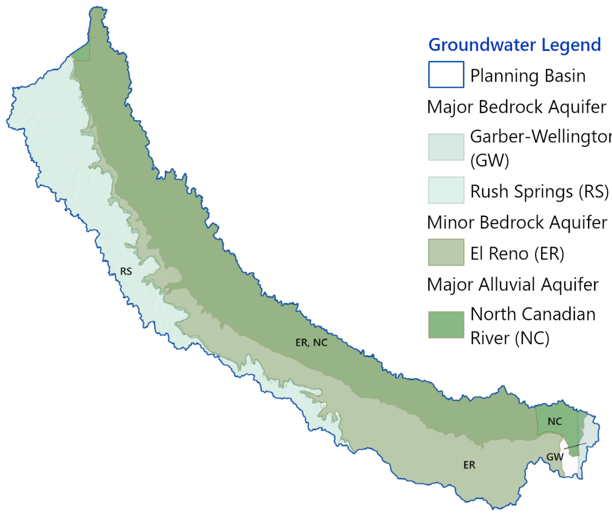
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 51

Middle North Canadian River / Central Region







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

SUMMARY

- Basin 51 - Middle North Canadian River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 9,721 acre-feet per year (61%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 51 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 51 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 51 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 51 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Reduce water demands through agricultural water saving options (CI, LS). WSS
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

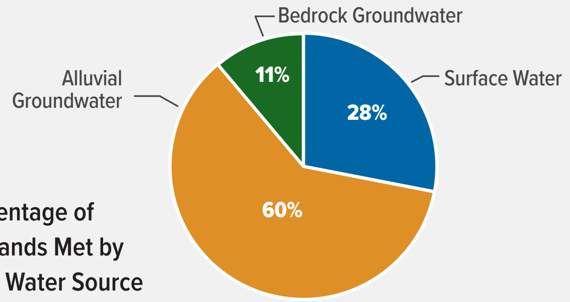
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
71,489	79,053	84,989	98,382	123,882	145,090

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 51 accounts for approximately 6% of the overall water demands of the Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	236	257	272	307	378	436
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	7,476	8,762	9,420	10,740	12,640	14,280
Livestock	1,050	1,019	1,017	990	952	921
Oil & Gas	2,724	2,724	2,724	2,724	2,724	2,724
Public Supply	4,448	4,790	5,014	5,515	6,492	7,303
Thermoelectric Power	9	6	6	2	2	2
Total	**15,944**	**17,558**	**18,452**	**20,278**	**23,188**	**25,665**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	157	241	414	655	834	83%
Alluvial Groundwater Depletion	1,120	1,768	3,089	5,179	6,959	92%
Bedrock Groundwater Depletion	1,314	1,426	1,668	2,058	2,390	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	996,910

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

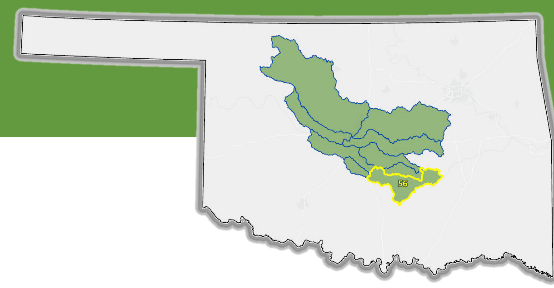
Water Management Category	Demand Sector	Basin 51 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Effective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

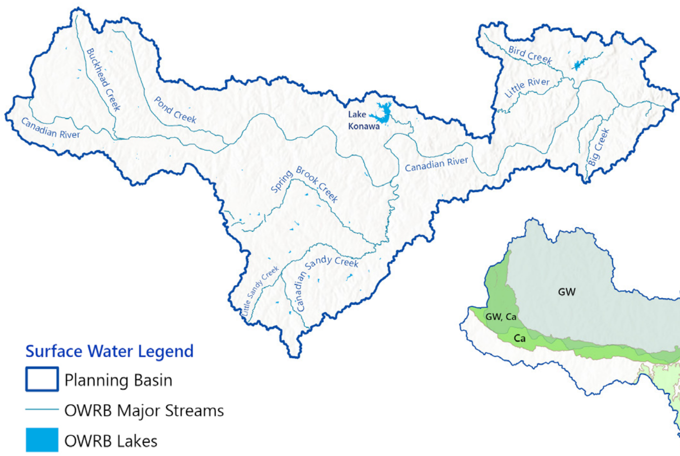
In addition to the water management strategies, water users need:

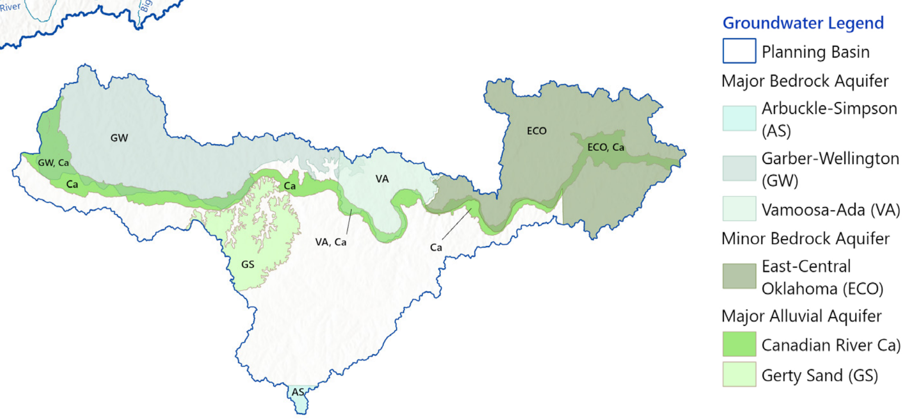
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 56

Lower Canadian River - 1 / Central Region







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

SUMMARY

- Basin 56 - Lower Canadian River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 2,493 acre-feet per year (28%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 56 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 56 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 56 as early as 2030 and will continue through 2075.
- Basin 56 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 56 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
    - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
    - Stormwater capture and use (PS, SSI). WM WSS
    - Water reuse (PS, SSI). WM WSS
    - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

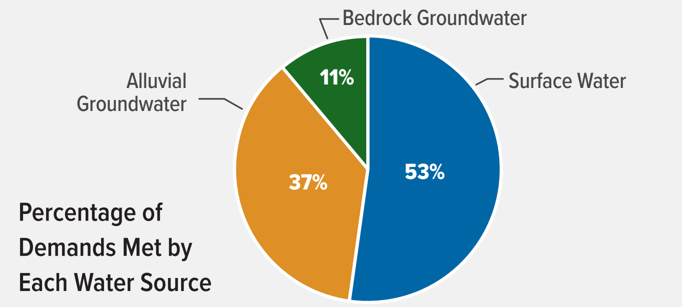
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
101,956	104,293	105,788	109,316	115,951	121,450

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 56 accounts for approximately 3% of the overall water demands of the Central Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,293	1,325	1,336	1,369	1,428	1,482
Self-supplied Industrial	270	263	264	267	274	280
Crop Irrigation	1,404	2,437	2,712	3,298	3,298	3,298
Livestock	1,257	1,246	1,252	1,244	1,237	1,237
Oil & Gas	808	808	808	808	808	808
Public Supply	3,223	3,273	3,291	3,355	3,493	3,588
Thermoelectric Power	621	422	401	516	602	677
Total	**8,878**	**9,775**	**10,065**	**10,858**	**11,141**	**11,371**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	134	175	306	272	270	25%
Alluvial Groundwater Depletion	369	495	799	827	852	23%
Bedrock Groundwater Depletion	3	3	4	4	4	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
630,200	Yes	No	735,790

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

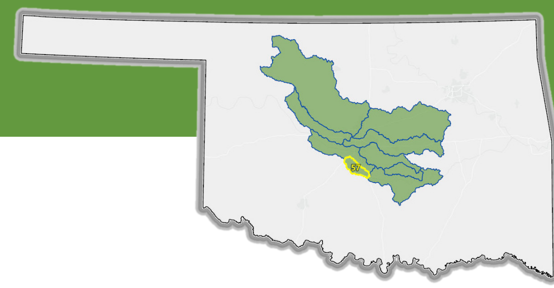
Water Management Category	Demand Sector	Basin 56 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Effective at Meeting Future Demands

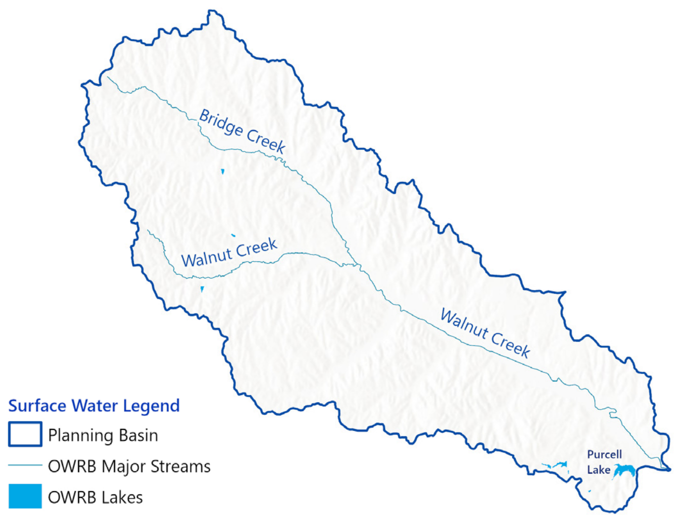
In addition to the water management strategies, water users need:

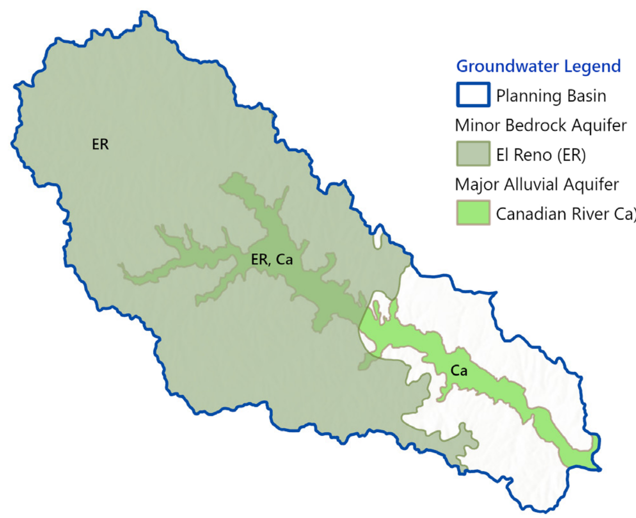
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 57

Lower Canadian River - 2 / Central Region







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

SUMMARY

- Basin 57 - Lower Canadian River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 330 acre-feet per year (13%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 57 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 57 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 57 as early as 2030 and will continue through 2075.
- Basin 57 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 57 is projected to have groundwater available for appropriation through 2075
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

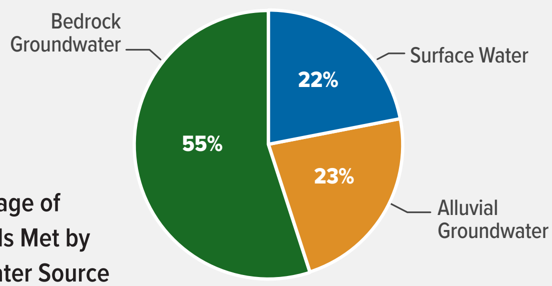
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
13,630	13,827	13,932	14,334	14,995	15,728

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 57 accounts for approximately 1% of the overall water demands of the Central Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	654	662	667	683	711	743
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	120	242	240	237	236	236
Livestock	305	297	296	289	279	271
Oil & Gas	343	343	343	343	343	343
Public Supply	1,116	1,132	1,139	1,170	1,220	1,277
Thermoelectric Power	-	-	-	-	-	-
Total	**2,538**	**2,676**	**2,685**	**2,722**	**2,789**	**2,869**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	110	109	109	108	109	28%
Alluvial Groundwater Depletion	7	9	20	38	60	35%
Bedrock Groundwater Depletion	1,432	1,439	1,465	1,510	1,564	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
41,700	Yes	No	230,100

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

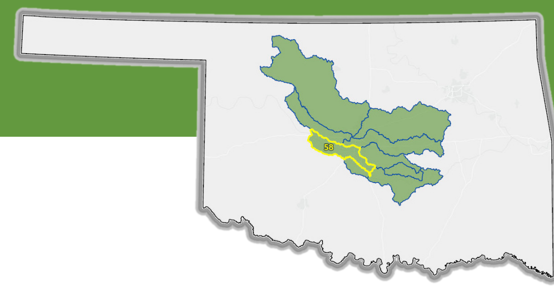
Water Management Category	Demand Sector	Basin 57 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

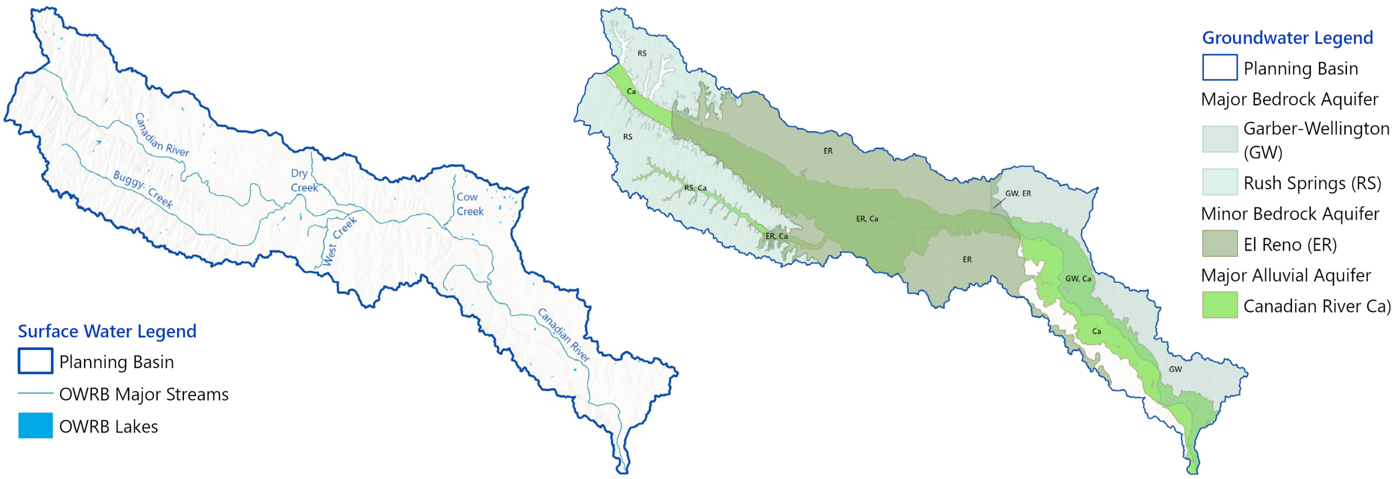
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 58

Middle Canadian River / Central Region





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

SUMMARY

- Basin 58 - Middle Canadian River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 8,513 acre-feet per year (23%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 58 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 58 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 58 as early as 2030 and will continue through 2075.
- Basin 58 is projected to have surface water available for appropriation through 2075, but its permitting may be subject to provisions of the 2016 Water Settlement Agreement.
- Basin 58 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

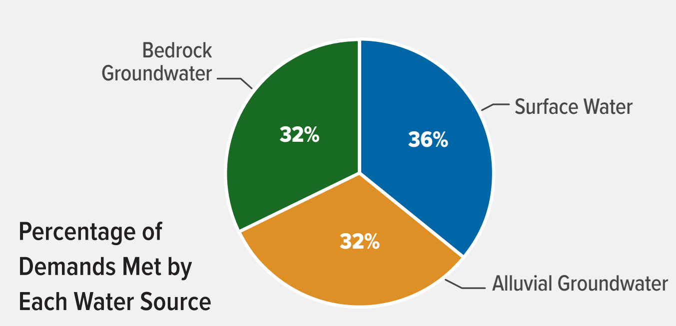
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
136,001	143,904	150,421	164,909	191,976	214,761

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 58 accounts for approximately 11% of the overall water demands of the Central Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	725	757	779	830	926	1,010
Self-supplied Industrial	5,004	4,878	4,833	4,696	4,492	4,356
Crop Irrigation	4,888	5,020	5,134	5,532	6,242	6,862
Livestock	1,024	997	995	971	938	911
Oil & Gas	1,973	1,973	1,973	1,973	1,973	1,973
Public Supply	22,274	22,953	23,544	24,819	27,146	29,127
Thermoelectric Power	1,797	1,221	1,158	1,493	1,742	1,959
Total	**37,685**	**37,798**	**38,417**	**40,313**	**43,459**	**46,198**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	49	92	197	441	689	97%
Alluvial Groundwater Depletion	1	3	178	493	774	15%
Bedrock Groundwater Depletion	557	611	825	1,319	1,749	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
122,300	Yes	No	980,740

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

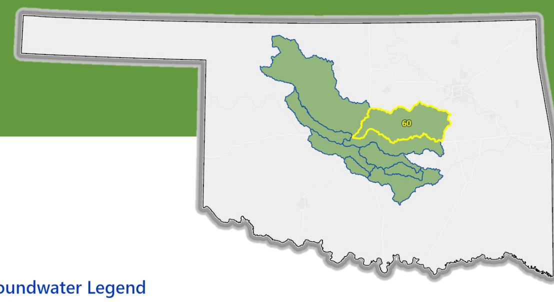
Water Management Category	Demand Sector	Basin 58 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

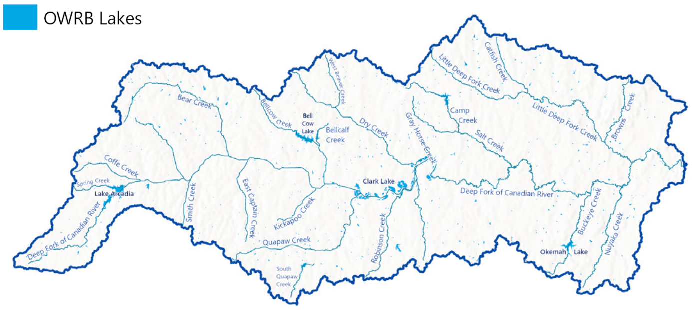
BASIN 60

Deep Fork River / Central Region



Surface Water Legend

- Planning Basin
- OWRB Major Streams
- OWRB Lakes



Groundwater Legend

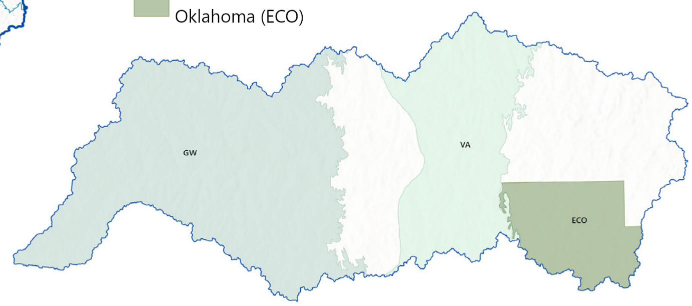
- Planning Basin

Major Bedrock Aquifer

- Garber-Wellington (GW)
- Vamoosa-Ada (VA)

Minor Bedrock Aquifer

- East-Central Oklahoma (ECO)



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

SUMMARY

- Basin 60 - Deep Fork River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 22,757 acre-feet per year (38%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 60 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 60 as early as 2030 and will continue through 2075.
- Basin 60 is projected to have surface water available for appropriation through 2075.
- Basin 60 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

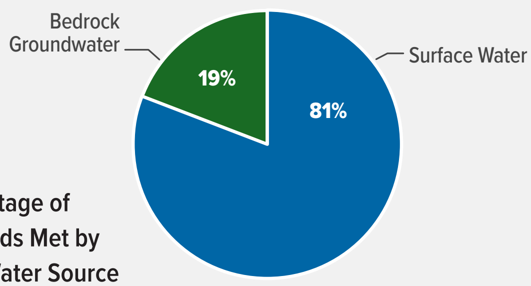
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
360,313	382,893	393,531	416,374	456,844	492,458

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 60 accounts for approximately 19% of the overall water demands of the Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	6,172	6,518	6,654	6,963	7,515	8,009
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	111	279	279	279	279	279
Livestock	1,832	1,785	1,783	1,742	1,684	1,638
Oil & Gas	579	579	579	579	579	579
Public Supply	47,400	50,711	52,445	56,083	62,412	67,999
Thermoelectric Power	3,888	2,641	2,506	3,229	3,768	4,237
Total	**59,982**	**62,514**	**64,245**	**68,876**	**76,237**	**82,740**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	996	1,641	3,015	5,503	8,015	85%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	60	59	101	141	176	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
464,800	No	No	1,749,390

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

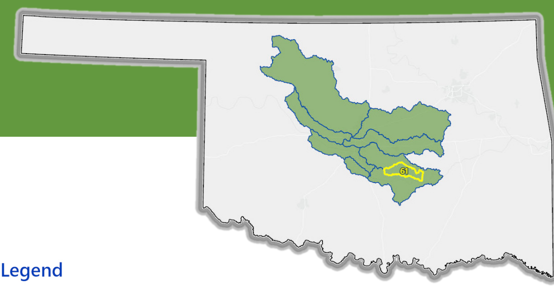
Water Management Category	Demand Sector	Basin 60 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

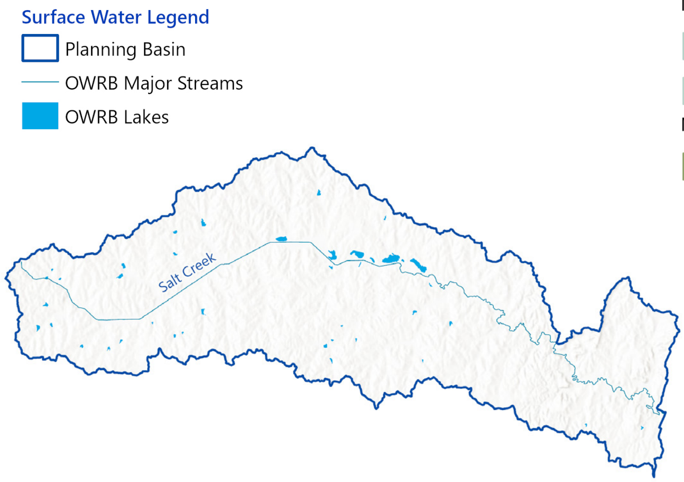
In addition to the water management strategies, water users need:

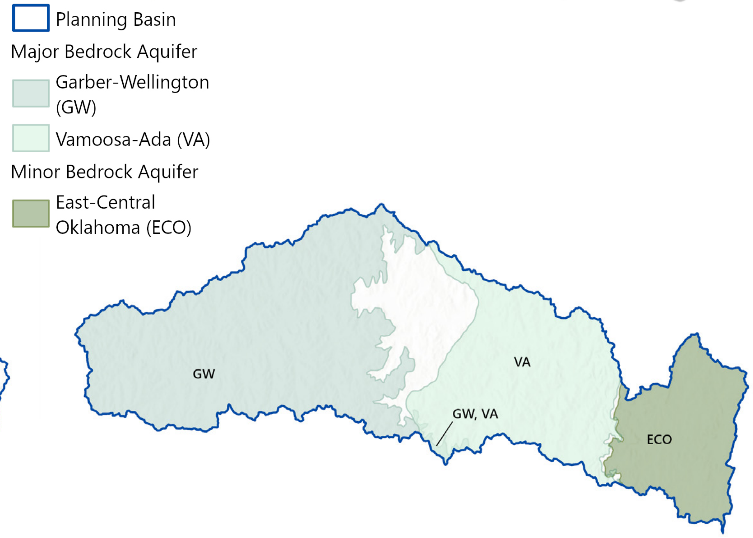
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 61

Little River - 1 / Central Region







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

SUMMARY

- Basin 61 - Little River - 1 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 54 acre-feet per year (3%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 61 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 61 as early as 2030 and will continue through 2075.
- Basin 61 is projected to have surface water available for appropriation through 2075.
- Basin 61 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

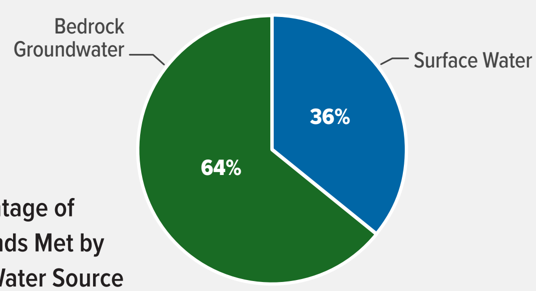
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
19,773	20,220	20,186	20,187	20,276	20,320

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 61 accounts for approximately less than 1% of the overall water demands of the Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	885	905	906	909	917	924
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	14	23	23	23	23	23
Livestock	279	273	273	267	260	254
Oil & Gas	86	86	86	86	86	86
Public Supply	492	504	505	509	516	523
Thermoelectric Power	-	-	-	-	-	-
Total	**1,755**	**1,791**	**1,792**	**1,794**	**1,802**	**1,809**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	3	4	6	11	15	17%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	12	13	12	12	12	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
178,700	No	No	325,720

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

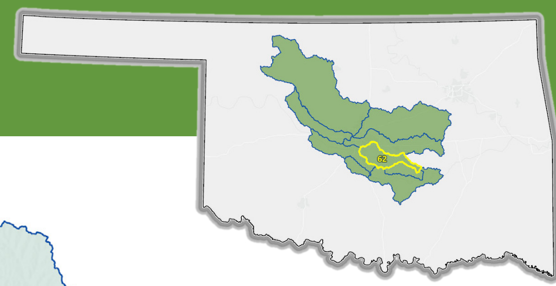
Water Management Category	Demand Sector	Basin 61 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

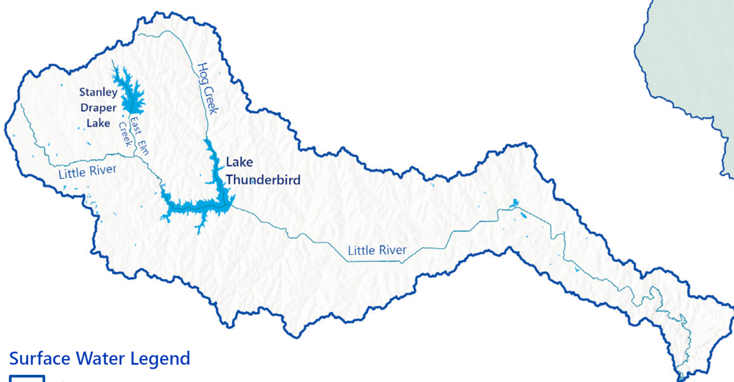
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 62

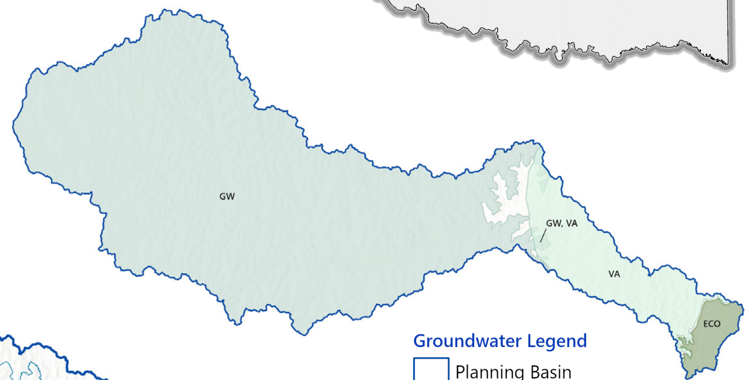
Little River - 2 / Central Region





Surface Water Legend

- Planning Basin
- OWRB Major Streams
- OWRB Lakes



Groundwater Legend

- Planning Basin

Major Bedrock Aquifer

- Garber-Wellington (GW)
- Vamoosa-Ada (VA)

Minor Bedrock Aquifer

- East-Central Oklahoma (ECO)

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

SUMMARY

- Basin 62 - Little River - 2 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 7,469 acre-feet per year (30%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 62 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 62 as early as 2030 and will continue through 2075.
- Basin 62 is projected to have surface water available for appropriation through 2075.
- Basin 62 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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

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OKLAHOMA Water Resources Board

Population

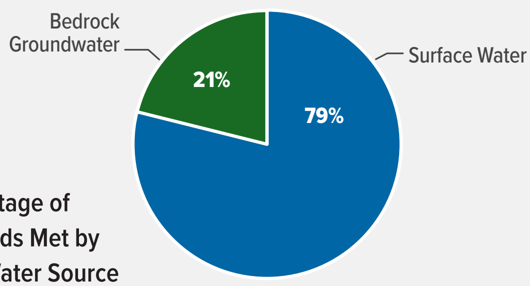
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
213,896	220,682	225,843	236,766	256,470	273,219

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 62 accounts for approximately 8% of the overall water demands of the Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,288	1,319	1,335	1,369	1,432	1,486
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	227	359	359	359	359	359
Livestock	452	441	441	431	418	408
Oil & Gas	105	105	105	105	105	105
Public Supply	23,054	23,962	24,584	25,894	28,230	30,238
Thermoelectric Power	-	-	-	-	-	-
Total	**25,126**	**26,186**	**26,823**	**28,159**	**30,544**	**32,595**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	232	381	705	1,409	2,394	83%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	60	61	64	67	71	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
92,700	No	No	723,740

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

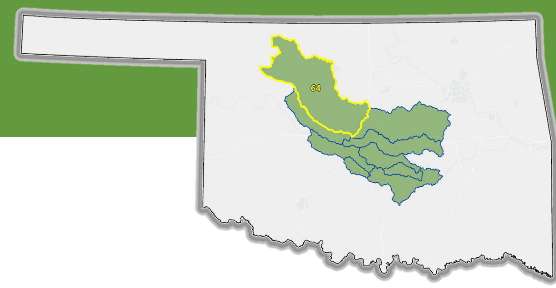
Water Management Category	Demand Sector	Basin 62 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

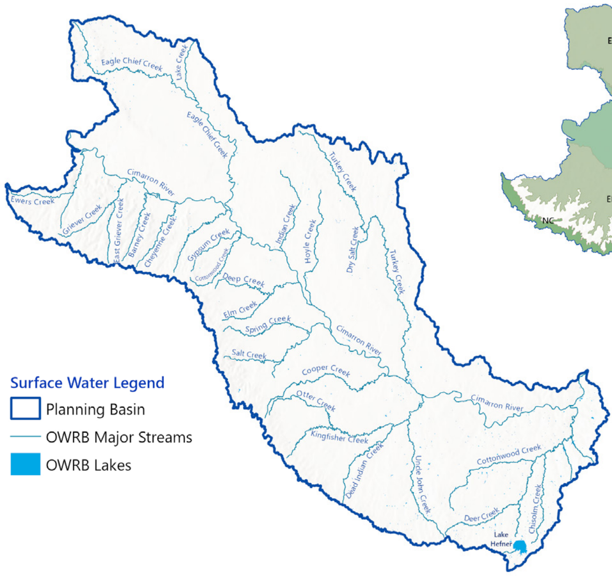
In addition to the water management strategies, water users need:

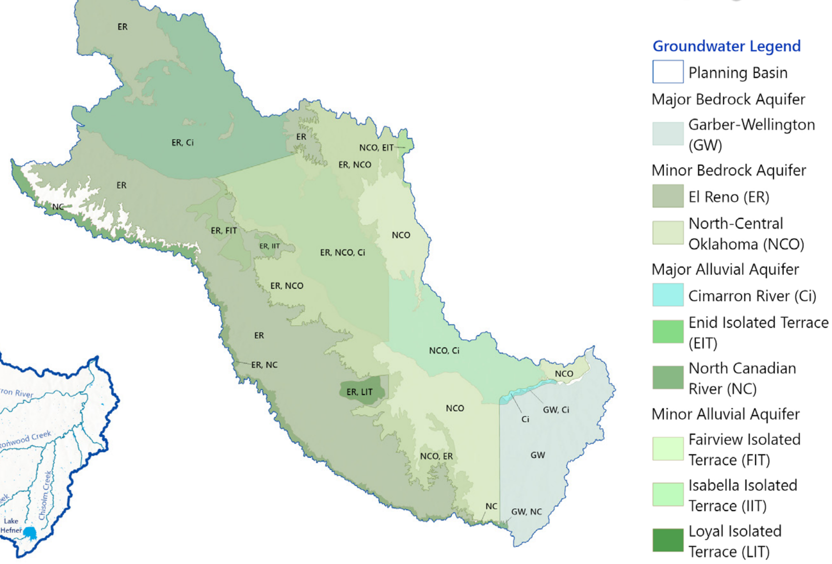
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 64

Middle Cimarron River / Central Region







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

SUMMARY

- Basin 64 - Middle Cimarron River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 33,715 acre-feet per year (36%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 64 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 64 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 64 as early as 2030 and will continue through 2075.
- Basin 64 is projected to have surface water available for appropriation through 2075.
- Basin 64 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
    - Stormwater capture and use (PS, SSI). WM WSS
    - Water reuse (PS, SSI). WM WSS
    - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

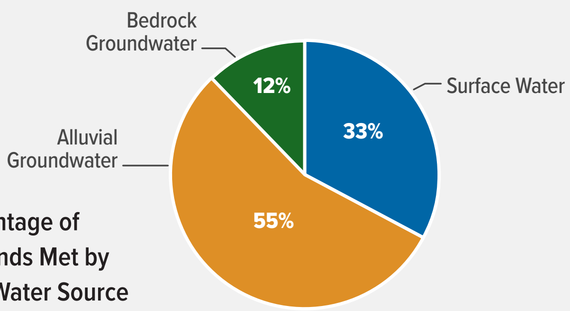
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
245,902	264,091	275,040	299,505	343,893	381,874

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 64 accounts for approximately 29% of the overall water demands of the Central Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,907	2,029	2,092	2,244	2,508	2,745
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	46,647	55,884	57,175	59,523	62,511	65,858
Livestock	5,688	5,614	5,633	5,580	5,512	5,482
Oil & Gas	9,154	9,154	9,154	9,154	9,154	9,154
Public Supply	29,356	31,448	32,545	35,002	39,426	43,228
Thermoelectric Power	-	-	-	-	-	-
Total	**92,753**	**104,129**	**106,600**	**111,503**	**119,112**	**126,467**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	393	684	1,422	2,782	4,590	89%
Alluvial Groundwater Depletion	5,966	6,926	8,800	11,482	14,248	34%
Bedrock Groundwater Depletion	3,206	3,380	3,706	4,260	4,864	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
370,300	No	No	6,071,180

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 64 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Effective at Meeting Future Demands

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Northwest
Planning Region

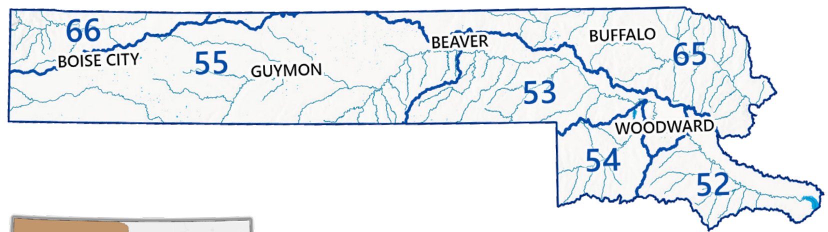
Summary

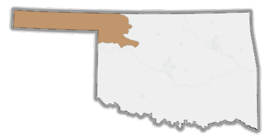
- Northwest Region demands are supplied predominantly by bedrock groundwater supplies.
- Water demand (withdrawal) is projected to increase by 44,057 acre-feet per year (7%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water is projected to remain legally available for permitting through 2075 only in Basins 54 and 65 of the Northwest Region. Groundwater is legally available for permitting in all Northwest Region basins.
- In addition to the Statewide Recommendations, Northwest Region stakeholders expressed interest in developing a regional economic plan, investing in technology and research, creating interconnections between systems, supporting irrigation districts, reforming federal crop insurance, metering of all water uses, expanding the Master Irrigators program and developing broader education program about best production/irrigation practices.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Northwest Region represents 1% of the state's 2075 projected population and 30% 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 Northwest 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
- For some basins where existing and traditional strategies are unable to meet future demands, 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. WM 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

OKLAHOMA Water Resources Board

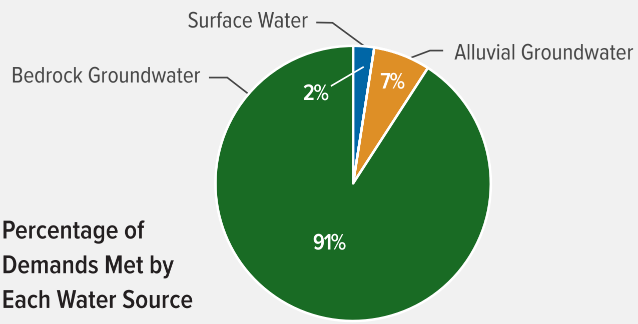
Population

2020	2030	2035	2045	2060	2075
58,718	58,879	58,749	59,136	61,036	61,553

Water Demand Projections

Water demands (withdrawals) are projected to increase by 7% between 2020 and 2075.

The Northwest Region's largest demand sector is Crop Irrigation, representing 94% of the region's 2075 water demands. The second largest demand sector is Livestock, representing 3% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Northwest Region, Self-supplied Domestic, Crop Irrigation, Livestock, Public Supply, and Thermoelectric Power demands will increase while Self-supplied Industrial demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	623	639	634	633	663	670
Self-supplied Industrial	2,946	2,872	2,866	2,853	2,787	2,718
Crop Irrigation	573,272	592,484	596,533	603,750	611,703	615,324
Livestock	17,306	17,430	17,615	17,797	18,115	18,550
Oil & Gas	1,697	1,697	1,697	1,697	1,697	1,697
Public Supply	12,814	12,910	12,894	13,025	13,555	13,741
Thermoelectric Power	164	111	106	136	159	179
Total	**608,824**	**628,144**	**632,345**	**639,891**	**648,679**	**652,880**

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

Physical Water Shortages WIW 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 or projected demands, whichever is less.

The Northwest 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
52	8	8	6	6	6	7%
53	-	-	-	-	-	0%
54	1	1	1	1	1	4%
55	4	5	9	12	14	58%
65	1,033	1,034	1,039	1,044	1,047	52%
66	95	95	95	95	95	76%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
52	784	823	699	665	733	42%
53	497	761	1,236	1,867	2,146	59%
54	2	2	2	2	2	4%
55	-	-	-	-	-	No AGW Demand
65	558	757	1,120	1,536	1,721	66%
66	-	-	-	-	-	No AGW Demand

AFY = acre-feet per year

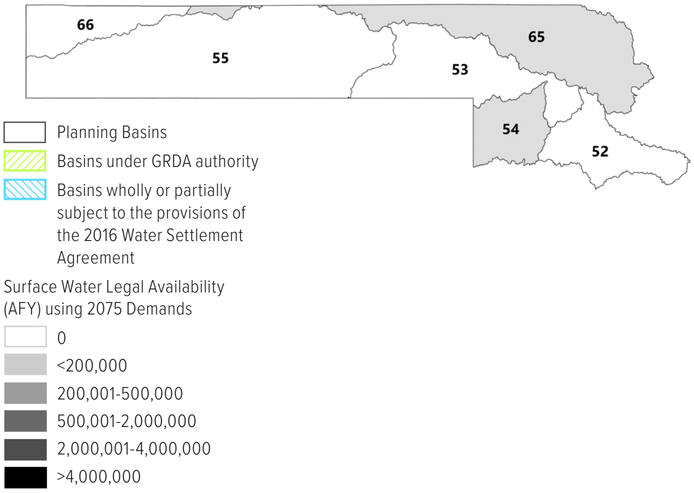
BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
52	2,840	2,869	2,943	3,064	3,185
53	37,119	38,419	40,774	43,452	44,620
54	10,611	10,611	10,606	10,612	10,608
55	422,563	423,861	426,128	428,605	429,749
65	41,611	42,355	43,673	45,195	45,878
66	18,481	18,480	18,469	18,455	18,445

AFY = acre-feet per year

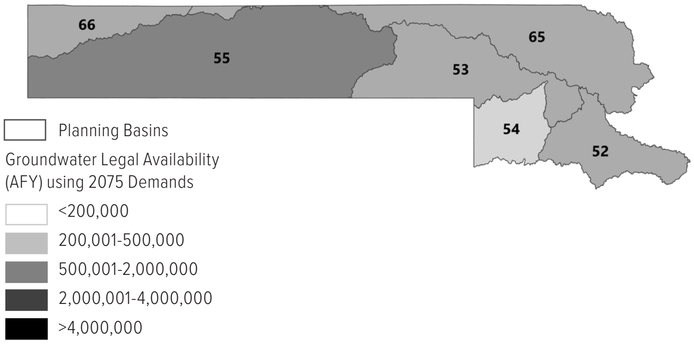
Legal Water Availability WM WSS

Surface water is projected to remain legally available for permitting through 2075 only in Basins 54 and 65 within the Northwest Region. Groundwater is legally available for permitting in all of the Northwest Region basins.

Surface Water Legal Availability



Groundwater Legal Availability



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)
Canton	0
Optima	No Yield

--- 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)
Cimarron River	Alluvial	Major	temporary 2.0
El Reno	Bedrock	Minor	temporary 2.0
North Canadian River	Alluvial	Major	1.0
Ogallala Northwest	Bedrock	Major	1.4
Ogallala Panhandle	Bedrock	Major	2.0
Ogallala-Whitehorse	Bedrock	Major	temporary 2.0
Rush Springs	Bedrock	Major	temporary 2.0

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: Since groundwater is the primary source of drinking water in the region, water quality concerns such as elevated nitrate and fluoride levels in the Ogallala are important to monitor, as they can adversely affect human health.

Lakes: Impacts affecting lakes in this region include nutrients, chlorophyll- a, and turbidity, all of which affect recreation and water supply uses. Consistent with high levels of nutrients and productivity, lakes in this region are classified as eutrophic and hypereutrophic. High levels of nutrients and chlorophyll can lead to increased treatment cost, taste & odor issues for water supply, and reduced recreation.

Streams: Rivers and streams are impacted by drought-flood cycling and scarcity. These factors contribute to water insecurity.

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)
$362M	**$302M**	**$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.

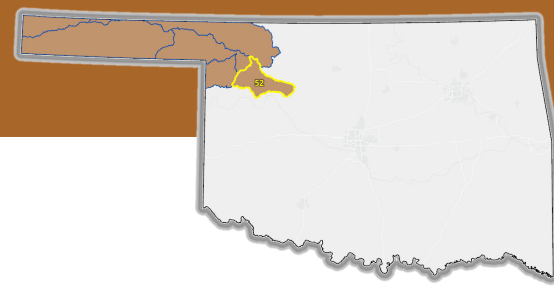
System Size	Near-term Drinking Water Cost (2024 dollars)	Future Drinking Water Costs through 2035 (2025 dollars)[1]	Future Drinking Water Costs through 2045 (2025 dollars)[2]
Small	$16M	$850M	$653M
Small-Medium	N/A	N/A	N/A
Medium-Large	$58M	$461M	$88M
Large	N/A	N/A	N/A
Non-Public suppliers	$288M	N/A	N/A
Total	**$362M**	**$1.31B**	**$741M**

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

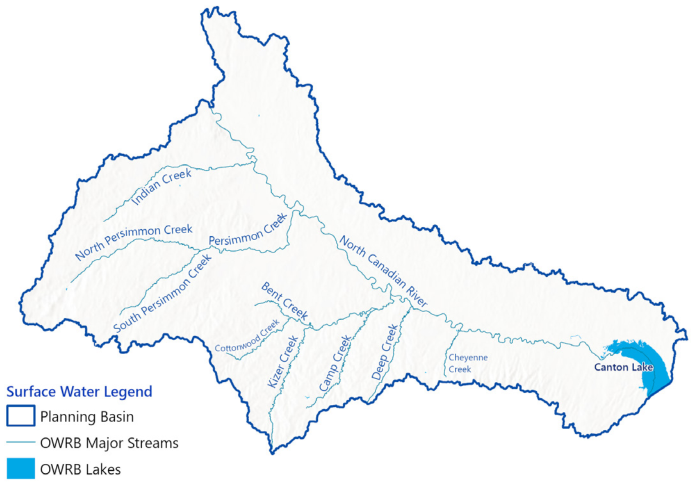
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

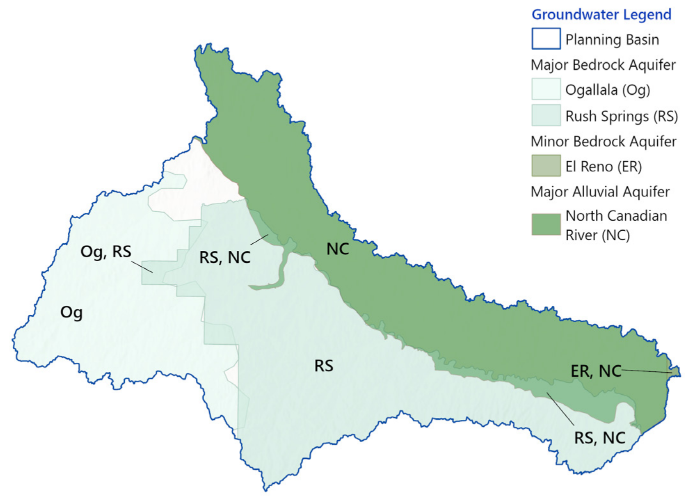
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 52



Upper North Canadian River - 1
Northwest Region





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

SUMMARY

- Basin 52 - Upper North Canadian River - 1 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 2,956 acre-feet per year (23%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 52 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 52 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 52 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 52 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

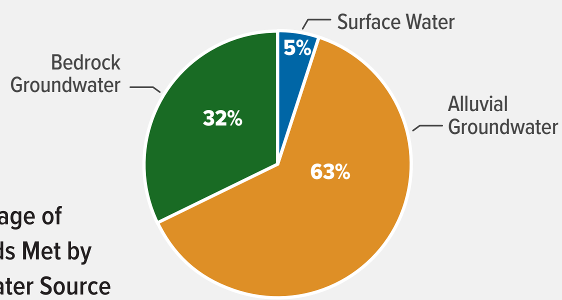
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
10,790	11,054	11,175	11,585	12,590	13,222

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 52 accounts for approximately 2% of the overall water demands of the Northwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	110	116	118	126	143	155
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	10,124	12,022	12,104	12,283	12,579	12,893
Livestock	1,164	1,158	1,165	1,163	1,163	1,170
Oil & Gas	624	624	624	624	624	624
Public Supply	755	768	773	793	847	877
Thermoelectric Power	164	111	106	136	159	179
Total	**12,942**	**14,798**	**14,890**	**15,126**	**15,515**	**15,898**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	8	8	6	6	6	7%
Alluvial Groundwater Depletion	784	823	699	665	733	42%
Bedrock Groundwater Depletion	2,840	2,869	2,943	3,064	3,185	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	785,180

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

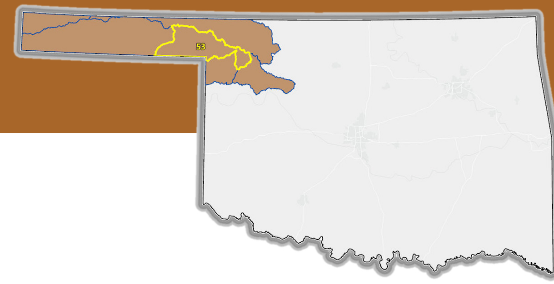
Water Management Category	Demand Sector	Basin 52 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

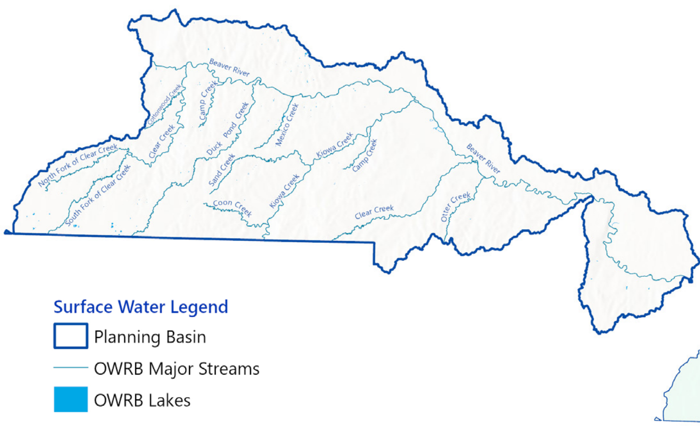
In addition to the water management strategies, water users need:

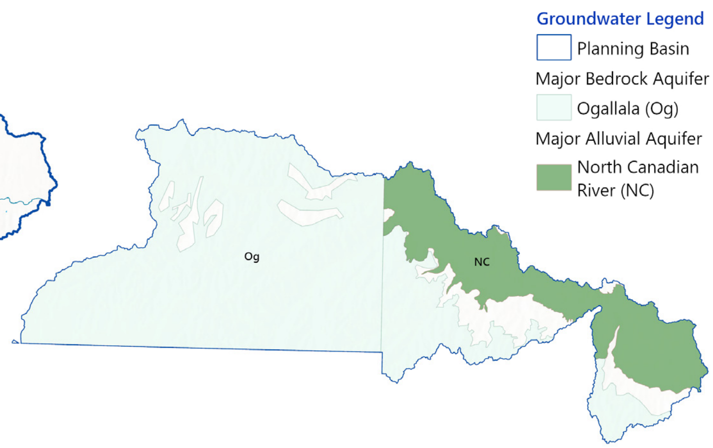
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 53

Upper North Canadian River - 2
Northwest Region







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

SUMMARY

- Basin 53 - Upper North Canadian River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 15,965 acre-feet per year (28%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 53 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 53 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 53 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

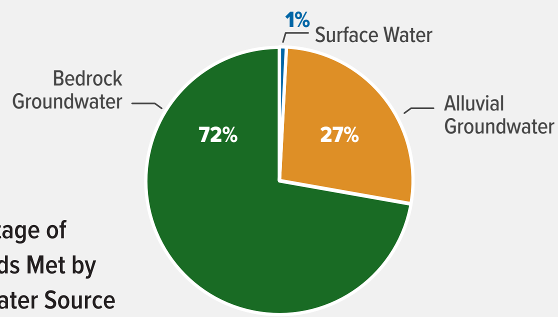
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
7,005	7,250	7,169	7,119	7,300	7,302

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 53 accounts for approximately 11% of the overall water demands of the Northwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	158	164	161	157	158	155
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	47,016	52,120	53,912	57,097	60,562	62,059
Livestock	1,682	1,684	1,698	1,706	1,721	1,748
Oil & Gas	189	189	189	189	189	189
Public Supply	7,919	8,051	8,054	8,181	8,591	8,779
Thermoelectric Power	-	-	-	-	-	-
Total	**56,964**	**62,207**	**64,014**	**67,330**	**71,221**	**72,929**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	497	761	1,236	1,867	2,146	59%
Bedrock Groundwater Depletion	37,119	38,419	40,774	43,452	44,620	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	1,239,200

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

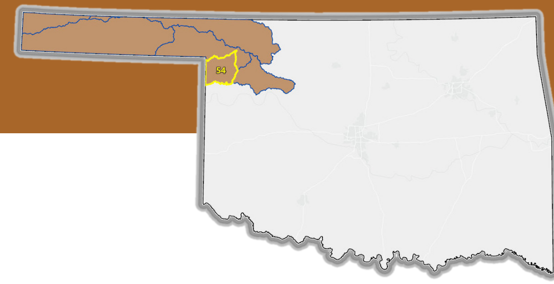
Water Management Category	Demand Sector	Basin 53 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Potentially Effective with Local Variability

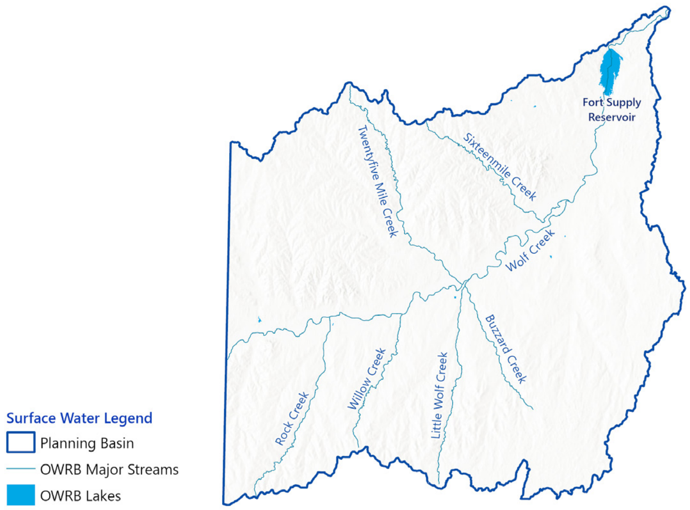
In addition to the water management strategies, water users need:

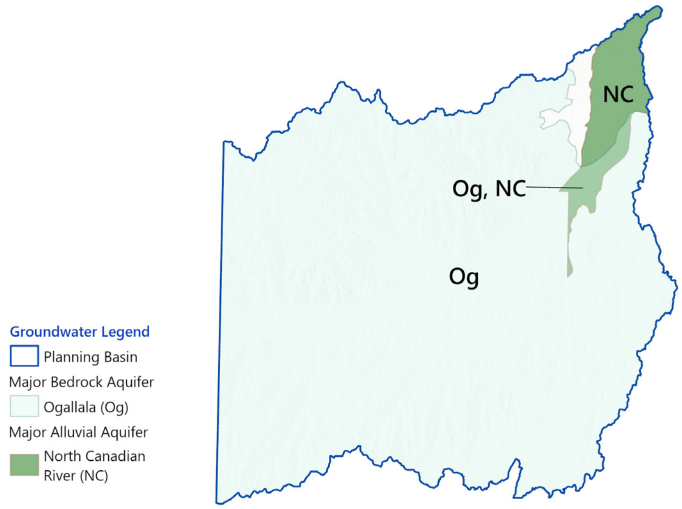
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 54

Upper North Canadian River - 3
Northwest Region







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

SUMMARY

- Basin 54 - Upper North Canadian River - 3 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 568 acre-feet per year (4%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 54 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 54 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 54 as early as 2030 and will continue through 2075.
- Basin 54 is projected to have surface water available for appropriation through 2075.
- Basin 54 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

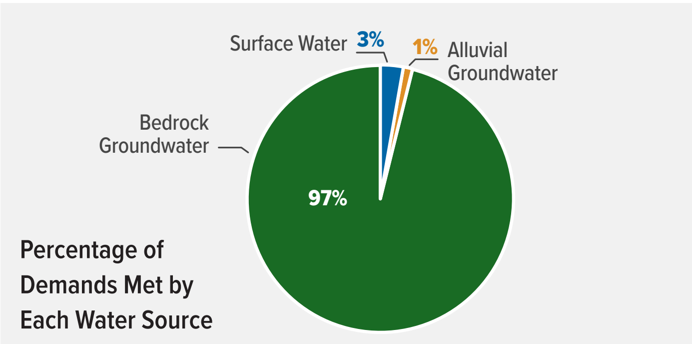
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
3,702	3,762	3,749	3,751	3,873	3,882

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 54 accounts for approximately 3% of the overall water demands of the Northwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	82	84	83	82	83	82
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	14,199	14,747	14,747	14,747	14,747	14,747
Livestock	737	740	747	751	761	775
Oil & Gas	412	412	412	412	412	412
Public Supply	464	475	469	458	461	447
Thermoelectric Power	-	-	-	-	-	-
Total	**15,896**	**16,458**	**16,459**	**16,452**	**16,464**	**16,464**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	1	1	1	1	1	4%
Alluvial Groundwater Depletion	2	2	2	2	2	4%
Bedrock Groundwater Depletion	10,611	10,611	10,606	10,612	10,608	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
1,200	No	Yes	456,470

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

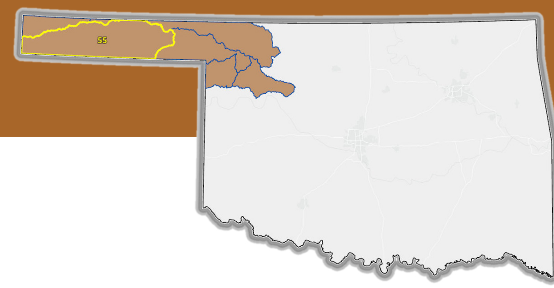
Water Management Category	Demand Sector	Basin 54 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

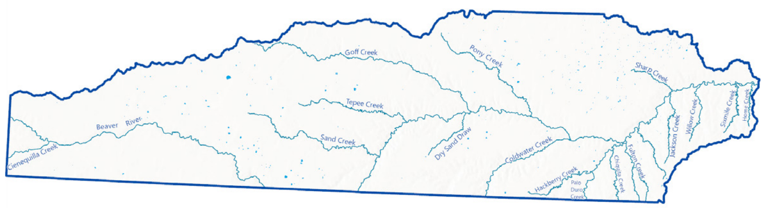
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 55

North Canadian Headwaters
Northwest Region

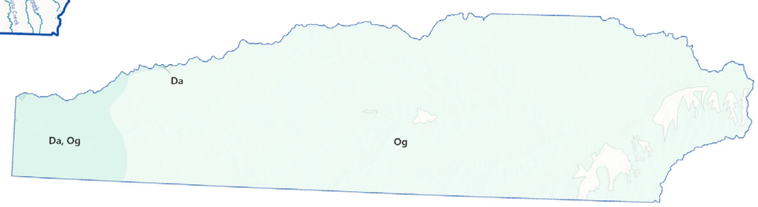




Surface Water Legend
- Planning Basin
- OWRB Major Streams
- OWRB Lakes

Groundwater Legend
- Planning Basin

Major Bedrock Aquifer
- Dakota (Da)
- Ogallala (Og)



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

SUMMARY

- Basin 55 - North Canadian Headwaters demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 14,730 acre-feet per year (3%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 55 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 55 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 55 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

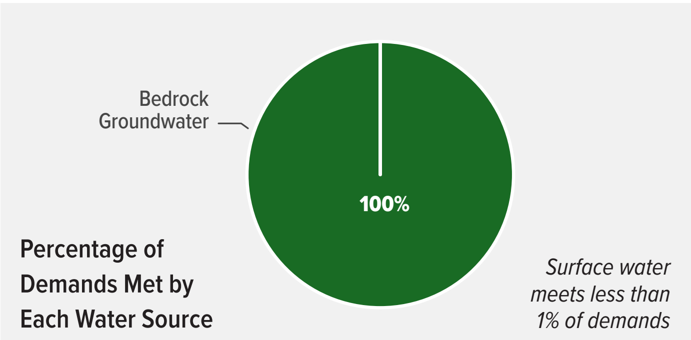
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
23,288	22,251	22,144	21,887	21,290	20,600

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 55 accounts for approximately 69% of the overall water demands of the Northwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	108	105	102	96	93	86
Self-supplied Industrial	2,946	2,872	2,866	2,853	2,787	2,718
Crop Irrigation	420,589	427,859	429,099	431,302	433,699	434,735
Livestock	10,257	10,425	10,567	10,768	11,096	11,495
Oil & Gas	210	210	210	210	210	210
Public Supply	2,895	2,753	2,732	2,681	2,596	2,491
Thermoelectric Power	-	-	-	-	-	-
Total	**434,006**	**444,225**	**445,576**	**447,910**	**450,481**	**451,736**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	4	5	9	12	14	58%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	422,563	423,861	426,128	428,605	429,749	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	3,752,410

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

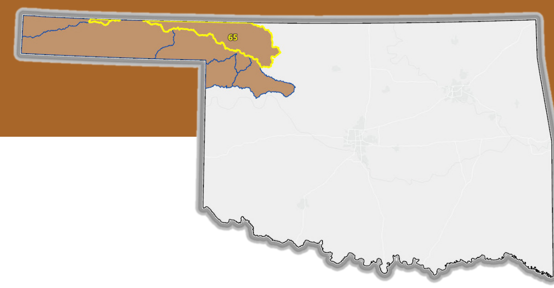
Water Management Category	Demand Sector	Basin 55 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Ineffective at Meeting Future Demands

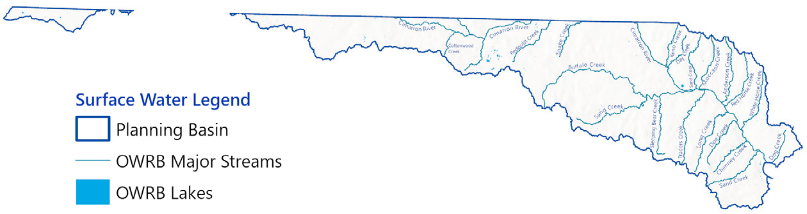
In addition to the water management strategies, water users need:

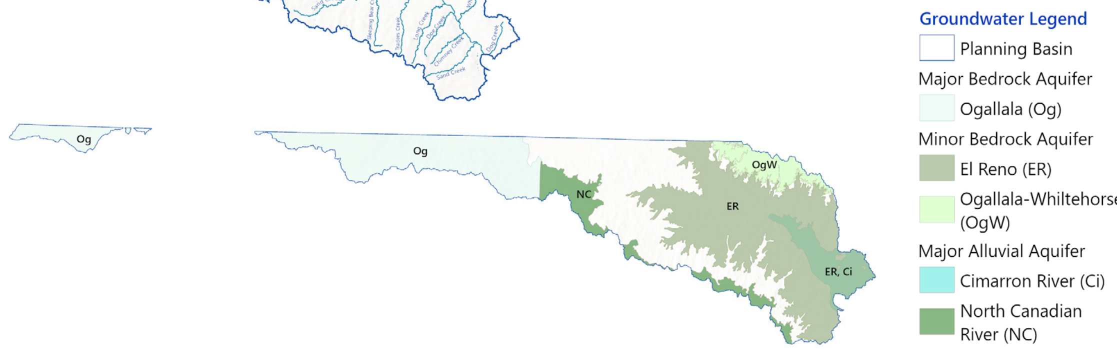
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 65

Upper Cimarron River / Northwest Region







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

SUMMARY

- Basin 65 - Upper Cimarron River demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 9,278 acre-feet per year (15%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 65 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 65 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 65 as early as 2030 and will continue through 2075.
- Basin 65 is projected to have surface water available for appropriation through 2075.
- Basin 65 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

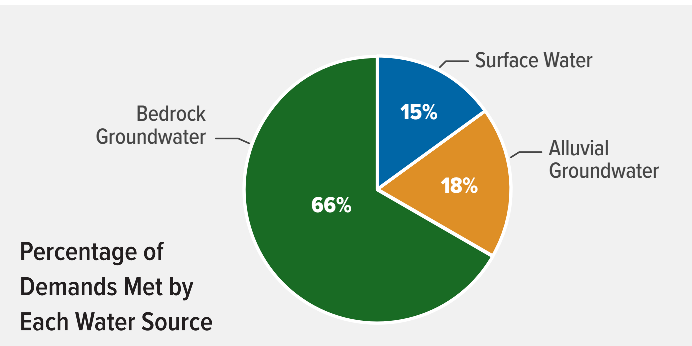
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
12,871	13,623	13,609	13,977	15,244	15,920

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 65 accounts for approximately 11% of the overall water demands of the Northwest Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	142	152	152	156	173	181
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	59,525	63,283	64,218	65,867	67,662	68,437
Livestock	2,757	2,732	3,746	2,731	2,715	2,718
Oil & Gas	252	252	252	252	252	252
Public Supply	781	863	866	912	1,061	1,147
Thermoelectric Power	-	-	-	-	-	-
Total	**63,458**	**67,282**	**68,234**	**69,918**	**71,863**	**72,736**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	1,033	1,034	1,039	1,044	1,047	52%
Alluvial Groundwater Depletion	558	757	1,120	1,536	1,721	66%
Bedrock Groundwater Depletion	41,611	42,355	43,673	45,195	45,878	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
20,200	No	No	1,718,010

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 65 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Potentially Effective with Local Variability

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
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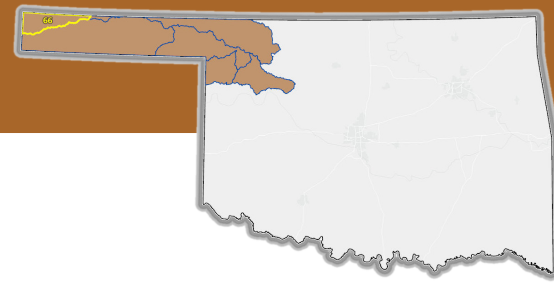
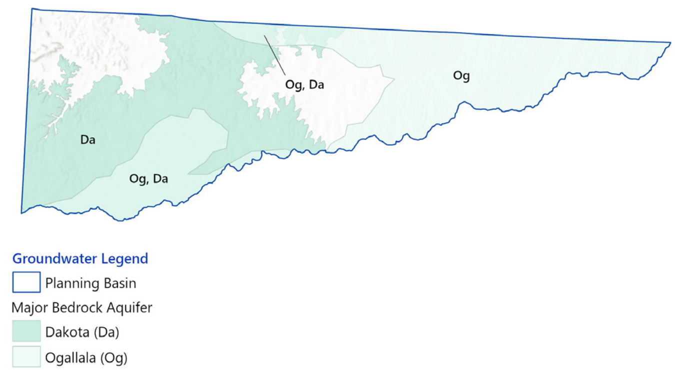
BASIN 66

Cimarron Headwaters / Northwest Region





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

SUMMARY

- Basin 66 - Cimarron Headwaters demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 559 acre-feet per year (2%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 66 as early as 2030 and will continue through 2075.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 66 as early as 2030 and will continue through 2075.
- Surface water is fully allocated, limiting diversions to existing permitted amounts.
- Basin 66 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS

OWRB Water Planning Page
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OKLAHOMA Water Resources Board

Population

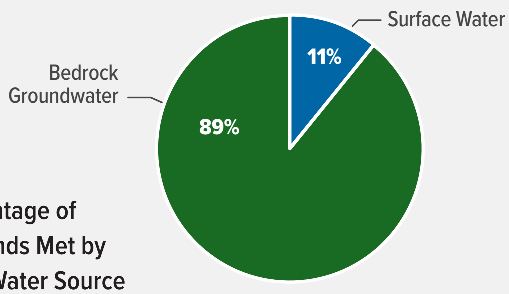
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
1,062	939	903	817	739	627

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 66 accounts for approximately 4% of the overall water demands of the Northwest Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	21	19	18	16	14	11
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	21,819	22,453	22,453	22,453	22,453	22,453
Livestock	709	692	692	678	659	644
Oil & Gas	10	10	10	10	10	10
Public Supply	-	-	-	-	-	-
Thermoelectric Power	-	-	-	-	-	-
Total	**22,559**	**23,173**	**23,172**	**23,156**	**23,136**	**23,118**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	95	95	95	95	95	76%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	18,481	18,480	18,469	18,455	18,445	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
-	No	No	789,650

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 66 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Ineffective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Ineffective at Meeting Future Demands
Water Transfers	All sectors	Ineffective at Meeting Future Demands

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Upper Arkansas Planning Region

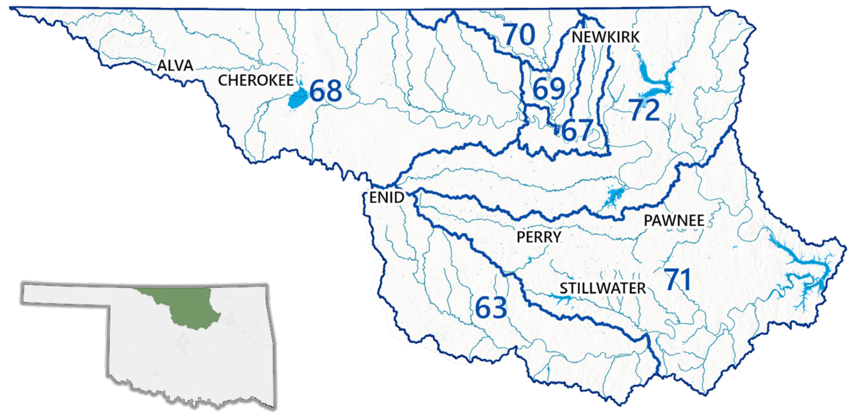
Summary

- Upper Arkansas Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 5,642 acre-feet per year (6%) between 2020 and 2075.
- Physical water shortages are projected for surface water and groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Upper Arkansas Region Basins.
- In addition to the Statewide Recommendations, Upper Arkansas Region stakeholders expressed the need to consider investing in regionalization, invasive species removal, and studies that support all water use and economic sectors.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Upper Arkansas Region represents 7% of the state's 2075 projected population and 4% 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 Upper Arkansas 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). WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI
- For some basins where existing and traditional strategies are unable to meet future demands, stormwater capture and use (PS, SSI), 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

OKLAHOMA Water Resources Board

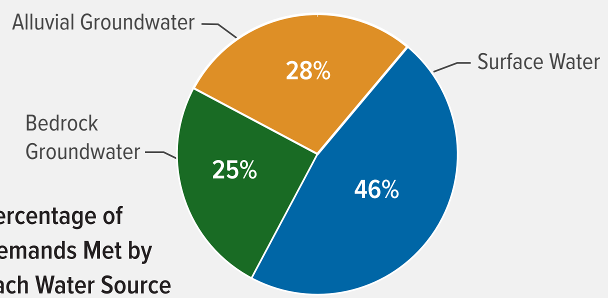
Population

2020	2030	2035	2045	2060	2075
282,997	289,586	291,448	294,680	307,569	314,984

Water Demand Projections

Water demands (withdrawals) are projected to decrease by 6% between 2020 and 2075.

The Upper Arkansas 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 31% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Upper Arkansas Region, Self-supplied Domestic, Crop Irrigation, and Public Supply demands will increase while Self-supplied Industrial, Livestock, and Thermoelectric Power demands will decrease between 2020 and 2075. There is no change in Oil & Gas demands.

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	2,556	2,646	2,665	2,709	2,831	2,920
Self-supplied Industrial	4,674	4,557	4,433	4,185	3,901	3,568
Crop Irrigation	16,034	22,151	22,521	23,369	24,926	26,828
Livestock	6,992	6,795	6,782	6,614	6,373	6,177
Oil & Gas	2,693	2,693	2,693	2,693	2,693	2,693
Public Supply	37,865	38,268	38,308	38,382	39,643	40,068
Thermoelectric Power	21,327	15,130	14,192	5,070	4,335	4,245
Total	**92,141**	**92,239**	**91,594**	**83,022**	**84,701**	**86,499**

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

Physical Water Shortages WIW 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 Upper Arkansas Region is projected to experience surface water gaps (where demand exceeds supplies) and groundwater depletions (where water use exceeds the rate or 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
Basin	**Maximum Magnitude (AFY)**					**Frequency**
63	120	163	272	473	807	11%
67	-	-	-	-	-	0%
68	-	-	-	-	-	0%
69	116	107	91	72	55	1%
70	212	212	210	208	207	3%
71	475	520	236	494	896	13%
72	-	-	-	-	-	0%

AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
63	133	191	319	550	815	13%
67	283	260	160	119	60	1%
68	97	143	219	388	536	3%
69	8	8	8	7	7	3%
70	105	105	105	105	105	7%
71	17	24	1	15	23	6%
72	-	-	-	-	-	0%

AFY = acre-feet per year

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
63	19	19	15	12	11
67	4,070	3,995	3,847	3,683	3,480
68	3,146	3,177	3,256	3,454	3,615
69	356	346	327	307	281
70	722	720	718	715	711
71	47	49	50	52	57
72	1,536	1,485	1,402	1,341	1,282

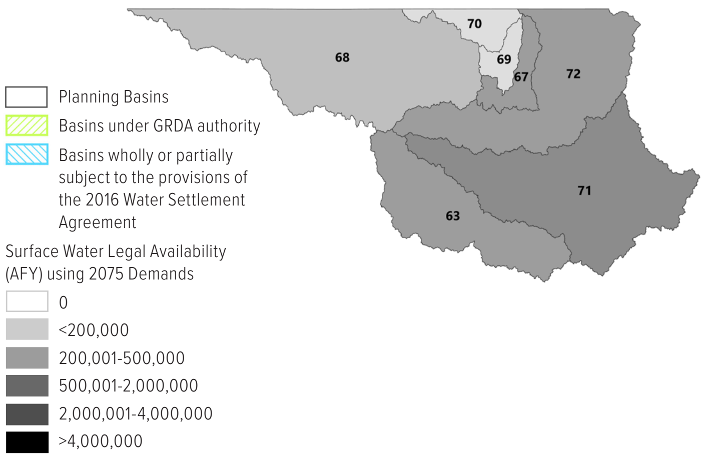
AFY = acre-feet per year

Arkansas River near Ralston

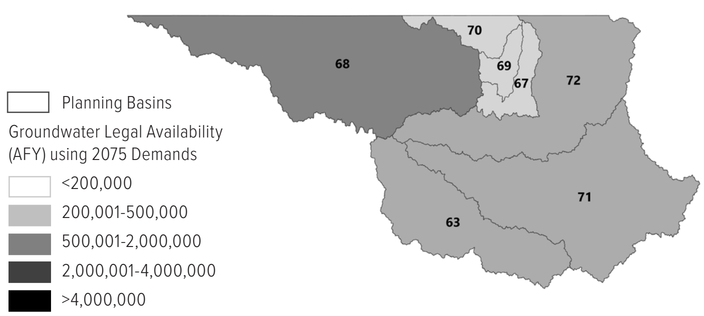
Legal Water Availability WM WSS

Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Upper Arkansas Region basins.

Surface Water Legal Availability



Groundwater Legal Availability



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)
Langston	---
Great Salt Plains	No Yield
Carl Blackwell	0
Boomer	---
Cleveland City	---
Cushing	---
Keystone	8,432
Lone Chimney	2
McMurtry	0
Pawnee	---
Perry	---
Fairfax City	---
Kaw	37,620
Ponca	0
Sooner	0

--- 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)
Arkansas River	Alluvial	Major	temporary 2.0
Chikaskia River	Alluvial	Minor	temporary 2.0
Cimarron River	Alluvial	Major	temporary 2.0
El Reno	Bedrock	Minor	temporary 2.0
Enid Isolated Terrace	Alluvial	Major	0.5
Garber-Wellington	Bedrock	Major	2.0
North-Central Oklahoma	Bedrock	Minor	temporary 2.0
Ogallala-Whitehorse	Bedrock	Major	temporary 2.0
Salt Fork of the Arkansas River	Alluvial	Major	temporary 2.0
Vamoosa-Ada	Bedrock	Major	2.0

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: Groundwater comes from an assortment of major bedrock and alluvial aquifers that experience elevated concentrations of nitrate, total dissolved solids, manganese, and salinity.

Lakes: Water quality in this region is impacted by elevated levels of nutrients and chlorophyll-a—factors that directly affect both recreational and water supply uses. Lakes in this area are classified as mesotrophic to eutrophic, reflecting their moderate to high nutrient concentrations and biological productivity.

Streams: Rivers and streams are impacted by erosion, high mineral concentrations, increased sedimentation, and increased nutrient concentrations. These factors contribute to 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)
$2.64B	**$386M**	**$19M**

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	$1.20B	$151M	$1.48B
Small-Medium	$21M	$120M	$136M
Medium-Large	$1.08B	$1.96B	$3.99B
Large	N/A	N/A	N/A
Non-Public suppliers	$336M	N/A	N/A
Total	**$2.64B**	**$2.23B**	**$5.61B**

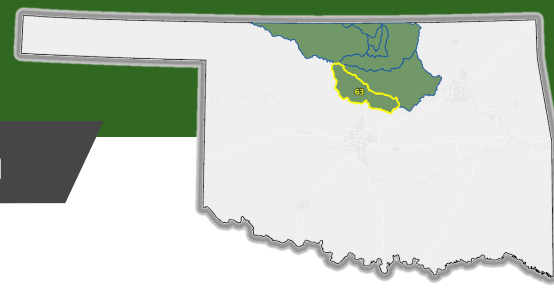
M = million; B = billion; N/A = not applicable

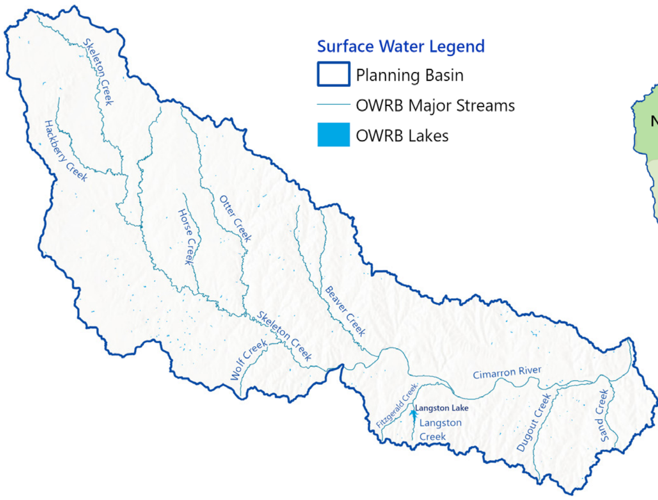
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

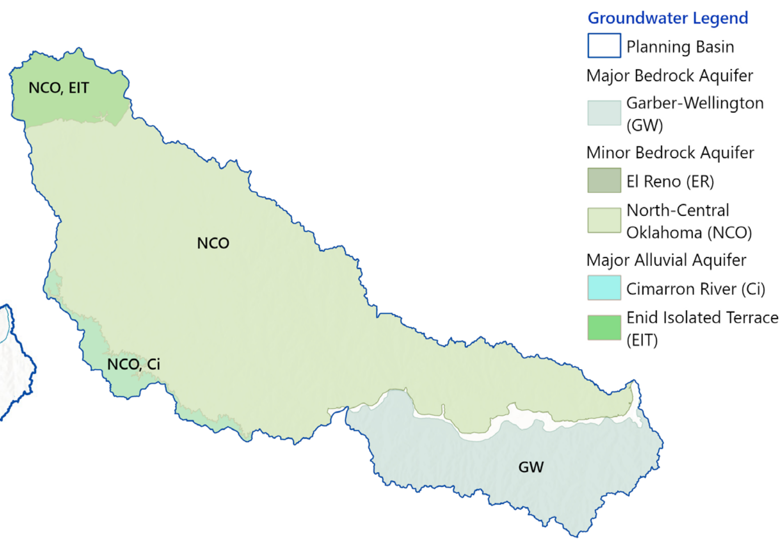
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 63

Lower Cimarron River / Upper Arkansas Region







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

SUMMARY

- Basin 63 - Lower Cimarron River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 3,853 acre-feet per year (28%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 63 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 63 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 63 as early as 2030 and will continue through 2075.
- Basin 63 is projected to have surface water available for appropriation through 2075.
- Basin 63 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

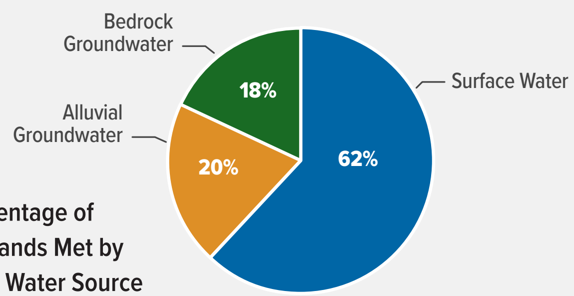
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
70,130	73,008	74,630	77,815	84,153	89,316

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 63 accounts for approximately 20% of the overall water demands of the Upper Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	934	978	999	1,045	1,124	1,197
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	972	1,374	1,509	1,816	2,368	3,042
Livestock	1,324	1,292	1,291	1,265	1,227	1,197
Oil & Gas	1,146	1,146	1,146	1,146	1,146	1,146
Public Supply	9,403	9,531	9,663	9,977	10,596	11,049
Thermoelectric Power	-	-	-	-	-	-
Total	**13,779**	**14,321**	**14,609**	**15,248**	**16,461**	**17,632**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	120	163	272	473	807	11%
Alluvial Groundwater Depletion	133	191	319	550	815	13%
Bedrock Groundwater Depletion	19	19	15	12	11	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
631,100	No	No	1,403,130

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

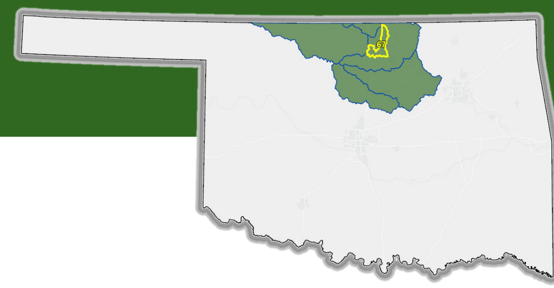
Water Management Category	Demand Sector	Basin 63 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Effective at Meeting Future Demands

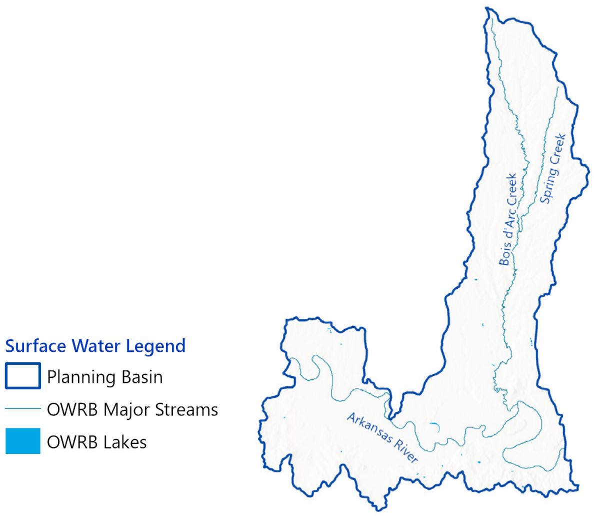
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 67

Lower Salt Fork Arkansas River - 1
Upper Arkansas Region





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

SUMMARY

- Basin 67 - Lower Salt Fork Arkansas River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 1,065 acre-feet per year (10%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 67 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 67 as early as 2030 and will continue through 2075.
- Basin 67 is projected to have surface water available for appropriation through 2075.
- Basin 67 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

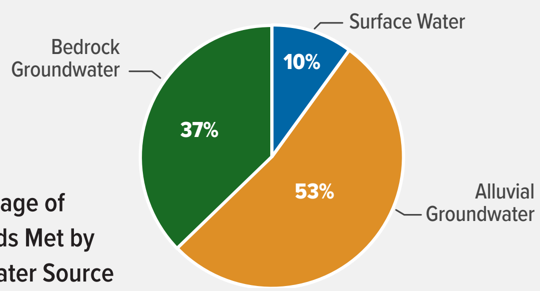
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
9,711	9,305	9,045	8,534	7,969	7,272

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 67 accounts for approximately 11% of the overall water demands of the Upper Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	8	8	8	8	7	7
Self-supplied Industrial	3,730	3,636	3,533	3,329	3,101	2,821
Crop Irrigation	2,571	3,487	3,487	3,487	3,487	3,487
Livestock	153	149	148	145	139	135
Oil & Gas	44	44	44	44	44	44
Public Supply	4,074	3,894	3,783	3,564	3,321	3,021
Thermoelectric Power	8	6	5	7	8	9
Total	**10,589**	**11,224**	**11,009**	**10,583**	**10,108**	**9,524**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	283	260	160	119	60	1%
Bedrock Groundwater Depletion	4,070	3,995	3,847	3,683	3,480	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
649,200	No	No	399,090

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

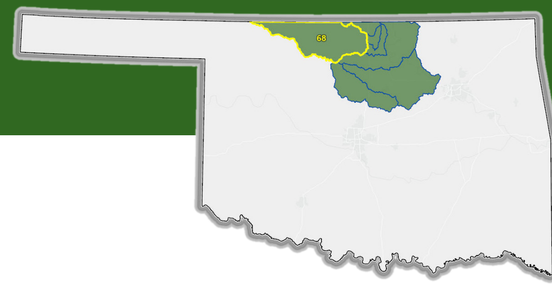
Water Management Category	Demand Sector	Basin 67 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Effective at Meeting Future Demands

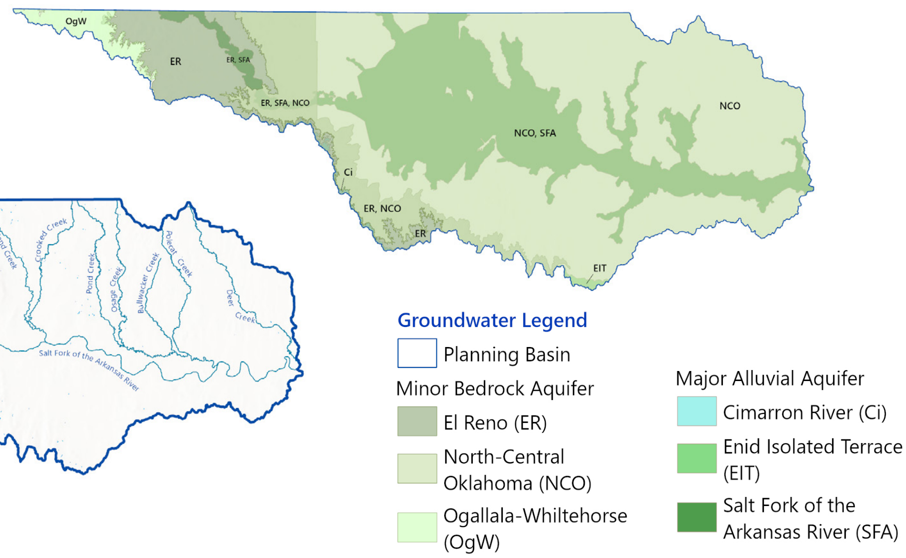
In addition to the water management strategies, water users need:

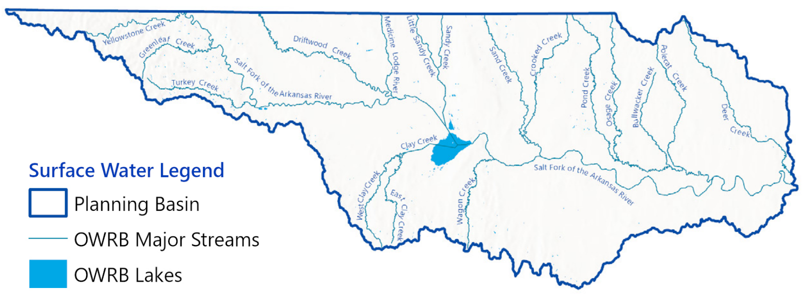
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 68

Upper Salt Fork Arkansas River
Upper Arkansas Region







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

SUMMARY

- Basin 68 - Upper Salt Fork Arkansas River demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 2,602 acre-feet per year (22%) between 2020 and 2075.
- No surface water gaps are projected.
- Physical alluvial groundwater depletions are projected in Basin 68 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 68 as early as 2030 and will continue through 2075.
- Basin 68 is projected to have surface water available for appropriation through 2075.
- Basin 68 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

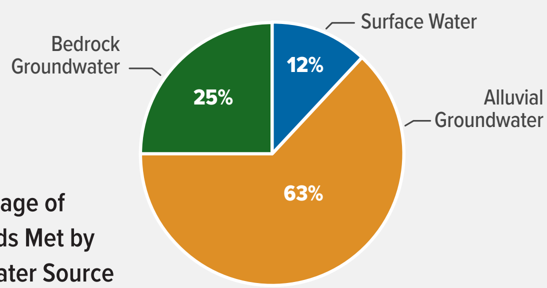
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
23,600	24,194	24,436	25,253	27,584	29,033

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 68 accounts for approximately 17% of the overall water demands of the Upper Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	149	158	162	173	200	219
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	6,288	7,167	7,214	7,319	7,513	7,752
Livestock	1,915	1,858	1,853	1,803	1,733	1,675
Oil & Gas	677	677	677	677	677	677
Public Supply	2,700	2,897	2,958	3,151	3,664	4,008
Thermoelectric Power	-	-	-	-	-	-
Total	**11,728**	**12,756**	**12,863**	**13,122**	**13,787**	**14,330**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	97	143	219	388	536	3%
Bedrock Groundwater Depletion	3,146	3,177	3,256	3,454	3,615	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
410,200	No	No	3,857,240

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

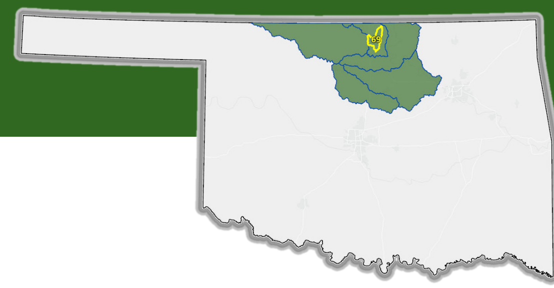
WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 68 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Partially Effective - Shortages Remain
Water Transfers	All sectors	Effective at Meeting Future Demands

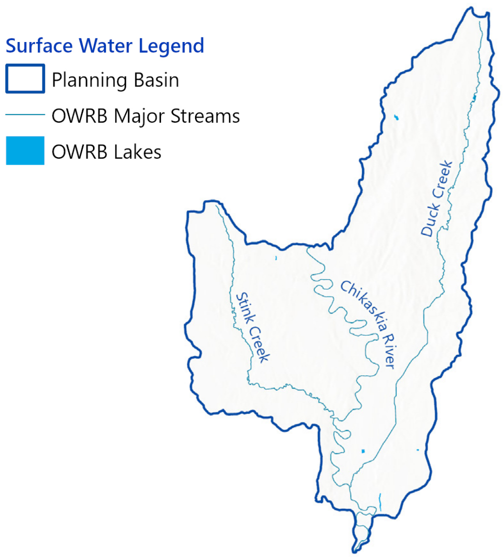
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 69



Lower Salt Fork Arkansas River - 2
Upper Arkansas Region



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

SUMMARY

- Basin 69 - Lower Salt Fork Arkansas River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to decrease by 173 acre-feet per year (7%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 69 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 69 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 69 as early as 2030 and will continue through 2075.
- Basin 69 is projected to have surface water available for appropriation through 2075.
- Basin 69 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

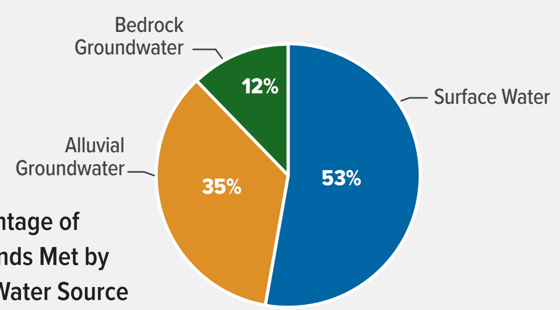
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
6,880	6,576	6,389	6,020	5,608	5,102

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 69 accounts for approximately 3% of the overall water demands of the Upper Arkansas Region.



Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1	1	1	1	0	0
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	771	1,046	1,046	1,046	1,046	1,046
Livestock	86	83	83	81	78	75
Oil & Gas	27	27	27	27	27	27
Public Supply	1,690	1,615	1,569	1,478	1,377	1,253
Thermoelectric Power	-	-	-	-	-	-
Total	**2,575**	**2,772**	**2,726**	**2,633**	**2,529**	**2,402**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	116	107	91	72	55	1%
Alluvial Groundwater Depletion	8	8	8	7	7	3%
Bedrock Groundwater Depletion	356	346	327	307	281	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
139,500	No	No	275,390

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

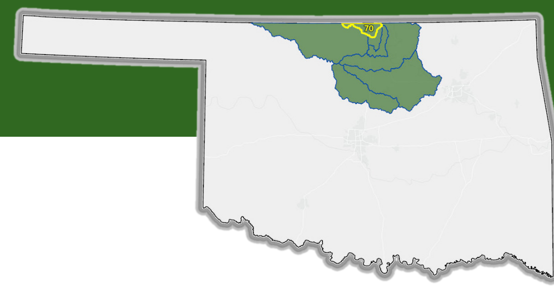
Water Management Category	Demand Sector	Basin 69 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Potentially Effective with Local Variability
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

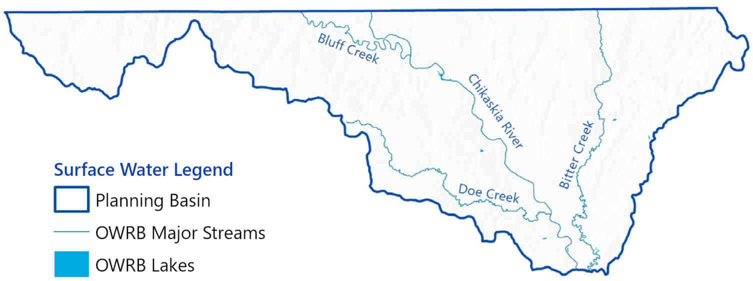
In addition to the water management strategies, water users need:

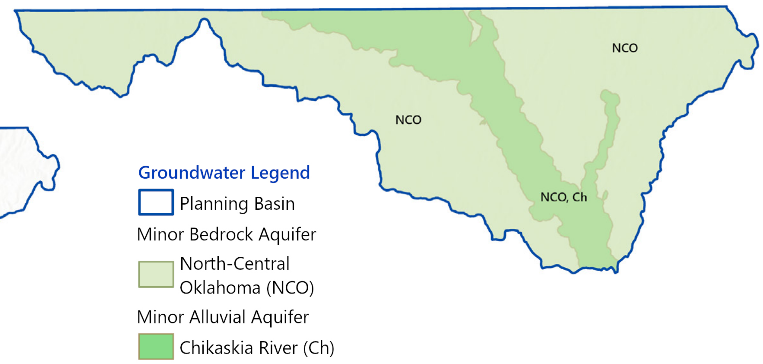
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 70

Lower Salt Fork Arkansas River - 3
Upper Arkansas Region







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

SUMMARY

- Basin 70 - Lower Salt Fork Arkansas River - 3 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to increase by 714 acre-feet per year (23%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 70 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 70 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 70 as early as 2030 and will continue through 2075.
- Basin 70 is projected to have surface water available for appropriation through 2075.
- Basin 70 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

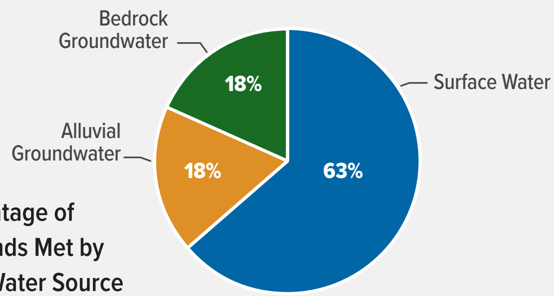
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
7,847	7,524	7,322	6,924	6,496	5,956

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 70 accounts for approximately 4% of the overall water demands of the Upper Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	4	4	4	4	4	5
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	2,877	3,634	3,634	3,634	3,634	3,634
Livestock	124	120	120	117	113	109
Oil & Gas	33	33	33	33	33	33
Public Supply	115	110	106	100	93	85
Thermoelectric Power	-	-	-	-	-	-
Total	**3,152**	**3,902**	**3,898**	**3,889**	**3,878**	**3,866**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	212	212	210	208	207	3%
Alluvial Groundwater Depletion	105	105	105	105	105	7%
Bedrock Groundwater Depletion	722	720	718	715	711	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
68,500	No	No	360,640

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

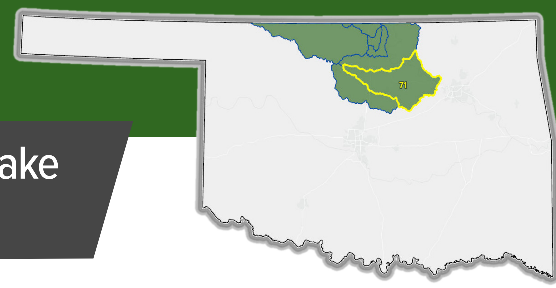
Water Management Category	Demand Sector	Basin 70 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	May Increase Shortages - Use with Other Strategies
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Ineffective at Meeting Future Demands
Reuse	PS, SSI	Ineffective at Meeting Future Demands
Water Transfers	All sectors	Potentially Effective with Local Variability

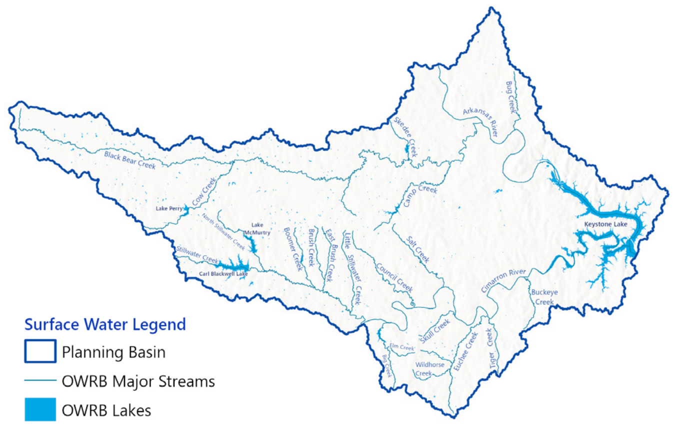
In addition to the water management strategies, water users need:

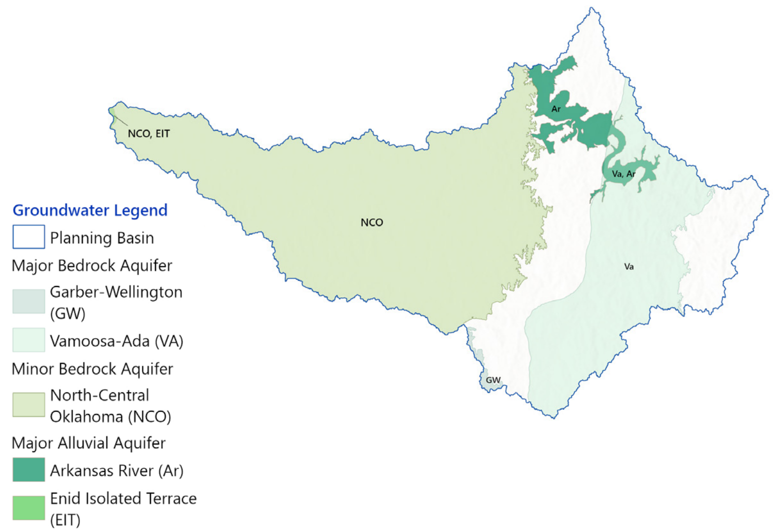
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 71

Arkansas River - Cimarron Rivers to Keystone Lake
Upper Arkansas Region







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

SUMMARY

- Basin 71 - Arkansas River - Cimarron Rivers to Keystone Lake demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 6,343 acre-feet per year (35%) between 2020 and 2075.,
- Physical surface water gaps are projected in Basin 71 as early as 2030 and will continue through 2075.
- Physical alluvial groundwater depletions are projected in Basin 71 as early as 2030 and will continue through 2075.
- Physical bedrock groundwater depletions are projected in Basin 71 as early as 2030 and will continue through 2075.
- Basin 71 is projected to have surface water available for appropriation through 2075.
- Basin 71 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

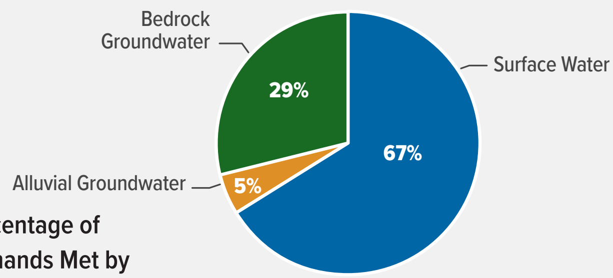
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
120,288	125,002	126,350	128,179	135,079	139,310

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 71 accounts for approximately 28% of the overall water demands of the Upper Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,162	1,197	1,198	1,195	1,223	1,233
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,200	3,397	3,558	3,928	4,615	5,456
Livestock	2,081	2,022	2,017	1,967	1,894	1,835
Oil & Gas	484	484	484	484	484	484
Public Supply	13,220	13,807	13,973	14,171	14,993	15,482
Thermoelectric Power	-	-	-	-	-	-
Total	**18,147**	**20,907**	**21,230**	**21,747**	**23,210**	**24,490**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	475	520	236	494	896	13%
Alluvial Groundwater Depletion	17	24	1	15	23	6%
Bedrock Groundwater Depletion	47	49	50	52	57	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
2,134,500	No	No	1,988,170

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

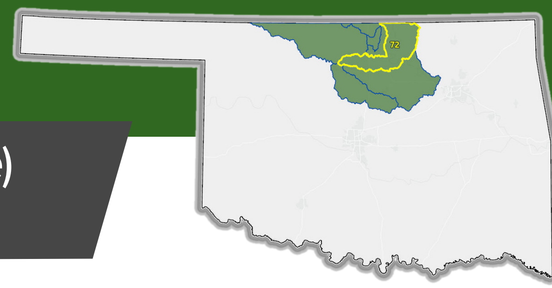
Water Management Category	Demand Sector	Basin 71 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

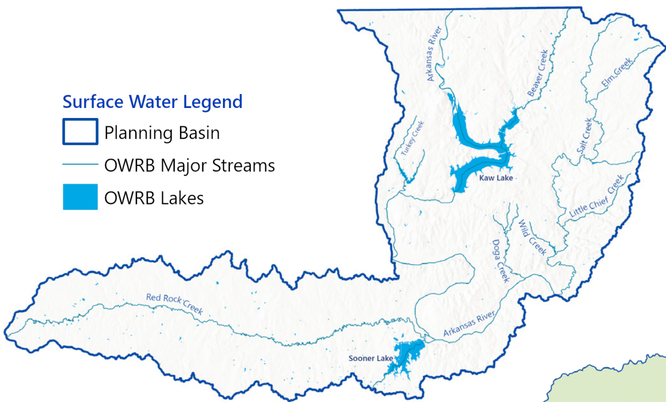
In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 72

Arkansas River Mainstem (To Kansas State Line)
Upper Arkansas Region





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

SUMMARY

- Basin 72 - Arkansas River Mainstem (To Kansas State Line) demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to decrease by 17,916 acre-feet per year (56%) between 2020 and 2075.
- No surface water gaps are projected.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 72 as early as 2030 and will continue through 2075.
- Basin 72 is projected to have surface water available for appropriation through 2075.
- Basin 72 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Stormwater capture and use (PS, SSI). WM WSS
  - Water reuse (PS, SSI). WM WSS
  - Water transfers (all sectors). WM WSS

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

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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

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OKLAHOMA Water Resources Board

Population

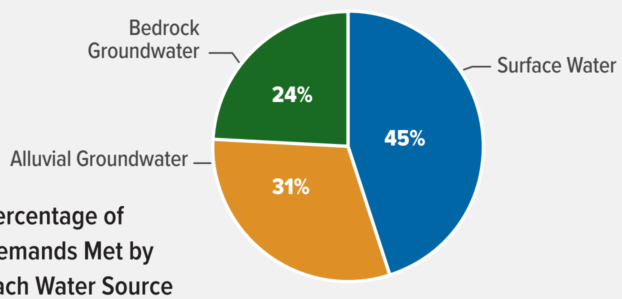
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
44,541	43,977	43,276	41,955	40,680	38,995

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 72 accounts for approximately 16% of the overall water demands of the Upper Arkansas Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	297	300	294	284	271	259
Self-supplied Industrial	944	920	900	857	800	747
Crop Irrigation	1,355	2,045	2,073	2,139	2,262	2,411
Livestock	1,310	1,272	1,269	1,236	1,189	1,150
Oil & Gas	281	281	281	281	281	281
Public Supply	6,664	6,415	6,254	5,939	5,598	5,170
Thermoelectric Power	21,318	15,125	14,186	5,064	4,327	4,236
Total	**32,170**	**26,357**	**25,258**	**15,800**	**14,728**	**14,254**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	1,536	1,485	1,402	1,341	1,282	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY)	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY)
914,900	No	No	1,930,010

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 72 Evaluation
Demand Management	PS, SSI, OG, TE	Partially Effective - Shortages Remain
Agriculture Options	CI, LS	Partially Effective - Shortages Remain
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	May Increase Shortages - Use with Other Strategies
Stormwater Capture & Use	PS, SSI	Effective at Meeting Future Demands
Reuse	PS, SSI	Effective at Meeting Future Demands
Water Transfers	All sectors	Effective at Meeting Future Demands

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

Grand
Planning Region

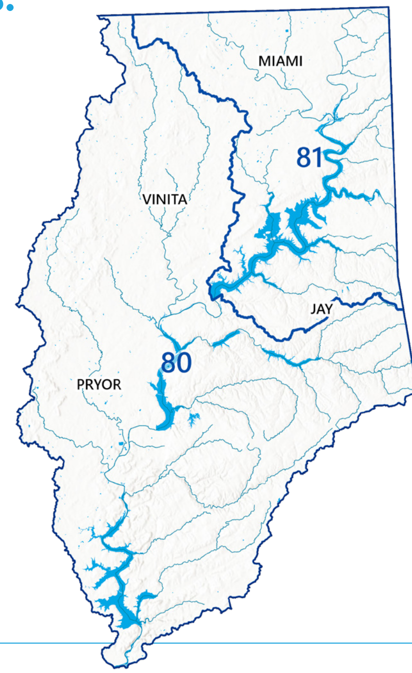
Summary

- Grand Region demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,570 acre-feet per year (7%) between 2020 and 2075.
- Physical water shortages are projected for surface water and bedrock groundwater as early as 2030 and will continue through 2075.
- Surface water and groundwater are projected to remain legally available for permitting through 2075 in all Grand Region basins. Surface water throughout the region is administered by the Grand River Dam Authority, while groundwater is administered by OWRB.
- In addition to the Statewide Recommendations, Grand Region stakeholders expressed the need to invest in regionalization, instream (or nonconsumptive) flow, non-point source mitigation (source water protection), new technology to improve water quality, and the need to meter all uses.

OWRB Water Planning Page

oklahoma.gov/owrb/water-planning

The Grand Region represents 3% of the state's 2075 projected population and 1% 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 Grand 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). WSS WDI
- Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

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

OKLAHOMA Water Resources Board

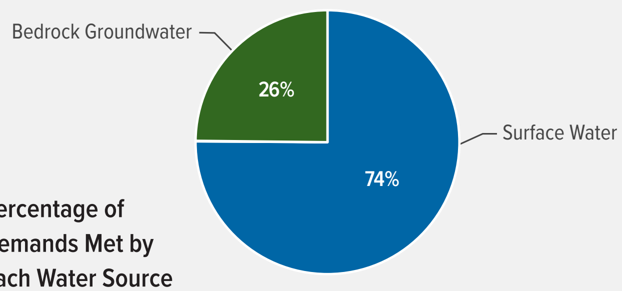
Population

2020	2030	2035	2045	2060	2075
160,961	167,411	165,982	164,118	162,912	161,846

Water Demand Projections

Water demands (withdrawals) are projected to increase by 7% between 2020 and 2075.

The Grand Region's largest demand sector is Public Supply, representing 33% of the region's 2075 water demands. The second largest demand sector is Thermoelectric Power, representing 25% of the region's 2075 water demands.



Percentage of Demands Met by Each Water Source

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 Grand Region, Self-supplied Domestic, Crop Irrigation, and Thermoelectric Power demands will increase while 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	2,257	2,343	2,317	2,292	2,292	2,280
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,458	1,788	1,897	2,116	2,379	2,379
Livestock	5,990	6,006	6,045	5,951	5,800	5,684
Oil & Gas	254	254	254	254	254	254
Public Supply	9,008	9,139	8,984	8,769	8,561	8,303
Thermoelectric Power	4,652	3,955	4,003	4,716	5,511	6,290
Total	**23,618**	**23,484**	**23,499**	**24,098**	**24,797**	**25,188**

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

Physical Water Shortages WIW 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 Grand Region is projected to experience surface water gaps (where demand exceeds supplies) and bedrock groundwater depletions (where water use exceeds the rate of recharge), as detailed in the table and text below. No alluvial groundwater depletion is projected.

SURFACE WATER GAP	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
80	-	184	396	1,159	1,745	82%
81	-	-	-	-	-	0%

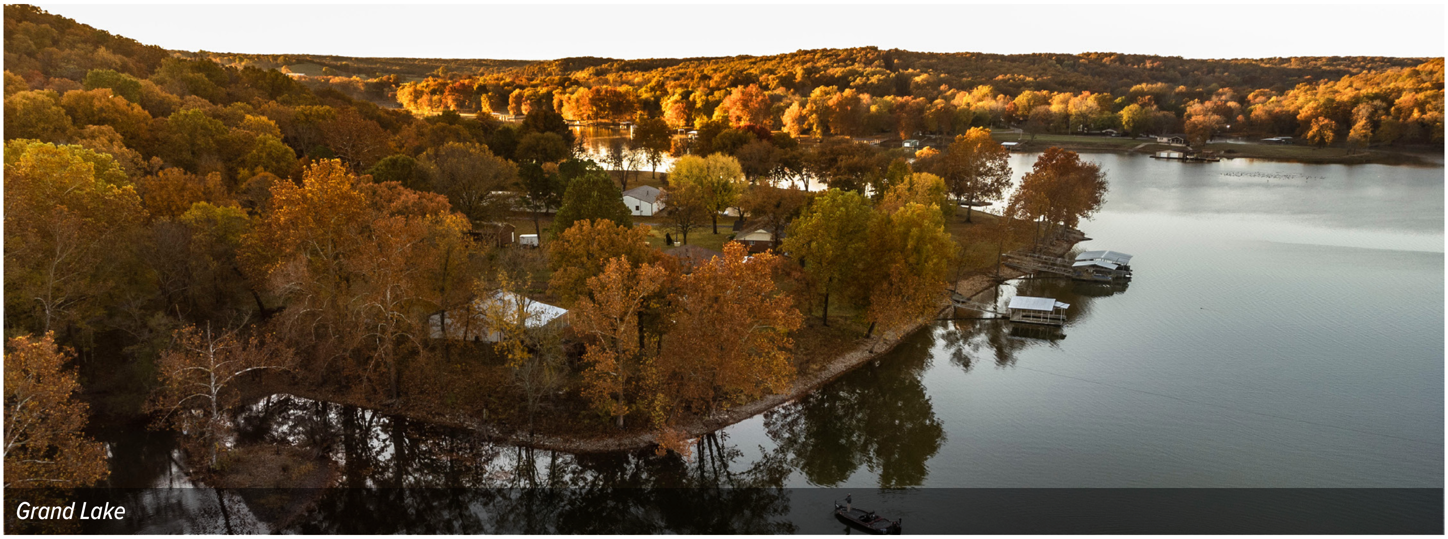
AFY = acre-feet per year

ALLUVIAL GROUNDWATER DEPLETION	2030	2035	2045	2060	2075	2075
Basin	**Maximum Magnitude (AFY)**					**Frequency**
80	-	-	-	-	-	0%
81	-	-	-	-	-	No AGW Demand

AFY = acre-feet per year

BEDROCK GROUNDWATER DEPLETION	2030	2035	2045	2060	2075
Basin	**Average Magnitude (AFY)**				
80	24	21	14	10	8
81	52	51	38	29	18

AFY = acre-feet per year



Grand Lake

Legal Water Availability WM WSS

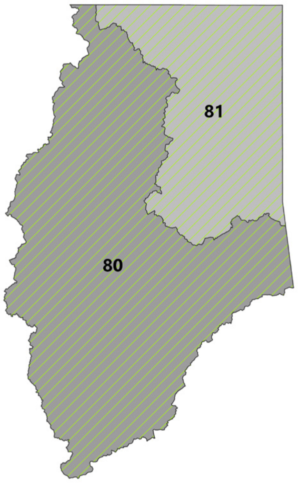
Surface water and groundwater are projected to remain legally available for permitting through 2075 in all of the basins within the Grand Region. Surface water in this Region is administered by the Grand River Dam Authority, while groundwater is administered by OWRB.

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

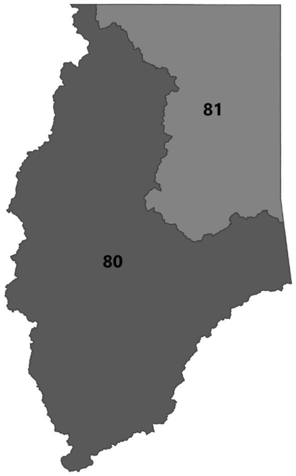


Groundwater Legal Availability

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)
Eucha/Spavinaw Lakes	0
Fort Gibson	---
Hudson (Markham Ferry)	---
W.R. Holway	0
Grand	---

--- 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)
Arkansas River	Alluvial	Major	temporary 2.0
Boone	Bedrock	Minor	temporary 2.0
Cherokee Group	Bedrock	Minor	temporary 2.0
Middle Neosho River	Alluvial	Minor	temporary 2.0
Northeastern Oklahoma Pennsylvanian	Bedrock	Minor	temporary 2.0
Northern Neosho River	Alluvial	Minor	temporary 2.0
Roubidoux	Bedrock	Major	temporary 2.0
Southern Neosho River	Alluvial	Minor	temporary 2.0

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: The Roubidoux aquifer, the main groundwater source for the Grand region, has elevated total dissolved solids and salinity, while the Arkansas River alluvial aquifer shows some manganese concerns.

Lakes: Water quality in this region is impacted by elevated levels of nutrients and chlorophyll-a—factors that directly affect both recreational and water supply uses. Lakes in this area are classified as eutrophic, approaching hypereutrophic, reflecting their moderate to high nutrient concentrations and biological productivity.

Streams: Water quality of Grand Lake is heavily influenced by heavy metals, sedimentation, runoff, and riparian loss concerns in its watershed. These factors contribute to poor aesthetics, habitat degradation, increased nutrients, health concerns, tourism concerns, 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)
$436M	**$392M**	**$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	$49M	$750M	$7.26B
Small-Medium	$91M	$1.10B	$1.42B
Medium-Large	$60M	$0M	$0M
Large	N/A	N/A	N/A
Non-Public suppliers	$96M	N/A	N/A
Total	**$295M**	**$1.85B**	**$8.68B**

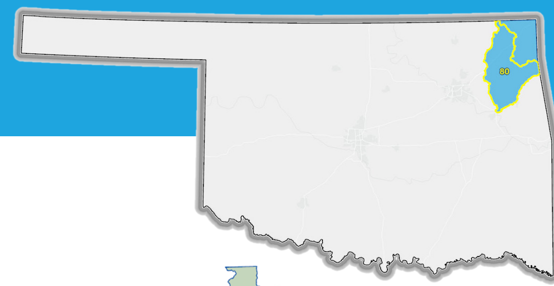
M = million; B = billion; N/A = not applicable

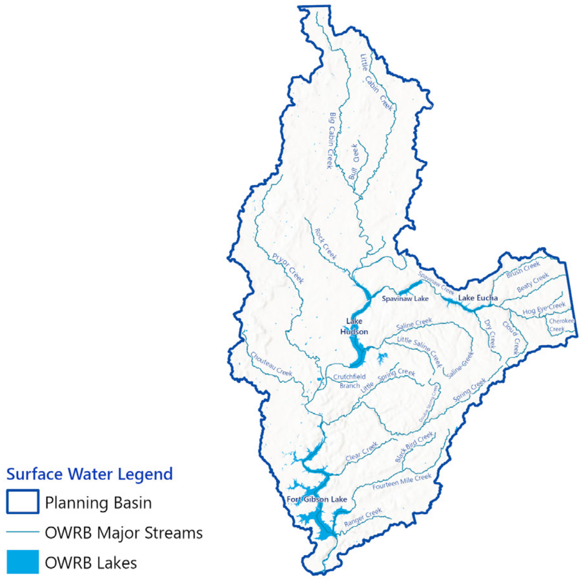
1. Not inclusive of near-term costs.
2. Not inclusive of near-term or future drinking water costs through 2035.

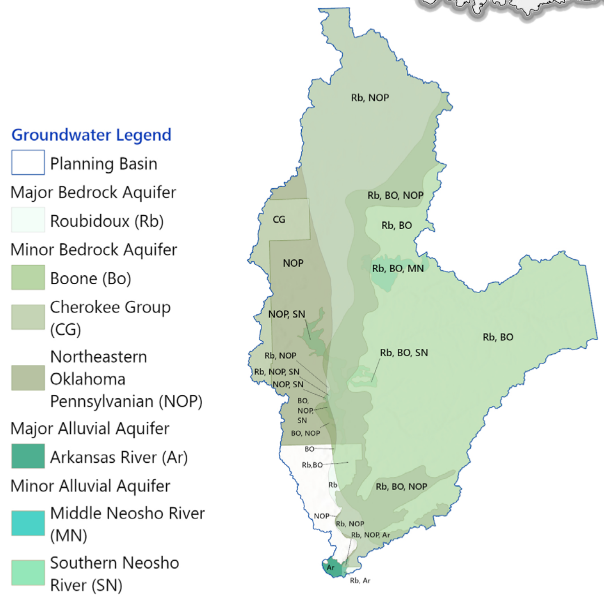
Visit OWRB Water Planning page **(https://oklahoma.gov/owrb/water-planning.html)** for more information on region water quality and trend analysis.

BASIN 80

Grand (Neosho) River - 1 / Grand Region







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

SUMMARY

- Basin 80 - Grand (Neosho) River - 1 demands are supplied by a combination of surface water, groundwater, and out-of-basin supplies.
- Water demand (withdrawal) is projected to increase by 1,634 acre-feet per year (10%) between 2020 and 2075.
- Physical surface water gaps are projected in Basin 80 as early as 2035 and will continue through 2075.
- No alluvial groundwater depletions are projected.
- Physical bedrock groundwater depletions are projected in Basin 80 as early as 2030 and will continue through 2075.
- Basin 80 surface water is administered by the Grand River Dam Authority. It is projected to have surface water available for appropriation through 2075.
- Basin 80 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

OKLAHOMA Water Resources Board

Population

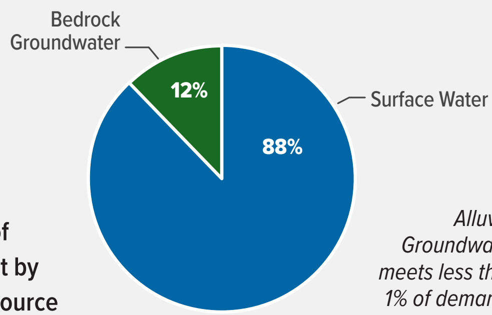
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
111,954	116,917	116,293	115,348	114,542	114,347

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 80 accounts for approximately 73% of the overall water demands of the Grand Region.



Percentage of Demands Met by Each Water Source

Alluvial Groundwater meets less than 1% of demands

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,198	1,255	1,246	1,239	1,246	1,252
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	1,422	1,636	1,744	1,964	2,227	2,227
Livestock	3,930	3,912	3,931	3,860	3,752	3,666
Oil & Gas	249	249	249	249	249	249
Public Supply	5,397	5,435	5,336	5,180	4,994	4,799
Thermoelectric Power	4,652	3,955	4,003	4,716	5,511	6,290
Total	**16,848**	**16,442**	**16,508**	**17,209**	**17,979**	**18,482**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	184	396	1,159	1,745	82%
Alluvial Groundwater Depletion	-	-	-	-	-	0%
Bedrock Groundwater Depletion	24	21	14	10	8	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY) [3]	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY) [3]
1,454,100	No	No	5,145,930

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.
3. Surface water in this basin is administered by the Grand River Dam Authority, while groundwater is administered by OWRB.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

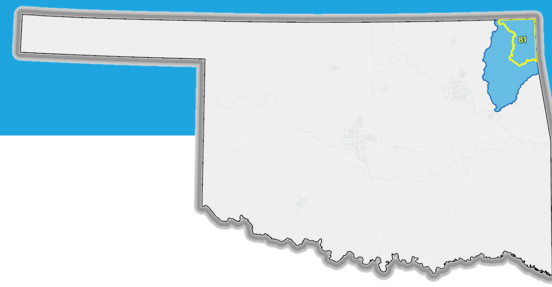
Water Management Category	Demand Sector	Basin 80 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective When Paired with Demand Management/ Agriculture Options
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

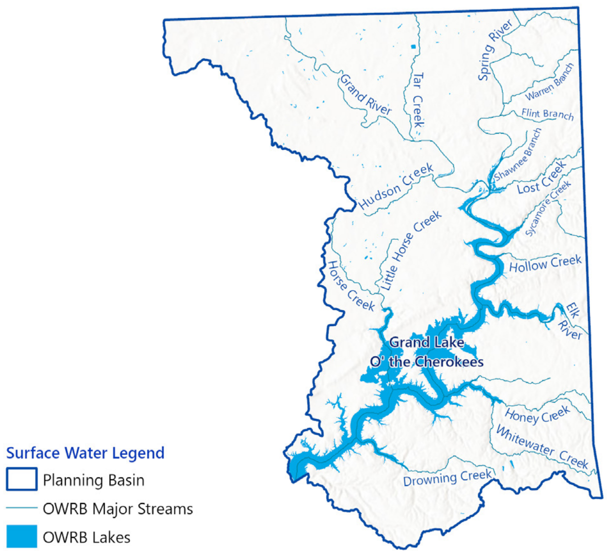
In addition to the water management strategies, water users need:

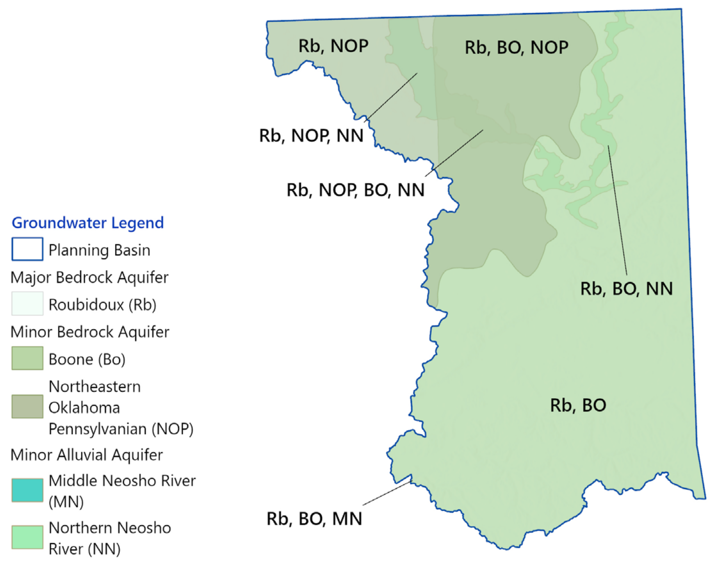
- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

BASIN 81

Grand (Neosho) River - 2 / Grand Region







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

SUMMARY

- Basin 81 - Grand (Neosho) River - 2 demands are supplied by a combination of surface water and groundwater.
- Water demand (withdrawal) is projected to decrease by 64 acre-feet per year (1%) between 2020 and 2075.
- No surface water gaps are projected.
- There are no alluvial groundwater demands in this basin.
- Physical bedrock groundwater depletions are projected in Basin 81 as early as 2030 and will continue through 2075.
- Basin 81 surface water is administered by the Grand River Dam Authority. It is projected to have surface water available for appropriation through 2075.
- Basin 81 is projected to have groundwater available for appropriation through 2075.
- To mitigate projected water supply shortages in this basin, 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 demands through agricultural water saving options (CI, LS). WSS
  - Continue/increase reliance on in-basin surface water (all sectors). WSS WDI
  - Continue/increase reliance on in-basin groundwater (all sectors). WSS WDI

OWRB Water Planning Page
oklahoma.gov/owrb/water-planning

Refer to the **"Guide to Region and Basin Fact Sheets"** for a description of the types of information detailed in this fact sheet.

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 are designed to address current and anticipated water supply challenges and 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

OKLAHOMA Water Resources Board

Population

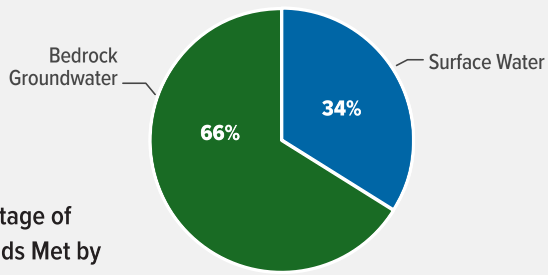
How is the population expected to change in the future?

2020	2030	2035	2045	2060	2075
49,007	50,494	49,689	48,770	48,370	47,499

Water Demand Projections

How much water is needed to meet Oklahomans' needs?

Basin 81 accounts for approximately 27% of the overall water demands of the Grand Region.



Percentage of Demands Met by Each Water Source

Total Demand by Sector (AFY)

	2020	2030	2035	2045	2060	2075
Self-supplied Domestic	1,059	1,088	1,071	1,053	1,046	1,028
Self-supplied Industrial	-	-	-	-	-	-
Crop Irrigation	36	153	153	153	153	153
Livestock	2,060	2,094	2,115	2,091	2,048	2,017
Oil & Gas	4	4	4	4	4	4
Public Supply	3,611	3,704	3,648	3,589	3,567	3,504
Thermoelectric Power	-	-	-	-	-	-
Total	**6,770**	**7,042**	**6,991**	**6,889**	**6,818**	**6,706**

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

Physical Water Shortages

Will there be enough "wet water" physically available to meet anticipated needs?

WIW WM WSS

	Magnitude (AFY)					Frequency[1]
	2030	2035	2045	2060	2075	2075
Surface Water Gap	-	-	-	-	-	0%
Alluvial Groundwater Depletion	-	-	-	-	-	No AGW Demand
Bedrock Groundwater Depletion	52	51	38	29	18	N/A

1. Probability of a water shortage occurring in at least one month of the year.

Legal Water Availability

Will there be water available for permitting after meeting 2075 demands?

WM WSS

Estimated Surface Water available for appropriation in 2075 (AFY) [3]	Inside 2016 Water Settlement Area? [1]	Is there a downstream mainstem restriction? [2]	Estimated Groundwater available for appropriation in 2075 (AFY) [3]
474,200	No	No	2,658,980

1. If, yes – basin wholly or partially subject to the provisions of the 2016 Water Settlement Agreement.
2. If, yes – mainstem restriction may impact water available for appropriation within the basin.
3. Surface water in this basin is administered by the Grand River Dam Authority, while groundwater is administered by OWRB.

Water Management Strategies

What approaches are most viable for meeting future needs and mitigating shortages?

WSS WDI WIW WM

Water Management Category	Demand Sector	Basin 81 Evaluation
Demand Management	PS, SSI, OG, TE	Effective at Meeting Future Demands
Agriculture Options	CI, LS	Effective at Meeting Future Demands
Increase Reliance on In-Basin Surface Water	All sectors	Effective at Meeting Future Demands
Increase Reliance on In-Basin Groundwater	All sectors	Effective at Meeting Future Demands
Stormwater Capture & Use	PS, SSI	No Shortage or Needs Met by Other Strategies
Reuse	PS, SSI	No Shortage or Needs Met by Other Strategies
Water Transfers	All sectors	No Shortage or Needs Met by Other Strategies

In addition to the water management strategies, water users need:

- Options to address water quality concerns, which could include expanding source water protection programs and expanding water quality studies.
- Ways to address infrastructure limitations, which could include additional water funding from the State, Federal, and/or public-private partnerships, and by providers setting water rates that fully fund system operation and maintenance.

APPENDIX B GLOSSARY

Unless otherwise indicated, definitions provided are consistent with those found in Oklahoma Administrative Code, Title 785 Oklahoma Water Resources Board Rules.

Acre-foot: volume of water that would cover one acre of land to a depth of one foot; equivalent to 43,560 cubic feet or 325,851 gallons.

Agricultural use: water used for livestock, poultry, fish farms, fish hatcheries, veterinary services, feed lots, etc. (see also "Irrigation use").

Alkalinity: generally, the measurement of the water's ability to neutralize acids. High alkalinity usually indicates the presence of carbonate, bicarbonates, or hydroxides. Waters that have high alkalinity values are often considered undesirable because of excessive hardness and high concentrations of sodium salts. Waters with low alkalinity have little capacity to buffer acidic inputs and are susceptible to acidification (low pH).

Alluvial aquifer: generally, an aquifer with porous media consisting of loose, unconsolidated sediments deposited by fluvial (river) or aeolian (wind) processes, typical of river beds, floodplains, dunes, and terraces.

Alluvial groundwater (AGW): generally, water found in an alluvial aquifer.

Alluvium: generally, sediments of clay, silt, gravel, or other unconsolidated material deposited over time by a flowing stream on its floodplain or delta; frequently associated with higher-lying terrace deposits of groundwater.

Appropriation: the process by which an appropriative stream water right is acquired. A completed appropriation results in an appropriative right.

Appropriative right to stream water: right acquired under the procedure provided by law to take a specific quantity of public water by direct diversion from a stream, an impoundment thereon, or a playa lake, and to apply such water to a specific beneficial use or uses.

Aquifer: generally, a geologic unit or formation that contains sufficient saturated, permeable material to yield economically significant quantities of water to wells and springs.

Aquifer Storage and Recovery Activities (ASR): activities that exclusively include activities for the storage of water in and recovery of water from an aquifer pursuant to a site-specific aquifer storage and recovery plan. Activities not conducted pursuant to a site-specific aquifer storage and recovery plan shall not be considered ASR activities.

Artificial recharge: any man-made process specifically designed for the primary purpose of increasing the amount of water entering into a groundwater basin or subbasin.

Attainable uses: generally, best uses achievable for a particular waterbody given water of adequate quality.

Background: ambient condition upstream or upgradient from a facility, practice, or activity that has not been affected by that facility, practice, or activity.

Basin: see Surface water basin.

Basin outlet: generally, the furthest downstream geographic point on the mainstem river or stream in an OCWP planning basin.

Bedrock aquifer: generally, an aquifer with porous media consisting of lithified (semi-consolidated or consolidated) sediments, such as limestone, sandstone, siltstone, or fractured crystalline rock.

Bedrock groundwater (BGW): generally, water found in a bedrock aquifer.

Beneficial use: use of such quantity of stream or groundwater when reasonable intelligence and reasonable diligence are exercised in its application for a lawful purpose and as is economically necessary for that purpose. Beneficial uses include but are not limited to municipal, industrial, agricultural, irrigation, recreation, fish and wildlife, etc.

Board: the Oklahoma Water Resources Board authorized by law to make final adjudications, execute contracts, adopt rules, and carry out other powers and duties set forth by law, or duties authorized by law to be delegated to the Executive Director, or any other employee or agent or staff member thereof assigned by the Executive Director.

Chlorophyll-a: generally, the primary photosynthetic plant pigment used in water quality analysis as a measure of algae growth.

Commercial use: generally, use which includes but is not limited to water for businesses, industrial parks, laundries, cafes, motels/hotels, institutions, food processing and water used in the transportation of metal ores and non-metals by pipelines.

Conductivity: generally, a measure of the ability of water to pass electrical current. High specific conductance indicates high concentrations of dissolved solids.

Conjunctive management: generally, a water management approach that takes into account the interactions between groundwaters and surface waters and how those interactions may affect water availability.

Conservation: generally, the protection from loss and waste. Conservation of water may mean to save or store water for later use, or to use water more efficiently.

Conservation pool: generally, reservoir storage of water for the project's authorized purpose other than flood control.

Consumptive use: means use of water, which diverts it from a water supply.

Clean Water SRF (CW SRF): see State Revolving Fund (SRF).

Dam: any artificial barrier, together with appurtenant works, which does or may impound or divert water.

Dedicated land: the tract or tracts of land which the applicant owns, leases, or from which the applicant holds a valid right to withdraw groundwater and which is listed in the application and used to calculate the amount of groundwater requested.

Degradation: generally, any condition caused by the activities of humans resulting in the prolonged impairment of any constituent of an aquatic environment.

Demand: generally, the amount of water required to meet the needs of people, communities, industry, agriculture, and other users.

Demand forecast: generally, an estimate of expected water demands for a future planning year.

Demand management: generally, adjusting use of water through temporary or permanent conservation measures or restrictions to meet the water needs of a basin or region.

Demand sectors: generally, distinct categories of consumptive users of the state's water resources. For OCWP analysis, seven demand sectors were analyzed: thermoelectric power, self-supplied residential, self-supplied industrial, oil and gas, municipal and industrial, livestock, and crop irrigation.

Dependable yield: generally, the maximum amount of water a reservoir can dependably supply from storage during a drought of record.

Depletion: generally, a condition that occurs when the amount of existing and/or future demand for groundwater exceeds available recharge.

Dissolved oxygen (DO): generally, amount of oxygen gas dissolved in a given volume of water at a particular temperature and pressure, often expressed as a concentration in parts of oxygen per million parts of water. Low levels of dissolved oxygen facilitate the release of nutrients from sediments.

Diversion: generally, means to take water from a stream or waterbody into a pipe, canal, or other conduit, either by pumping or gravity flow.

Domestic use: means the use of water by a natural individual or by a family or household for household purposes, for farm and domestic animals up to the normal grazing capacity of the land whether or not the animals are actually owned by such natural individual or family, and for the irrigation of land not exceeding a total of three (3) acres in area for the growing of gardens, orchards, and lawns. Domestic use also includes: (1) the use of water for agriculture purposes by natural individuals, (2) use of water for fire protection, and (3) use of water by non-household entities for drinking water purposes, restroom use, and the watering of lawns, provided that the amount of groundwater used for any such purposes does not exceed five (5) acre-feet per year.

Drainage area: means the area above the discharge drained by a receiving stream.

Drinking Water SRF (DW SRF): see State Revolving Fund (SRF).

Drought management: generally, the short-term measures used to temporarily reduce water use to sustain a basin's or region's needs during times of below normal rainfall.

Ecoregion: a geographical area within which ecosystems and the type, quality and quantity of environmental resources are generally similar, as more specifically described in the United States Environmental Protection Agency's (EPA) 1997 revision of Omernick, "Ecoregions of the Conterminous United States," Annals of the Association of American Geographers.

Effluent: generally, any fluid emitted by a source to a stream, reservoir, or basin, including a partially or completely treated waste fluid that is produced by and flows out of an industrial or wastewater treatment plant or sewer.

Elevation: generally, the elevation in feet in relation to mean sea level (MSL).

Equal proportionate share (EPS): generally, the maximum annual yield of water from a groundwater basin or subbasin which shall be allocated to each acre of land overlying such basin or subbasin. It shall be that percentage of the maximum annual yield, which is equal to the percentage of the land overlying the fresh groundwater basin or subbasin which is owned or leased by an applicant for a regular permit.

Enlargement: any change in or addition to an existing dam or reservoir which raises or may raise the water storage elevation of the water impounded by the dam or reservoir.

Eutrophic: generally, a classification of lake water quality (or "trophic status") indicating high nutrient levels that promote rapid growth of algae and aquatic plants. This often leads to oxygen depletion in deeper waters below the surface.

Eutrophication: generally, the process whereby the condition of a waterbody changes from one of low biologic productivity and clear water to one of high productivity and water made turbid by the accelerated growth of algae.

Excess or surplus water: water in excess of the appropriator's present and reasonable future need. Excess or surplus water shall mean that amount of water which is greater than the present or reasonable foreseeable future water requirements needed to satisfy all beneficial uses within an area of origin.

Flood: general and temporary conditions of partial or complete inundation of normally dry land areas from the overflow of lakes, streams, rivers or any other inland waters

Flood control pool: generally, reservoir storage of excess runoff above the conservation pool storage capacity that is discharged at a regulated rate to reduce potential downstream flood damage.

Floodplain: the land adjacent to a body of water which has been or may be covered by flooding, including, but not limited to, the one-hundred-year flood (the flood expected to be equaled or exceeded every 100 years on average).

Fresh water: water that has less than five thousand (5,000) parts per million total dissolved solids. All other water is salt water.

Gap: generally, an anticipated shortage in supply of surface water relative to the projected surface water demand due to a deficiency of physical water supply or the inability or failure to obtain necessary water rights.

Groundwater: means waters of the state under the surface of the earth regardless of the geologic structure in which it is standing or moving outside the cut bank of any definite stream.

Groundwater basin: a distinct underground body of water overlain by contiguous land having substantially the same geological and hydrological characteristics and yield capabilities. The area boundaries of a major or minor basin can be determined by political boundaries, geological, hydrological, or other reasonable physical boundaries.

Groundwater recharge: see Recharge.

Hardness: generally, a measure of the mineral content of water. Water containing high concentrations (usually greater than 60 ppm) of iron, calcium, magnesium, and hydrogen ions is usually considered "hard water."

High Quality Waters (HQW): generally, those waters of the state whose historic water quality and physical habitat provide conditions suitable for the support of sensitive and intolerant climax communities of aquatic organisms, whether or not that waterbody currently contains such a community, and support high levels of recreational opportunity.

Hydraulic conductivity: generally, the coefficient of proportionality that describes the rate at which a fluid can move through a permeable medium. It is a function of both the medium and of the fluid flowing through it; also defined as the quantity of water that will flow through a unit cross-sectional area of porous material per unit of time under a hydraulic gradient of 1.00 (measured at right angles to the direction of flow) at a specified temperature.

Hydrologic unit code (HUC): generally, a numerical designation utilized by the United States Geologic Survey and other federal and state agencies as a way of identifying all drainage basins in the United States in a nested arrangement from largest to smallest, consisting of a multi-digit code that identifies each of the levels of classification within two-digit fields.

Impaired water: generally, a waterbody in which the quality fails to meet the standards prescribed for its beneficial uses. One or more designated beneficial uses are not being attained.

Impoundment: generally, a body of water, such as a pond or lake, confined by a dam, dike, floodgate, or other barrier established to collect and store water.

Industrial use: the use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value.

Infiltration: generally, the gradual downward flow of water from the surface of the earth into the subsurface.

Instream flow: generally, a quantity of water to be set aside in a stream or river to ensure downstream environmental, social, and economic benefits are met (further defined in the OCWP Instream Flow Issues & Recommendations report).

Interbasin transfer: generally, the physical conveyance of water from one OCWP planning basin to another, constructed for purposes of moving water to satisfy water demands in the receiving basin.

Irrigation use: use of water for the production of food, fiber, crops, timber, fruits, nuts; and water applied to pastures, fields, landscaping, horticultural services, and golf courses.

Levee: a man-made structure, usually an earthen embankment, designed and constructed to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

Life of a groundwater basin or subbasin: that period of time during which at least fifty (50) percent of the total overlying land of the basin or subbasin will retain a saturated thickness allowing pumping of the maximum annual yield for a minimum twenty (20) year life of such basin or subbasin, provided that after July 1, 1994, the average saturated thickness will be calculated to be maintained at five feet (5') for alluvium and terrace aquifers and fifteen feet (15') for bedrock aquifers unless otherwise determined by the Board; provided further that after July 1, 1994, whether fifty (50) percent of the total overlying land of the basin or subbasin retains a saturated thickness allowing pumping for a minimum twenty (20) year life of the basin or subbasin need not be considered by the Board.

Major groundwater basin: a distinct underground body of water overlain by contiguous land and having essentially the same geological and hydrological characteristics and from which groundwater wells yield at least fifty (50) gallons per minute on the average basinwide if from a bedrock aquifer, and at least one hundred fifty (150) gallons per minute on the average basinwide if from an alluvium and terrace aquifer, or as otherwise designated by the Board.

Marginal water: water which has at least five thousand (5,000) and less than ten thousand (10,000) parts per million total dissolved solids.

Maximum annual yield (MAY): determination by the Board of the total amount of fresh groundwater that can be produced from each basin or subbasin allowing a minimum twenty-year life of such basin or subbasin.

Maximum storage: the amount of water which may be stored behind a dam with the lake level at the top of the dam embankment.

Mesotrophic: generally, a surface water quality characterization, or "trophic status," describing those lakes with moderate primary productivity and moderate nutrient levels.

Million gallons per day (mgd): generally, a rate of flow equal to 1.54723 cubic feet per second or 3.0689 acre-feet per day.

Mining use: any use wherein the water is applied to mining processes including but not limited to oil and gas recovery operations, for drilling and reworking wells, and for conducting oil and gas field operations.

Minor groundwater basin: a distinct underground body of water overlain by contiguous land and having substantially the same geological and hydrological characteristics and which is not a major groundwater basin.

Municipal and rural water use: the use of water by a municipality, rural water district, water corporations, or community for the promotion and protection of safety, health and comfort; distribution to natural persons for the maintenance of life and property; public and private business pursuits; and the furtherance of all generally recognized municipal purposes, except large recreational uses such as lakes unless in conjunction with other uses.

Natural recharge: all flow of water into a groundwater basin or subbasin by natural processes including percolation from irrigation.

Non-consumptive use: generally, the use of water in a manner that does not reduce the amount of supply, such as navigation, hydropower production, protection of habitat and ecosystems, maintaining water levels for boating recreation, or maintaining flow, level, and/or temperature for fishing, swimming, habitat, etc.

Nonpoint source (NPS): a source of pollution, which is diffuse and does not have a single point of origin or is introduced into a receiving stream from a specific outlet.

Normal pool elevation: means the elevations listed in the "Oklahoma Water Atlas," OWRB publication No. 135, or most recent version thereof.

Normal pool storage: generally, the volume of water held in a reservoir when it is at normal pool elevation.

Numerical criteria: generally, the concentrations or other quantitative measures of chemical, physical or biological parameters that are assigned to protect the beneficial use of a waterbody.

Numerical standard: generally, the most stringent of the numerical criteria assigned to the beneficial uses for a given stream.

Nutrient-impaired reservoir: reservoir with a beneficial use or uses impaired by human-induced eutrophication as determined by a Nutrient-Limited Watershed Impairment Study.

Nutrient-Limited Watershed (NLW): generally, the watershed of a waterbody with a designated beneficial use that is adversely affected by excess nutrients as determined by a Carlson's Trophic State Index (using chlorophyll-a) of 62 or greater, or is otherwise listed as "NLW" in Appendix A of the OWQS.

Nutrients: generally, elements or compounds essential as raw materials for an organism's growth and development; these include carbon, oxygen, nitrogen, and phosphorus.

Oklahoma Water Quality Standards (OWQS): generally, the rules promulgated by the Oklahoma Department of Environmental Quality (ODEQ) in Oklahoma Administrative Code Title 252, Chapter 730, which establish classifications of uses of waters of the state, criteria to maintain and protect such classifications, and other standards or policies pertaining to the quality of such waters.

Outfall: a point source that contains the effluent being discharged to the receiving water.

Percolation: generally, the movement of water through unsaturated subsurface soil layers, usually continuing downward to the groundwater or water table (distinguished from Seepage).

Permit availability: generally, the amount of water that could be made available for withdrawals under permits issued in accordance with Oklahoma water law. This may also be referred to as legal availability.

pH: generally, the measurement of the hydrogen-ion concentration in water. A pH below 7 is acidic (the lower the number, the more acidic the water, with a decrease of one full unit representing an increase in acidity of ten times) and a pH above 7 (to a maximum of 14) is basic (the higher the number, the more basic the water). In Oklahoma, fresh waters typically exhibit a pH range from 5.5 in the southeast to almost 9.0 in central areas.

Phosphorus limited: generally, in reference to water chemistry, where growth or amount of primary producers (e.g., algae) is restricted in a waterbody due in large part to the amount of available phosphorus.

Physical water availability: generally, the amount of water present in streams, rivers, lakes, reservoirs, and aquifers, sometimes referred to as "wet water."

Point source: generally, any discernible, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, well, discrete fissure, container, rolling stock or concentrated animal feeding operation from which pollutants are or may be discharged. This term does not include return flows from irrigation agriculture.

Pollution: generally, contamination or other alteration of the physical, chemical or biological properties of any natural waters of the State, or such discharge of any liquid, gaseous or solid substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

Potable: generally, describing water suitable for drinking.

Primary Body Contact Recreation (PBCR): generally, a classification in OWQS of a waterbody's use; involves direct body contact with the water where a possibility of ingestion exists. In these cases, the water shall not contain chemical, physical or biological substances in concentrations that irritate the skin or sense organs or are toxic or cause illness upon ingestion by human beings.

Primary productivity: generally, the production of chemical energy in organic compounds by living organisms. In lakes and streams, this is essentially the lowest denominator of the food chain (phytoplankton) bringing energy into the system via photosynthesis.

Prior groundwater right: the right to use groundwater established by compliance with the laws in effect prior to July 1, 1973, the effective date of the Groundwater Act.

Provider: generally, private or public entity that supplies water to end users or other providers. For OCWP analyses, "public water providers" included approximately 896 non-profit, local governmental municipal or community water systems and rural water districts. The OCWP breaks public water providers into the following size categories:

- **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.

Public water supply: use of water for drinking water purposes by housing developments, trailer parks, churches, schools, etc., other than water used for "municipal or rural water use."

Recharge: generally, the inflow of water to an alluvial or bedrock aquifer.

Recreation, fish, and wildlife use: the use of water for swimming, water skiing, boating, fishing, hunting or other forms of water recreation, and water for fish and wildlife conservation

Reservoir: any surface depression, which contains or will contain the water impounded by a dam.

Return water or return flow: the portion of water diverted from a water supply, which finds its way back into a watercourse.

Riparian water right (riparian right): generally, the right of an owner of land adjoining a stream or watercourse to use water from that stream for domestic purposes.

Riverine: relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Salinity: generally, the concentration of salt in water measured in milligrams per liter (mg/L) or parts per million (ppm).

Salt water: any water containing more than five thousand (5,000) parts per million total dissolved solids.

Scenic Rivers: generally, streams in "Scenic River" areas designated by the Oklahoma Legislature that possess unique natural scenic beauty, water conservation, fish, wildlife and outdoor recreational values.

Sediment: generally, particles transported and deposited by water deriving from rocks, soil, or biological material.

Sensitive sole source groundwater basin or subbasin: a major groundwater basin or subbasin all or a portion of which has been designated as "Sole Source Aquifer" by the EPA, and includes any portion of an contiguous aquifer located withing five (5) miles of the known areal extent of the surface water outcrop of the sensitive sole source groundwater basin.

Sensitive Water Supplies (SWS): generally, the designation that applies to public and private water supplies possessing conditions that make them more susceptible to pollution events.

Soft water: generally, water that contains low levels of magnesium and calcium salts.

State Revolving Fund (SRF): fund or program to be used for loans to eligible entities for qualified projects in accordance with Federal law, rules and guidelines administered by the EPA and state law. There are two separate SRF programs administered in Oklahoma: one is for purpose of controlling water pollution, the Clean Water SRF (CW SRF), and the other is for the purpose or providing safe drinking water (the DW SRF).

Stormwater: generally, storm water runoff, snow melt runoff, and surface runoff and drainage.

Stream system: drainage area of a watercourse or series of watercourses, which converge in a large watercourse, the boundaries of which have been defined and which has been designated by the Board as a stream system.

Stream water: water in a definite stream that includes but is not limited to water in ponds, lakes, reservoirs, and playa lakes.

Streamflow: generally, the rate of water discharged from a source indicated in volume with respect to time.

Surface water (SW): generally, water in streams and waterbodies as well as diffused over the land surface.

Surface water basin: generally, geographic area drained by a single stream system. For OCWP analysis, Oklahoma has been divided into 82 surface water basins (also referenced as "planning basins").

Temporary permit: generally, for groundwater basins or subbasins for which a maximum annual yield has not been determined, temporary permits are granted to users allocating two acre-feet of water per acre of land per year. Temporary permits are for one-year terms that can be revalidated annually by the permittee. When the maximum annual yield and equal proportionate share are approved by the OWRB, all temporary permits overlying the studied basin are converted to regular permits at the new approved allocation amount.

Terrace deposits: generally, fluvial or wind-blown deposits occurring along the margin and above the level of a body of water and representing the former floodplain of a stream or river.

Total dissolved solids (TDS): a measure, in parts per million, of dissolved combined organic or inorganic substances suspended in water. Total dissolved solids is used as an aggregate indicator of water quality.

Total maximum daily load (TMDL): sum of individual wasteload allocations for point sources, safety reserves, and loads from nonpoint source and natural backgrounds.

Total nitrogen: generally, for water quality analysis, a measure of all forms of nitrogen (organic and inorganic). Excess nitrogen can lead to harmful algae blooms, hypoxia, and declines in wildlife and habitat.

Total phosphorus: generally, for water quality analysis, a measure of all forms of phosphorus, often used as an indicator of eutrophication and excessive productivity.

Transmissivity: generally, measure of how much water can be transmitted horizontally through an aquifer. Transmissivity is the product of hydraulic conductivity of the rock and saturated thickness of the aquifer.

Tributary: generally, stream or other body of water, surface or underground, that contributes to another larger stream or body of water.

Trophic State Index (TSI): the results of the calculation for chlorophyll-a concentration using both the Carlson, R.E. 1977, A Trophic State Index for Lakes, Limnology and Oceanography, 22:361-369 and the methods outlined in the Board guidance document "Guidance For Determining Lake Trophic State For Determination Of Nutrient Limited Waters Status."

Trophic status: generally, a measure of a lake's biological productivity. The various trophic status levels (Oligotrophic, Mesotrophic, Eutrophic, and Hypereutrophic) provide a relative measure of overall water quality conditions in a lake.

Turbidity: generally, a combination of suspended and colloidal materials (e.g., silt, clay, or plankton) that reduce the transmission of light through scattering or absorption. Turbidity values are generally reported in Nephelometric Turbidity Units (NTU).

Unappropriated water available: water available for appropriation which is the amount of water within a particular stream system, stream sub-system, or watershed available for appropriation as determined by the Board at a proposed point of diversion and/or from a specific water supply which currently is not appropriated.

Vested stream water right (vested right): right established by the beneficial use of stream water from a water supply prior to the enactment and pursuant to the provisions of recognized by the OWRB as having been established by compliance with state stream water laws in effect prior to 1963.

Waste: use of water in such an inefficient manner that excessive losses occur or any manner that is not a beneficial use or use of water in excess of the amount which is authorized by the water right.

Waste by depletion: unauthorized use of wells or groundwater; drilling a well, taking, or using fresh groundwater without a permit, except for domestic use; taking more fresh groundwater than is authorized by the permit; taking or using fresh groundwater in any manner so that the water is lost for beneficial use; transporting fresh groundwater from a well to the place of use in such a manner than there is an excessive loss in transit; using fresh groundwater to reach a pervious stratum and be lost into cavernous or otherwise pervious materials encountered in a well…drilling wells and producing fresh groundwater therefrom except in accordance with the well spacing previously determined by the Board; using fresh groundwater for air conditioning or cooling purposes without providing facilities to aerate and reuse such water.

Waste by pollution: permitting or causing the pollution of a fresh water strata or basin through any act that will permit fresh groundwater polluted by minerals or other waste to filter or intrude into a basin or subbasin, or failure to properly plug abandoned fresh water wells in accordance with rules of the Board and file reports thereof.

Water quality: generally, the physical, chemical, and biological characteristics of water that determine diversity, stability, and productivity of the climax biotic community or affect human health.

Water right: generally, the right to the use of stream or groundwater for beneficial use reflected by permits or vested rights for stream water or permits or prior rights for groundwater.

Water reuse: wastewater that is treated to be used for other purposes, may also be called recycled water or reclaimed water.

Water storage elevation: generally, that elevation of water surface which may be obtained by the temporary or permanent storage of water. This elevation is normally at the principal spillway elevation.

Water supply: a natural body of water, whether static or moving on or under the surface of the ground, or in a man-made reservoir, available for beneficial use on a reasonably dependable basis.

Water supply availability: generally, for OCWP analysis, the consideration of whether water is available that meets three necessary requirements: physical water is present, the water is of a suitable quality, and a water right or permit to use the water has been or can be obtained.

Water management strategies: generally, alternatives that a basin or region may implement to meet changing water demands. The OCWP analysis considered the following seven high-level categories of water management strategies:

- **Demand Management**: Reducing water demands through conservation and drought management for non-agriculture uses.
- **Agriculture Options**: Water conservation and efficiency tools for irrigated cropland and livestock production.

- **Water Transfers**: Obtaining water resources from external suppliers or regions.
- **Increase Reliance on Surface Water**: Developing or utilizing above-ground water resources within a basin.
- **Increase Reliance on Groundwater**: Developing or utilizing underground water resources within a basin.
- **Stormwater Capture and Use**: Collecting and beneficially using post-precipitation runoff.
- **Reuse**: Reclaiming and treating water for beneficial purposes.

Water table: generally, the upper surface of a zone of saturation; the upper surface of the groundwater.

Waterbody: a body of waters of the state.

Watercourse: the channel or area that conveys a flow of water.

Waters of the state: generally, all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.

Watershed: the boundaries of a drainage area of a watercourse or series of watercourses which diverge above a designated location or diversion point, as determined by the Board.

Well: any type of excavation for the purpose of obtaining groundwater or to monitor or observe conditions under the surface of the earth; does not include oil and gas wells.

Well yield: generally, the amount of water that a water supply well can produce (usually measured in gallons per minute, gpm), which generally depends on the geologic formation and details of well construction.

Withdrawal: generally, the water removed from a supply source.

APPENDIX C PUBLIC WATER SYSTEMS AND COMMUNITIES WITHIN EACH BASIN

Appendix C includes tables that identify public water systems and communities within each basin. When a community or rural water district spans more than one basin, the entity's name is associated with more than one basin number in the tables. The percentages were used to assign permit values to basins. For example, Tulsa Permit No. 19540517 is split between use basins 49 (42%), 73 (52%), 77 (2%), and 78 (4%). The percentage of permit is based on the percentage of service area within each basin.

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
51 East Corp	Upper Arkansas	71	100%
Achille	Blue-Boggy	13	100%
Ada	Blue-Boggy	12	2%
Ada	Central	56	56%
Ada	Blue-Boggy	8	3%
Ada	Blue-Boggy	9	39%
Adair	Grand	80	100%
Adair Co RWD #1 (Cherry Tree)	Lower Arkansas	46	100%
Adair Co RWD #1 (Cherry Tree)	Lower Arkansas	82	0%
Adair Co RWD #2	Lower Arkansas	46	15%
Adair Co RWD #2	Lower Arkansas	82	85%
Adair Co RWD #3	Lower Arkansas	46	0%
Adair Co RWD #3	Lower Arkansas	82	100%
Adair Co RWD #4	Lower Arkansas	46	35%
Adair Co RWD #4	Lower Arkansas	82	65%
Adair Co RWD #5	Lower Arkansas	82	100%
Adair Co RWS & SWMD #6	Lower Arkansas	82	100%
Adamson RWD #8	Eufaula	48	100%
Addington	Beaver-Cache	26	100%
Afton	Grand	80	1%
Afton	Grand	81	100%
Agra	Central	60	77%
Agra	Upper Arkansas	71	23%
Albion	Southeast	6	100%
Alderson	Eufaula	48	100%
Alex	Lower Washita	15	1%
Alex	Lower Washita	16	99%
Alfalfa Co RWS & SWMD #1 (North)	Central	64	0%
Alfalfa Co RWS & SWMD #1 (North)	Upper Arkansas	68	100%
Aline	Central	64	100%
Allen	Central	56	25%
Allen	Blue-Boggy	8	75%
Altus	Southwest	32	1%
Altus	Southwest	33	75%
Altus	Southwest	34	22%
Altus	Southwest	35	0%
Altus	Southwest	38	25%
Altus	Southwest	40	8%
Alva	Central	64	42%
Alva	Upper Arkansas	68	58%
Amber	Lower Washita	16	100%
Ames	Central	64	100%
Amorita	Upper Arkansas	68	100%
Anadarko	Lower Washita	16	66%
Anadarko	West Central	17	34%
Antlers	Southeast	6	100%
Apache	Beaver-Cache	28	100%
Arapaho	West Central	19	100%
Arcadia	Central	60	100%
Ardmore	Lower Washita	14	48%
Ardmore	Lower Washita	21	52%
Arkoma	Lower Arkansas	44	99%
Armstrong	Blue-Boggy	12	100%
Arnett	West Central	59	100%
Asher	Central	56	100%
Ashland	Blue-Boggy	8	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Atoka	Blue-Boggy	8	97%
Atoka	Blue-Boggy	9	3%
Atoka Co RWD #1 (Wardville)	Blue-Boggy	8	100%
Atoka Co RWD #2	Blue-Boggy	8	29%
Atoka Co RWD #2	Blue-Boggy	9	71%
Atoka Co RWD #3 (Caney)	Blue-Boggy	9	100%
Atoka Co RWS & SWMD #4	Southeast	6	1%
Atoka Co RWS & SWMD #4	Blue-Boggy	7	11%
Atoka Co RWS & SWMD #4	Blue-Boggy	8	28%
Atoka Co RWS & SWMD #4	Blue-Boggy	9	60%
Atwood	Central	56	100%
Avant	Middle Arkansas	74	100%
Bar-Dew Water Assoc Inc	Middle Arkansas	76	100%
Barnsdall	Middle Arkansas	74	100%
Bartlesville	Middle Arkansas	76	100%
Bearden	Central	50	100%
Beaver	Northwest	53	39%
Beaver	Northwest	55	61%
Beaver Co RWD #1 (Turpin)	Northwest	55	100%
Beaver Co RWD #2 (Gate)	Northwest	65	100%
Beckham Co RWD #1	West Central	19	13%
Beckham Co RWD #1	Southwest	34	63%
Beckham Co RWD #1	Southwest	36	17%
Beckham Co RWD #1	Southwest	37	8%
Beckham Co RWD #1	Southwest	38	0%
Beckham Co RWD #2	Southwest	37	87%
Beckham Co RWD #2	Southwest	43	13%
Beckham Co RWD #3	West Central	19	1%
Beckham Co RWD #3	West Central	20	43%
Beckham Co RWD #3	Southwest	34	27%
Beckham Co RWD #3	Southwest	37	28%
Beggs	Eufaula	48	90%
Beggs	Middle Arkansas	49	6%
Beggs	Central	60	4%
Bennington	Blue-Boggy	10	9%
Bennington	Blue-Boggy	11	91%
Bernice	Grand	81	100%
Bessie	West Central	19	100%
Bethany	Central	50	40%
Bethany	Central	51	47%
Bethany	Central	60	0%
Bethany	Central	64	13%
Bethel Acres	Central	50	94%
Bethel Acres	Central	62	6%
Big Cabin	Grand	80	100%
Billings	Upper Arkansas	72	100%
Binger	Lower Washita	16	100%
Birch Creek RWD	Middle Arkansas	76	100%
Bixby	Middle Arkansas	49	100%
Blackburn	Upper Arkansas	71	100%
Blackwell	Upper Arkansas	69	97%
Blackwell	Upper Arkansas	70	3%
Blackwell RW Corp	Upper Arkansas	67	3%
Blackwell RW Corp	Upper Arkansas	68	28%
Blackwell RW Corp	Upper Arkansas	69	29%
Blackwell RW Corp	Upper Arkansas	70	39%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Blair	Southwest	33	1%
Blair	Southwest	34	1%
Blair	Southwest	38	100%
Blair	Southwest	42	32%
Blanchard	Lower Washita	15	0%
Blanchard	Lower Washita	16	1%
Blanchard	Central	57	0%
Blanchard	Central	58	1%
Blue Jacket	Grand	80	100%
Bluejacket	Grand	80	100%
Boise City	Northwest	55	100%
Bokchito	Blue-Boggy	11	100%
Bokoshe	Lower Arkansas	45	100%
Boley	Central	50	100%
Boswell	Blue-Boggy	7	62%
Boswell	Blue-Boggy	9	38%
Bowlegs	Eufaula	48	46%
Bowlegs	Central	62	54%
Bowlegs Lima Water	Eufaula	48	65%
Bowlegs Lima Water	Central	61	7%
Bowlegs Lima Water	Central	62	27%
Boynton	Middle Arkansas	49	100%
Bradley	Lower Washita	15	100%
Braggs	Lower Arkansas	47	100%
Braman	Upper Arkansas	70	100%
Bray	Lower Washita	14	100%
Breckenridge	Upper Arkansas	63	1%
Breckenridge	Upper Arkansas	71	69%
Breckenridge	Upper Arkansas	72	30%
Breckinridge	Upper Arkansas	71	100%
Bridge Creek	Lower Washita	16	1%
Bridge Creek	Central	57	0%
Bridge Creek	Central	58	0%
Bridgeport	West Central	59	100%
Bristow	Central	60	100%
Broken Arrow	Middle Arkansas	49	67%
Broken Arrow	Middle Arkansas	73	2%
Broken Arrow	Middle Arkansas	77	28%
Broken Arrow	Middle Arkansas	78	2%
Broken Bow	Southeast	2	0%
Broken Bow	Southeast	3	100%
Broken Bow	Southeast	4	0%
Bromide	Blue-Boggy	9	100%
Brooksville	Central	62	100%
Bryan Co RW & SD #5	Blue-Boggy	11	15%
Bryan Co RW & SD #5	Blue-Boggy	12	11%
Bryan Co RW & SD #5	Blue-Boggy	13	65%
Bryan Co RW & SD #5	Lower Washita	21	9%
Bryan Co RWD #6	Blue-Boggy	11	86%
Bryan Co RWD #6	Blue-Boggy	9	14%
Bryan Co RWD #7	Blue-Boggy	10	27%
Bryan Co RWD #7	Blue-Boggy	11	73%
Bryan Co RWD #9	Blue-Boggy	13	100%
Bryan Co RWS & SWMD #2	Blue-Boggy	12	53%
Bryan Co RWS & SWMD #2	Lower Washita	21	47%
Buckhorn RWD	Lower Washita	14	59%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Buckhorn RWD	Lower Washita	21	41%
Buffalo	Northwest	65	100%
Burbank	Upper Arkansas	72	100%
Burlington	Upper Arkansas	68	100%
Burns Flat	West Central	19	77%
Burns Flat	Southwest	34	23%
Burnt Cabin RWD	Lower Arkansas	82	100%
Butler	West Central	19	100%
Byars	Lower Washita	14	87%
Byars	Central	56	13%
Byng	Central	56	100%
Byron	Upper Arkansas	68	100%
Cache	Beaver-Cache	29	100%
Caddo	Blue-Boggy	11	60%
Caddo	Blue-Boggy	9	40%
Caddo Co RWD #1 (Lookeba)	Lower Washita	16	100%
Caddo Co RWD #3	Lower Washita	16	17%
Caddo Co RWD #3	West Central	17	16%
Caddo Co RWD #3	West Central	19	30%
Caddo Co RWD #3	Beaver-Cache	25	5%
Caddo Co RWD #3	Beaver-Cache	28	22%
Caddo Co RWD #3	Southwest	33	1%
Caddo Co RWD #3	Southwest	34	2%
Caddo Co RWD #3	Southwest	35	6%
Calera	Blue-Boggy	13	100%
Calumet	Central	51	100%
Calumet	Central	64	0%
Calvin	Central	56	100%
Camargo	West Central	59	100%
Camargo RWD #2	West Central	59	100%
Cameron	Lower Arkansas	45	100%
Canadian	Eufaula	48	100%
Canadian Co RWD #1	Central	51	59%
Canadian Co RWD #1	Central	58	41%
Canadian Co RWD #4	Central	51	38%
Canadian Co RWD #4	Central	64	62%
Canadian Co Water Authority	Central	51	56%
Canadian Co Water Authority	Central	58	44%
Caney	Blue-Boggy	9	100%
Canton	Central	51	100%
Canute	West Central	19	100%
Canute	Southwest	34	53%
Capron	Upper Arkansas	68	100%
Carlton Landing	Eufaula	48	100%
Carmen	Central	64	100%
Carnegie	West Central	17	2%
Carnegie	West Central	19	98%
Carney	Central	60	74%
Carney	Upper Arkansas	63	26%
Carrier	Central	64	100%
Carter	Southwest	36	1%
Carter	Southwest	37	99%
Cashion	Central	64	100%
Castle	Central	50	95%
Castle	Central	60	5%
Catoosa	Middle Arkansas	73	44%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Catoosa	Middle Arkansas	78	0%
Cedar Valley	Central	64	100%
Cement	Lower Washita	16	100%
Centrahoma	Blue-Boggy	8	31%
Centrahoma	Blue-Boggy	9	100%
Central High	Beaver-Cache	25	100%
Chandler	Central	60	100%
Chattanooga	Beaver-Cache	29	75%
Chattanooga	Beaver-Cache	30	25%
Checotah	Lower Arkansas	47	100%
Checotah	Eufaula	48	25%
Chelsea	Middle Arkansas	79	91%
Chelsea	Grand	80	100%
Cherokee	Upper Arkansas	68	100%
Cherokee Co RWD #1 (Ft Gibson)	Lower Arkansas	47	37%
Cherokee Co RWD #1 (Ft Gibson)	Grand	80	63%
Cherokee Co RWD #11	Grand	80	100%
Cherokee Co RWD #12	Lower Arkansas	82	100%
Cherokee Co RWD #13	Lower Arkansas	82	100%
Cherokee Co RWD #2 (Keys)	Lower Arkansas	47	17%
Cherokee Co RWD #2 (Keys)	Lower Arkansas	82	83%
Cherokee Co RWD #3	Lower Arkansas	47	1%
Cherokee Co RWD #3	Grand	80	82%
Cherokee Co RWD #3	Lower Arkansas	82	17%
Cherokee Co RWD #7 (Welling)	Lower Arkansas	82	100%
Cherokee Co RWD #8 (Briggs)	Lower Arkansas	82	100%
Cherokee Co RWD #9	Grand	80	100%
Cheyenne	West Central	20	100%
Chickasha	Lower Washita	16	100%
Choctaw	Central	50	100%
Choctaw	Central	62	0%
Choctaw Co RWD #1	Blue-Boggy	10	68%
Choctaw Co RWD #1	Southeast	5	10%
Choctaw Co RWD #1	Blue-Boggy	7	23%
Choctaw Co RWSG & SWMD #3	Southeast	5	100%
Choctaw RWD #2	Southeast	1	95%
Choctaw RWD #2	Southeast	3	5%
Chouteau	Grand	80	100%
Cimarron City	Central	64	100%
Claremore	Middle Arkansas	75	0%
Claremore	Middle Arkansas	78	97%
Claremore	Grand	80	2%
Clarita Olney Water Co Inc	Blue-Boggy	8	18%
Clarita Olney Water Co Inc	Blue-Boggy	9	82%
Clayton	Southeast	6	100%
Clearview	Eufaula	48	100%
Cleo Springs	Central	64	100%
Cleveland	Upper Arkansas	71	100%
Clinton	West Central	19	100%
Coal Co RWD #5	Blue-Boggy	8	100%
Coalgate	Blue-Boggy	8	100%
Colbert	Blue-Boggy	13	100%
Colcord	Grand	80	86%
Colcord	Lower Arkansas	82	14%
Cole	Central	57	100%
Collinsville	Middle Arkansas	74	1%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Collinsville	Middle Arkansas	75	99%
Colony	West Central	18	100%
Comanche	Lower Washita	23	30%
Comanche	Beaver-Cache	25	7%
Comanche	Beaver-Cache	26	62%
Comanche Co RWD #3	Beaver-Cache	25	50%
Comanche Co RWD #3	Beaver-Cache	27	1%
Comanche Co RWD #3	Beaver-Cache	28	46%
Comanche Co RWD #3	Beaver-Cache	29	2%
Comanche Co RWD #4	Beaver-Cache	28	0%
Comanche Co RWD #4	Beaver-Cache	29	59%
Comanche Co RWD #4	Beaver-Cache	30	30%
Comanche Co RWD #4	Southwest	33	12%
Commerce	Grand	81	100%
Consolidated RWD #1 Leflore Co	Lower Arkansas	45	100%
Consolidated RWD #3 Creek Co	Middle Arkansas	49	100%
Cooperton	West Central	19	100%
Cooperton	Southwest	35	0%
Copan	Middle Arkansas	76	100%
Cordell	West Central	19	100%
Corn	West Central	18	63%
Corn	West Central	19	100%
Cornish	Lower Washita	23	100%
Cotton Co RWD #1	Beaver-Cache	30	0%
Cotton Co RWD #1	Beaver-Cache	31	100%
Cotton Co RWD #2	Beaver-Cache	24	0%
Cotton Co RWD #2	Beaver-Cache	25	8%
Cotton Co RWD #2	Beaver-Cache	27	19%
Cotton Co RWD #2	Beaver-Cache	28	13%
Cotton Co RWD #2	Beaver-Cache	29	35%
Cotton Co RWD #2	Beaver-Cache	30	11%
Cotton Co RWD #2	Beaver-Cache	31	15%
Council Hill	Eufaula	48	100%
Covington	Upper Arkansas	63	100%
Covington	Upper Arkansas	71	10%
Coweta	Middle Arkansas	49	78%
Coweta	Middle Arkansas	77	22%
Cowlington	Lower Arkansas	46	100%
Coyle	Upper Arkansas	63	100%
Craig Co RWD #1	Grand	80	100%
Craig Co RWD #2	Middle Arkansas	79	41%
Craig Co RWD #2	Grand	80	59%
Craig Co RWS & SWMD #3	Grand	80	100%
Creek Co RWD #1	Middle Arkansas	49	90%
Creek Co RWD #1	Central	60	10%
Creek Co RWD #10	Middle Arkansas	49	29%
Creek Co RWD #10	Upper Arkansas	71	71%
Creek Co RWD #2	Middle Arkansas	49	100%
Creek Co RWD #4	Middle Arkansas	49	100%
Creek Co RWD #5	Upper Arkansas	71	100%
Creek Co RWD #7	Middle Arkansas	49	100%
Crescent	Upper Arkansas	63	2%
Crescent	Central	64	98%
Cromwell	Eufaula	48	10%
Cromwell	Central	50	90%
Crowder	Eufaula	48	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Cushing	Upper Arkansas	71	100%
Custer City	West Central	19	95%
Custer City	West Central	59	5%
Custer Co RWD #3	West Central	19	64%
Custer Co RWD #3	West Central	59	36%
Cyril	Lower Washita	16	100%
Dacoma	Central	64	100%
Davenport	Central	60	100%
Davidson	Beaver-Cache	30	1%
Davidson	Beaver-Cache	31	100%
Davis	Lower Washita	14	100%
Deer Creek	Upper Arkansas	68	100%
Deer Creek RW Corp	Central	64	100%
Del City	Central	50	100%
Delaware	Middle Arkansas	79	100%
Delaware Co RWD #1	Grand	80	100%
Delaware Co RWD #10	Grand	81	100%
Delaware Co RWD #3	Grand	80	0%
Delaware Co RWD #3	Grand	81	100%
Delaware Co RWD #9	Grand	81	100%
Depew	Central	60	100%
Devol	Beaver-Cache	31	100%
Dewar	Eufaula	48	100%
Dewey	Middle Arkansas	76	100%
Dewey Co RWD #1	West Central	59	100%
Dewey Co RWD #3	Northwest	52	65%
Dewey Co RWD #3	West Central	59	35%
Dibble	Lower Washita	15	68%
Dibble	Lower Washita	16	1%
Dibble	Central	57	31%
Dickson	Lower Washita	14	47%
Dickson	Lower Washita	21	53%
Dill City	West Central	19	6%
Dill City	Southwest	34	100%
Disney	Grand	80	20%
Disney	Grand	81	80%
Dougherty	Lower Washita	14	100%
Douglas	Upper Arkansas	63	100%
Dover	Central	64	100%
Drummond	Central	64	100%
Drumright	Upper Arkansas	71	100%
Duke	Southwest	38	100%
Duke Central Vue Water	Southwest	38	89%
Duke Central Vue Water	Southwest	39	4%
Duke Central Vue Water	Southwest	40	7%
Duncan	Lower Washita	14	30%
Duncan	Lower Washita	23	0%
Duncan	Beaver-Cache	25	20%
Duncan	Beaver-Cache	26	50%
Durant	Blue-Boggy	12	89%
Durant	Blue-Boggy	13	11%
Durant	Lower Washita	21	0%
Dustin	Eufaula	48	100%
Eakly	West Central	18	100%
Earlsboro	Eufaula	48	3%
Earlsboro	Central	50	93%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Earlsboro	Central	62	3%
East Central Okla Water Authority	Lower Arkansas	47	100%
East Duke	Southwest	38	100%
Edmond	Central	60	78%
Edmond	Central	64	22%
El Reno	Central	51	88%
El Reno	Central	58	1%
El Reno	Central	64	11%
Eldorado	Southwest	40	100%
Elgin	Beaver-Cache	25	31%
Elgin	Beaver-Cache	28	69%
Elk City	Southwest	34	100%
Elk City	Southwest	37	0%
Elm Bend RWD Inc	Middle Arkansas	76	42%
Elm Bend RWD Inc	Middle Arkansas	79	58%
Elmer	Southwest	38	33%
Elmer	Southwest	40	67%
Elmore City	Lower Washita	14	100%
Elmore City RW Corp	Lower Washita	14	97%
Elmore City RW Corp	Lower Washita	15	3%
Empire City	Beaver-Cache	25	63%
Empire City	Beaver-Cache	26	37%
Enid	Upper Arkansas	63	86%
Enid	Central	64	10%
Enid	Upper Arkansas	68	0%
Enid	Upper Arkansas	71	0%
Enid	Upper Arkansas	72	4%
Erick	Southwest	37	100%
Erin Springs	Lower Washita	15	100%
Etowah	Central	62	100%
Eufaula	Eufaula	48	100%
Fair Oaks	Middle Arkansas	77	53%
Fair Oaks	Middle Arkansas	78	0%
Fairfax	Upper Arkansas	72	100%
Fairland	Grand	81	100%
Fairmont	Upper Arkansas	63	54%
Fairmont	Upper Arkansas	71	46%
Fairview	Northwest	52	16%
Fairview	Central	64	100%
Fallis	Central	60	100%
Fanshawe	Lower Arkansas	45	100%
Fargo	Northwest	54	100%
Faxon	Beaver-Cache	29	100%
Fitzhugh	Blue-Boggy	12	97%
Fitzhugh	Central	56	2%
Fitzhugh	Blue-Boggy	9	1%
Fletcher	Lower Washita	16	22%
Fletcher	Beaver-Cache	25	44%
Fletcher	Beaver-Cache	28	33%
Foraker	Upper Arkansas	72	100%
Forest Park	Central	50	14%
Forest Park	Central	60	86%
Forgan	Northwest	53	46%
Forgan	Northwest	55	9%
Forgan	Northwest	65	54%
Fort Cobb	West Central	17	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Fort Coffee	Lower Arkansas	46	100%
Fort Gibson	Lower Arkansas	47	83%
Fort Gibson	Grand	80	17%
Fort Supply	Northwest	53	100%
Fort Towson	Southeast	5	100%
Foss	West Central	19	100%
Foss Reservoir MCD	West Central	19	76%
Foss Reservoir MCD	West Central	20	24%
Foster	Lower Washita	14	100%
Foyil	Middle Arkansas	78	100%
Francis	Central	56	100%
Frederick	Beaver-Cache	30	43%
Frederick	Beaver-Cache	31	57%
Frederick	Southwest	32	18%
Freedom	Northwest	65	100%
Frontier Development Authority	West Central	19	35%
Frontier Development Authority	West Central	20	65%
Gage	Northwest	54	100%
Gans	Lower Arkansas	46	100%
Garber	Upper Arkansas	71	86%
Garber	Upper Arkansas	72	14%
Garfield Co RWD #1 (Krem-Hill)	Upper Arkansas	63	0%
Garfield Co RWD #1 (Krem-Hill)	Central	64	2%
Garfield Co RWD #1 (Krem-Hill)	Upper Arkansas	68	80%
Garfield Co RWD #1 (Krem-Hill)	Upper Arkansas	72	18%
Garfield Co RWD #5	Upper Arkansas	63	57%
Garfield Co RWD #5	Central	64	43%
Garfield Co RWD #6	Upper Arkansas	63	14%
Garfield Co RWD #6	Upper Arkansas	67	8%
Garfield Co RWD #6	Upper Arkansas	68	19%
Garfield Co RWD #6	Upper Arkansas	69	0%
Garfield Co RWD #6	Upper Arkansas	71	15%
Garfield Co RWD #6	Upper Arkansas	72	43%
Garfield Co RWD #7	Upper Arkansas	63	13%
Garfield Co RWD #7	Upper Arkansas	68	87%
Garvin	Southeast	1	31%
Garvin	Southeast	3	69%
Garvin Co RWD #1	Lower Washita	14	94%
Garvin Co RWD #1	Lower Washita	15	2%
Garvin Co RWD #1	Central	56	4%
Garvin Co RWD #2	Lower Washita	14	17%
Garvin Co RWD #2	Lower Washita	15	83%
Garvin Co RWD #4	Lower Washita	14	81%
Garvin Co RWD #4	Lower Washita	15	19%
Garvin Co RWD #6 (Wells)	Lower Washita	14	100%
Garvin Co RWD #6 (Wells)	Central	56	0%
Gate	Northwest	65	100%
Geary	Central	51	34%
Geary	Central	58	45%
Geary	West Central	59	21%
Gene Autry	Lower Washita	14	100%
Geronimo	Beaver-Cache	28	100%
Gerty	Blue-Boggy	8	100%
Glencoe	Upper Arkansas	71	100%
Glenpool	Middle Arkansas	49	100%
Goldsby	Central	57	29%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Goldsby	Central	58	71%
Goltry	Central	64	84%
Goltry	Upper Arkansas	68	16%
Goodwell	Northwest	55	100%
Gore	Lower Arkansas	47	32%
Gore	Lower Arkansas	82	68%
Gotebo	West Central	19	100%
Gould	Southwest	38	15%
Gould	Southwest	41	85%
Gracemont	Lower Washita	16	100%
Grady Co RWD #1	Lower Washita	16	100%
Grady Co RWD #2	Lower Washita	16	100%
Grady Co RWD #3	Lower Washita	15	100%
Grady Co RWD #6	Lower Washita	16	81%
Grady Co RWD #6	Central	58	19%
Grady Co RWD #7 (Ninnekah)	Lower Washita	14	0%
Grady Co RWD #7 (Ninnekah)	Lower Washita	15	3%
Grady Co RWD #7 (Ninnekah)	Lower Washita	16	97%
Grainola	Upper Arkansas	72	100%
Grand Lake	Grand	81	100%
Grand Lake Towne	Grand	81	100%
Grandfield	Beaver-Cache	29	1%
Grandfield	Beaver-Cache	30	52%
Grandfield	Beaver-Cache	31	48%
Granite	Southwest	36	16%
Granite	Southwest	42	84%
Grant Co RWD #1	Upper Arkansas	68	100%
Grayhorse RWD	Upper Arkansas	71	51%
Grayhorse RWD	Upper Arkansas	72	49%
Grayson	Eufaula	48	100%
Greenfield	Central	51	100%
Grove	Grand	81	100%
Guthrie	Central	60	3%
Guthrie	Central	64	100%
Guymon	Northwest	55	100%
Haileyville	Eufaula	48	100%
Hallett	Upper Arkansas	71	100%
Hammon	West Central	20	100%
Hanna	Eufaula	48	100%
Hardesty	Northwest	55	100%
Harmon Electric	Southwest	38	98%
Harmon Electric	Southwest	39	1%
Harmon Electric	Southwest	42	1%
Harmon Water Corp	Southwest	38	26%
Harmon Water Corp	Southwest	39	3%
Harmon Water Corp	Southwest	40	17%
Harmon Water Corp	Southwest	41	55%
Harper Co Water Corp	Northwest	53	3%
Harper Co Water Corp	Northwest	65	97%
Harrah	Central	50	98%
Harrah	Central	60	2%
Hartshorne	Eufaula	48	100%
Haskell	Lower Arkansas	47	0%
Haskell	Middle Arkansas	49	100%
Haskell Co Water Company	Lower Arkansas	45	1%
Haskell Co Water Company	Lower Arkansas	46	61%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Haskell Co Water Company	Lower Arkansas	47	26%
Haskell Co Water Company	Eufaula	48	12%
Hastings	Beaver-Cache	24	100%
Haworth	Southeast	1	100%
Headrick	Southwest	33	77%
Headrick	Southwest	34	23%
Healdton	Lower Washita	22	96%
Healdton	Lower Washita	23	4%
Heavener	Lower Arkansas	45	100%
Helena	Central	64	100%
Hendrix	Blue-Boggy	13	100%
Hennessey	Central	64	100%
Henryetta	Eufaula	48	100%
Hickory	Blue-Boggy	12	10%
Hickory	Lower Washita	21	90%
Hillsdale	Upper Arkansas	68	100%
Hinton	Lower Washita	16	28%
Hinton	West Central	59	72%
Hitchcock	Central	51	3%
Hitchcock	Central	64	100%
Hitchita	Eufaula	48	100%
Hobart	West Central	19	22%
Hobart	Southwest	34	78%
Hoffman	Eufaula	48	100%
Holdenville	Eufaula	48	51%
Holdenville	Central	56	49%
Hollis	Southwest	38	0%
Hollis	Southwest	39	8%
Hollis	Southwest	41	100%
Hollister	Beaver-Cache	30	100%
Hominy	Middle Arkansas	74	100%
Hooker	Northwest	55	100%
Hoot Owl	Grand	80	100%
Horntown	Eufaula	48	100%
Howe	Lower Arkansas	45	100%
Hughes Co RWD #1	Eufaula	48	94%
Hughes Co RWD #1	Central	50	6%
Hughes Co RWD #2	Eufaula	48	63%
Hughes Co RWD #2	Central	56	0%
Hughes Co RWD #2	Blue-Boggy	8	37%
Hughes Co RWD #3	Eufaula	48	93%
Hughes Co RWD #3	Central	56	7%
Hughes Co RWD #4	Central	56	100%
Hughes Co RWD #5	Eufaula	48	71%
Hughes Co RWD #5	Central	56	29%
Hughes Co RWD #6 (Gerty)	Eufaula	48	23%
Hughes Co RWD #6 (Gerty)	Central	56	35%
Hughes Co RWD #6 (Gerty)	Blue-Boggy	8	42%
Hugo	Blue-Boggy	10	42%
Hugo	Southeast	5	58%
Hulbert	Grand	80	100%
Hunter	Upper Arkansas	72	100%
Hydro	West Central	59	100%
Idabel	Southeast	1	32%
Idabel	Southeast	2	36%
Idabel	Southeast	3	32%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Indiahoma	Beaver-Cache	29	100%
Indianola	Eufaula	48	100%
Indianola RWD #18	Eufaula	48	100%
Inola	Middle Arkansas	77	100%
IXL	Central	60	100%
Jackson Co Water Corp	Southwest	32	8%
Jackson Co Water Corp	Southwest	33	40%
Jackson Co Water Corp	Southwest	34	12%
Jackson Co Water Corp	Southwest	38	39%
Jackson Co Water Corp	Southwest	40	1%
Jamestown	Middle Arkansas	79	100%
Jay	Grand	80	42%
Jay	Grand	81	58%
Jefferson	Upper Arkansas	68	100%
Jefferson Co Cons RWD #1	Lower Washita	14	1%
Jefferson Co Cons RWD #1	Lower Washita	21	10%
Jefferson Co Cons RWD #1	Lower Washita	22	13%
Jefferson Co Cons RWD #1	Lower Washita	23	45%
Jefferson Co Cons RWD #1	Beaver-Cache	24	8%
Jefferson Co Cons RWD #1	Beaver-Cache	25	8%
Jefferson Co Cons RWD #1	Beaver-Cache	26	10%
Jefferson Co Cons RWD #1	Beaver-Cache	31	4%
Jenks	Middle Arkansas	49	100%
Jennings	Upper Arkansas	71	100%
Jet	Upper Arkansas	68	100%
Johnson	Central	50	100%
Johnston Co RWD #3	Blue-Boggy	12	29%
Johnston Co RWD #3	Lower Washita	21	71%
Johnston Co RWD #3	Blue-Boggy	9	0%
Johnston Co RWS & SWMD #4	Blue-Boggy	12	42%
Johnston Co RWS & SWMD #4	Blue-Boggy	9	58%
Jones	Central	50	0%
Jones	Central	60	1%
Kansas	Grand	80	76%
Kansas	Lower Arkansas	82	24%
Katie	Lower Washita	14	100%
Kaw City	Upper Arkansas	72	100%
Kay Co RWD #1	Upper Arkansas	72	100%
Kay Co RWD #2	Upper Arkansas	72	100%
Kay Co RWD #3	Upper Arkansas	67	55%
Kay Co RWD #3	Upper Arkansas	69	7%
Kay Co RWD #3	Upper Arkansas	72	38%
Kay Co RWD #4	Upper Arkansas	72	100%
Kay Co RWD #5 (Dale Water Corp)	Upper Arkansas	67	18%
Kay Co RWD #5 (Dale Water Corp)	Upper Arkansas	69	16%
Kay Co RWD #5 (Dale Water Corp)	Upper Arkansas	70	13%
Kay Co RWD #5 (Dale Water Corp)	Upper Arkansas	72	53%
Kellyville	Middle Arkansas	49	100%
Kemp	Blue-Boggy	13	100%
Kendrick	Central	60	100%
Kenefic	Blue-Boggy	12	100%
Keota	Lower Arkansas	46	100%
Ketchum	Grand	80	51%
Ketchum	Grand	81	49%
Keyes	Northwest	55	100%
Kiefer	Middle Arkansas	49	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Kildare	Upper Arkansas	67	65%
Kildare	Upper Arkansas	72	35%
Kingfisher	Central	64	100%
Kingston	Lower Washita	21	100%
Kinta	Lower Arkansas	46	100%
Kiowa	Eufaula	48	2%
Kiowa	Blue-Boggy	8	98%
Kiowa Co RWS & SWMD #1	Southwest	36	100%
Knowles	Northwest	53	96%
Knowles	Northwest	65	4%
Konawa	Central	56	100%
Krebs	Eufaula	48	100%
Kremlin	Upper Arkansas	68	100%
Kusa RWD #3	Eufaula	48	100%
Lahoma	Upper Arkansas	63	2%
Lahoma	Central	64	100%
Lake Aluma	Central	60	100%
Lamar	Eufaula	48	100%
Lambert	Upper Arkansas	68	100%
Lamont	Upper Arkansas	68	100%
Langley	Grand	80	93%
Langley	Grand	81	7%
Langston	Upper Arkansas	63	100%
Latimer Co RWD #1	Lower Arkansas	45	31%
Latimer Co RWD #1	Eufaula	48	69%
Latimer Co RWD #2	Southeast	6	100%
Latimer Co RWD #4	Lower Arkansas	45	100%
Latimer Co RWD #4	Lower Arkansas	46	0%
Latimer RWD #3	Lower Arkansas	45	91%
Latimer RWD #3	Southeast	6	9%
Laverne	Northwest	53	100%
Lawrence Creek	Upper Arkansas	71	100%
Lawton	Beaver-Cache	25	35%
Lawton	Beaver-Cache	26	12%
Lawton	Beaver-Cache	28	96%
Lawton	Beaver-Cache	29	4%
Le Ann Water	Middle Arkansas	76	100%
Le Flore	Lower Arkansas	45	100%
Lee Creek RWD	Lower Arkansas	46	100%
Leedey	West Central	19	13%
Leedey	West Central	20	87%
Leflore Co RWD #1	Lower Arkansas	45	100%
Leflore Co RWD #14	Lower Arkansas	44	17%
Leflore Co RWD #14	Lower Arkansas	45	52%
Leflore Co RWD #14	Lower Arkansas	46	31%
Leflore Co RWD #15	Lower Arkansas	45	86%
Leflore Co RWD #15	Southeast	4	0%
Leflore Co RWD #15	Southeast	6	14%
Leflore Co RWD #17	Southeast	4	22%
Leflore Co RWD #17	Southeast	6	78%
Leflore Co RWD #2	Lower Arkansas	44	91%
Leflore Co RWD #2	Lower Arkansas	45	9%
Leflore Co RWD #3	Southeast	6	100%
Leflore Co RWD #5	Lower Arkansas	45	100%
Lehigh	Blue-Boggy	8	100%
Lenapah	Middle Arkansas	79	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Leon	Lower Washita	21	100%
Leon RWD #1 (Love County)	Lower Washita	21	100%
Lexington	Central	56	72%
Lexington	Central	58	28%
Liberty	Middle Arkansas	49	100%
Lima	Eufaula	48	100%
Lincoln Co RWD #1	Central	60	100%
Lincoln Co RWD #2	Central	60	100%
Lincoln Co RWD #3	Central	60	100%
Lincoln Co RWD #4	Central	60	32%
Lincoln Co RWD #4	Upper Arkansas	63	11%
Lincoln Co RWD #4	Upper Arkansas	71	57%
Lindsay	Lower Washita	15	100%
Loco	Lower Washita	23	100%
Locust Grove	Grand	80	100%
Logan Co RWD #1	Central	60	22%
Logan Co RWD #1	Central	64	78%
Logan Co RWD #2	Central	64	100%
Logan Co RWS & SWMD #3	Upper Arkansas	63	82%
Logan Co RWS & SWMD #3	Central	64	3%
Logan Co RWS & SWMD #3	Upper Arkansas	71	15%
Lone Chimney	Upper Arkansas	71	100%
Lone Chimney Water Association	Upper Arkansas	71	100%
Lone Grove	Lower Washita	14	17%
Lone Grove	Lower Washita	21	39%
Lone Grove	Lower Washita	22	44%
Lone Wolf	Southwest	34	100%
Longdale	Central	51	100%
Longtown RW & S District #1 Pittsburg C	Eufaula	48	100%
Lookeba	Lower Washita	16	100%
Loveland	Beaver-Cache	30	100%
Loyal	Central	64	100%
Luther	Central	60	100%
Macomb	Central	62	100%
Madill	Lower Washita	21	100%
Major Co RWD #1	Central	51	0%
Major Co RWD #1	Northwest	52	5%
Major Co RWD #1	Central	64	95%
Manchester	Upper Arkansas	68	99%
Mangum	Southwest	36	31%
Mangum	Southwest	38	66%
Mangum	Southwest	39	16%
Mangum	Southwest	42	17%
Manitou	Beaver-Cache	30	100%
Mannford	Middle Arkansas	49	3%
Mannford	Upper Arkansas	71	97%
Mannsville	Lower Washita	21	100%
Maramec	Upper Arkansas	71	100%
Marble City	Lower Arkansas	46	100%
Marietta	Lower Washita	21	100%
Marland	Upper Arkansas	67	53%
Marland	Upper Arkansas	72	47%
Marlow	Lower Washita	14	52%
Marlow	Beaver-Cache	25	48%
Marshall	Upper Arkansas	63	100%
Marshall Co Water Corp	Lower Washita	21	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Martha	Southwest	38	100%
Maud	Central	61	59%
Maud	Central	62	41%
May	Northwest	53	100%
Mayes Co RWD #2	Middle Arkansas	77	42%
Mayes Co RWD #2	Middle Arkansas	78	0%
Mayes Co RWD #2	Grand	80	58%
Mayes Co RWD #3	Grand	80	4%
Mayes Co RWD #3	Grand	81	96%
Mayes Co RWD #4	Grand	80	100%
Mayes Co RWD #5	Middle Arkansas	79	8%
Mayes Co RWD #5	Grand	80	92%
Mayes Co RWD #6	Grand	80	100%
Mayes Co RWD #6	Grand	81	0%
Mayes Co RWD #7	Grand	80	100%
Mayes Co RWD #8	Grand	80	100%
Mayes Co RWD #9	Grand	80	100%
Maysville	Lower Washita	15	100%
McAlester	Eufaula	48	100%
McClain Co RWD #8	Lower Washita	14	4%
McClain Co RWD #8	Lower Washita	15	70%
McClain Co RWD #8	Central	56	26%
McCurtain	Lower Arkansas	45	17%
McCurtain	Lower Arkansas	46	83%
McCurtain Co RWD #1	Southeast	1	57%
McCurtain Co RWD #1	Southeast	2	42%
McCurtain Co RWD #1	Southeast	3	1%
McCurtain Co RWD #2	Southeast	1	49%
McCurtain Co RWD #2	Southeast	3	51%
McCurtain Co RWD #5 (Hochatown)	Southeast	3	55%
McCurtain Co RWD #5 (Hochatown)	Southeast	4	45%
McCurtain Co RWD #7	Southeast	1	95%
McCurtain Co RWD #7	Southeast	2	1%
McCurtain Co RWD #7	Southeast	3	3%
McCurtain Co RWD #8 (Mt Fork Water)	Southeast	2	25%
McCurtain Co RWD #8 (Mt Fork Water)	Southeast	3	72%
McCurtain Co RWD #8 (Mt Fork Water)	Southeast	4	3%
McIntosh Co RWD #13 (Wells)	Eufaula	48	100%
McIntosh Co RWD #13 (Wells)	Central	50	0%
McIntosh Co RWD #3 (Victor)	Lower Arkansas	47	92%
McIntosh Co RWD #3 (Victor)	Eufaula	48	8%
McIntosh Co RWD #4 (Hitchita)	Eufaula	48	100%
McIntosh Co RWD #5	Lower Arkansas	47	73%
McIntosh Co RWD #5	Eufaula	48	27%
McIntosh Co RWD #6 (Vivian)	Eufaula	48	100%
McIntosh Co RWD #8 (Texanna)	Eufaula	48	100%
McIntosh Co RWS & SWMD #2 (Onapa)	Lower Arkansas	47	24%
McIntosh Co RWS & SWMD #2 (Onapa)	Eufaula	48	76%
McIntosh Co RWS & SWMD #9	Eufaula	48	100%
McLoud	Central	50	100%
Mead	Lower Washita	21	100%
Medford	Upper Arkansas	68	100%
Medicine Park	Beaver-Cache	28	100%
Meeker	Central	50	12%
Meeker	Central	60	88%
Meno	Central	64	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Meridian	Central	60	100%
Meridian Water Supply	Central	60	100%
Miami	Grand	81	100%
Midwest City	Central	50	99%
Midwest City	Central	62	1%
Milburn	Blue-Boggy	12	100%
Milburn	Lower Washita	21	11%
Mill Creek	Lower Washita	21	100%
Millerton	Southeast	1	89%
Millerton	Southeast	3	11%
Minco	Central	58	0%
Moffett	Lower Arkansas	46	100%
Moore	Central	50	1%
Moore	Central	58	6%
Moore	Central	62	94%
Mooreland	Northwest	52	100%
Morris	Eufaula	48	100%
Morrison	Upper Arkansas	71	100%
Mounds	Middle Arkansas	49	100%
Mountain Park	Southwest	33	100%
Mountain Park MCD	Beaver-Cache	30	11%
Mountain Park MCD	Southwest	33	35%
Mountain Park MCD	Southwest	34	50%
Mountain Park MCD	Southwest	35	4%
Mountain View	West Central	19	100%
Muldrow	Lower Arkansas	46	100%
Mule Barn	Upper Arkansas	71	100%
Mulhall	Upper Arkansas	63	100%
Murray Co RWD #1	Blue-Boggy	12	1%
Murray Co RWD #1	Lower Washita	14	78%
Murray Co RWD #1	Lower Washita	21	9%
Murray Co RWD #1	Central	56	12%
Muskogee	Lower Arkansas	47	75%
Muskogee	Middle Arkansas	49	22%
Muskogee	Middle Arkansas	77	1%
Muskogee	Grand	80	2%
Muskogee Co RWD #1 (Oktaha)	Lower Arkansas	47	99%
Muskogee Co RWD #1 (Oktaha)	Middle Arkansas	49	1%
Muskogee Co RWD #10	Middle Arkansas	49	100%
Muskogee Co RWD #2 (Gooseneck)	Lower Arkansas	47	100%
Muskogee Co RWD #3	Lower Arkansas	47	11%
Muskogee Co RWD #3	Eufaula	48	62%
Muskogee Co RWD #3	Middle Arkansas	49	27%
Muskogee Co RWD #4	Lower Arkansas	47	100%
Muskogee Co RWD #5	Lower Arkansas	47	100%
Muskogee Co RWD #6	Lower Arkansas	47	40%
Muskogee Co RWD #6	Middle Arkansas	49	60%
Muskogee Co RWD #7	Lower Arkansas	47	95%
Muskogee Co RWD #7	Grand	80	5%
Muskogee Co RWD #9	Middle Arkansas	49	100%
Mustang	Central	50	69%
Mustang	Central	58	31%
Mutual	Northwest	52	100%
Nash	Upper Arkansas	68	100%
New Alluwe	Middle Arkansas	79	100%
New Cordell	West Central	19	94%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
New Cordell	Southwest	34	6%
Newcastle	Central	57	0%
Newcastle	Central	58	0%
Newkirk	Upper Arkansas	67	99%
Newkirk	Upper Arkansas	72	1%
Nichols Hills	Central	60	0%
Nichols Hills	Central	64	13%
Nicoma Park	Central	50	100%
Ninnekah	Lower Washita	16	100%
Noble	Central	58	86%
Noble	Central	62	14%
Noble Co RWD #1 (Lucien)	Upper Arkansas	63	3%
Noble Co RWD #1 (Lucien)	Upper Arkansas	71	97%
Noble Co RWD #2	Upper Arkansas	71	80%
Noble Co RWD #2	Upper Arkansas	72	20%
Noble Co RWD #3	Upper Arkansas	67	15%
Noble Co RWD #3	Upper Arkansas	72	85%
Noble Co RWD #4	Upper Arkansas	67	12%
Noble Co RWD #4	Upper Arkansas	72	88%
Norge	Lower Washita	16	100%
Norge Water Co.	Lower Washita	16	100%
Norman	Central	58	0%
Norman	Central	62	79%
North Blaine Water	Central	51	1%
North Blaine Water	Northwest	52	0%
North Blaine Water	Central	64	99%
North Enid	Upper Arkansas	63	100%
North Miami	Grand	81	100%
Nowata	Middle Arkansas	79	100%
Nowata Co RW & S District #1	Middle Arkansas	76	68%
Nowata Co RW & S District #1	Middle Arkansas	79	32%
Nowata Co RWD #2	Middle Arkansas	76	1%
Nowata Co RWD #2	Middle Arkansas	79	99%
Nowata Co RWD #3	Middle Arkansas	79	100%
Nowata Co RWD #6	Middle Arkansas	79	100%
Nowata Co RWD #7	Middle Arkansas	79	100%
Oak Grove	Upper Arkansas	71	100%
Oakland	Lower Washita	21	100%
Oaks	Grand	80	100%
Oaks	Lower Arkansas	82	0%
Oaks Water Works Inc	Grand	80	100%
Oakwood	West Central	59	100%
Ochelata	Middle Arkansas	76	100%
Oilton	Upper Arkansas	71	100%
Okarche	Central	64	100%
Okarche RWD	Central	51	8%
Okarche RWD	Central	64	92%
Okay	Lower Arkansas	47	10%
Okay	Middle Arkansas	49	26%
Okay	Middle Arkansas	77	100%
Okay	Grand	80	24%
Okeene	Central	64	100%
Okemah	Central	50	90%
Okemah	Central	60	10%
Okfuskee Co RWD #1 (Boley)	Central	50	97%
Okfuskee Co RWD #1 (Boley)	Central	60	3%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Okfuskee Co RWD #2	Eufaula	48	7%
Okfuskee Co RWD #2	Central	50	56%
Okfuskee Co RWD #2	Central	60	37%
Okfuskee Co RWD #3	Eufaula	48	42%
Okfuskee Co RWD #3	Central	50	7%
Okfuskee Co RWD #3	Central	60	51%
Oklahoma City	Central	50	0%
Oklahoma City	Central	51	8%
Oklahoma City	Central	56	6%
Oklahoma City	Central	58	13%
Oklahoma City	Central	60	0%
Oklahoma City	Central	61	4%
Oklahoma City	Central	62	16%
Oklahoma City	Central	64	15%
Oklahoma City	Southeast	6	0%
Oklahoma City	Blue-Boggy	7	2%
Oklahoma City	Blue-Boggy	8	7%
Oklahoma City	Blue-Boggy	9	3%
Okmulgee	Eufaula	48	100%
Okmulgee Co RWD #1	Eufaula	48	100%
Okmulgee Co RWD #2 (Preston)	Eufaula	48	37%
Okmulgee Co RWD #2 (Preston)	Middle Arkansas	49	63%
Okmulgee Co RWD #20	Eufaula	48	25%
Okmulgee Co RWD #20	Middle Arkansas	49	75%
Okmulgee Co RWD #21	Eufaula	48	100%
Okmulgee Co RWD #4	Eufaula	48	100%
Okmulgee Co RWD #5 (Bryant RWD #5)	Eufaula	48	100%
Okmulgee Co RWD #6 (Hectorville RWD	Eufaula	48	8%
Okmulgee Co RWD #6 (Hectorville RWD	Middle Arkansas	49	85%
Okmulgee Co RWD #6 (Hectorville RWD	Central	60	7%
Okmulgee Co RWD #7 (Nuyaka)	Eufaula	48	57%
Okmulgee Co RWD #7 (Nuyaka)	Central	60	43%
Oktaha	Lower Arkansas	47	100%
Olustee	Southwest	38	100%
Oologah	Middle Arkansas	78	100%
Optima	Northwest	55	100%
Orlando	Upper Arkansas	63	68%
Orlando	Upper Arkansas	71	32%
Osage	Upper Arkansas	71	100%
Osage Co RWD #1	Middle Arkansas	74	3%
Osage Co RWD #1	Middle Arkansas	76	97%
Osage Co RWD #15	Middle Arkansas	74	100%
Osage Co RWD #18 (Evergreen)	Middle Arkansas	74	100%
Osage Co RWD #20 (Hulah)	Middle Arkansas	76	100%
Osage Co RWD #21	Upper Arkansas	71	0%
Osage Co RWD #21	Upper Arkansas	72	76%
Osage Co RWD #21	Middle Arkansas	74	23%
Osage Co RWD #21	Middle Arkansas	76	1%
Osage Co RWD #5	Middle Arkansas	74	71%
Osage Co RWD #5	Middle Arkansas	76	29%
Osage Co RWS & SWD #3 (Braden)	Upper Arkansas	72	100%
Ottawa Co RWD #3	Grand	81	100%
Ottawa Co RWD #4	Grand	81	100%
Ottawa Co RWD #5	Grand	81	100%
Ottawa Co RWD #6	Grand	81	100%
Ottawa Co RWD #7	Grand	81	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Owasso	Middle Arkansas	73	88%
Owasso	Middle Arkansas	74	0%
Owasso	Middle Arkansas	75	11%
Owasso	Middle Arkansas	78	1%
Paden	Central	50	6%
Paden	Central	60	94%
Panama	Lower Arkansas	44	100%
Paoli	Lower Washita	15	100%
Paradise Hill	Lower Arkansas	82	100%
Pauls Valley	Lower Washita	14	100%
Pawhuska	Middle Arkansas	74	100%
Pawhuska	Middle Arkansas	76	3%
Pawnee	Upper Arkansas	71	100%
Pawnee Co RWD #1	Upper Arkansas	71	100%
Pawnee Co RWD #3	Upper Arkansas	71	100%
Pawnee Co RWD #4	Upper Arkansas	71	100%
Pawnee Co RWD #5	Upper Arkansas	71	100%
Payne Co RW Corp #3	Upper Arkansas	63	25%
Payne Co RW Corp #3	Upper Arkansas	71	75%
Payne Co RWD #3	Upper Arkansas	63	81%
Payne Co RWD #3	Upper Arkansas	71	19%
Payne Co RWD #4	Upper Arkansas	71	100%
Peggs	Grand	80	100%
Pensacola	Grand	80	100%
Peoria	Grand	81	100%
Perkins	Upper Arkansas	63	100%
Perry	Upper Arkansas	71	100%
Phillips	Blue-Boggy	8	100%
Phillips RWD #1	Blue-Boggy	8	100%
Piedmont	Central	64	100%
Pink	Central	50	5%
Pink	Central	62	95%
Pittsburg	Eufaula	48	100%
Pittsburg Co PWA (Crowder)	Eufaula	48	100%
Pittsburg Co RWD #14	Lower Arkansas	46	8%
Pittsburg Co RWD #14	Eufaula	48	92%
Pittsburg Co RWD #16	Eufaula	48	100%
Pittsburg Co RWD #4 (Canadian)	Eufaula	48	100%
Pittsburg Co RWD #5	Eufaula	48	100%
Pittsburg Co RWD #6 (Alderson)	Eufaula	48	100%
Pittsburg Co RWD #7 (Haywood)	Eufaula	48	100%
Pittsburg Co RWD #9 (McAlester)	Eufaula	48	100%
Pocasset	Lower Washita	16	100%
Pocola	Lower Arkansas	44	91%
Pocola	Lower Arkansas	45	9%
Ponca City	Upper Arkansas	67	38%
Ponca City	Upper Arkansas	72	62%
Pond Creek	Upper Arkansas	68	100%
Pontotoc Co RWD #1 (Homer)	Central	56	3%
Pontotoc Co RWD #1 (Homer)	Blue-Boggy	8	96%
Pontotoc Co RWD #1 (Homer)	Blue-Boggy	9	1%
Pontotoc Co RWD #6 (Fittstown)	Blue-Boggy	12	11%
Pontotoc Co RWD #6 (Fittstown)	Blue-Boggy	9	89%
Pontotoc Co RWD #7	Central	56	20%
Pontotoc Co RWD #7	Blue-Boggy	8	50%
Pontotoc Co RWD #7	Blue-Boggy	9	30%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Pontotoc Co RWD #8	Blue-Boggy	12	11%
Pontotoc Co RWD #8	Central	56	86%
Pontotoc Co RWD #8	Blue-Boggy	9	3%
Pontotoc Co RWD #9	Blue-Boggy	9	100%
Porter	Middle Arkansas	49	34%
Porter	Middle Arkansas	77	66%
Porum	Lower Arkansas	47	100%
Porum	Eufaula	48	13%
Poteau	Lower Arkansas	44	6%
Poteau	Lower Arkansas	45	100%
Pottawatomie Co Development Authority	Central	50	53%
Pottawatomie Co Development Authority	Central	61	0%
Pottawatomie Co Development Authority	Central	62	46%
Pottawatomie Co RWD #2 (Tri County)	Eufaula	48	15%
Pottawatomie Co RWD #2 (Tri County)	Central	50	69%
Pottawatomie Co RWD #2 (Tri County)	Central	60	1%
Pottawatomie Co RWD #2 (Tri County)	Central	62	15%
Pottawatomie Co RWD #3	Central	56	100%
Prague	Central	50	52%
Prague	Central	60	48%
Prue	Upper Arkansas	71	100%
Pryor	Grand	80	100%
Pryor East RWD #1	Grand	80	100%
Purcell	Lower Washita	15	5%
Purcell	Central	56	13%
Purcell	Central	57	44%
Purcell	Central	58	37%
Pushmataha Co RWD #1	Southeast	6	100%
Pushmataha Co RWD #2 (Albion)	Southeast	6	100%
Pushmataha Co RWD #3	Southeast	3	9%
Pushmataha Co RWD #3	Southeast	5	14%
Pushmataha Co RWD #3	Southeast	6	71%
Pushmataha Co RWD #3	Blue-Boggy	7	6%
Pushmataha Co RWD #5 (Nashoba)	Southeast	3	97%
Pushmataha Co RWD #5 (Nashoba)	Southeast	6	3%
Putnam	West Central	59	100%
Quapaw	Grand	81	100%
Quapaw Tribe	Grand	81	100%
Quay	Upper Arkansas	71	100%
Quinlan Community RWD #1	Northwest	52	13%
Quinlan Community RWD #1	Central	64	23%
Quinlan Community RWD #1	Northwest	65	65%
Quinton	Lower Arkansas	46	100%
R&C Water Corp	Upper Arkansas	68	100%
R&C Water Corp	Upper Arkansas	70	0%
Ralston	Upper Arkansas	71	100%
Ramona	Middle Arkansas	75	18%
Ramona	Middle Arkansas	76	82%
Randlett	Beaver-Cache	30	1%
Randlett	Beaver-Cache	31	99%
Ratliff City	Lower Washita	14	100%
Rattan	Southeast	5	100%
Ravia	Lower Washita	21	100%
Red Bird	Middle Arkansas	49	89%
Red Bird	Middle Arkansas	77	11%
Red Oak	Lower Arkansas	45	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Red Rock	Upper Arkansas	72	100%
Redbird	Middle Arkansas	49	89%
Redbird	Middle Arkansas	77	11%
Reed	Southwest	39	40%
Reed	Southwest	42	8%
Reed	Southwest	43	52%
Renfrow	Upper Arkansas	68	100%
Rentiesville	Lower Arkansas	47	100%
Reydon	West Central	20	100%
Ringling	Lower Washita	23	100%
Ringwood	Central	64	100%
Ripley	Upper Arkansas	63	6%
Ripley	Upper Arkansas	71	94%
Rock Island	Lower Arkansas	44	0%
Rock Island	Lower Arkansas	45	100%
Rocky	Southwest	34	100%
Roff	Blue-Boggy	12	100%
Roger Mills RWD #2 (Red Star)	West Central	19	4%
Roger Mills RWD #2 (Red Star)	West Central	20	69%
Roger Mills RWD #2 (Red Star)	West Central	59	27%
Roger Mills RWS & SWMD #1	West Central	20	100%
Roger Mills RWS & SWMD #3	West Central	20	100%
Rogers Co RWD #2	Middle Arkansas	78	100%
Rogers Co RWD #3 Lake Plant	Middle Arkansas	73	9%
Rogers Co RWD #3 Lake Plant	Middle Arkansas	75	6%
Rogers Co RWD #3 Lake Plant	Middle Arkansas	78	46%
Rogers Co RWD #3 Lake Plant	Middle Arkansas	79	30%
Rogers Co RWD #3 Lake Plant	Grand	80	9%
Rogers Co RWD #4	Middle Arkansas	75	46%
Rogers Co RWD #4	Middle Arkansas	76	1%
Rogers Co RWD #4	Middle Arkansas	78	31%
Rogers Co RWD #4	Middle Arkansas	79	22%
Rogers Co RWD #5	Middle Arkansas	73	16%
Rogers Co RWD #5	Middle Arkansas	77	6%
Rogers Co RWD #5	Middle Arkansas	78	78%
Rogers Co RWD #6	Middle Arkansas	77	67%
Rogers Co RWD #6	Middle Arkansas	78	33%
Rogers Co RWD #7	Middle Arkansas	78	65%
Rogers Co RWD #7	Grand	80	35%
Rogers Co RWD #8	Middle Arkansas	78	100%
Rogers Co RWD #9	Middle Arkansas	78	100%
Roland	Lower Arkansas	46	100%
Roosevelt	Southwest	35	100%
Rosedale	Central	56	100%
Rosston	Northwest	53	100%
Roundhill RWD #4	Blue-Boggy	8	100%
Rush Springs	Lower Washita	14	100%
Ryan	Lower Washita	21	7%
Ryan	Beaver-Cache	24	93%
Salina	Grand	80	100%
Sallisaw	Lower Arkansas	46	100%
Sand Springs	Middle Arkansas	49	0%
Sand Springs	Upper Arkansas	71	2%
Sand Springs	Middle Arkansas	74	2%
Sapulpa	Middle Arkansas	49	0%
Sapulpa Rural Water Company	Middle Arkansas	49	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Sasakwa	Central	61	100%
Sasakwa PWA	Central	61	100%
Sasakwa RWD	Central	56	79%
Sasakwa RWD	Central	61	21%
Savanna	Eufaula	48	100%
Sawyer	Southeast	5	100%
Sayre	Southwest	37	100%
Schulter	Eufaula	48	100%
Seiling	Northwest	52	100%
Seminole	Eufaula	48	100%
Seminole Co RW & SWMD #3	Eufaula	48	57%
Seminole Co RW & SWMD #3	Central	50	43%
Seminole Co RWD #1	Eufaula	48	100%
Seminole Co RWD #2	Eufaula	48	100%
Seminole Co RWD #5	Eufaula	48	100%
Sentinel	Southwest	34	100%
Sequoyah Co RWD #3	Lower Arkansas	46	100%
Sequoyah Co RWD #4	Lower Arkansas	46	100%
Sequoyah Co RWD #5	Lower Arkansas	46	46%
Sequoyah Co RWD #5	Lower Arkansas	47	13%
Sequoyah Co RWD #5	Lower Arkansas	82	40%
Sequoyah Co RWD #7	Lower Arkansas	44	0%
Sequoyah Co RWD #7	Lower Arkansas	46	100%
Sequoyah Co Water Assoc	Lower Arkansas	46	85%
Sequoyah Co Water Assoc	Lower Arkansas	47	3%
Sequoyah Co Water Assoc	Lower Arkansas	82	12%
Shady Point	Lower Arkansas	45	100%
Shamrock	Central	60	100%
Sharon	Northwest	52	100%
Shattuck	Northwest	54	100%
Shawnee	Central	50	99%
Shawnee	Central	60	1%
Shawnee	Central	62	0%
Shidler	Upper Arkansas	72	100%
Silo	Blue-Boggy	12	48%
Silo	Lower Washita	21	52%
Skedee	Upper Arkansas	71	100%
Skiatook	Upper Arkansas	71	0%
Skiatook	Middle Arkansas	74	86%
Skiatook	Middle Arkansas	75	14%
Slaughterville	Central	56	42%
Slaughterville	Central	58	44%
Slaughterville	Central	62	13%
Slick	Middle Arkansas	49	2%
Slick	Central	60	98%
Smith Village	Central	50	100%
Smithville	Southeast	4	100%
Snyder	Southwest	33	100%
Snyder	Southwest	35	0%
Soper	Blue-Boggy	7	100%
South Coffeyville	Middle Arkansas	79	100%
Southern Okla Water Corp	Lower Washita	14	28%
Southern Okla Water Corp	Lower Washita	21	59%
Southern Okla Water Corp	Lower Washita	22	14%
Sparks	Central	60	100%
Spaulding	Central	56	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Spavinaw	Grand	80	100%
Spencer	Central	50	100%
Sperry	Middle Arkansas	73	7%
Sperry	Middle Arkansas	74	93%
Spiro	Lower Arkansas	44	17%
Spiro	Lower Arkansas	46	83%
Spiro East RWS	Lower Arkansas	44	42%
Spiro East RWS	Lower Arkansas	46	58%
Sportsmen Acres	Grand	80	100%
Springer	Lower Washita	14	100%
St Louis RWD	Central	61	100%
St. Louis	Central	61	100%
Stephens Co RW & SD #1	Lower Washita	14	76%
Stephens Co RW & SD #1	Lower Washita	23	24%
Stephens Co RWD #3 (Meridian)	Beaver-Cache	26	100%
Stephens Co RWD #4 (Loco)	Lower Washita	23	100%
Stephens Co RWD #5	Lower Washita	14	53%
Stephens Co RWD #5	Lower Washita	23	11%
Stephens Co RWD #5	Beaver-Cache	25	27%
Stephens Co RWD #5	Beaver-Cache	26	9%
Sterling	Beaver-Cache	25	100%
Stick Ross Mt Water Co.	Lower Arkansas	47	85%
Stick Ross Mt Water Co.	Lower Arkansas	82	15%
Stidham	Eufaula	48	100%
Stigler	Lower Arkansas	47	100%
Stillwater	Upper Arkansas	71	100%
Stilwell	Lower Arkansas	46	13%
Stilwell	Lower Arkansas	82	87%
Stonewall	Blue-Boggy	9	100%
Strang	Grand	80	100%
Stratford	Central	56	100%
Strike-Axe Hwy 60	Middle Arkansas	76	100%
Stringtown	Southeast	6	10%
Stringtown	Blue-Boggy	8	100%
Strong City	West Central	20	100%
Stroud	Central	60	100%
Stuart	Eufaula	48	100%
Sugden	Beaver-Cache	24	100%
Sulphur	Lower Washita	14	100%
Summit	Lower Arkansas	47	100%
SW Water Inc	Upper Arkansas	68	100%
Sweetwater	Southwest	37	100%
Taft	Middle Arkansas	49	100%
Tahlequah	Grand	80	18%
Tahlequah	Lower Arkansas	82	82%
Talala	Middle Arkansas	78	100%
Talihina	Southeast	6	100%
Taloga	West Central	59	100%
Tamaha	Lower Arkansas	46	99%
Tamaha	Lower Arkansas	47	1%
Tatums	Lower Washita	14	100%
Tecumseh	Central	50	67%
Tecumseh	Central	62	33%
Temple	Beaver-Cache	27	34%
Temple	Beaver-Cache	31	66%
Terlton	Upper Arkansas	71	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Terral	Lower Washita	21	100%
Texas Co RWD #1	Northwest	55	100%
Texhoma	Northwest	55	100%
Texola	Southwest	37	95%
Texola	Southwest	43	5%
Thackerville	Lower Washita	21	100%
The Village	Central	64	100%
Thirsty Water Corp	Southwest	36	7%
Thirsty Water Corp	Southwest	37	0%
Thirsty Water Corp	Southwest	42	4%
Thirsty Water Corp	Southwest	43	89%
Thomas	West Central	59	100%
Tillman Co RWD #1	Beaver-Cache	27	3%
Tillman Co RWD #1	Beaver-Cache	29	11%
Tillman Co RWD #1	Beaver-Cache	30	66%
Tillman Co RWD #1	Beaver-Cache	31	20%
Tipton	Beaver-Cache	30	1%
Tipton	Beaver-Cache	31	28%
Tipton	Southwest	32	100%
Tishomingo	Lower Washita	21	100%
Tonkawa	Upper Arkansas	67	95%
Tonkawa	Upper Arkansas	68	5%
Tonkawa	Upper Arkansas	69	0%
Tribbey	Central	56	4%
Tribbey	Central	61	30%
Tribbey	Central	62	66%
Tryon	Central	60	4%
Tryon	Upper Arkansas	63	96%
Tullahassee	Middle Arkansas	49	11%
Tullahassee	Middle Arkansas	77	89%
Tulsa	Middle Arkansas	49	41%
Tulsa	Middle Arkansas	73	46%
Tulsa	Middle Arkansas	74	0%
Tulsa	Middle Arkansas	75	0%
Tulsa	Middle Arkansas	77	5%
Tulsa	Middle Arkansas	78	7%
Tupelo	Blue-Boggy	9	100%
Tushka	Blue-Boggy	9	100%
Tuttle	Central	58	0%
Tyrone	Northwest	55	100%
Union City	Central	51	21%
Union City	Central	58	0%
Valley Brook	Central	50	100%
Valley Park	Middle Arkansas	78	100%
Valliant	Southeast	1	63%
Valliant	Southeast	3	37%
Velma	Lower Washita	14	100%
Vera	Middle Arkansas	74	17%
Vera	Middle Arkansas	75	83%
Verden	Lower Washita	16	100%
Verdigris	Middle Arkansas	78	100%
Vernon	Eufaula	48	100%
Vian	Lower Arkansas	46	100%
Vici	Northwest	52	44%
Vici	West Central	59	56%
Vinita	Grand	80	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Wagoner	Middle Arkansas	77	63%
Wagoner	Grand	80	37%
Wagoner Co RWD #1	Middle Arkansas	77	8%
Wagoner Co RWD #1	Grand	80	92%
Wagoner Co RWD #2	Grand	80	100%
Wagoner Co RWD #4	Middle Arkansas	49	46%
Wagoner Co RWD #4	Middle Arkansas	77	47%
Wagoner Co RWD #4	Middle Arkansas	78	7%
Wagoner Co RWD #5	Middle Arkansas	49	44%
Wagoner Co RWD #5	Middle Arkansas	77	56%
Wagoner Co RWD #6	Middle Arkansas	77	95%
Wagoner Co RWD #6	Grand	80	5%
Wagoner Co RWD #7	Middle Arkansas	77	58%
Wagoner Co RWD #7	Grand	80	42%
Wagoner Co RWD #9	Grand	80	100%
Wainwright	Lower Arkansas	47	100%
Wakita	Upper Arkansas	68	100%
Walters	Beaver-Cache	27	24%
Walters	Beaver-Cache	28	41%
Walters	Beaver-Cache	29	35%
Wanette	Central	56	100%
Wann	Middle Arkansas	76	100%
Wapanucka	Blue-Boggy	9	100%
Warner	Lower Arkansas	47	100%
Warr Acres	Central	50	3%
Warr Acres	Central	51	0%
Warr Acres	Central	60	15%
Warr Acres	Central	64	82%
Warwick	Central	60	100%
Washington	Central	57	100%
Washington Co RWD #1	Middle Arkansas	76	100%
Washington Co RWD #2	Middle Arkansas	76	100%
Washington Co RWD #3	Middle Arkansas	73	20%
Washington Co RWD #3	Middle Arkansas	74	31%
Washington Co RWD #3	Middle Arkansas	75	49%
Washington Co RWD #3	Middle Arkansas	76	1%
Washington Co RWD #3	Middle Arkansas	78	0%
Washington Co RWD #5	Middle Arkansas	76	100%
Washita Co RWD #2	West Central	18	18%
Washita Co RWD #2	West Central	19	79%
Washita Co RWD #2	West Central	59	3%
Water Improvement District #3	Middle Arkansas	73	42%
Water Improvement District #3	Middle Arkansas	74	58%
Watonga	Central	51	77%
Watonga	Central	64	23%
Watts	Lower Arkansas	82	100%
Waukomis	Upper Arkansas	63	70%
Waukomis	Central	64	30%
Waurika	Beaver-Cache	24	87%
Waurika	Beaver-Cache	26	13%
Wayne	Lower Washita	15	52%
Wayne	Central	56	48%
Waynoka	Central	64	13%
Waynoka	Northwest	65	87%
Weatherford	West Central	59	100%
Webb City	Upper Arkansas	72	100%

Appendix C.1 - Community / Public Supplier

Community / Public Supplier Name	Planning Region	Planning Basin Number	Percent within Basin
Webbers Falls	Lower Arkansas	47	100%
Welch	Grand	80	100%
Welch	Grand	81	43%
Weleetka	Eufaula	48	100%
Wellston	Central	60	100%
West Davis RWD	Lower Washita	14	100%
West Siloam Springs	Lower Arkansas	82	100%
Western Carter Co Water Corp	Lower Washita	14	81%
Western Carter Co Water Corp	Lower Washita	22	18%
Western Carter Co Water Corp	Lower Washita	23	1%
Westport	Upper Arkansas	71	100%
Westville	Lower Arkansas	82	100%
Wetumka	Eufaula	48	48%
Wetumka	Central	50	52%
Wewoka	Eufaula	48	100%
Whitefield	Lower Arkansas	47	100%
Wilburton	Lower Arkansas	45	100%
Wilburton	Eufaula	48	10%
Willow	Southwest	36	100%
Willow	Southwest	43	11%
Wilson	Lower Washita	22	100%
Winchester	Eufaula	48	23%
Winchester	Middle Arkansas	49	77%
Wister	Lower Arkansas	45	100%
Woodlawn Park	Central	51	100%
Woods Co RWD #1	Upper Arkansas	68	100%
Woods Co RWD #2	Northwest	65	78%
Woods Co RWD #3	Central	64	44%
Woods Co RWD #3	Northwest	65	22%
Woods Co RWD #3	Upper Arkansas	68	34%
Woodville	Lower Washita	21	100%
Woodward	Northwest	53	100%
Woodward Co RWD #1	Northwest	52	3%
Woodward Co RWD #1	Northwest	65	97%
Woodward Co RWD #2	Northwest	52	47%
Woodward Co RWD #2	Northwest	53	43%
Woodward Co RWD #2	Northwest	54	10%
Wright City	Southeast	3	100%
Wyandotte	Grand	81	100%
Wynnewood	Lower Washita	14	100%
Wynona	Middle Arkansas	74	100%
Yale	Upper Arkansas	71	100%
Yeager	Eufaula	48	100%
Yukon	Central	50	1%
Yukon	Central	51	99%
Yukon	Central	58	4%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
ADAIR	82	Lower Arkansas	44%
ADAIR	46	Lower Arkansas	12%
ALFALFA	68	Upper Arkansas	31%
ALFALFA	64	Central	5%
ATOKA	8	Blue-Boggy	45%
ATOKA	9	Blue-Boggy	34%
ATOKA	7	Blue-Boggy	24%
ATOKA	6	Southeast	4%
ATOKA	12	Blue-Boggy	3%
ATOKA	48	Eufaula	0%
BEAVER	53	Northwest	61%
BEAVER	65	Northwest	19%
BEAVER	55	Northwest	14%
BECKHAM	37	Southwest	79%
BECKHAM	43	Southwest	32%
BECKHAM	36	Southwest	28%
BECKHAM	34	Southwest	16%
BECKHAM	20	West Central	4%
BLAINE	51	Central	46%
BLAINE	59	West Central	11%
BLAINE	64	Central	10%
BLAINE	52	Northwest	3%
BRYAN	11	Blue-Boggy	100%
BRYAN	13	Blue-Boggy	100%
BRYAN	12	Blue-Boggy	31%
BRYAN	10	Blue-Boggy	29%
BRYAN	9	Blue-Boggy	9%
BRYAN	21	Lower Washita	6%
CADDO	17	West Central	100%
CADDO	18	West Central	69%
CADDO	16	Lower Washita	44%
CADDO	28	Beaver-Cache	27%
CADDO	58	Central	5%
CADDO	59	West Central	5%
CADDO	19	West Central	2%
CANADIAN	51	Central	48%
CANADIAN	58	Central	40%
CANADIAN	64	Central	7%
CANADIAN	50	Central	3%
CANADIAN	16	Lower Washita	1%
CANADIAN	59	West Central	0%
CARTER	22	Lower Washita	64%
CARTER	14	Lower Washita	23%
CARTER	21	Lower Washita	9%
CARTER	23	Lower Washita	8%
CHEROKEE	82	Lower Arkansas	39%
CHEROKEE	80	Grand	15%
CHEROKEE	47	Lower Arkansas	12%
CHEROKEE	46	Lower Arkansas	0%
CHOCTAW	5	Southeast	75%
CHOCTAW	7	Blue-Boggy	72%
CHOCTAW	10	Blue-Boggy	71%
CHOCTAW	1	Southeast	8%
CHOCTAW	9	Blue-Boggy	5%
CHOCTAW	3	Southeast	1%
CHOCTAW	6	Southeast	0%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
CIMARRON	66	Northwest	97%
CIMARRON	55	Northwest	32%
CLEVELAND	62	Central	50%
CLEVELAND	58	Central	19%
CLEVELAND	56	Central	12%
CLEVELAND	50	Central	1%
COAL	8	Blue-Boggy	27%
COAL	9	Blue-Boggy	22%
COMANCHE	29	Beaver-Cache	73%
COMANCHE	28	Beaver-Cache	63%
COMANCHE	25	Beaver-Cache	37%
COMANCHE	33	Southwest	4%
COMANCHE	30	Beaver-Cache	3%
COMANCHE	35	Southwest	3%
COMANCHE	16	Lower Washita	2%
COMANCHE	19	West Central	1%
COTTON	27	Beaver-Cache	100%
COTTON	31	Beaver-Cache	30%
COTTON	29	Beaver-Cache	24%
COTTON	30	Beaver-Cache	20%
COTTON	25	Beaver-Cache	14%
COTTON	28	Beaver-Cache	9%
CRAIG	80	Grand	25%
CRAIG	79	Middle Arkansas	21%
CRAIG	81	Grand	8%
CREEK	49	Middle Arkansas	26%
CREEK	60	Central	22%
CREEK	71	Upper Arkansas	10%
CUSTER	19	West Central	30%
CUSTER	20	West Central	19%
CUSTER	59	West Central	15%
CUSTER	18	West Central	3%
DELAWARE	81	Grand	39%
DELAWARE	80	Grand	18%
DELAWARE	82	Lower Arkansas	9%
DEWEY	59	West Central	32%
DEWEY	52	Northwest	26%
DEWEY	51	Central	4%
DEWEY	19	West Central	4%
DEWEY	20	West Central	1%
ELLIS	54	Northwest	80%
ELLIS	59	West Central	27%
ELLIS	53	Northwest	10%
ELLIS	52	Northwest	1%
GARFIELD	63	Upper Arkansas	33%
GARFIELD	72	Upper Arkansas	12%
GARFIELD	64	Central	7%
GARFIELD	71	Upper Arkansas	7%
GARFIELD	68	Upper Arkansas	6%
GARVIN	14	Lower Washita	33%
GARVIN	15	Lower Washita	29%
GARVIN	56	Central	4%
GRADY	16	Lower Washita	53%
GRADY	15	Lower Washita	29%
GRADY	58	Central	22%
GRADY	57	Central	20%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
GRADY	25	Beaver-Cache	9%
GRADY	14	Lower Washita	6%
GRANT	68	Upper Arkansas	42%
GRANT	70	Upper Arkansas	26%
GRANT	72	Upper Arkansas	0%
GREER	42	Southwest	100%
GREER	43	Southwest	52%
GREER	36	Southwest	43%
GREER	39	Southwest	37%
GREER	38	Southwest	27%
GREER	34	Southwest	1%
HARMON	41	Southwest	92%
HARMON	39	Southwest	63%
HARMON	38	Southwest	18%
HARMON	43	Southwest	16%
HARMON	40	Southwest	13%
HARPER	65	Northwest	39%
HARPER	53	Northwest	17%
HASKELL	46	Lower Arkansas	28%
HASKELL	47	Lower Arkansas	13%
HASKELL	45	Lower Arkansas	3%
HASKELL	48	Eufaula	2%
HUGHES	56	Central	19%
HUGHES	48	Eufaula	15%
HUGHES	8	Blue-Boggy	11%
HUGHES	50	Central	2%
JACKSON	40	Southwest	85%
JACKSON	38	Southwest	55%
JACKSON	33	Southwest	46%
JACKSON	32	Southwest	31%
JACKSON	41	Southwest	8%
JACKSON	34	Southwest	7%
JEFFERSON	24	Beaver-Cache	100%
JEFFERSON	23	Lower Washita	52%
JEFFERSON	26	Beaver-Cache	24%
JEFFERSON	21	Lower Washita	12%
JEFFERSON	31	Beaver-Cache	11%
JEFFERSON	25	Beaver-Cache	4%
JOHNSTON	12	Blue-Boggy	42%
JOHNSTON	21	Lower Washita	23%
JOHNSTON	9	Blue-Boggy	8%
JOHNSTON	14	Lower Washita	0%
KAY	69	Upper Arkansas	100%
KAY	67	Upper Arkansas	85%
KAY	70	Upper Arkansas	74%
KAY	72	Upper Arkansas	23%
KAY	68	Upper Arkansas	4%
KINGFISHER	64	Central	22%
KINGFISHER	63	Upper Arkansas	9%
KIOWA	35	Southwest	97%
KIOWA	34	Southwest	40%
KIOWA	33	Southwest	29%
KIOWA	36	Southwest	26%
KIOWA	19	West Central	24%
KIOWA	30	Beaver-Cache	7%
KIOWA	28	Beaver-Cache	1%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
KIOWA	29	Beaver-Cache	1%
LATIMER	45	Lower Arkansas	24%
LATIMER	6	Southeast	11%
LATIMER	48	Eufaula	6%
LATIMER	46	Lower Arkansas	4%
LE FLORE	44	Lower Arkansas	100%
LE FLORE	45	Lower Arkansas	73%
LE FLORE	4	Southeast	27%
LE FLORE	6	Southeast	18%
LE FLORE	46	Lower Arkansas	9%
LE FLORE	3	Southeast	5%
LINCOLN	60	Central	39%
LINCOLN	63	Upper Arkansas	9%
LINCOLN	71	Upper Arkansas	3%
LINCOLN	50	Central	3%
LOGAN	63	Upper Arkansas	31%
LOGAN	64	Central	8%
LOGAN	60	Central	7%
LOGAN	71	Upper Arkansas	0%
LOVE	22	Lower Washita	36%
LOVE	21	Lower Washita	21%
LOVE	23	Lower Washita	8%
MAJOR	64	Central	23%
MAJOR	52	Northwest	12%
MAJOR	65	Northwest	0%
MARSHALL	21	Lower Washita	25%
MAYES	80	Grand	32%
MAYES	77	Middle Arkansas	3%
MAYES	81	Grand	1%
MAYES	78	Middle Arkansas	0%
MCCLAIN	57	Central	80%
MCCLAIN	15	Lower Washita	41%
MCCLAIN	58	Central	13%
MCCLAIN	56	Central	10%
MCCLAIN	14	Lower Washita	1%
MCCLAIN	16	Lower Washita	0%
MCCURTAIN	2	Southeast	100%
MCCURTAIN	1	Southeast	91%
MCCURTAIN	4	Southeast	73%
MCCURTAIN	3	Southeast	59%
MCINTOSH	48	Eufaula	18%
MCINTOSH	47	Lower Arkansas	13%
MURRAY	14	Lower Washita	19%
MURRAY	21	Lower Washita	4%
MURRAY	12	Blue-Boggy	1%
MUSKOGEE	47	Lower Arkansas	59%
MUSKOGEE	49	Middle Arkansas	18%
MUSKOGEE	48	Eufaula	0%
MUSKOGEE	80	Grand	0%
MUSKOGEE	77	Middle Arkansas	0%
NOBLE	72	Upper Arkansas	23%
NOBLE	71	Upper Arkansas	17%
NOBLE	67	Upper Arkansas	15%
NOBLE	63	Upper Arkansas	1%
NOBLE	68	Upper Arkansas	0%
NOWATA	79	Middle Arkansas	61%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
NOWATA	76	Middle Arkansas	8%
NOWATA	80	Grand	0%
OKFUSKEE	50	Central	20%
OKFUSKEE	60	Central	13%
OKFUSKEE	48	Eufaula	4%
OKLAHOMA	50	Central	28%
OKLAHOMA	60	Central	13%
OKLAHOMA	62	Central	5%
OKLAHOMA	64	Central	4%
OKLAHOMA	51	Central	1%
OKLAHOMA	58	Central	1%
OKLAHOMA	50	Central	0%
OKMULGEE	49	Middle Arkansas	16%
OKMULGEE	48	Eufaula	12%
OKMULGEE	60	Central	6%
OSAGE	74	Middle Arkansas	93%
OSAGE	76	Middle Arkansas	56%
OSAGE	72	Upper Arkansas	37%
OSAGE	71	Upper Arkansas	12%
OSAGE	73	Middle Arkansas	5%
OSAGE	49	Middle Arkansas	3%
OSAGE	67	Upper Arkansas	0%
OSAGE	73	Middle Arkansas	0%
OSAGE	74	Middle Arkansas	0%
OTTAWA	81	Grand	52%
OTTAWA	80	Grand	1%
PAWNEE	71	Upper Arkansas	25%
PAWNEE	72	Upper Arkansas	5%
PAYNE	71	Upper Arkansas	25%
PAYNE	63	Upper Arkansas	17%
PITTSBURG	48	Eufaula	36%
PITTSBURG	8	Blue-Boggy	9%
PITTSBURG	6	Southeast	6%
PITTSBURG	46	Lower Arkansas	4%
PITTSBURG	45	Lower Arkansas	0%
PONTOTOC	56	Central	33%
PONTOTOC	12	Blue-Boggy	24%
PONTOTOC	9	Blue-Boggy	21%
PONTOTOC	8	Blue-Boggy	8%
PONTOTOC	14	Lower Washita	0%
PONTOTOC	21	Lower Washita	0%
POTTAWATOMIE	61	Central	59%
POTTAWATOMIE	62	Central	33%
POTTAWATOMIE	50	Central	28%
POTTAWATOMIE	56	Central	12%
POTTAWATOMIE	60	Central	1%
POTTAWATOMIE	48	Eufaula	0%
POTTAWATOMIE	50	Central	0%
PUSHMATAHA	6	Southeast	60%
PUSHMATAHA	3	Southeast	35%
PUSHMATAHA	5	Southeast	25%
PUSHMATAHA	7	Blue-Boggy	4%
ROGER MILLS	20	West Central	74%
ROGER MILLS	37	Southwest	21%
ROGER MILLS	59	West Central	10%
ROGERS	78	Middle Arkansas	95%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
ROGERS	75	Middle Arkansas	46%
ROGERS	73	Middle Arkansas	18%
ROGERS	79	Middle Arkansas	18%
ROGERS	77	Middle Arkansas	17%
ROGERS	80	Grand	4%
ROGERS	76	Middle Arkansas	1%
SEMINOLE	61	Central	41%
SEMINOLE	50	Central	16%
SEMINOLE	62	Central	11%
SEMINOLE	56	Central	9%
SEMINOLE	48	Eufaula	6%
SEQUOYAH	46	Lower Arkansas	43%
SEQUOYAH	82	Lower Arkansas	8%
SEQUOYAH	47	Lower Arkansas	2%
SEQUOYAH	44	Lower Arkansas	0%
STEPHENS	26	Beaver-Cache	76%
STEPHENS	25	Beaver-Cache	36%
STEPHENS	23	Lower Washita	32%
STEPHENS	14	Lower Washita	18%
TEXAS	55	Northwest	54%
TEXAS	65	Northwest	3%
TEXAS	66	Northwest	3%
TILLMAN	30	Beaver-Cache	70%
TILLMAN	32	Southwest	69%
TILLMAN	31	Beaver-Cache	55%
TILLMAN	33	Southwest	21%
TILLMAN	29	Beaver-Cache	1%
TILLMAN	34	Southwest	0%
TILLMAN	40	Southwest	0%
TULSA	73	Middle Arkansas	77%
TULSA	75	Middle Arkansas	27%
TULSA	49	Middle Arkansas	25%
TULSA	74	Middle Arkansas	5%
TULSA	78	Middle Arkansas	3%
TULSA	77	Middle Arkansas	1%
TULSA	71	Upper Arkansas	1%
TULSA	73	Middle Arkansas	0%
TULSA	74	Middle Arkansas	0%
WAGONER	77	Middle Arkansas	78%
WAGONER	49	Middle Arkansas	13%
WAGONER	80	Grand	5%
WAGONER	78	Middle Arkansas	2%
WASHINGTON	76	Middle Arkansas	36%
WASHINGTON	75	Middle Arkansas	27%
WASHINGTON	74	Middle Arkansas	2%
WASHINGTON	79	Middle Arkansas	0%
WASHITA	19	West Central	39%
WASHITA	34	Southwest	35%
WASHITA	18	West Central	29%
WASHITA	36	Southwest	3%
WASHITA	20	West Central	2%
WOODS	65	Northwest	21%
WOODS	68	Upper Arkansas	17%
WOODS	64	Central	13%
WOODWARD	52	Northwest	58%
WOODWARD	54	Northwest	20%

Appendix C.2 - County

County	Planning Basin Number	Planning Region	Percent within County
WOODWARD	65	Northwest	17%
WOODWARD	53	Northwest	13%
WOODWARD	64	Central	2%
WOODWARD	59	West Central	0%

APPENDIX D

WATER QUANTITY CONVERSION FACTORS

Table D.1 Water Quantity Conversion Factors

		Desired Unit				
		cfs	gpm	mgd	AFY	AFD
Initial Unit	cfs	--	450	0.646	724	1.98
	gpm	0.00222	--	0.00144	1.61	0.00442
	mgd	1.55	695	--	1,120	3.07
	AFY	0.0014	0.62	0.00089	--	0.00274
	AFD	0.504	226	0.326	365	--

Notes:
EXAMPLE: Converting from mgd to cfs: To convert from an initial value of 140 mgd to cfs, multiply 140 times 1.55 to come up with the desired conversion, which would be 217cfs (140 x 1.55 = 217).

1 acre-foot = 325, 851 gallons; AFD - acre-feet per day; AFY - acre-feet per year; cfs - cubic feet per second; gpm - gallons per minute; mgd - million gallons per day

APPENDIX E

FUTURE DRINKING WATER COST METHODOLOGY

APPENDIX E DRINKING WATER FUTURE COST METHODOLOGY

The methodology used to develop project cost estimates is similar to the United States Environmental Protection Agency's methodology presented in the 2023 Drinking Water Infrastructure Needs Survey (DWINS) and Assessment: Seventh Report to Congress (https://www.epa.gov/DWINSA_September2023). A few key differences between the OCWP and DWINS projected cost methodology are:

- DWINS looks only at Drinking Water State Revolving Fund (DW SRF)-eligible projects, whereas OCWP includes all projects. (Projects for growth only are not typically DW SRF-eligible.)
- DWINS collects a list of projects from surveyed systems whereas OCWP collects a list from surveyed system **and** identifies other future projects based on growth projections, infrastructure replacement due to age, etc. This means that the OCWP projection is more complete and more conservative. This assumption of infrastructure replacement based on industry standards of expected useful life is likely the biggest driver between the difference in DWINS and OCWP projected needs and this assumption is consistent with method used in 2012 OCWP projected costs.
  - From DWINS: "For a project to be included, the water system must document that they are committed to completing the project, and that it is feasible and necessary. One way to show commitment is for the project to be listed in a water system's capital improvement plan. To show the project is necessary and feasible a water system might submit a preliminary engineering report."
  - The OCWP project list does not have this same requirement, as its intent is to better understand the "full" future water cost needs.
- DWINS and OCWP use a similar method of statistically significant sampling and extrapolation to develop costs. The OCWP method is applied at a smaller scale (planning region level) whereas DWINS is applied at the state and national levels.
  - DWINS has sampling goals of 100 percent for large systems, 22.7 percent for medium systems (sampling utilities in every state), and 1.6 percent nationally for small systems.
  - OCWP has an actual sampling rate of 100 percent for large systems, 31 percent for medium-large systems, 20 percent for small-medium systems, and 2 percent for small systems. Overall, the OCWP has a slightly higher sampling rate than DWINS, which should increase its accuracy.

To develop drinking water infrastructure costs, system information and project data were collected from the sources listed above, plus the Water Infrastructure Needs Survey, the 2025 OCWP Local Projects and Projects Data Collection Form and Survey, and individual system capital improvement plans. System information (e.g., water treatment capacity, length of distribution system pipe, etc.) and local project and program data were integrated into a water provider (system) checklist, which was used to develop project lists for selected water providers. Systems were selected based on the quality and quantity of data available. A standard set of assumptions was integrated into each provider checklist to complete project lists. These assumptions that were typically used in project list development include the following:

- To determine parameters needed for cost modeling, a single pipeline with a diameter sized to carry all the needed capacity a distance 25 miles was used. When a system had an existing water treatment plant or a new plant planned, raw water pumping was included in the treatment plant cost. Otherwise, raw water pumping costs were estimated separately.

- It was assumed that water treatment infrastructure would be rehabilitated every 30 years. Additional treatment capacity to meet a system's project demand was included in this cost. It was assumed that the treatment type was conventional, unless more specific information was available for either existing or new facilities.
- In the absence of more information, systems were assumed to have approximately 10 percent of their treatment capacity in finished water storage. This study assumed that ground-level water storage tanks would be used unless further specific information was known.
- To estimate the needs associated with a growing distribution system infrastructure, it was assumed that the distribution system total length grows in proportion to population growth. Population growth rate was estimated on the planning basin level in most cases if further specific information was unknown.
- Distribution and transmission lines were assumed to have a standard replacement and rehabilitation timeline. This estimate included all components required for distribution and was not limited to pipe, installation, hydrants, valves, and site work. Pipe was assumed to be replaced or rehabilitated every 70 years in this study.
- Costs associated with purchasing water were not specifically developed. However, water infrastructure needs associated with providers that use only purchased water were included in the regional cost estimates.

The DWINS cost models were used to estimate project costs for each project if one was not provided. These cost models utilize minimal project information that is generally available (e.g., water treatment plant design capacity and pipeline size) and typically gathered from the selection of water providers. Projected costs have been adjusted to 2025 dollars with the Construction Materials Producer Price Index.

Project data was used from a statistically significant sample of small, small-medium, and medium-large systems, then incorporated into the estimate for each OCWP region. System size categorization was based on each system's 2020 reported service population.

The analysis was completed based on system size and project type. For system size, a region's total need was calculated by summing the needs of each system size held in that region. Needs for each system size were calculated with Equation 1.

$$C_{RG,Z,Y} = [(N_{S,\,RG,\,Z} \text{ x } (\sum(C_{SP,Z,Y}) / N_{SP,\,RG,\,Z})] + \sum(R_{S,Y})$$

Equation 1 – Regional System Size Cost Equation

$C_{RG,Z,Y}$ = Drinking water infrastructure needs cost (C) for a given planning region (RG), system size (Z), and planning year

$N_{S,\,RG,\,Z}$ = Total number of public water supply systems (S) in a given planning region (RG) for a given system size (Z)

$N_{SP,\,RG,\,Z}$ = Number of public water supply systems sampled (SP) in a given planning region (RG) for a given system size (Z)

$\sum(C_{SP,Z,Y})$ = Sum of project costs (C) for sampled public water supply systems (SP) of a given size (Z) and planning year (Y)

$\sum(R_{S,RG,Y})$ = Sum of reservoir project costs (R) for a given system size (S), planning region (RG), and planning year (Y)

As noted in the Total Regional Cost by System Size Equation (below), the total projected drinking water cost for each planning region was estimated from each regional system size cost. For instance, the Beaver-Cache Region's estimate was calculated by summing the costs calculated for small, small-medium, and large systems. There are no medium-large systems in the Beaver-Cache Region. See below for the equation on

$$T_{RG,Z,Y} = \sum(C_{SL,RG}) + \sum(C_{SM,R}) + \sum(C_{ML,RG}) + \sum(C_{LG,RG})$$

Equation 2 - Total Regional Cost by System Size Equation

$T_{RG,Z,Y}$ = Total regional (RG) cost for a given planning year (Y) summed by system size (Z)

$\sum(C_{SL, RG,Y})$ = Sum of project costs for small systems (SL) in a particular planning region (RG) and planning year (Y)

$\sum(C_{SM, RG, Y})$ = Sum of project costs for small-medium systems (SM) in a particular planning region (RG) and planning year (Y)

$\sum(C_{ML,RG, Y})$ = Sum of project costs for medium-large systems (ML) in a particular planning region (RG) and planning year (Y)

$\sum(C_{LG,RG, Y})$ = Sum of project costs for large systems (LG) in a particular planning region (RG) and planning year (Y)

Individual projects were classified by infrastructure type: distribution and transmission, treatment, storage, and source. The distribution and transmission category includes the cost to transport all raw and finished water. All infrastructure to treat raw surface water (SW) or groundwater was included in the treatment category. The storage category includes all finished water storage and onsite raw water storage. Individual project costs for dams and reservoirs were added to the source category cost if they were provided by one of the sampled systems.

$$C_{RG,IF,Y} = [(N_{S, RG, IF} \times (\sum(C_{SP,IF,Y})/ N_{SP, RG, IF})]$$

Equation 3 - Regional Cost by Infrastructure Type

$C_{RG,IF,Y}$ = Drinking water infrastructure needs cost (C) for a given planning region (RG), infrastructure type (IF), and planning year (Y)

$N_{S, RG, IF}$ = Total number of public water supply systems (S) in a given planning region (RG) for a given infrastructure type size (IF)

$N_{SP, RG, Z}$ = Number of public water supply systems sampled (SP) in a given planning region (RG) for a given infrastructure type (IF)

$\sum(C_{SP,IF,Y})$ = Sum of project costs (C) for sampled public water supply systems (SP) of a given infrastructure type (IF) and planning year (Y)

SW intakes, wells, and spring collectors were included in the source category. As shown in Equation 4, individual project costs for dams and reservoirs were added to the source cost if they were provided. The sum of results from Equation 2 (for each infrastructure type) and Equation 3 were calculated to determine the total need for each region. Total regional costs are the same for planning years evaluated (2035 and 2045) whether they are categorized by either system size or infrastructure type.

$$T_{RG,IF,Y} = \sum C_{RG,IF,Y} + \sum(R_{SP,Y})$$

Equation 4 – Total Regional Cost by Infrastructure Type

$T_{RG,IF,Y}$ = Total regional cost (T) for a given planning year (Y) summed by infrastructure type (Z)

$\sum(R_{RG,Y})$ = Sum of reservoir project costs (R) in a given planning region (RG) and planning year (Y)

APPENDIX F

DIFFERENCES BETWEEN SURFACE WATER PHYSICAL AND LEGAL AVAILABILITY

DIFFERENCES BETWEEN SURFACE WATER PHYSICAL AND LEGAL AVAILABILITY

A reliable water source is contingent upon having the water physically present for diversion and use (physical supply or "wet water"), possessing the necessary water rights to divert water (legal supply or "paper water"), adequate water quality for intended use, and sufficient infrastructure to divert, treat, and convey the water for use. The Oklahoma Comprehensive Water Plan (OCWP) evaluates supply and demand factors at the region and/or basin level.

The physically available and legally available surface water flows are two separate analyses.

Generally, similarities between physical and legal analysis are:

- Both account for unappropriated dependable yield from reservoirs. The physical analysis used an earlier unappropriated dependable yield database. The values may differ slightly but are generally similar.
- Both account for interstate compact requirements. The physical surface water analysis takes compact water out from water coming into the state (most upstream basin), while the legal analysis takes it out from selected basins. The amount of water removed is similar.

Generally, differences between physical and legal availability are:

- The surface water legal analysis removes domestic use and pending permit application amounts from the available water. These are in addition to factoring in future changes in water demand for the seven use sectors used throughout the OCWP. The pending permit application amounts are a significant driver of the differences between surface and legal water availability in Basins 5, 7, 8, and 27.
- Physical surface water supply analysis uses United States Geological Survey (USGS) stream gage data from October 1949 to September 2021 (water years 1950 to 2020). The surface water legal analysis uses flow data from 1940 to 2007.
- The physical surface water analysis is based on the June 2023 permit database. All in-basin permits are accounted for, while only permitted interbasin transfers greater than 500 acre-feet per year are included in the physical surface water analysis.
- The normal storage volume of Natural Resources Conservation Service (NRCS) reservoirs is not included in the physical surface water analysis but is included in the legal analysis. The presence of the NRCS reservoirs is embedded in the historical USGS gage record that is used for the physical water availability analysis. However, the physical analysis does not account for any additional available firm yield that might still be available for use from the NRCS reservoirs.
- The physical and legal availability analysis assumes that all water from upstream basins is available to downstream basins (Figure 1).

More information on the water supply analyses is available in the *Physical Water Supply Availability Report* and *Legal Availability Analysis Report*.

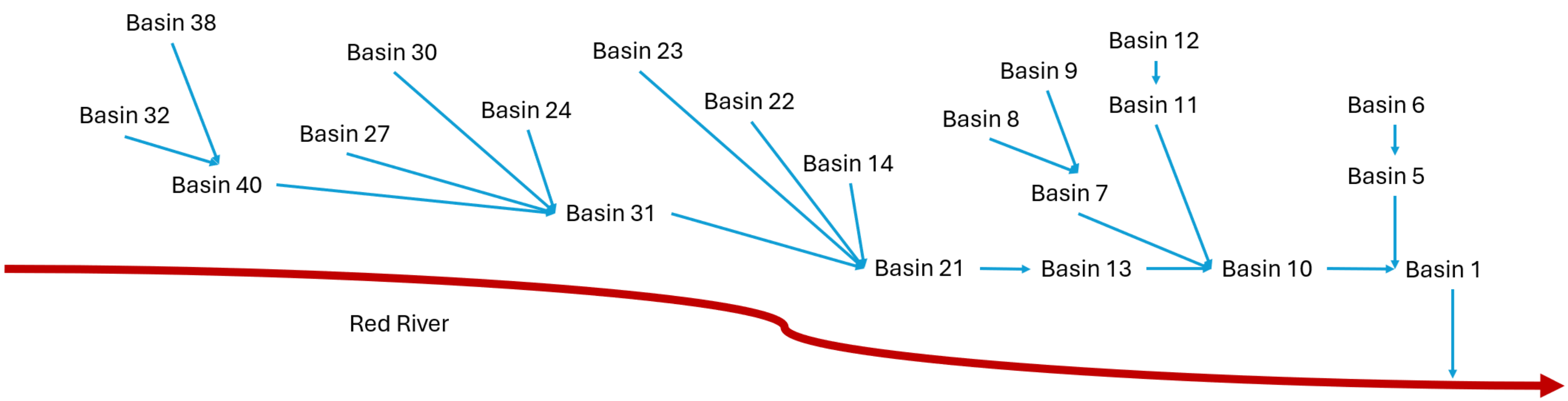


Figure 1 Flow Schematic Used for Physical and Legal Surface Water Availability Analysis