# Exhibit J
# SB 610 Water Supply Assessment

# SB 610 WATER SUPPLY ASSESSMENT

## 2740 WEST NIELSEN AVENUE OFFICE/WAREHOUSE PROJECT

## FRESNO, CALIFORNIA

LSA

October 2022

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## FRESNO, CALIFORNIA

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## FIGURES



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# LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| 1,2,3-TCP | 1,2,3-trichloropropane |
| AF | acre-feet |
| AFY | acre-feet per year |
| CALGreen Code | California Green Building Standards Code |
| CEQA | California Environmental Quality Act |
| City | City of Fresno |
| County | County of Fresno |
| CPC | California Plumbing Code |
| CVP | Central Valley Project |
| CVPIA | Central Valley Project Improvement Act |
| CY | calendar year |
| DBCP | 1,2-dibromo-3-chloropropane |
| DDR | Department of Drinking Water |
| DPU | Department of Public Utilities |
| DWR | Department of Water Resources |
| FID | Fresno Irrigation District |
| FMFCD | Fresno Metropolitan Flood Control District |
| GIS | Geographic Information System |
| gpm | gallons per minute |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| IGSM | Integrated Groundwater and Surface Water Model |
| Metro Plan | Fresno Metropolitan Water Resource Management Plan |
| mg/L | milligrams per liter |
| mgd | million gallons per day |
| NESWTF | Northeast Surface Water Treatment Facility |
| NFWRF | North Fresno Wastewater Reclamation Facility |

| | |
|---|---|
| PCE | perchloroethylene |
| PFAS | per- and polyfluoroalkyl substances |
| PG&E | Pacific Gas and Electric Company |
| project | 2740 West Nielsen Avenue Office/Warehouse Project |
| RWMP | Recycled Water Master Plan |
| RWRF | Regional Wastewater Reclamation Facility |
| SB | Senate Bill |
| SESWTF | Southeast Surface Water Treatment Facility |
| SOI | Sphere of Influence |
| SR | State Route |
| SWRCB | State Water Resources Control Board |
| SWTF | surface water treatment facility |
| TCE | trichloroethylene |
| TDS | total dissolved solids |
| TTDF | Tertiary Treatment and Disinfection Facility |
| USBR | United States Bureau of Reclamation |
| UV | ultraviolet |
| UWMP | Urban Water Management Plan |
| WRF | Wastewater Reclamation Facility |
| WSA | Water Supply Assessment |
| WSCP | Water Shortage Contingency Plan |
| WSIP | Water Storage Investment Program |
| WY | water year |

# INTRODUCTION

The City of Fresno (City) is conducting an environmental review under the requirements of the California Environmental Quality Act (CEQA) for the proposed 2740 West Nielsen Avenue Office/Warehouse Project (project) in Fresno, Fresno County, California. This Water Supply Assessment (WSA) has been prepared pursuant to the requirements of Senate Bill (SB) 610, which requires public water agencies, parties, or purveyors that may supply water to certain proposed development projects to prepare a WSA for use in environmental documentation for such projects, pursuant to CEQA. This WSA contains information from the City of Fresno 2020 Urban Water Management Plan (UWMP),[1] which was adopted by the City in June 2021. A WSA is required for any project that is subject to CEQA and includes an industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupy more than 40 acres of land, or having more than 650,000 square feet of floor area.

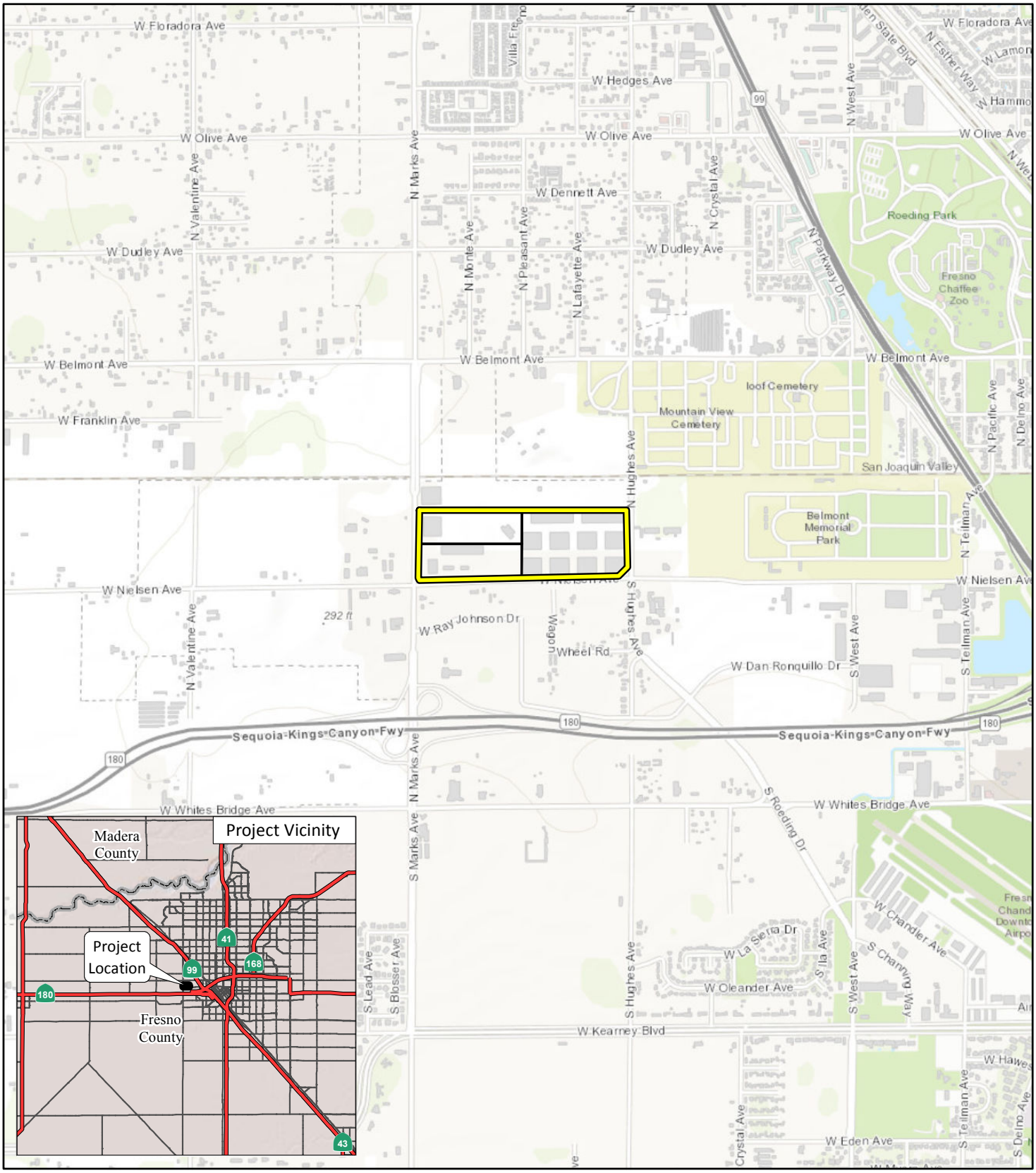
## PROJECT DESCRIPTION

The 48.03-acre project site is currently vacant but previously consisted of an industrial warehouse that has since been demolished. The project site is bounded to the north by vacant, undeveloped land, to the east by North Hughes Avenue, to the south by West Nielsen Avenue, and to the west by North Marks Avenue. Regional access to the site is provided by State Route (SR) 180, which is located approximately 0.3 mile south of the project site, and SR-99, which is located approximately 0.8 mile east of the project site. Figure 1 shows the site's regional and local context. Figure 2 depicts an aerial photograph of the project site and surrounding land uses.

The project would result in the construction of four office/warehouse buildings that would be configured for heavy industrial uses by tenants that have not been identified. The proposed buildings would result in a total gross floor area of approximately 901,438 square feet. The buildings' exterior would be up to 44 feet high, with an interior height of up to 36 feet, and designed with a total of 201 loading dock doors on the north and south sides of the buildings. The four buildings would consist of the following: Building 1 would be 468,812 square feet and would provide 122 loading dock doors; Building 2 would be 248,786 square feet and would provide 46 loading dock doors; Building 3 would be 93,074 square feet and would provide 18 loading dock doors; and Building 4 would be 90,766 square feet and would provide 15 loading dock doors. Figure 3 shows the project site plan.

The proposed project would comply with the latest California Green Building Standards Code (CALGreen Code) building measures and Title 24 standards.

[1] Fresno, City of. 2021. *City of Fresno 2020 Urban Water Management Plan*. June.




LSA

LEGEND

Project Location

Proposed Parcels

FIGURE 1

N

0 1000 2000

FEET

*2740 West Nielsen Avenue Office/Warehouse Project*

Regional Project Location

SOURCE: Esri Topographic Map (2021)

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LSA

FIGURE 2

Project Site

Proposed Parcels

N

0 500 1000

FEET

*2740 West Nielsen Office/Warehouse Project*

Aerial Photograph of Project Site and Surrounding Land Uses

SOURCES: Google Earth, 9/9/2019; LSA 2021

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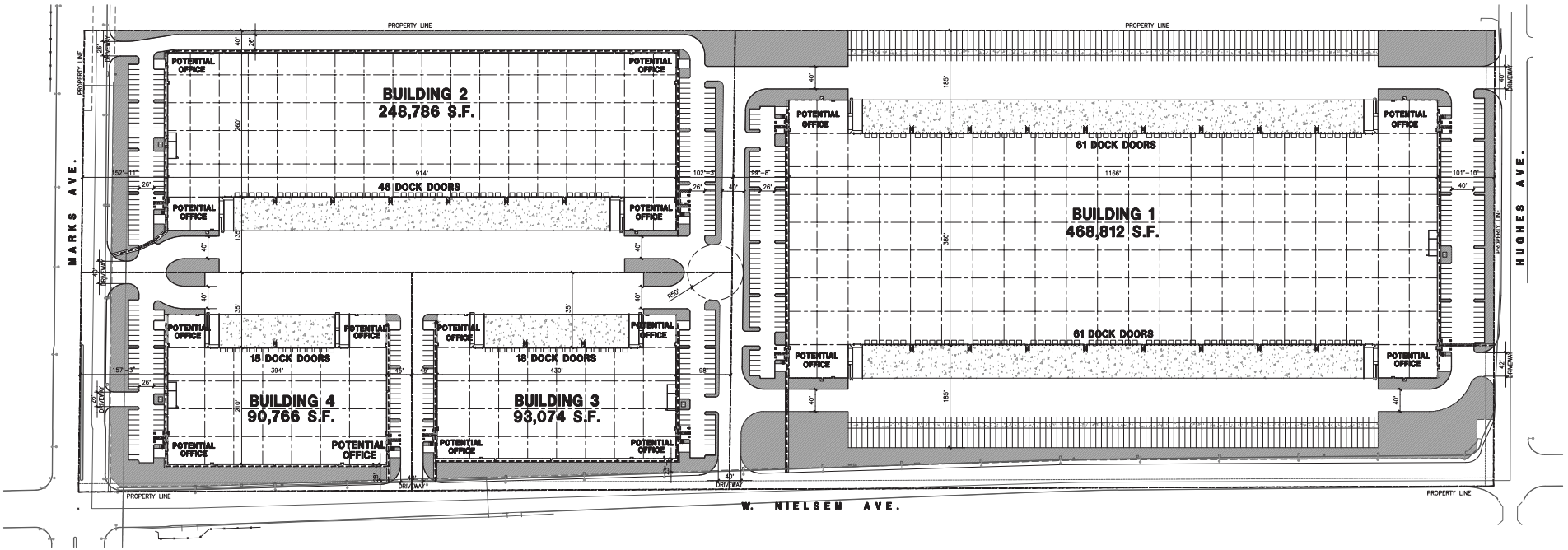


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FIGURE 3

0 120 240

FEET

N

*2740 West Nielsen Office/Warehouse Project*
Site Plan

SOURCE: HPA Architecture, Inc., 2021

FreP:\SNN2102 2740 W. Nielsen\PRODUCTS\Graphics\Figure 3.ai (10/5/2021)

As shown in Figure 3, vehicular access to the site would be provided by North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue.

A total of 594 on-site parking spaces would be provided for vehicles and trucks. Of the 594 parking spaces, 385 spaces would be dedicated for standard vehicles, 11 spaces would be dedicated for accessible standard vehicles, and 10 spaces would be dedicated for accessible vans. The remaining 188 spaces would be dedicated for trailers, would be located along the eastern and western edges of the project site, and would be behind two 8-foot-tall gates, which would be installed to separate the general parking area from the truck storage and dock loading area.

Consistent with City requirements, drought-tolerant landscaping would be provided throughout the project site.

The project site is located in an urban area and is currently served by existing utilities, including: water, sanitary sewer, storm drainage, electricity, and natural gas infrastructure. Water service to the project site would be provided by the City. New water within the project site would connect to the existing 14-inch main located on North Marks Avenue and the 16-inch main on North Hughes Avenue. The project would also include an on-site 12-inch main. The City would provide wastewater collection and treatment for the proposed project, and maintains an existing 12- to 18-inch line located in West Nielsen Avenue. The proposed project includes the installation of a new on-site 8-inch wastewater line that would connect to the City's existing line. The proposed project would include construction of a new curb and gutter along North Marks Avenue, West Nielsen Avenue, and North Hughes Avenue that would connect to the existing Fresno Metropolitan Flood Control District (FMFCD) stormwater system.

Electricity and natural gas services to the site are provided by Pacific Gas and Electric Company (PG&E). Existing underground utility connections and gas mains provide electricity and gas to the project site. New underground electrical lines would be installed.

Construction of the proposed project is anticipated to occur in two phases over a total 24-month period. The first phase would include the construction of Buildings 2, 3, and 4 and would occur for 12 months. The second phase would include the construction of Building 1 and would occur for 12 months. The proposed project would comply with City standards, including the City's current building code, landscape standards, and lighting standards. In addition, the proposed project would be graded similar to other developments throughout Fresno.

# WATER SUPPLY RIGHTS AND ENTITLEMENTS

The City of Fresno relies on groundwater from the North Kings Subbasin; surface water from the Central Valley Project (CVP), through a contract with the United States Bureau of Reclamation (USBR); Kings River water, through a contract with Fresno Irrigation District (FID); and recycled water to meet current and future water demands. The following pages are extracted directly from the 2020 UWMP (Pages 6-1 through 6-32) in satisfaction of Water Code sections 10910(A)(1) and 10910(D)(2). This information is applicable to the entire City of Fresno municipal water service area, including the project site.

## GROUNDWATER

The City overlies the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin. The City is one of many water purveyors that use groundwater from the Kings Subbasin.

The City has a network of over 270 municipal wells and currently operates approximately 202 municipal supply wells within the Kings Subbasin. Until late 2004, the City relied solely on groundwater to meet the water demands. The City's desire is to continue to use groundwater within a larger conjunctive use program that maximizes its existing water rights and surface water supply sources.

### Basin Description

The Department of Water Resources (DWR) has partitioned the State into 10 major hydrologic regions (also referred to as "basins") and then further divided each basin into subbasins. The City is located in the Kings Subbasin (DWR Groundwater Subbasin Number 5-22.08) and lies within the larger San Joaquin Valley Groundwater Basin in the Central Valley of California. The Kings Subbasin covers approximately 1,530 square miles.

#### *Basin Location*

The San Joaquin Valley Groundwater Basin is bounded to the north by the Sacramento-San Joaquin Delta and Sacramento Valley, to the east by the Sierra Nevada, to the south by the San Emigdio and Tehachapi mountains, and to the west by the Coast Ranges. The Kings Subbasin, located within the southern half of the San Joaquin Valley Groundwater Basin, is bounded to the north by the San Joaquin River, to the east by the alluvium-granite rock interface of the Sierra Nevada foothills, to the south by the southern fork of the Kings River, and to the west by the Delta-Mendota and Westside Subbasins. The Kings Subbasin is split into seven Groundwater Sustainability Agency (GSA) management areas, with Fresno located in the North Kings GSA. Figure 6-1 of the 2020 UWMP illustrates the location of Fresno within the Kings Subbasin.

### *Area Geology*

The upper several hundred feet of geology within the Kings Subbasin generally consists of highly permeable, coarse-grained deposits, which are termed older alluvium. Figure 6-2 of the 2020 UWMP presents an idealized hydrogeologic cross-section that illustrates the general depth of various lithologic features within the Kings Subbasin, near Fresno.

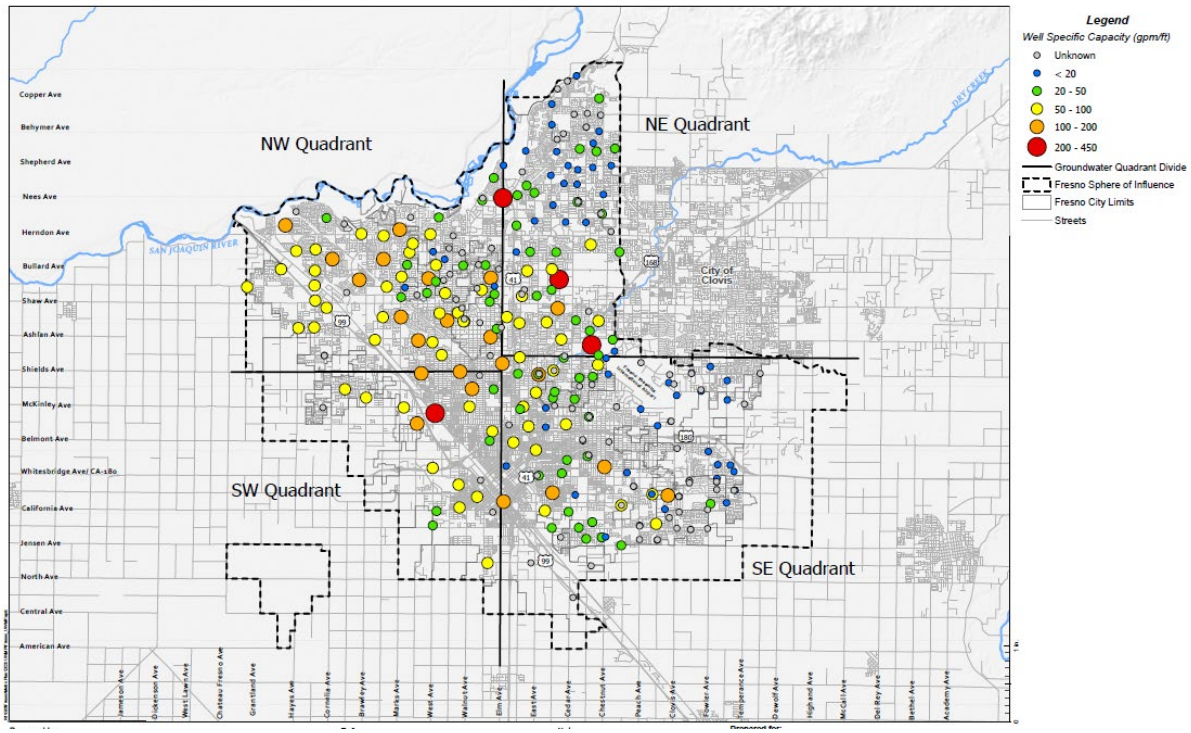
Coarse-grained stream channel deposits, associated with deposits by the ancestral San Joaquin and Kings Rivers, underlie much of northwest Fresno. There is a laterally extensive clay layer, at an average depth of approximately 250 feet below the ground surface, beneath most of the south and southeastern portions of Fresno.

Below the older alluvium, to depths ranging about 600–1,200 feet below ground surface, the finer-grained sediments of the tertiary-quaternary continental deposits are typically encountered. Substantial groundwater has been produced and utilized from these depths by the City. However, deeper deposits located in the southeastern and northern portions of Fresno have produced less groundwater.

There are also reduced deposits in the northern and eastern portions of Fresno, at depths generally below 700 or 800 feet, which are associated with high concentrations of iron, manganese, arsenic, hydrogen sulfide, and methane gas. Groundwater at these depths does not generally provide a significant source for municipal supply wells.

### *Aquifer Characteristics*

The aquifer beneath Fresno was characterized using data compiled during aquifer tests performed at the City's production wells. As part of updating the detailed hydrogeologic evaluation, aquifer test data (pump tests) were reviewed to update the hydrogeologic analysis and evaluate the specific capacity data. The specific capacity indicates the ability of a particular well to produce water. Figure 4 shows the estimated specific capacity of each active well from early 2020 pump test data. As shown in the figure, the northwestern and southwestern portions of Fresno have wells with higher specific capacities.




Source: 2020 Urban Water Management Plan, Figure 6-3 (City of Fresno 2021).

**Figure 4: City Wells Specific Capacity**

## Groundwater Management

In 2014, a three-bill legislative package was signed into law, composed of Assembly Bill 1739, SB 1168, and SB 1319, collectively known as the Sustainable Groundwater Management Act (SGMA) of 2014, which is codified in Section 10720 et seq. of the California Water Code. This legislation created a statutory framework for groundwater management in California that can be sustained during the planning and implementation horizon without causing undesirable results. SGMA requires governments and water agencies of "critically overdrafted" basins to reach sustainability by 2040. The Kings Subbasin was designated a critically overdrafted basin in the DWR's Bulletin 118. The North Kings GSA is working within the SGMA framework to reach groundwater sustainability.

The City was a founding member of the North Kings GSA, which consists of the following public agencies:

- FID
- City of Fresno
- City of Clovis
- City of Kerman
- County of Fresno

- Biola Community Services District
- Garfield Water District
- International Water District

The Kings Subbasin contains seven GSAs, including the North Kings GSA, as listed below and shown in Figure 6-1 of the 2020 UWMP:

- Central Kings GSA
- James Irrigation District GSA
- Kings River East GSA
- McMullin Area GSA
- North Kings GSA
- North Fork Kings GSA
- South Kings GSA

The seven GSAs operate cooperatively across the basin via a coordination agreement that ensures common approaches to sustainability items such as similarity of data usage and methodologies, consistent interpretations of the basin setting, and common assumptions and development of water budgets, monitoring networks, sustainable management criteria, and data management systems.

As required by SGMA, the North Kings GSA considers six sustainability indicators:

- Chronic lowering of groundwater levels, indicating significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality
- Significant and unreasonable land subsidence
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

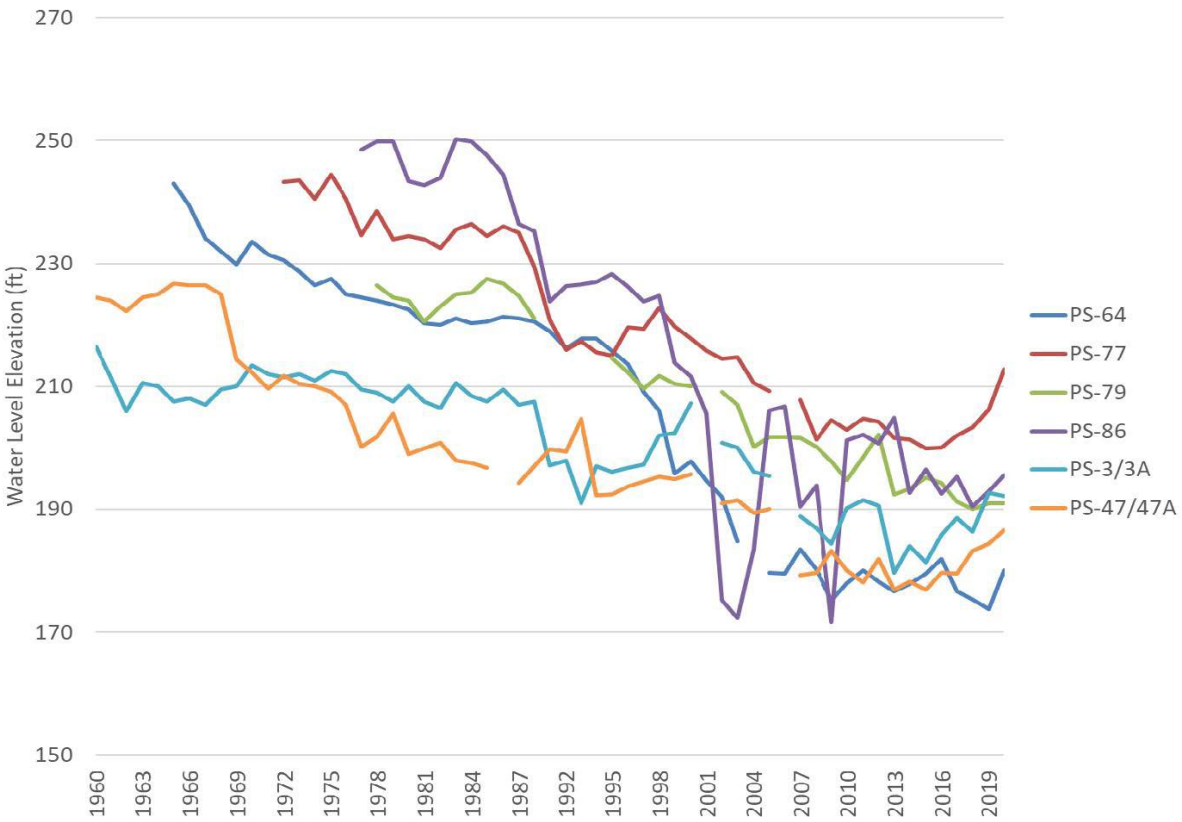
Each indicator has an identified undesirable result, measurable objective, and minimum threshold. The measurable objective and minimum threshold allow the North Kings GSA to evaluate their progress for the subject indicator and determine if conditions are improving, remaining stable or degrading. The sustainability indicators of primary concern within the City are groundwater levels, groundwater storage, and groundwater quality. The methodology for the water quality indicators has been developed and the methodology is

still being developed for the groundwater levels and groundwater storage indicators. A copy of the Groundwater Sustainability Plan (GSP) is provided in Appendix G of the 2020 UWMP.

## Overdraft Conditions

SGMA directs DWR to identify groundwater basins and subbasins in conditions of critical overdraft. As defined by SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." As mentioned, DWR classifies the Kings Basin as being in a state of critical overdraft in its Bulletin 118, and the future of the groundwater basin has been projected to see continued overdraft conditions.

The Kings Subbasin groundwater aquifer supplies the City, other municipalities, agriculture, and rural residential areas with a consistent source of water. Like much of the Kings Subbasin, groundwater levels beneath Fresno were relatively shallow at 25 feet below ground surface in 1940, prior to the start of World War II. After the war, the State, including the City, began growing at a rapid rate. For the period from 1959 to 1968, it was reported groundwater levels declined at a rate of 2.8 feet per year. The City continued to rely on the groundwater aquifer for decades, monitoring groundwater levels continuously. Groundwater levels since 1990 have declined at a lower rate than previously. Rates of decline slowed further starting in 2004, when the Northeast Surface Water Treatment Facility (NESWTF) started operations and the City renewed focus on increasing groundwater recharge. In 2019 and 2020, surface water accounted for more than half of the total water supply in Fresno. With the reduced pumping due to higher reliance on surface water, the groundwater levels have begun to increase in certain areas of Fresno in the last few years. Figure 5 provides a depiction of the City's depth to groundwater for six representative wells across the Sphere of Influence (SOI) since 1960.




Source: 2020 Urban Water Management Plan, Figure 6-4 (City of Fresno 2021).

**Figure 5: Time Series of Groundwater Levels at Representative Wells**

The City expects to continue to operate its three surface water treatment facilities (SWTFs) and pump groundwater at a lower rate than historically so that the groundwater basin can recover. According to the 2020 UWMP, one of the City's primary objectives is to maximize the use of available surface water treatment supplies to reduce overall reliance on groundwater. Additionally, the City plans to continue its groundwater recharge program to protect the groundwater basin. Figure 6-5 of the 2020 UWMP shows the active and proposed recharge basins and FID Canals the City utilizes as part of groundwater recharge program.

## Groundwater Quality

Groundwater within the North Kings Subbasin generally meets primary and secondary drinking water standards for municipal water use and is described as being bicarbonate-type water, including calcium, magnesium, and sodium as the dominant ions. Total dissolved solids (TDS) concentrations rarely exceed 600 milligrams per liter (mg/L) and range from 200 to 700 mg/L. However, the groundwater basin has been impacted by multiple chemical contaminants that affect the City's ability to fully utilize the groundwater basin resources without some type of wellhead treatment in certain areas.

Figure 6-6 of the 2020 UWMP presents the general location of regional plumes and major point sources within Fresno. The primary contaminants are nitrate, 1,2-dibromo-3-chloropropane (DBCP), 1,2,3-trichloropropane (1,2,3-TCP), and other volatile organic compounds like trichloroethylene (TCE) and perchloroethylene (PCE). The City has received settlements in a number of lawsuits related to these contaminants and has constructed wellhead treatment systems and implemented blending plans for a number of wells. Approximately 40 City wells are being treated for contaminants such as PCE, DBCP, TCE, 1,2,3-TCP, perfluorooctanoic acid, perfluorooctanesulfonic acid, ethylene dibromide, and nitrate, and an additional 20 wells include treatment for iron, manganese, and hydrogen sulfide removal or corrosion control.

As shown in Figure 6-6 of the 2020 UWMP, extensive groundwater contamination nearly covers the City's entire water service area; only areas located in the northwest appear to be relatively unaffected by regional groundwater contamination. Also, many of the City's wells are impacted by one or more of the contaminant plumes (indicated by the presence of overlapping plumes on the figure). The figure also shows the approximately 93 existing active wells that are impacted by at least one contaminant plume and the 60 existing wells with wellhead treatment. The City is also managing contamination from spreading by pumping specific wells to control the plume.

### Estimated Groundwater Yield

As part of the City's ongoing preparation of the Fresno Metropolitan Water Resource Management Plan (Metro Plan) update, the City is developing a storage accounting framework to estimate groundwater yield. The storage framework will track the City's groundwater recharge, pumping, and flows into and out of the City's SOI and incorporate bi-annual monitoring of well water level readings on a grid basis.

The most recent available information on the City's groundwater yield is from a hydrologic groundwater and surface water model that was prepared for the Upper Kings Basin Integrated Regional Water Management Authority. The City contributed additional funding to the effort so the model would be more refined for its service area and capable of assisting in the development of the City's previous Metro Plan. The Kings Basin Integrated Groundwater and Surface Water Model (IGSM) was completed in 2007 and provided outputs specific to the City's SOI. The IGSM was developed and calibrated utilizing data for the period of 1964–2004. Building off the calibrated IGSM, additional modeling was conducted in 2008 to evaluate the City's proposed water supply plan and its ability to attain the balanced use of groundwater by the buildout year of 2025. The estimated groundwater yield within the City's SOI presented in this section is based on the modeling efforts to establish the various natural elements of the underlying aquifer.

### *Natural Recharge*

As a result of the IGSM effort, the long-term average deep percolation from rainfall and irrigation-applied water for the period of 1964–2004 was found to be 42,700 acre-feet per year (AFY) for the entire SOI. However, as urbanization continues within the SOI, the amount of deep percolation will decline because of increased runoff and less open land for natural recharge. For 2005, it was estimated deep percolation would be about 37,000 AFY and would reduce annually, ultimately declining to and remaining at 27,000 AFY by buildout in 2025. The current General Plan anticipates SOI buildout will occur in 2056. Holding the 2005 value of 37,000 AFY and extending the 27,000 AFY to 2056, intermediate values were straight-line interpolated. Additionally, the City currently covers 73,500 acres of the 100,277 acres within its SOI, representing 73 percent urbanization, which would approximate the City's water system service area. Table A shows estimated natural recharge through 2045.

**Table A: Normal Year Supply and Demand Comparison (acre-feet per year)**

| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Natural Recharge[1] | 24,970 | 25,480 | 25,910 | 26,280 | 26,570 | 26,790 |
| Net Subsurface Inflow[1] | 47,510 | 49,910 | 52,320 | 54,720 | 57,120 | 59,530 |
| **Sustainable Yield** | **72,480** | **75,390** | **78,230** | **81,000** | **83,690** | **86,320** |
| Intentional Recharge[2] | 60,000 | 62,700 | 65,400 | 68,100 | 70,800 | 73,500 |
| **Total Estimated Groundwater Yield** | **132,480** | **138,090** | **143,630** | **149,100** | **154,490** | **159,820** |

Source: 2020 Urban Water Management Plan, Table 6-1 (City of Fresno 2021).

[1] Based on the Kings Basin Integrated Groundwater and Surface Water Model and projected City land growth.

[2] Projected normal year intentional recharge from Table 4-7 of the 2020 Urban Water Management Plan.

### *Net Subsurface Inflow*

Again, utilizing information developed from the IGSM, average net subsurface inflow into the SOI was characterized as being 64,800 acre-feet (AF) annually for the period of 1964–2004. Applying the previously described 73 percent proportioning factor of the developed SOI area to overall SOI area, approximately 47,510 AFY would be attributed to the City's water service area in 2020. This value will increase in future years as the City annexes more land until the SOI is built out. Table A shows the estimated subsurface inflows for future

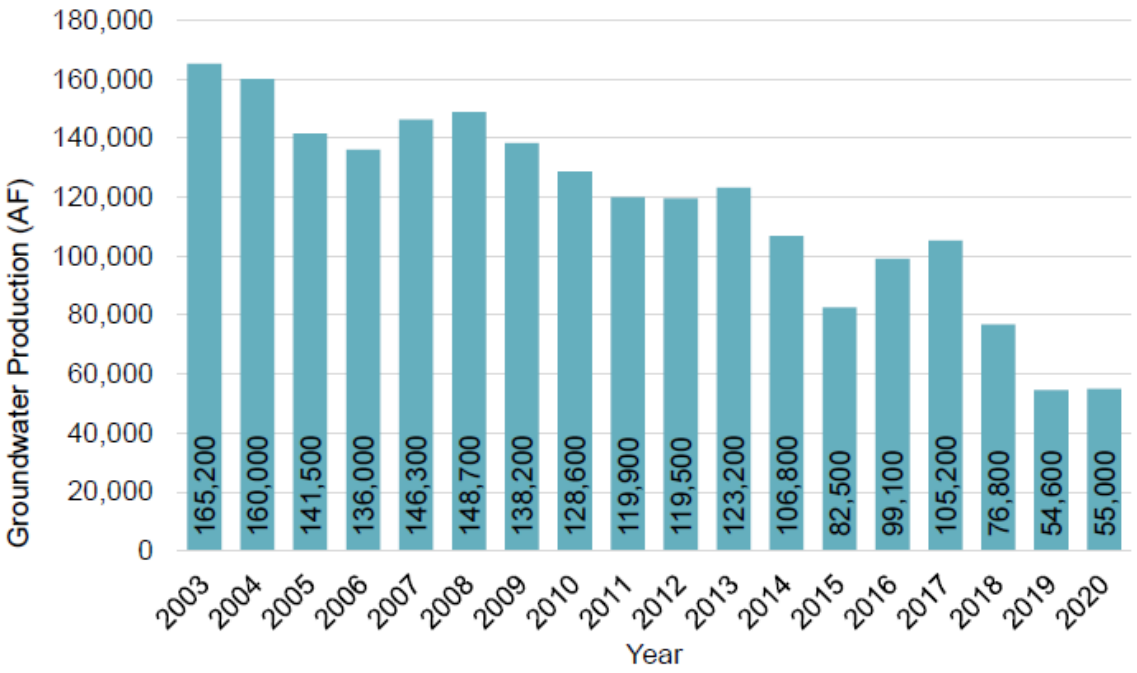
years. The City has historically benefited from the net subsurface inflows and requires these flows for replenishment necessary to maintain the sustainable yield of the groundwater aquifer system.

### *Intentional Groundwater Recharge*

The City has long made efforts toward offsetting the decline of groundwater levels and minimizing overdraft conditions through an active intentional recharge program that started in 1971. Through cooperative agreements with FMFCD and FID, the City has access to not only City-owned basins, but also those of these two agencies. Utilizing available surface water supplies, the City recharged on average approximately 60,000 AFY from 2000 to 2019; however, with the reduction in available surface water supplies, intentional recharge declined to 34,700 AF in 2014 and 19,800 AF in 2015, followed by an increase in recharge in years 2016, 2017, and 2019 to help replenish the aquifer. In 2019, the City's recharge of 82,993 AF was the maximum annual recharge attained during this period. The City has averaged over 60,000 AFY the previous 5 years and plans to gradually increase recharge by about 540 AFY each year. However, during wet years, the City will recharge more water when it is available to allow to the City to draw on additional groundwater during dry years, when surface water is not available. Intentional recharge is included in the non-potable demand projections as well as contributing to the estimated groundwater yield presented in Table A.

## Historic Groundwater Pumping

The City has historically relied on groundwater as its main supply source prior to the construction of its SWTFs. With the recent investments in surface water infrastructure, the City has been able to drastically reduce its groundwater pumping. Figure 6 shows the historic groundwater pumping since 2003. As shown, pumping has dropped significantly since 2003, the City's peak year for groundwater production.




Source: 2020 Urban Water Management Plan, Figure 6-7 (City of Fresno 2021).

**Figure 6: Historic Groundwater Production**

## SURFACE WATER

With the completion and operation of the Southeast Surface Water Treatment Facility (SESWTF), surface water is now a primary water supply used to meet potable demands within Fresno. The City contracts with FID for Kings River water and with the USBR for CVP water from the Friant-Kern Canal. The surface water supply is used either for potable uses through treatment and distribution or delivery to recharge basins for groundwater recharge. The Kings River water year (WY) is October through September, while USBR uses a WY of March through February. The City has historically used a calendar year (CY) for its analysis, so monthly water supply information was compiled in CY format for this report.

### USBR Friant Division Contract Supply

The City, through an agreement originally executed in January 1961, secured a surface water supply from the USBR CVP Friant Division. This agreement, for an annual water supply of 60,000 AF of Class 1 water, was last renewed in 2010 as a Section 9(d) contract that provides water from the San Joaquin River in perpetuity. A copy of the renewed contract is provided in Appendix H of the UWMP. The USBR CVP Friant Division facilities generally include Friant Dam (Millerton Reservoir), the Friant-Kern Canal, and the Madera Canal. The Friant-Kern Canal is maintained and operated by the Friant Water Authority. The USBR water supply is a wholesale supply.

Construction of Friant Dam was completed in 1947, and the dam began making diversions to the Friant-Kern Canal in 1949. Full operations of the CVP Friant Division did not commence until the Madera Canal was completed in 1951. Class 1 water was intended to be a supply that would be dependable in practically every year, regardless of the type of hydrologic WY. Class 2 water is essentially excess water available as determined by USBR and is less reliable than Class 1 water.

Class 1 water was historically very reliable until the 2006 San Joaquin River Restoration Settlement Agreement between the departments of the Interior and Commerce, the Natural Resources Defense Council, and the Friant Water Users Authority (which is now the Friant Water Authority). The City is a member of the Friant Water Authority. The settlement ended an 18-year legal dispute over the operation of Friant Dam brought by a coalition of conservation and fishing groups. The agreement characterized Class 1 deliveries by six hydrologic year types based on a recurrence over an 82-year simulation (1922–2003): wet, normal-wet, normal-dry, dry, critical-high, and critical-low. The projected surface water available for the City from USBR during each hydrologic year defined by the 2006 Settlement Agreement is summarized in Table B. As shown in the table, the average simulated delivery is 53,680 AFY and the median simulated delivery, which is similar to normal year delivery, is 60,000 AFY. The median value is higher than the average value because 100% allocation of 60,000 AF is simulated in 50 of 82 years but the dry and critical years result in substantial reductions, which bring down the average allocation.

**Table B: Available USBR Simulated Allocation (1922-2003)**

| Water Year Type | Percent of Years over Simulation Period of Deliveries[1] | Number of Years in that Year Type | Range of Allocation to City (AF) | Average Allocation to City (AF) |
|---|---|---|---|---|
| Wet | Highest 20% | 16 | 60,000 | 60,000 |
| Normal-Wet | 50% to 80% | 25 | 60,000 | 60,000 |
| Normal-Dry | 20% to 50% | 25 | 47,500 to 60,000 | 57,060 |
| Dry | 5% to 20% | 12 | 28,100 to 46,800 | 36,575 |
| Critical[2] | Lowest 5% | 4 | 13,900 to 24,700 | 19,025 |
| **Total** | | **82** | **Average** | **53,680** |
| | | | **Median** | **60,000** |

Source: 2020 Urban Water Management Plan, Table 6-2 (City of Fresno 2021).

[1] As defined in 2006 Settlement Agreement

[2] Includes both critical-high and critical-low, which are differentiated by the amount of unimpaired runoff. The simulation uses deliveries through 2006 and does not include the zero allocation years in 2014 and 2015.

AF = acre-feet

The Settlement Agreement estimates the reduced supply available to the City compared to historic supplies, most evident in dry years. Restrictions on exports from the Delta have hindered the USBR from making deliveries to the Exchange Contractors via the Delta-Mendota Canal. The Exchange Contractors allowed the formation of the CVP Friant Division by agreeing to not exercise their historic pre-1914 water rights to the San Joaquin and Kings rivers if guaranteed water deliveries continued through the Delta-Mendota Canal or other facilities. If USBR is unable to deliver water to the Exchange Contractors, they have the right to receive their water from the San Joaquin River, which reduces the Class 1 water availability.

Reduced deliveries from the Delta to the Exchange Contractors resulted in the CVP Friant Division contractors with zero allocations of Class 1 water in USBR WY 2014 and 2015, though the City received USBR deliveries in CY 2014 (prior to the USBR WY starting in March). Annual USBR deliveries since 2007 are shown in Figure 6-6 of the 2020 UWMP.

In addition to the Class 1 water available to the City, the USBR contract also makes available water classified as: recovered water account water; Section 215 water; and unreleased

restoration flows, unreleased recirculation flows, and uncontrolled season flows. The complexities of each water type are beyond the scope of this report but are mentioned here to reflect the other water acquisition opportunities afforded to the City through this contract. The San Joaquin River water supply has excellent water quality as it originates from snowmelt from the high Sierras and has not been detrimentally impacted.

### Fresno Irrigation District Supply

FID is one of 28 agencies that receives an entitlement of water from the Kings River through the Kings River Water Association. Water entitlements for Kings River Water Association contract members are determined based on a methodology that was initially developed in 1917–1919 to establish entitlements for early claimed rights holders. The methodology was based on historic mean daily natural flow conditions at Piedra, which is approximately 3 miles downstream from the then yet to be built Pine Flat Dam and "at the heart of Kings River uses, regulation, and stream control and storage."

On December 20, 2016, the Revised, Amended, and Restated Cooperative Agreement was executed between FID and the City for Water Utilization and Conveyance (2016 FID Agreement). The 2016 FID Agreement replaces the 1976 Cooperative Agreement and ends in 2035. The agreement identifies the City's contracted percentage of FID's Kings River water based on the City's water service area located within the FID service area as a percentage of the FID land area. FID land area varies slightly every year because it is dependent on the acreage receiving water deliveries for that year rather than the total acreage within FID (roughly 200,000 acres). As the City incorporates new land area into its service area, the percentage of FID supply increases. However, the 2016 FID Agreement sets the maximum percentage as 29.0 percent, although the City's service area is anticipated to expand and encompass more than 29.0 percent of FID's service area between 2025 and 2030. In 2020, the City's percentage of overall FID Kings River deliveries was 25.79 percent. The FID Agreement identifies that the 29.0 percent maximum was based on moderate growth in Growth Area 1 of the City's SOI (shown in Exhibit C in the 2016 Agreement). As such, the supply projections in this plan limit the City's FID supply with the 29.0 percent cap, but if the agreement were revised in the future the City's FID allocation percentage could grow beyond 29.0 percent as the water service area expands.

The City has historically not used all of its available allocation in any given year, although it pays a flat rate for its total allocation regardless of use. Water unused by the City is reallocated by FID to its other customers.

The City's potential supply from FID was summarized using actual Kings River deliveries for CYs 1964–2019, then categorized by the same WY types used for the USBR Friant supply. The range and average FID deliveries by WY type are shown in Table C. The average of all 56 CY delivery totals of FID Kings River deliveries is 452,541 AF, which equates to an average potential City supply of 131,237 AF, assuming the maximum 29.0 percent City supply

percentage. Table D lists the historic and projected allocation of FID's Kings River water for the City in normal (average) CYs. The City percentage of FID supplies was estimated assuming the City's water service area will grow from 59,100 acres to 84,300 acres by buildout.

**Table C: FID Diversions by Water Year Type (1964 to 2019)**

| Water Year Type | Percent of Years[1] | Number of Years between 194 and 2019 | Total FID Deliveries (AF)[2] | | Example Average Available to City[3] |
|---|---|---|---|---|---|
| | | | Range | Average | |
| Wet | Highest 20% | 11 | 563,500 to 644,600 | 590,700 | 171,300 |
| Normal-Wet | 50% to 80% | 17 | 452,800 to 563,300 | 513,700 | 149,000 |
| Normal-Dry | 20% to 50% | 17 | 362,600 to 448,000 | 415,000 | 120,400 |
| Dry | 5% to 20% | 8 | 253,700 to 362,000 | 315,700 | 91,600 |
| Critical | Lowest 5% | 3 | 158,100 to 253,300 | 210,200 | 61,000 |
| | | **56** | **Average** | **453,800** | **131,600** |

Source: 2020 Urban Water Management Plan, Table 6-3 (City of Fresno 2021).

1 As defined in the 2006 Settlement Agreement

2 Assigns water year type defined in the 2006 Settlement Agreement to FID deliveries from 1964 to 2019.

3 Based on the maximum 29.0 percent City supply percentage to provide an example City supply amount.

AF = acre-feet

**Table D: Projected FID Kings River Allocation for City, Normal Years**

| Year | Projected Total FID Allocation, AFY | Projected Allocation to City, AFY[1] |
|---|---|---|
| 2025 | 27.55% | 125,030 |
| 2030 | 29.00% | 131,600 |
| 2035 | 29.00% | 131,600 |
| 2040 | 29.00% | 131,600 |
| 2045 | 29.00% | 131,600 |

Source: 2020 Urban Water Management Plan, Table 6-4 (City of Fresno 2021).

[1] Projected City Allocation (%) x 453,800 AFY (estimated normal year diversion by FID, per Table 6-3 of the 2020 Urban Water Management Plan [Table G])

AFY = acre-feet per year

FID = Fresno Irrigation Dis

## STORMWATER

The Fresno-Clovis Metropolitan Area and surrounding rural vicinities are within the service area boundaries of the FMFCD, which has primary responsibility for managing the local stormwater flows. Most stormwater in Fresno drains to urban stormwater basins, where the water is retained to attenuate peak-flow runoff and recharge stormwater, or is pumped to local irrigation canals for conveyance away from the municipal areas. FMFCD's operation of stormwater basins is predicated on maintaining storage capacity for rain events, which limits accessibility for recharge activities during the rainy season. FMFCD estimates the amount of stormwater that is recharged each wet season. However, recharge attained with the FMFCD basins largely occurs in May through October, when limited storage capacity is required. Dry-season recharge is accomplished by diverting surface waters from the Kings River and Millerton Reservoir using City-allocated surface water. It is difficult to estimate stormwater recharge volumes as there is no physical measurement of stormwater flows into the basins, and infiltration rates can vary with water elevation and degree of siltation in the basin. However, FMFCD estimates that stormwater recharge in urban basins during the winter months may range from 7,000 AF per year to 22,200 AF per year.

## WASTEWATER AND RECYCLED WATER

### Recycled Water Coordination

The City is currently expanding its recycled water supplies to increase offset use of potable water for landscape irrigation. In 2010, the City completed a Recycled Water Master Plan (adopted by the City Council in 2013) to evaluate and plan for increased recycled water use in Fresno. The City's last Metro Plan, adopted in 2014, also outlined projects to increase the use of recycled water to offset potable demands. The City is currently updating the Metro

Plan and will reevaluate recommendations and projects to increase recycled water use. The City owns and operates two water reclamation facilities (WRFs): (1) the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) and (2) the North Fresno Wastewater Reclamation Facility (NFWRF), both of which can produce Title 22 recycled water for use within the City's service area.

Coordination with other water agencies and potential consumers within the planning area is inherently within the purview of the City's Department of Public Utilities (DPU) as this department provides both water and wastewater services. DPU has been on the forefront of numerous water supply preservation, enhancement, and development projects and programs for decades. The concept of multiagency coordination is fully embraced by the department, as is evident with the previously discussed joint agency agreements and the commitment to construct new infrastructure to further develop new resources. The endeavor to develop recycled water as a resource was a requirement of a development in north Fresno, where the developer was conditioned to have a net-zero impact on water resources. The fundamental component of this development was the construction and dedication of the NFWRF to the City.

There are only a few agencies besides the City that have wastewater collection and treatment facilities within and immediately adjacent to the plan area. These agencies include the City of Clovis, Malaga County Water District, Pinedale County Water District, and Pinedale Public Utility District.

As the City is the primary responsible agency for wastewater collection and treatment for its annexed areas and certain County islands, it has taken the lead role of developing and implementing recycled water facilities to serve the same area.

### *City of Clovis*

The RWRF was developed under a Joint Powers Authority agreement executed in 1977 among the City of Fresno, the City of Clovis, and the County of Fresno. Both of the cities contribute to the cost of operations and maintenance and capital expenditures for the RWRF based on formulas in the agreement. This facility provides service for most of Clovis' sewer flows.

The City of Clovis recently constructed its own wastewater treatment facility that produces tertiary-level effluent and is distributed in a dedicated purple pipe system within portions of its service area.

### *County of Fresno*

The County of Fresno, like the City of Clovis, is a party to the RWRF Joint Powers Authority for treatment of flows from unincorporated areas encompassed by the City's service area.

### *Malaga County Water District*

Malaga County Water District provides water and sewer service to an unincorporated County area of about 2.25 square miles, which covers a small portion of the City's SOI. The district provides wastewater collection and treatment for residential and non-residential customers.

### *Pinedale County Water District*

Pinedale County Water District provides water, sewer, and solid waste service to an area of about 2 square miles, which covers an unincorporated County island and a portion of Fresno. The district provides wastewater collection to an area of 699 acres and diverts the flow to the City's collection system for treatment at the RWRF.

### *Pinedale Public Utility District*

Pinedale Public Utility District provides wastewater, street lighting, street sweeping, and landscape maintenance. The district services an area of 362 acres in the northern portion of Fresno, serving both an unincorporated County island and portions of the city. The collected wastewater is diverted to the City's collection system for treatment at the RWRF.

## Wastewater Collection, Treatment, and Disposal

The City's wastewater collection system was originally developed in 1891 with the installation of a 24-inch outfall sewer that discharged to a 40-acre sewer farm located southwest of town. The amount of land and number of facilities at this location continued to be expanded as Fresno grew over the years. Today, the City's wastewater collection system consists of about 1,630 miles of pipes ranging in size from 4 inches in diameter to 84 inches in diameter. This collection system also utilizes 15 lift stations throughout Fresno, ranging in pumping capacity from 0.25 million gallons per day (mgd) to 2.2 mgd.

### *Wastewater Treatment and Discharge Within Service Area*

The City is served by two wastewater treatment plants, briefly described below.

**Fresno-Clovis Regional Wastewater Reclamation Facility.**The RWRF has developed from what was once a sewer farm to a state-of-the-art wastewater treatment facility. In 1966, the City of Fresno was appointed the sewering agency for the local metropolitan region and shortly after began long-range planning and construction of new facilities to handle increasing flows and regulatory requirements. The RWRF treats flows from not only Fresno, but also sewered County areas (some County areas remain unsewered), the City of Clovis, Pinedale County Water District, and Pinedale Public Utility District.

Flows received at this facility peaked at 81,100 AF in 2006 and have been steadily decreasing since, with the average influent flow about 63,000 AF over the last 5 years. The

RWRF includes preliminary, primary, secondary, and tertiary treatment units with disinfection. Secondary treatment consists of three treatment trains with an annual average capacity of 87 mgd, consisting of 30 mgd for Train A and 57 mgd for Trains B and C combined. In 2017, a 5 mgd tertiary treatment system—the Tertiary Treatment and Disinfection Facility (TTDF)—was completed. The system can be expanded to 15 mgd and ultimately to 30 mgd.

The City has three primary means of effluent disposal:

1. Undisinfected secondary effluent to on-site and off-site farmland for restricted irrigation
2. Undisinfected secondary effluent to percolation ponds
3. Disinfected tertiary effluent to the recycled water distribution system

The percolated effluent has been deemed equivalent to Title 22 tertiary-treated water by the State Water Resources Control Board (SWRCB) Department of Drinking Water (DDW). The City has been extracting this water for reuse in areas within and surrounding the RWRF, as well as to FID's canals, through an exchange agreement for delivery to FID agricultural customers.

The discharged effluent is within the City boundaries and located just southwest of the metropolitan area. The treated effluent percolation ponds are within the City's SOI and hydrologic sphere that benefit the City's overall regional water budget.

**North Fresno Wastewater Reclamation Facility.**The NFWRF was constructed as part of a residential, commercial, and golf course master planned development located in the northern portion of Fresno. As a condition of the planned community, the developer was required to construct a wastewater treatment facility that would produce tertiary-level effluent for use within the development to ensure the overall project had a net-zero impact on water resources. This facility is presently rated at 0.71 mgd (average monthly flow) and 1.07 mgd (maximum daily flow). However, the ultraviolet (UV) light disinfection system was only validated for 300 gallons per minute (gpm) (0.43 mgd), which is the current flow limit until the DDW approves a higher flow. This facility is expandable to 1.25 mgd (average monthly flow). The disinfected tertiary effluent from the plant is largely used to irrigate the Copper River Ranch Golf Course. Of the 325 AF of wastewater treated in 2020, 54 AF was used for irrigation of turf. Treated but unused effluent is diverted to the City's collection system to the RWRF.

### Recycled Water System Description

The 2014 Metro Plan recommended expanding reuse by: (1) using the NFWRF effluent to irrigate the Copper River Ranch Golf Course; and (2) deriving up to 25,000 AFY of recycled water for landscape irrigation or other non-potable uses from the RWRF or new satellite WRFs. Since then, the City has irrigated the Copper River Ranch Golf Course with recycled

water and has constructed much of the southwest recycled water distribution system. However, the City is currently updating the Metro Plan and reevaluating the target volume of reuse in Fresno beyond the southwest system considering new conditions and regulations, including the potential for potable reuse in the future.

### *Fresno-Clovis Regional Wastewater Reclamation Facility*

As mentioned above, the RWRF produces undisinfected secondary effluent for restricted irrigation to on-site and off-site farmlands and disinfected tertiary-treated effluent for the recycled water distribution system.

The City's RWRF diverts a portion of the undisinfected secondary effluent to irrigate non-food crops grown adjacent to this facility. The practice of using the secondary effluent to irrigate non-food crops has been carried out for decades and is expected to continue for the foreseeable future. The City owns nearly 3,300 acres of land for and around the RWRF, consisting of percolation ponds (1,750 acres) and other land available to farm non-food crops. Table E provides the annual quantities of recycled water applied to these crops for the period from 2015 to 2019.

**Table E: Historic Recycled Water Used Within Service Area (AF)**

| Recycle Water Facility | 2015 | 2015 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| RWRF, Secondary Effluent (Non-Food Crop Irrigation) | 8,688 | 7,329 | 4,540 | 7,031 | 3,652 | 3,845 |
| RWRF, Tertiary Effluent | 531 | 485 | 423 | 867 | 912 | 858 |
| NFWRF | 62 | 110 | 0 | 0 | 19 | 54 |
| **Total** | **9,281** | **7,924** | **4,963** | **7,898** | **4,583** | **4,757** |

Source: 2020 Urban Water Management Plan, Table 6-5 (City of Fresno 2021).
Note: Reuse at the NFWRF was zero in 2017 and 2018 because the recycled water delivery system was offline for system repairs.
AF = acre-feet
NFWRF = North Fresno Wastewater Reclamation Facility
RWRF = Regional Wastewater Reclamation Facility

Additionally, the RWRF produces Title 22 disinfected tertiary-treated effluent through the TTDF completed in 2017 and through tertiary-equivalent soil aquifer-treated recycled water recovered from the percolated secondary effluent. A series of 15 groundwater wells located

at the RWRF are used to extract previously percolated effluent groundwater from beneath the facility. The extracted groundwater has the potential to be used for higher beneficial use if it can be demonstrated this water has attained a level of treatment satisfactory to meet disinfected tertiary levels. The City embarked on a joint project with the WateReuse Research Foundation to demonstrate to State regulatory agencies the soil aquifer-treated recycled water met Title 22 levels. The culmination of this study is presented in a final report entitled "Demonstration of Filtration and Disinfection Compliance Through Soil-Aquifer Treatment," which was completed in 2013. This study concluded that, based on the documented sampled water quality data, the extracted groundwater met requirements for classification as disinfected tertiary-level recycled water. The SWRCB DDW stated that the percolated effluent water meets the tertiary treatment classification, and the City is making plans for its use as part of its recycled water production and distribution system. The combined rated production yield of the 15 wells, if run year-round, would be approximately 32,000 AFY. The City plans to blend the recycled extraction well water with the disinfected tertiary-level recycled water produced from the 5 mgd TTDF to feed the southwest recycled water distribution system. As new sales grow for the recycled water, additional recycled extraction of well water will be utilized to feed the City's southwest recycled water system.

The tertiary-equivalent soil aquifer-treated recycled water (recovered groundwater) is also used for on-site irrigation and transport to FID canals for delivery to customers during the irrigation season, as facilitated through an exchange agreement with FID.

Since the completion of the 2010 Recycled Water Master Plan (RWMP), the City has constructed most of the southwest recycled water system, shown in Figure 6-9 of the UWMP. The southwest recycled water system consists of a 3.2-million-gallon recycled water reservoir located at the RWRF, a 6,000 gpm (8.64 mgd) recycled water pump station located at the RWRF, a 640 gpm booster pump station (Roeding Park Booster), and 15.7 miles of 10-inch to 54-inch recycled water pipeline. Roughly 7.5 miles of pipeline remain to be constructed. The City also updated the demand and distribution system from the 2010 RWMP with the 2019 Citywide Recycled Water Demand and Southwest Recycled Water System Analysis to identify potential recycled water customers. This recent analysis will be incorporated into the latest Metro Plan update.

### *North Fresno Water Reclamation Facility*

As described earlier, the City has an existing recycled water plant in the northern portion of Fresno that receives and treats sewage from the residential, commercial, and golf course master-planned community. The NFWRF was constructed in 2008 but was not fully operational until 2009 due to the inability to run properly in extremely low-flow conditions. Subsequent modifications at the plant allowed it to run on a regular basis in 2010 and again in 2014 for UV approval. The amount of reuse has varied substantially since 2016 because the delivery system was offline in 2017 and 2018 for treated water basin slope repairs. City

staff indicated that 2016 is representative of operations going forward. The disinfected tertiary effluent is conveyed in a dedicated pipeline to an adjacent golf course for irrigation purposes. The quantities used for irrigation purposes are shown in Table E for the period of 2015–2019.

### Potential, Current, and Project Recycled Water Rates

The 2020 actual recycled water use and projected recycled water use in Fresno's service area is included in Table F. Secondary undisinfected reuse is projected to continue to be used to irrigate non-food crops adjacent to the RWRF in the future. The projected secondary undisinfected use going forward is based on the average use from 2015 to 2020. Additionally, the amount of tertiary recycled water from the RWRF is projected to increase to provide 6,210 AF for landscape and agricultural irrigation as the southwest recycled water system is built out. Projected tertiary recycled water from the NFWRF for golf course irrigation is projected to be 110 AF annually through 2045.

The 2015 UWMP anticipated that 21,200 AFY of recycled water would be produced and utilized in 2020. The previous projected increases in recycled water were based on recommendations from the 2010 RWMP, which included projects to increase recycled water use for landscape irrigation, agricultural irrigation, industrial use, and blending with raw surface water for groundwater recharge. Since the 2010 RWMP, the City has focused on constructing the southwest recycled water system to increase landscape and agricultural irrigation in the southwest portion of Fresno. The City is also currently updating the Metro Plan that is evaluating recycled water alternatives in Fresno and is expected to update its RWMP following the Metro Plan update to serve as a new guiding planning document for recycled water use by the City.

## Table F: Recycled Water within Service Area

| Beneficial Use Type | Potential Beneficial Uses of Recycled Water | Number of Potential Uses of Recycled Water (AF) | General Description of 2020 Uses | Level of Treatment | 2020 (AF) | 2025 (AF) | 2030 (AF) | 2035 (AF) | 2040 (AF) | 2045 (AF) |
|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural irrigation[1] | Non-food crop irrigation | 7,900 | Irrigate non-food crops | Secondary, Undisinfected | 3,845 | 7,900 | 7,900 | 7,900 | 7,900 | 7,900 |
| Landscape irrigation (excludes golf course) | Landscape irrigation | 5,800 | Landscape irrigation; distributed through the southwest recycled water distribution system | Tertiary | 858 | 5,800 | 5,800 | 5,800 | 5,800 | 5,800 |
| Agricultural irrigation[1] | Food crop irrigation | 410 | Irrigate limited food crops; distributed through the southwest recycled water distribution system | Tertiary | - | 410 | 410 | 410 | 410 | 410 |
| Golf course irrigation | Landscape irrigation | 110 | Copper River Golf Course | Tertiary | 54 | 110 | 110 | 110 | 110 | 110 |
| - | | | | **Total:** | **4,757** | **14,220** | **14,220** | **14,220** | **14,220** | **14,220** |

Source: 2020 Urban Water Management Plan, Table 6-6 (City of Fresno 2021).

*Table footnotes continued on next page.*

Notes: Name of Supplier Producing (Treating) the Recycled Water: City of Fresno
Name of Supplier Operating the Recycled Water Distribution System: City of Fresno
Supplemental Volume of Water Added in 2020: 0%
Source of 2020 Supplemental Water: N/A

[1] Recycled water for agricultural irrigation does not offset the City's potable water demands, and as such, is excluded from projected recycled water in subsequent tables.

AF = acre-feet

### Actions to Encourage and Optimize Future Water Use

The 2010 RWMP identified the need for the City to adopt an ordinance to establish a recycled water policy and criteria for its use within the City's SOI. On July 14, 2014, the Recycled Water Ordinance was adopted by the City Council, laying the foundation for the expanded use of recycled water within Fresno.

The focus of the ordinance includes the following:

- Establish an Administrative Authority.
- Establish approved uses of recycled water.
- Define areas of potential eligibility for recycled water service.
- Specify voluntary uses of recycled water, depending on user classifications.
- Require installation of a transmission and distribution infrastructure.
- Encourage the use of voluntary retrofits for existing users that may not be addressed in the ordinance.
- Require the City of Fresno to prepare Rules and Regulations.
- Provide enforcement and severability clauses.
- Establishing a means for the City to provide recycled water at a negotiated price.

Efforts to further the use of recycled water include the requirement that new developments within planned major recycled water distribution mains must install purple pipe. Then, as the City's capital projects construct a distribution infrastructure, these segments will be in place to facilitate connections to new customers, reduce program costs by avoiding digging up new street improvements, and reduce disruption to vehicular traffic.

Most of the southwest recycled water distribution system from the RWRF completed construction in 2021. The City has identified potential customers to connect to the recycled water system once it is completed to offset potable demand and increase recycled water use in Fresno.

## DESALINATED WATER OPPORTUNITIES

Fresno is located in the central San Joaquin Valley; therefore, seawater desalination is not applicable to the City. Additionally, the groundwater that exists within the immediate area of Fresno is not brackish in nature and does not require desalination treatment.

# WATER EXCHANGES AND TRANSFERS

## Exchanges and Transfer Opportunities

### *USBRR Supply*

The Central Valley Project Improvement Act (CVPIA) of 1992 authorized the transfer of all or a portion of a CVP contractor's water supply to any other California water users or water agencies. The CVPIA allows water transfers as long as they are consistent with federal and State water laws. The primary component of the CVPIA that specifies water transfer provisions for federal water supplies is Section 3405(a), which includes provisions regarding maximum annual water transfer, beneficial use, and approvals.

As part of the City's current Metro Plan update, the City is evaluating potential future water transfers and exchanges of its periodically available USBR water. Currently, the City does not have any plans to transfer its USBR water to other California water users.

### *FID/RWRF Groundwater Exchange Supply*

Since 1974, the City has had an agreement with FID to exchange recycled water for the delivery of surface water east of Fresno (Appendix I of the 2020 UWMP). The agreement between fid and the city for exchange of recycled water allows for water pumped from beneath the RWRF to be conveyed to FID's Dry Creek and Houghton canals for delivery to growers west of Fresno. In exchange for the water delivered to FID by the City, FID agreed to deliver 46% of the total from either its Kings River entitlement or USBR Class II supply to growers or basins in the eastern portion of FID "insofar as is feasible and practical." The water is to be considered additional to the water that would have been delivered to the eastern portion of FID, such that the additional delivered water used by growers is assumed to offset groundwater pumping in the area and, therefore, provide a groundwater basin benefit. This is an indirect benefit to the City.

The agreement includes a minimum of 100,000 AF delivered over a 10-year period and no more than 30,000 AF in any given year. As shown in Figure 6-10 of the 2020 UWMP, the City exceeded the maximum yearly delivery in 2003 and 2004 and has maintained more than 100,000 AF of deliveries over a 10-year period. However, since 2016, the City has reduced RWRF groundwater exchange deliveries. The City is currently discussing an update to the agreement with FID, while the 2020 Metro Plan will identify and recommend other beneficial uses for the City's percolated effluent.

## Emergency Interties

In 2007, the cities of Fresno and Clovis executed an agreement for interconnection of their potable water systems to provide service during emergencies and other times of hardship in either community. The agreement covers interconnections, including apportionment of

capital costs, at two locations: Leonard Avenue at the Gould Canal alignment and Behymer Avenue at Willow Avenue.

The agreement provided for temporary deliveries from Clovis to southeast Fresno through the Leonard Avenue connection through 2013. The Leonard Avenue interconnection was constructed and remains in place for emergency uses through manual operation.

The agreement also provided for temporary deliveries from Fresno to northern Clovis through the Behymer Avenue connection through 2015. However, the Behymer Avenue interconnection has yet to be constructed and, if constructed in the future, would serve only for emergency use.

## FUTURE WATER PROJECTS

The City is currently updating its Metro Plan, which will recommend programs and projects to improve the City's water supply portfolio and continue providing a safe, reliable, and sustainable water supply. While the outcomes of the Metro Plan update are currently being developed, the City's ongoing and future projects to improve its supply portfolio include:

- Expansion of the recycled water distribution system
- Expansion of the groundwater recharge program
- Expansion of surface water treatment capacity
- Beneficial transfers and exchanges

### Expand Recycled Water Distribution System

As described above, the City has made significant improvements to its recycled water system over the last 5 years and is currently expanding its recycled water distribution system. The expanded distribution system allows an additional 5,000 AF of recycled water use in the City to offset potable demands that can be used in all hydrological year types. The expansion is projected to be completed by 2025.

### Expand Groundwater Recharge Capacity

With the acknowledgement that the groundwater aquifer is and will remain an integral resource, the City is currently evaluating an expanded recharge program as part of the Metro Plan update. Expanding intentional recharge may include the development of new dedicated intentional recharge facilities and/or joint projects for basins with FMFCD and potentially FID. The target for recharge expansion is to maximize storage within the groundwater basin and optimize use of available surface water supplies in normal years. The stored water will be used more in the single-dry-year and consecutive-dry-years scenarios, when surface water supplies are less available. The timing for groundwater recharge capacity expansion will be examined as part of the Metro Plan update and, for the

UWMP, is assumed to increase to allow for an additional 540 AFY of recharge to occur on average each year.

### Expand Surface Water Treatment Capacity

A key component to the success of the City's ability to reverse the long-time overreliance on groundwater is the construction of its surface water treatment facilities. These have allowed the City to optimize the use of available surface water supplies. The City's NESWTF currently has a 30 mgd capacity and the capability to expand up to 60 mgd. The SESWTF is currently permitted to produce up to 54 mgd but, with the subsequent rerating of the media filters, will be capable of operating at a rated capacity of 80 mgd. The timing for the SWTF expansion will be examined as part of the Metro Plan update and determined based on need as the City grows and demands increase.

### Beneficial Transfers and Exchanges

The City is evaluating future beneficial transfers and exchanges of the City's USBR water in normal water years when available water supplies exceed demands.

## SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

Summaries of the above-discussed existing and planned sources of water are provided in Table G and Table H below.

### Table G: Actual Water Supplies

| Water Supply | 2020 | |
|---|---|---|
| | Actual Volume, AFY | Water Quality |
| Groundwater | 55,028 | Drinking Water |
| USBR CVP | 37,447 | Drinking Water |
| FID Kings River | 71,292 | Drinking Water |
| Recycled Water, RWRF | 858 | Recycled Water |
| Recycled Water, NFWRF | 54 | Recycled Water |
| **Total** | **164,679** | |

Source: 2020 Urban Water Management Plan, Table 6-7 (City of Fresno 2021).
AFY = acre-feet per year
CVP = Central Valley Project
FID = Fresno Irrigation District
NFWRF = North Fresno Wastewater Reclamation Facility
RWRF = Regional Wastewater Reclamation Facility
USBR = United States Bureau of Reclamation

### Table H: Projected Water Supplies

| Water Supply | Reasonably Available Volume, AFY | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 |
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| USBR CVP | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 |
| FID Kings River | 125,030 | 131,600 | 131,600 | 131,600 | 131,600 |
| Recycled Water, RWRF | 5,800 | 5,800 | 5,800 | 5,800 | 5,800 |
| Recycled Water, NFWRF | 110 | 110 | 110 | 110 | 110 |
| **Total** | **329,030** | **341,140** | **346,610** | **352,000** | **357,330** |

Source: 2020 Urban Water Management Plan, Table 6-8 (City of Fresno 2021).
AFY = acre-feet per year
CVP = Central Valley Project
FID = Fresno Irrigation District
NFWRF = North Fresno Wastewater Reclamation Facility
RWRF = Regional Wastewater Reclamation Facility
USBR = United States Bureau of Reclamation

## Supply Management

The City currently balances its surface water supplies and groundwater based on minimum production for operation of the SWTFs and minimum groundwater pumping to manage and control contamination plumes and prevent their spread. The minimum operation conditions typically occur in the low-demand winter months, and the City can increase surface water production during peak-demand months when surface water is available. In normal and wet years, the City intends to rely on more surface water supply and recharge raw surface water to replenish the groundwater basin and build storage for dry years. In dry years, when surface water is less available, the City will ramp up well production to meet demands. The City is expected to continue this supply management strategy in the future.

## Special Conditions

This section details climate change and future regulatory conditions that impact the City's supply sources.

### *Climate Change Effects*

Climate models disagree on average annual precipitation projections but agree on other hydrologic metrics relevant to water resources management, including:

- Snowpack declines
- Increased fraction of precipitation on extreme rainfall days
- Shorter, sharper rainy season
- Increased evapotranspiration
- Higher frequency of extremely wet and extremely dry years
- Higher incidence of an extreme dry year followed by an extreme wet year or vice versa

Climate change impacts were evaluated in the North Kings GSP using DWR climate change datasets, which were developed for the California Water Commission's Water Storage Investment Program (WSIP). The North Kings GSP analyzed WSIP water supply projections and found climate change will have no significant impact on the FID Kings River diversions. The North Kings GSP estimates the timing of the inflows to water reservoir and surface water supplies is anticipated to shift significantly due to warmer temperatures causing precipitation to arrive as rainfall instead of snowmelt. The warmer temperatures are also predicted to cause the snowmelt to turn to runoff earlier each spring. These climate impacts are estimated in the North Kings GSP to slightly increase inflows to the Kings River (0.6% in 2040 and 0.3% in 2070); however, they are not expected to impact the Kings River diversions significantly, and the timing will have a greater impact on water management, including a possible greater need for additional storage. The North Kings GSP also estimated climate impacts to the San Joaquin River supplies available to the CVP Friant Division Contractors, including the City's USBR Class I supplies, and found the WSIP dataset estimates a slight reduction in future water supplies. The 2020 UWMP considers water supply during an extreme-dry-year or multi-dry-year scenario, which may occur more often due to climate change.

### *Regulatory Conditions*

The City has existing contracts for its surface water supplies that are not facing any reduction due to forthcoming regulation. The City's groundwater supply is from an unadjudicated basin and is also considered reliable. The GSA is currently working toward determining a safe yield for the Kings Subbasin, which is the amount of water than can be pumped from the basin over a long-term period without producing undesirable results. The City is an active member of the GSA, working collaboratively to bring the basin into balance while protecting the City's groundwater supply.

Additionally, forthcoming California regulations for per- and polyfluoroalkyl substances (PFAS) may impact certain wells within Fresno. The City is currently monitoring and treating

some groundwater wells for PFAS. These regulations are not expected to impact the City's ability to use its full groundwater supply.

## ENERGY INTENSITY

Pursuant to California Water Code Section 10631.2(a), readily available information regarding energy intensity shall be reported in the 2020 UWMP. For the City, this includes the total energy usage at each production facility, including each well site and the three SWTFs. The electrical usage includes the energy to produce, treat, and pump the water into the distribution system. Because the City's distribution system includes over 200 groundwater wells, Table I presents the total energy usage, water produced, and average energy intensity for all groundwater wells and for each SWTF following the methodology presented in Appendix O of the DWR 2020 UWMP Guidebook. The energy intensity varies significantly among groundwater wells depending on the depth to the groundwater table, if the well includes treatment beyond disinfection, and other local conditions. The total energy intensity for all production and treatment in the City's distribution system in 2020 was 384 kilowatt-hours per AF.

### Table I: Water System Energy Intensity in 2020

| | Wells | NESWTF | SESWTF | T-3 SWTF | Total |
|---|---|---|---|---|---|
| Groundwater | 27,667,366 | 5,845,314 | 13,416,000 | 454,470 | **47,386,150** |
| USBR CVP | 56,445 | 20,724 | 45,367 | 875 | **123,411** |
| FID Kings River | 490 | 282 | 296 | 520 | **384** |

Source: 2020 Urban Water Management Plan, Table 6-9 (City of Fresno 2021).
CVP = Central Valley Project
FID = Fresno Irrigation District
NESWTF = Northeast Surface Water Treatment Facility
SESWTF = Southeast Surface Water Treatment Facility
T-3 SWTF T-3 = Water Storage and Modular Surface Water Treatment Facility
USBR = United States Bureau of Reclamation

# WATER SUPPLY

This section discusses projected supplies and demands for a normal year, single dry year, and 5-year consecutive drought. As shown in Table J, the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years. As shown in Table K, the City's surface water supplies are reduced in a single dry year, but all potable demands are met and groundwater recharge of raw surface water is reduced. As shown in Table L, the City is projected to meet all demands during a 5-year drought with its existing supplies. Potable demands are unrestricted, and non-potable water used for groundwater recharge is reduced in years 3 and 4 of a 5-year drought.

## Table J: Normal Year Supply and Demand Comparison (acre-feet per year)

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| Surface Water – USBR | 60,000 | 60,000 | 60,000 | 60,000 | 60,000 |
| Surface Water – FID | 125,030 | 131,600 | 131,600 | 131,600 | 131,600 |
| Recycled Water | 5,910 | 5,910 | ,5910 | 5,910 | 5,910 |
| **Supply Totals** | **329,030** | **341,140** | **346,610** | **352,000** | **357,330** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 62,700 | 65,400 | 68,100 | 70,800 | 73,500 |
| **Demand Totals** | **199,204** | **212,756** | **222,310** | **231,876** | **241,447** |
| **Difference** | **129,826** | **128,384** | **124,300** | **120,124** | **115,883** |

Source: 2020 Urban Water Management Plan, Table 7-1 (City of Fresno 2021).
FID = Fresno Irrigation District
USBR = United States Bureau of Reclamation

## Table K: Single Dry Year Supply and Demand Comparison (acre-feet per year)

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| Surface Water – USBR | 0 | 0 | 0 | 0 | 0 |
| Surface Water – FID | 45,852 | 45,852 | 45,852 | 45,852 | 45,852 |
| Recycled Water | 5,910 | 5,910 | 5,910 | 5,910 | 5,910 |
| **Supply Totals** | **189,852** | **159,392** | **200,862** | **206,252** | **211,582** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 27,588 | 28,776 | 29,964 | 31,152 | 32,340 |
| **Demand Totals** | **164,092** | **176,132** | **184,174** | **192,228** | **200,287** |
| **Difference** | **25,760** | **19,260** | **16,668** | **14,024** | **11,295** |

Source: 2020 Urban Water Management Plan, Table 7-2 (City of Fresno 2021).
FID = Fresno Irrigation District
USBR = United States Bureau of Reclamation

## Table L: Multiple Dry Years Supply and Demand Comparison

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **First Year** | | | | | |
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| Surface Water – USBR | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| Surface Water – FID | 99,725 | 99,725 | 99,725 | 99,725 | 99,725 |
| Recycled Water | 5,910 | 5,910 | 5,910 | 5,910 | 5,910 |
| **Supply Totals** | **273,725** | **279,265** | **284,735** | **290,125** | **295,455** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 62,700 | 65,400 | 68,100 | 70,800 | 73,500 |
| **Demand Totals** | **199,204** | **212,756** | **222,310** | **231,876** | **241,447** |
| **Difference** | **74,521** | **66,509** | **62,425** | **58,249** | **54,008** |
| **Second Year** | | | | | |
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| Surface Water – USBR | 37,200 | 37,200 | 37,200 | 37,200 | 37,200 |

## Table L: Multiple Dry Years Supply and Demand Comparison

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Surface Water – FID | 93,426 | 93,426 | 93,426 | 93,426 | 93,426 |
| Recycled Water | 5,910 | 5,910 | 5,910 | 5,910 | 5,910 |
| **Supply Totals** | **274,626** | **280,166** | **285,636** | **291,026** | **296,356** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 62,700 | 65,400 | 68,100 | 70,800 | 73,500 |
| **Demand Totals** | **199,204** | **212,756** | **222,310** | **231,876** | **241,447** |
| **Difference** | **75,422** | **67,410** | **63,326** | **59,150** | **54,909** |
| **Third Year** | | | | | |
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| Surface Water – USBR | 0 | 0 | 0 | 0 | 0 |
| Surface Water – FID | 73,568 | 73,568 | 73,568 | 73,568 | 73,568 |
| Recycled Water | 5,910 | 5,910 | 5,910 | 5,910 | 5,910 |
| **Supply Totals** | **217,568** | **223,108** | **228,578** | **233,968** | **239,298** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 53,763 | 46,281 | 43,526 | 40,677 | 37,761 |
| **Demand Totals** | **190,267** | **193,637** | **197,736** | **201,753** | **205,708** |
| **Difference** | **27,301** | **29,471** | **30,842** | **32,215** | **33,589** |
| **Fourth Year** | | | | | |
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |
| Surface Water – USBR | 0 | 0 | 0 | 0 | 0 |
| Surface Water – FID | 45,852 | 45,852 | 45,852 | 45,852 | 45,852 |
| Recycled Water | 5,910 | 5,910 | 5,910 | 5,910 | 5,910 |
| **Supply Totals** | **189,852** | **195,392** | **200,862** | **206,252** | **211,582** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 26,047 | 18,564 | 15,810 | 12,960 | 10,045 |
| **Demand Totals** | **162,551** | **165,920** | **170,020** | **174,036** | **177,992** |
| **Difference** | **27,301** | **29,471** | **30,842** | **32,215** | **33,589** |
| **Fifth Year** | | | | | |
| Groundwater | 138,090 | 143,630 | 149,100 | 154,490 | 159,820 |

## Table L: Multiple Dry Years Supply and Demand Comparison

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Surface Water – USBR | 45,000 | 45,000 | 45,000 | 45,000 | 45,000 |
| Surface Water – FID | 125,840 | 125,840 | 125,840 | 125,840 | 125,840 |
| Recycled Water | 5,910 | 5,910 | 5,910 | 5,910 | 5,910 |
| **Supply Totals** | **314,840** | **320,380** | **325,580** | **331,240** | **336,570** |
| Potable Demand | 136,504 | 147,356 | 154,210 | 161,076 | 167,947 |
| Non-Potable Demand | 62,700 | 65,400 | 68,100 | 70,800 | 73,500 |
| **Demand Totals** | **199,204** | **212,756** | **222,310** | **231,876** | **241,449** |
| **Difference** | **115,636** | **107,624** | **103,540** | **99,364** | **95,123** |

Source: 2020 Urban Water Management Plan, Table 7-3 (City of Fresno 2021).
FID = Fresno Irrigation District
USBR = United States Bureau of Reclamation

## CONTINGENCY ANALYSIS APPLICABLITY

The City's adopted 2020 UWMP contains an overview of the City's Water Shortage Contingency Plan (WSCP). The City's WSCP is used to provide guidance to the City's governing body and staff and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to extended drought and catastrophic supply interruptions. The WSCP, applicable to the entire City of Fresno municipal water service area, is fully applicable to the project and protective of the adequacy of the project's water supply.

As discussed in the 2020 UWMP, the WSCP describes the following:

1. **Water Supply Reliability Analysis:** Summarizes the City's water supply analysis and reliability and identifies any key issues that may trigger a shortage condition

2. **Annual Water Supply and Demand Assessment Procedures:** Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions

3. **Six Standard Shortage Stages:** Establishes water shortage levels to clearly identify and prepare for shortages

4. **Shortage Response Actions:** Describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand as well as minimize social and economic impacts to the community

5. **Communication Protocols:** Describes communication protocols under each stage to ensure customers, the public, and government agencies are informed of shortage conditions and requirements

6. **Compliance and Enforcement:** Defines compliance and enforcement actions available to administer demand reductions

7. **Legal Authority:** Lists the legal documents that grant the City the authority to declare a water shortage and implement and enforce response actions

8. **Financial Consequences of WSCP Implementation:** Describes the anticipated financial impact of implementing water shortage stages and identifies mitigation strategies to offset financial burdens

9. **Monitoring and Reporting:** Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation, with results used to determine if additional shortage response actions should be activated or if efforts are successful and response actions should be reduced

10. **WSCP Refinement Procedures:** Describes the factors that may trigger updates to the WSCP and outlines how to complete an update

11. **Special Water Features Distinctions:** Identifies exemptions for ponds, lakes, fountains, pools, and spas, etc.

12. **Plan Adoption, Submittal, and Availability:** Describes the process for the WSCP adoption, submittal, and availability after each revision

As identified in the 2020 UWMP, the 2020 WSCP is included as Appendix J to the 2020 UWMP.

# WATER DEMAND

This section discusses the citywide future estimated water use and estimated water demand associated with the proposed project.

## CITYWIDE DEMAND FACTORS FOR WATER USE

The City's 2020 UWMP estimated future water demands based on land use demand factors using 2018 metered consumption data. These demand factors were applied to the 2020 land use acreage by category to develop the demand projection beginning in 2020. Demand factors for land uses that grow over time and represent new developments were assigned a lower demand factor than the demand factors for existing development. Additionally, demand factors were assumed to slowly reduce over time due to passive conservation, which includes the replacement of older water fixtures and appliances with more efficient types. Table M shows the projected annual water use by land use type for 2025, 2030, 2035, 2040, and 2045.

### Table M: Citywide Demands for Potable and Non-Potable Water (acre-feet per year)

| Use Type | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single-Family | 76,255 | 80,429 | 82,934 | 85,437 | 87,936 |
| Multi-Family | 19,000 | 20,654 | 21,737 | 22,831 | 23,935 |
| Commercial[1] | 19,052 | 21,135 | 22,587 | 24,041 | 25,496 |
| Industrial | 7,410 | 9,003 | 9,922 | 10,841 | 11,758 |
| Landscape | 4,490 | 5,035 | 5,422 | 5,809 | 6,196 |
| Groundwater Recharge[2] | 62,700 | 65,400 | 68,100 | 70,800 | 73,500 |
| Other[3] | 200 | 200 | 200 | 200 | 200 |
| Losses | 10,097 | 10,900 | 11,408 | 11,917 | 12,426 |
| **Total** | **199,204** | **212,756** | **222,310** | **231,876** | **241,447** |

Source: 2020 Urban Water Management Plan, Tables 4-6 and 4-7 (City of Fresno 2021).
Notes:
[1] Includes industrial/governmental uses.
[2] Raw water.
[3] Travel meters.

As shown in Table M, overall water demands are projected to increase from 199,204 AFY in 2025 to 241,447 AFY in 2045, an increase of approximately 21 percent. The increase in water use for industrial uses is projected to increase at a faster rate of approximately 59 percent over the same period, from 7,410 AFY in 2025 to 11,758 AFY in 2045. Based on Table 4-3 of the 2020 UWMP, industrial acreage is expected to increase from 4,500 acres in

2020 to 9,300 acres in 2056, an increase of approximately 107 percent. As discussed above, demand factors for land uses that grow over time and represent new developments were assigned a lower demand factor than the demand factors for existing development.

## PROPOSED PROJECT WATER DEMAND

### Methodology

The potable demand projections in the 2020 UWMP for normal water use utilize land use-based projections. Under this methodology, existing land use and demand was accounted separately from future land use and demand. This allows different demand factors to be applied to current land use areas and future land use areas. Future land use areas represent future customers and developments that are expected to be more water-efficient than existing land uses and buildings due to the California Plumbing Code (CPC) and use of higher-efficiency appliances and landscapes.

The existing and future land use acreage was sourced from the City's Geographic Information System (GIS) database and the City's General Plan. The existing land use shapefile and associated acreage for each land use classification were used to represent 2020 land use data. Areas not served by the City were excluded from the existing land use shapefile. The future land use shapefile corresponds with the planned land use at buildout as described in the City's General Plan representing the year 2056. Although the City does not have any plans to serve areas currently served by others within the City limits, all areas within the City's SOI were assumed to be served by the City by buildout for conservative planning purposes. Table N lists the land use acreage by land use category for the 2020 and buildout 2056 water service areas used in the City's 2020 UWMP.

## Table N: Existing and Future Water Service Area Acreage

| Land Use Category | 2020 Water Service Area [1,3,4] | | 2056 Water Service Area[2] | |
|---|---|---|---|---|
| | Acres | Percent | Acres | Percent |
| Single-Family Residential | 27,700 | 47% | 40,000 | 47% |
| Multifamily Residential | 3,700 | 6% | 3,800 | 5% |
| Commercial | 4,500 | 8% | 8,600 | 10% |
| Public Facility | 5,600 | 9% | 7,200 | 9% |
| Industrial | 4,500 | 8% | 9,300 | 11% |
| Open Space/Landscape Irrigation | 13,100 | 22% | 11,000 | 13% |
| Mixed Use[3] | 0 | 0% | 3,900 | 5% |
| Downtown[3] | 0 | 0% | 600 | 1% |
| **Total** | **59,100** | **100%** | **84,300** | **100%** |

Source: 2020 Urban Water Management Plan, Table 4-3 (City of Fresno 2021).
Notes:

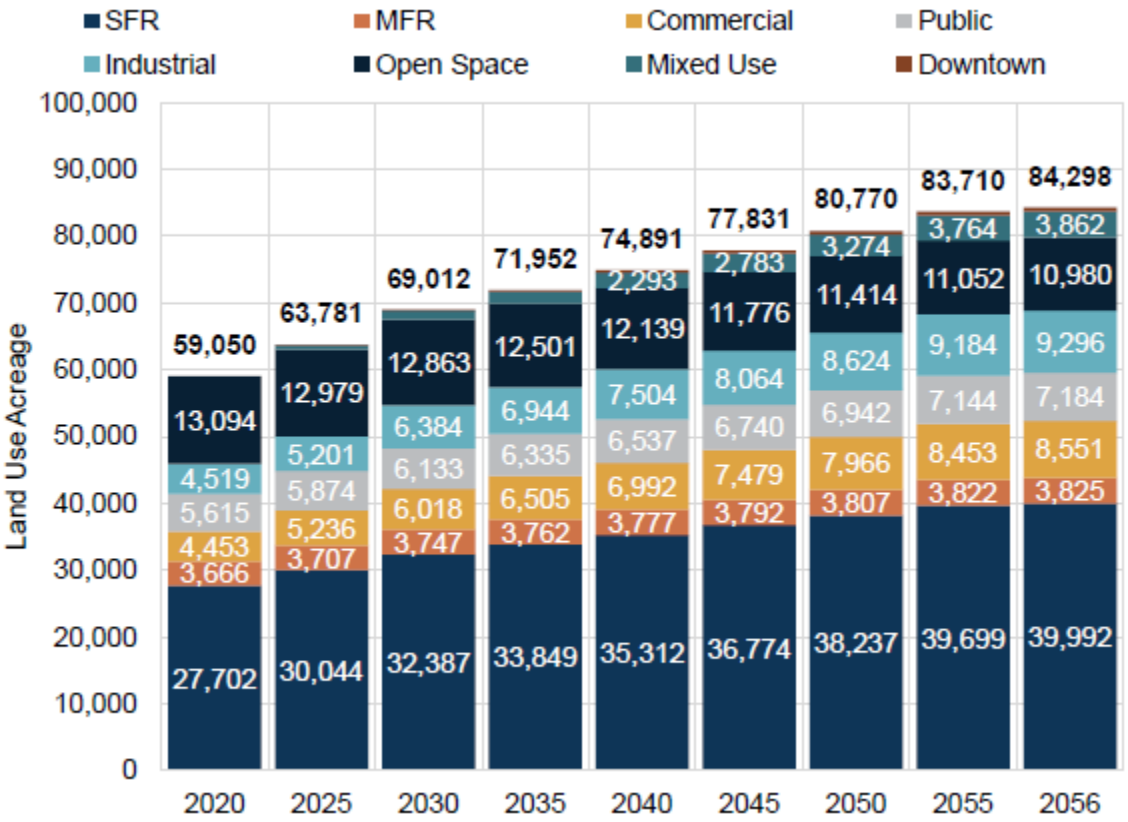
1 Acreage from City of Fresno GIS Shapefile of Land Uses provided 8/12/20 and reduced to the City's water service area (excludes Pinedale, Bakman, and California State University, Fresno, as well as unserved areas outside the City limits and SOI).

2 Future land use shapefile provided by the City on 8/12/20 and aligns with the General Plan for buildout in year 2056. The buildout service area acreage listed excludes the Fresno-Clovis Regional Wastewater Reclamation Facility; land used for road, highways, and railroads; and the north area outside of the SOI.

3 Mixed use and downtown land use categories are not in the existing land use shapefile. They are described in the General Plan as new designations for redevelopment of existing areas that contain a mix of land uses.

4 Approximately 11,300 acres of non-water-demanding vacant/partially vacant land is excluded from the 2020 water service area acreage.

The land use acreage between 2020 and 2056 was estimated in 5-year increments based on areas planned to be developed by 2030 from the City's Planning Department, and by linearly interpolating the remainder of the change in acreage for each land use category between 2030 and 2056. Figure 7 shows the existing and projected land use by customer class used to develop the projections.




Source: 2020 Urban Water Management Plan, Figure 4-3 (City of Fresno 2021).

**Figure 7: Existing and Projected Land Use**

## Assumptions

Project-specific water demand was calculated using the methodology from the 2020 UWMP, as described above, based on the following assumptions:

- Figure 7 above (Figure 4-3 of the 2020 UWMP) indicates there will be 5,201 acres of industrial uses in Fresno in 2025.
- Table M above (Table 4-6 of the 2020 UWMP) indicates the projected water demand for industrial land uses in 2025 will be 7,410 AFY.

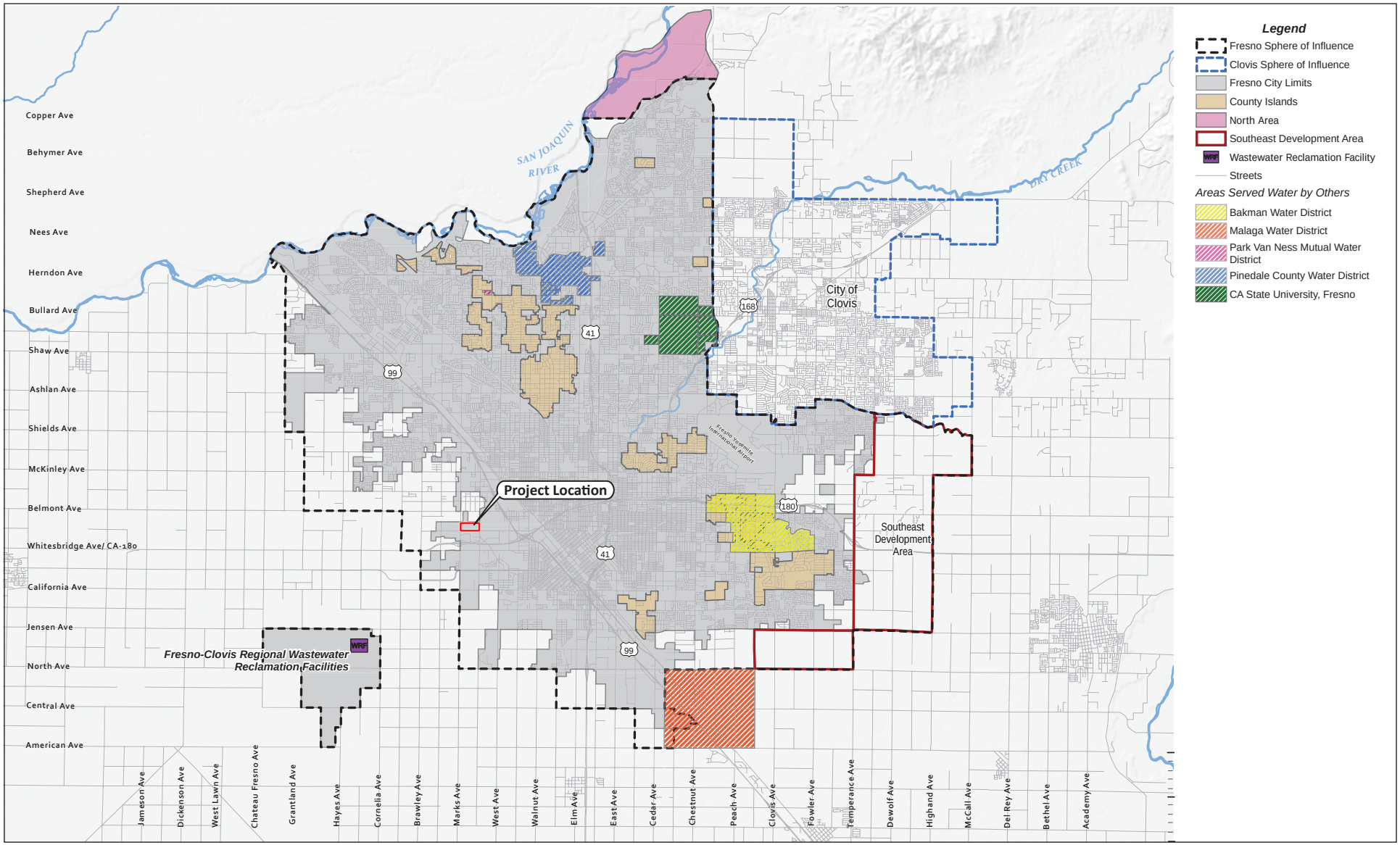
Therefore, it is assumed that industrial land uses, such as the proposed project, will demand approximately 1.42 AFY per acre in 2025.

## Proposed Project Water Demand

The total project site is 48.03 acres. Therefore, based on the assumptions identified above, the proposed project is estimated to demand approximately 68.2 AFY.

## APPLICABILITY OF THE URBAN WATER MANAGEMENT PLAN

The proposed project site is included in the land use area covered by the City's 2020 UWMP. Figure 8 shows the location of the project site in relation to the water service area boundaries covered by the 2020 UWMP. In addition, Figure 9 shows the proposed project's designation of Heavy Industrial. As shown in Table 4-3 of the 2020 UWMP, land use acreages and water demand in the 2020 UWMP were based on the City's General Plan land use designations for 2020 and buildout in 2056. As such, as shown in Figure 9, the acreage associated with the proposed project was assumed Industrial in the 2020 UWMP; therefore, it is assumed that demand for water was accounted for in the 2020 UWMP. There is no evidence, in consideration of the calculated project water demand, that such demand exceeds that estimated in the 2020 UWMP. The adequacy of the water supply for the project is thus consistent with the basis of the analysis of the City's water supply in the adopted 2020 UWMP.




LSA

Project Site Boundary

FIGURE 8

N

0 1.5 3

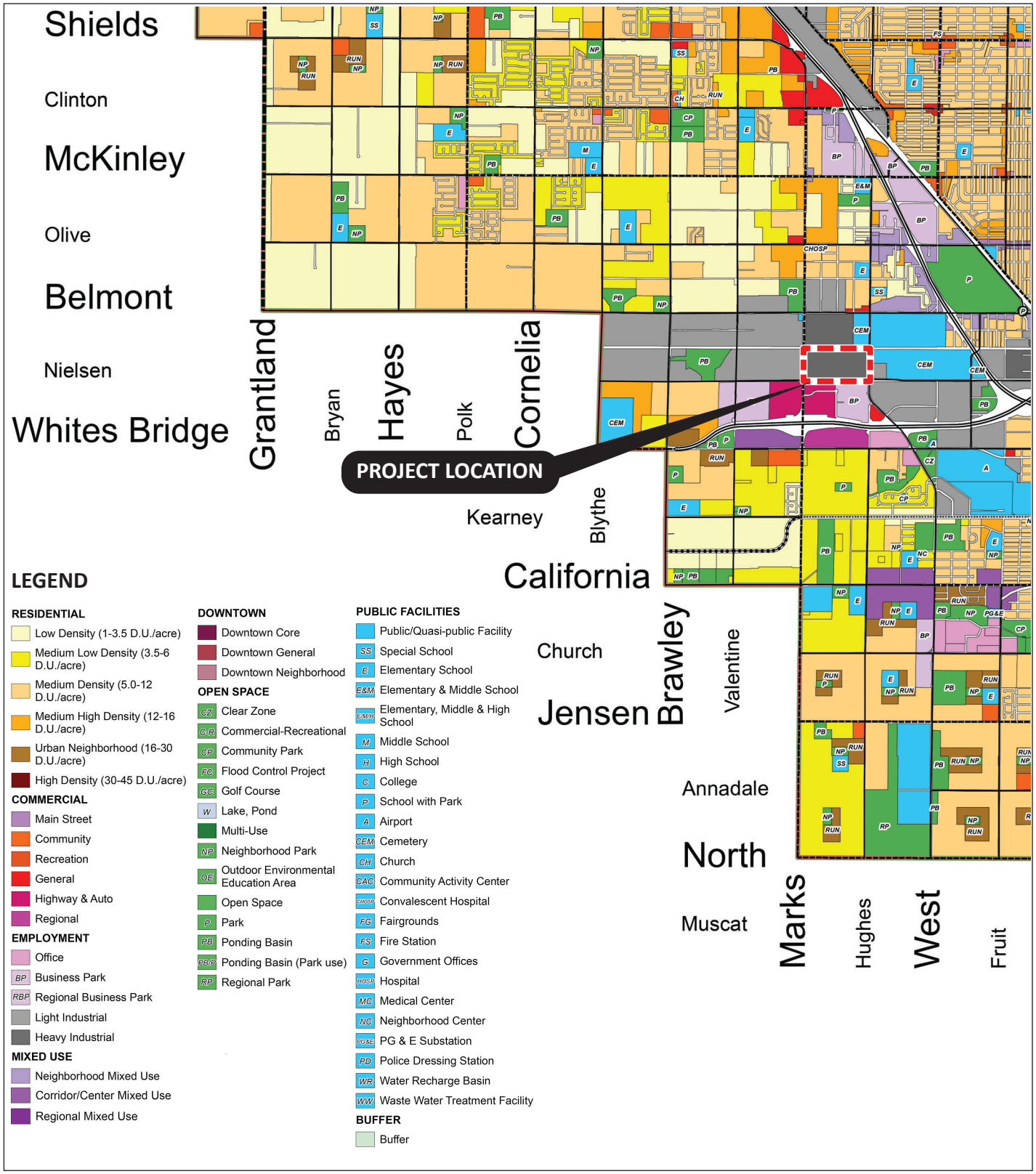
MILES

SOURCE: Source: 2020 Urban Water Management Plan, Figure 3-1 (City of Fresno 2021).

I:\SNN2102\G\Fig 8_Proj Site Relation to UWMP Boundaries.ai (7/20/2022)

*2740 West Nielsen Office/Warehouse Project*

Project Site in Relation to the 2020 UWMP Water Service Area Boundaries




LSA

FIGURE 9

N

NOT TO SCALE

SOURCE: City of Fresno, 2022

*2740 West Nielsen Office/Warehouse Project*
Project Site General Plan Land Use Designation

I:\SNN2102\G\Figure 9_Project Site General Plan Land Use Designation.ai (7/20/2022)

## ASSESSMENT FINDINGS

It is concluded that the City of Fresno's water system has sufficient capacity to supply the proposed 2740 West Nielsen Avenue Office/Warehouse Project and other projected demands within the City's service area through the year 2045. Therefore, it is recommended that the City of Fresno Water Division approve this assessment and forward the report to the City of Fresno Planning Department for inclusion in the CEQA documentation for the proposed project.