Appendix F:
Hydrology and Water Quality Supporting Information

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Southeast Development Area (SEDA)
Specific Plan
Water Technical Study

April 26th, 2023

Prepared for:

City of FRESNO

City of Fresno, California

Prepared by:

Blair, Church & Flynn
CONSULTING ENGINEERS

451 Clovis Avenue, Suite 200
Clovis, California 93612
Tel (559) 326-1400
Fax (559) 326-1500
www.bcf-engr.com

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CHAPTER 1
INTRODUCTION

1.1 Project Description and Background

The City of Fresno (City) is preparing a Specific Plan and Program Environmental Impact Report (PEIR) for the Southeast Development Area (SEDA). The SEDA Specific Plan Area (Plan Area), previously known as the Southeast Growth Area (SEGA), is an approximately 9,000-acre area in the southeast portion of the City of Fresno that is formally designated as a growth area in the City of Fresno General Plan (General Plan). The Plan Area is generally bound by the Gould Canal to the north, McCall and Highland Avenues to the east, Jenson and North Avenues to the south, and Locan, Temperance, and Minnewawa Avenues to the west; see Figure 1.1 for the Plan Area's location.

SEDA was approved for incorporation into the City by the Local Agency Formation Commission (LAFCo) in 2006, with a number of qualifying provisions, of which included the preparation of a Specific Plan and associated environmental documents before the land could be annexed to the City. Located in Growth Area II, SEDA was planned for development after other infill initiatives from the City's other planning efforts, and would be developed in phases. The General Plan established two levels of development – the General Plan Horizon and the General Plan Buildout. The General Plan Horizon is the level of development predicted to occur by the "Horizon Year," which was established as 2035, in accordance with the General Plan. General Plan Buildout is the level of development characterized by full occupancy of all developable sites in accordance with the General Plan; this was estimated to occur beyond 2035 (defined as past 2050).

As such, the General Plan defined development of SEDA under General Plan Horizon as a portion of the full buildout conditions – specifically, it assumed a residential development capacity of approximately 15,000 dwelling units, one third of the buildout capacity. Accordingly, the residential development capacity of SEDA under General Plan Buildout is approximately 45,000 dwelling units, and the General Plan assumed that the additional 30,000 dwelling units would not be developed until after 2035. However, though the General Plan was analyzed under the General Plan Horizon level, the associated MEIR (Master Environmental Impact Report) analyzed the environmental impacts of the General Plan under the buildout level of the Sphere of Influence (SOI), which encompasses other growth areas, including SEDA.

The Specific Plan for SEDA was developed for the buildout condition of the Plan Area of 45,000 dwelling units, and provides implementation mechanisms for development in the Plan Area that accommodate for increased density and accelerate housing production. As part of the City's General Plan, SEDA was designated with land use classifications as defined in the General Plan. The Specific Plan presents alternative land use classifications for SEDA, and seeks to propose how the Plan Area will develop over time to complete buildout conditions with these newly-defined land use categories.

As part of the Specific Plan process, a PEIR needs to be developed to evaluate the impacts associated with the proposed improvements to the Plan Area, and what, if any, mitigation measures are necessary to account for such impacts. This technical report will focus on the impacts of the SEDA Specific Plan on the water supply and distribution system proposed for the Plan Area.

1.2 Summary of Analysis

The City's General Plan assigned land use classifications to areas located within the SEDA Specific Plan Area. Each land use classification has a set of characteristics assigned to it with respect to a specific utility demand that have been determined and/or calculated by various contributing parties. The SEDA Specific Plan proposes new land use classifications for the Plan Area that may change the area's characteristics as it relates to utilities, e.g., water demand, wastewater generation, or storm water runoff, when compared to the General Plan. Additionally, some land uses have revised areas, which further alters those characteristics.

Changes in land use can affect a water distribution system's ability to supply, store, and distribute water to the City's residents. New development will require the construction of new water distribution facilities which may include water mains, valves, storage tanks, and booster pump stations, as well as potential new sources of water supply, such as new domestic water wells or surface water treatment plants. The City of Fresno's Metropolitan Water Resources Management Plan (Metro Plan)[1] and the Fresno General Plan Master Environmental Impact Report (MEIR)[2] include a number of proposed water facilities improvements to account for increased development and water demand based on the General Plan buildout conditions. The City of Fresno is currently developing an update to the Metro Plan, which includes an updated analysis of water demand factors for General Plan land uses developed by Akel Engineering Group, Inc,[3] which have been utilized in this analysis.

This technical study will focus on the analysis of water demand in the Plan Area, and how it may change based on Specific Plan development. The analysis to determine the change in water demands involved comparing the total demand determined for the Plan Area under both the General Plan and Specific Plan land use cases.

At the time of preparation of this study, the City was developing water demand factors for the new SEDA land use classifications. These factors were not available when completing the above stated analysis. Thus, a number of reasonable assumptions were made to correlate Specific Plan land uses with General Plan land uses in order to use the water demand factors prepared for the Metro Plan update.

This technical study focuses on specifically analyzing the change in water demand between the General Plan and the Specific Plan for SEDA in order to assist with the development of mitigation measures as needed.

[1] City of Fresno, "Metropolitan Water Resources Management Plan Update," Phase 1 – 2007, Phase 2 – 2011, Phase 3 – 2011, Phase 4 – 2014.
[2] City of Fresno, "Master Environmental Impact Report General Plan and Development Code Update," 2014.
[3] Akel Engineering Group Inc., "Water and Wastewater Unit Factor Update for Metropolitan Water Resources Management Plan Update."

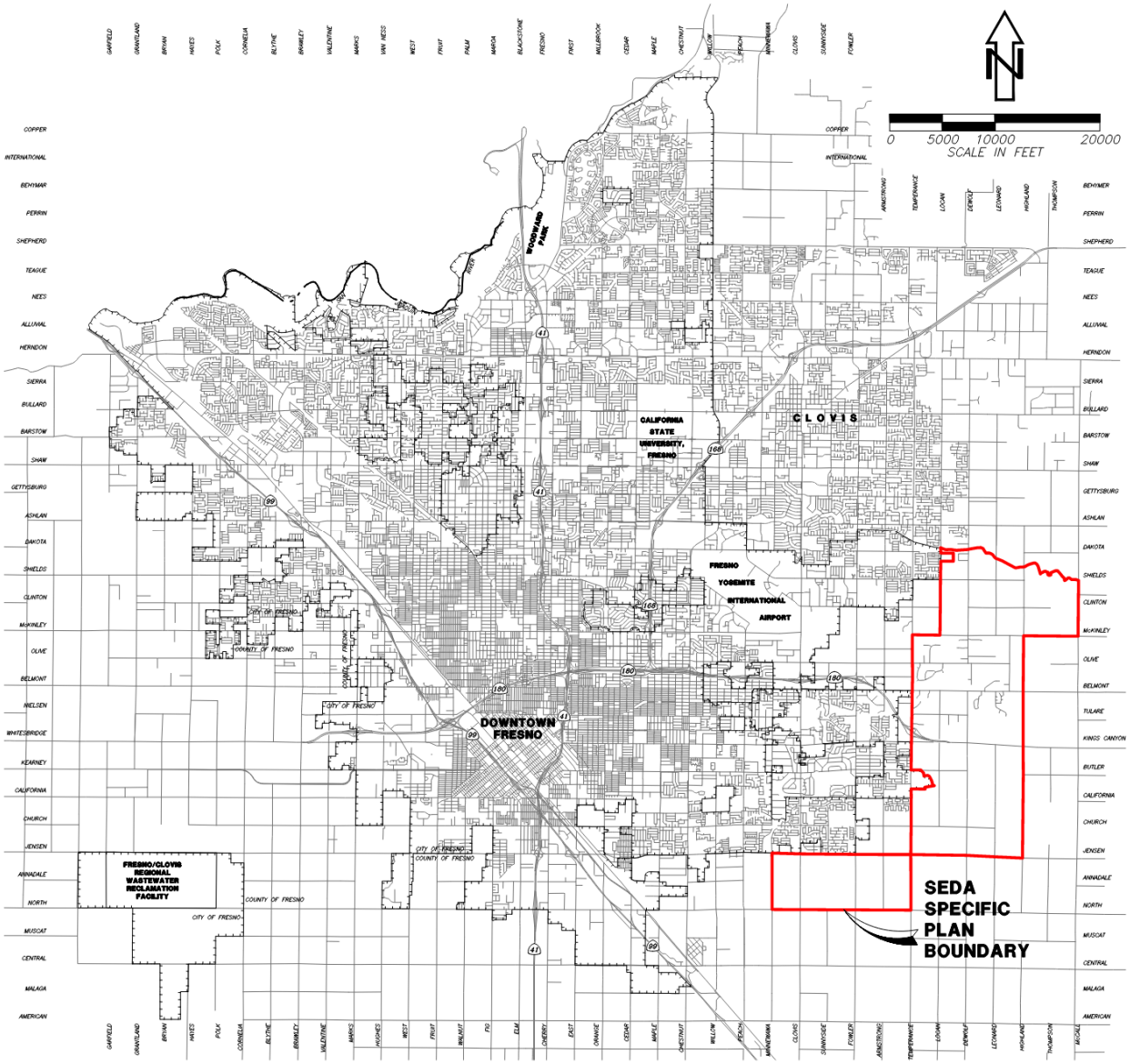


Figure 1.1 SEDA Specific Plan Location

CHAPTER 2
REGULATORY FRAMEWORK

2.1 General

The City of Fresno owns and operates the potable water distribution system that serves Fresno and other participating agencies, as well as the water supply sources and treatment facilities; specifically, the City Water Division manages the system. The City delivers potable water to urban residential, commercial, and industrial customers in over 115 square miles of the City, including many County islands and areas within the City's Sphere of Influence (SOI). Fresno's main sources of water include groundwater, treated surface water, and reclaimed water; groundwater is obtained through approximately 202 municipal supply wells located throughout Fresno; surface water is collected and treated at the Northeast Surface Water Treatment Facility (NESWTF), and the Southeast Surface Water Treatment Facility (SESWTF); reclaimed water is collected and treated at the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) and the North Fresno Wastewater Reclamation Facility (NFWRF), and is mainly utilized for landscape irrigation.

There are a number of federal, state, and local regulations that must be adhered to when planning potable water facilities, many of which provide guidance and requirements for the handling and distribution of potable water, as well as regulations to safeguard water quality; several are discussed in the following sections.

2.2 Federal Regulations

Clean Water Act[4]

The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act (CWA), regulates the discharge of pollutants into watersheds throughout the United States and quality standards for surface waters. It is the primary federal law regulating and governing water pollution, with the objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The CWA establishes the basic structure for regulating discharges of pollutants in waters of the United States and regulating quality standards for surface waters. Under the CWA, the Environmental Protection Agency (EPA) is tasked with developing national water quality criteria used as the basis for state water quality standards, and developing national water quality criteria recommendations for pollutants in surface waters. Water quality standards establish the designated use of a body of water (e.g., recreation, water supply, industrial, etc.), and a statement identifying the maximum concentrations of various pollutants that would not interfere with the designated use. Each state must set specific water quality standards, which serve as backup to federally set technology-based requirements. The City is responsible for monitoring water quality and conforming to the requirements of the CWA for all water sources.

Federal Safe Drinking Water Act[5]

The Federal Safe Drinking Water Act (SDWA) was established to protect the quality of drinking water in the United States. This law focuses on all waters actually or potentially designed for drinking, whether from above- or below-ground sources. The SDWA authorizes the EPA to establish national health-based minimum standards for drinking water to protect the public from naturally-occurring and man-made contaminants that may be found in drinking water. These standards, known as the National Primary Drinking Water Regulations, set enforceable maximum

[4] Clean Water Act, 33 U.S.C. §1251 et seq. (1972).
[5] Federal Safe Drinking Water Act, 42 U.S.C. §300f et seq. (1974).

contaminant levels for specific contaminants in drinking water, as well as required methods of treatment to remove said contaminants. The SDWA applies to all public water systems in the United States, except for private wells serving less than 25 people. In California, the Division of Drinking Water (DDW) within the State Water Resources Control Board (SWRCB) regulates public drinking water systems. If the water system does not meet the aforementioned standards, it is the responsibility of the water supplier to notify its customers.

2.3 State Regulations

California Porter-Cologne Water Quality Control Act[6]

The Porter-Cologne Water Quality Control Act is the principal law governing water quality in California, for both above- and below-ground supplies. This act designated the SWRCB as the statewide water quality planning agency, and gave authority to nine Regional Water Quality Control Boards (RWQCB) to oversee water quality on a day-to-day basis at both the local and regional levels. RWQCBs develop Regional Water Quality Plans (Basin Plans), regulate all pollutant or nuisance discharges that may affect either surface water or groundwater, and implement said water quality plans. The Central Valley RWQCB oversees the Fresno area.

California Urban Water Management Planning Act[7]

The Urban Water Management Planning Act updated the California Water Code (§10610-10656 and 10608) to include a requirement that all urban water suppliers within California prepare and adopt an Urban Water Management Plan (UWMP) and update it every five years. This applies to suppliers that provide either 3,000 acre-feet of water annually, or who serve more than 3,000 customers. UWMPs support suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands. The Act is intended to encourage and support water conservation efforts, and ensure efficient use of available water supplies. UWMPs must assess the reliability of water sources over a 20-year planning time period, describe demand management measures and water shortage contingency plans, planning for single and multiple dry water years, and discuss the use and planned use of recycled water.

Senate Bills 610 and 221[8]

Senate Bill (SB) 610 and SB 221 amended state law in 2002 to ensure better coordination between local water supply and land use decisions, and to confirm that there is an adequate water supply for new developments. These two companion measures require authorities to demonstrate that adequate and reliable 20-year water supplies are available for any new development, as well as existing water users.

SB 610 requires the preparation of UWMPs and Water Supply Assessments (WSAs) for projects (as defined by Water Code §10912) which are subject to California Environmental Quality Act (CEQA) provisions. Projects required to prepare a WSA include:

- Residential developments of more than 500 dwelling units;
- Shopping centers or business establishments employing more than 1,000 persons or having more than 500,000 square feet of floor area;
- Hotels or motels, or both, having more than 500 rooms;

[6] California Porter-Cologne Water Quality Act, California Water Code Div. 7 §13000 et seq. (1969).
[7] California Urban Water Management Plan Act, California Water Code §10610-10656, 10608.
[8] SB 610 Water Supply Planning, Chapter 643, Statutes of 2001, Costa; SB 221 Land Use: Water Supplies, Chapter 642, Statutes of 2001, Kuehl.

- Industrial, manufacturing or processing plants, or industrial parks planned to employ more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
- Mixed-use projects that include one or more of the projects specified above;
- Projects that would demand an amount of water equivalent to, or greater than, the amount of water required for 500 dwelling units.

SB 221 establishes consultation and analysis requirements for water supply planning for residential subdivisions including more than 500 dwelling units. Written verification by the water supplier that sufficient water is available for the proposed plan is required before construction can begin.

California Groundwater Management Act of 1992[9]

The Groundwater Management Act was signed into law in 1992, and made groundwater management part of the California Water Code (Division 6, Part 2.75, Chapters 1-5, §10750-10755.4). First introduced as Assembly Bill (AB) 3030, the Act established specific procedures on how Groundwater Management Plans (GWMPs) are to be developed and adopted by local agencies. The intent of the Act is to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions and to provide a methodology for developing a GWMP. The Act has since been modified by Senate Bill (SB) 1938 in 2002 and AB 359 in 2011.

- AB 3030 provided a systematic procedure for existing local agencies to develop GWMPs.
- SB 1938 modified the Act by requiring any public agency seeking State funds administered through the California Department of Water Resources (DWR) for the construction of groundwater projects to prepare and implement a GWMP.
- AB359 further modified the Act by requiring public agencies to prepare and implement GWMPs with an additional required component that focused on identifying groundwater recharge areas. It also included several plan adoption procedural changes, requires GWMPs to be submitted to DWR, and requires DWR to provide public access to this information.

Sustainable Groundwater Management Act of 2014 (SGMA)[10]

The Sustainable Groundwater Management Act (SGMA) includes a three-bill legislative package composed of AB 1739, SB 1168, and SB 1319. SGMA requires local agencies to form Groundwater Sustainability Agencies (GSAs) for high and medium priority basins, and develop and implement Groundwater Sustainability Plans (GSPs) to avoid and mitigate overdraft of groundwater within 20 years. SGMA places the authority of groundwater management with local agencies; it establishes a definition of sustainable groundwater management, establishes a framework for local agencies to develop plans and implement strategies to sustainably manage groundwater resources, prioritizes basins with the greatest problems, and sets a 20-year timeline for implementation.

State Updated Model Water Efficient Landscape Ordinance (AB 1881) (2015)[11]

The Model Water Efficient Landscape Ordinance (MWELO) is a state regulation designed to prevent water from being wasted on irrigated landscapes. Created in 1993, the MWELO was updated in 2015 by Executive Order EO B-29-15. Land use authorities (Cities and Counties) must ensure MWELO compliance on development projects with landscaped areas of 500 square feet or more. This applies to residential, commercial, industrial and institutional projects that require a

[9] California Groundwater Management Act, California Water Code Division 6, Part 2.75, Chapters 1-5, §10750-10755.4.
[10] Sustainable Groundwater Management Act (SGMA), California Water Code Div. 6, Part 2.74 §10720-10737.8 (2014).
[11] Model Water Efficient Landscape Ordinance (MWELO), Title 23 CCR, Div. 2, Chap. 2.7 §490 et seq.

permit, plan check, or design review. The California DWR provides technical assistance in helping Land Use Authorities adhere to the ordinance. The Fresno Municipal Code includes local ordinances that are required to reduce water consumption and conserve water.

State Mandated Water Reductions[12]

On January 18, 2022, as a result of drought conditions in California, the California SWRCB adopted Emergency Regulation Requirements for water conservation. The Governor previously urged Californians to reduce water usage in 2021 by 15%, however actual reduction was only about 6%. Thus, the SWRCB has enacted emergency regulations that will remain in effect for one year unless the SWRCB acts to end, modify, or readopt it. These regulations were readopted in December 2022 for another year. The regulations prohibit certain wasteful water use practices statewide, and encourage Californians to monitor their water usage more closely. Emergency Regulation Requirements prohibit using potable water for:

- Outdoor watering that lets water run onto sidewalks and other areas (except incidental runoff)
- Washing vehicles without an automatic shutoff nozzle
- Washing hard surfaces, like driveways and sidewalks, that don't absorb water
- Street cleaning or construction site preparation
- Filling decorative fountains, lakes, or ponds
- Outdoor watering within 48 hours after it rains at least 1/4 inch of rainfall
- Watering ornamental turf on public medians

An additional emergency water conservation regulation was enacted in June 2022 that prohibits the use of potable water to water decorative grass in commercial, industrial, and institutional areas including common areas of homeowners' associations.[13] The regulation also requires urban water suppliers to implement all demand-reduction actions under "Level 2" of their Water Shortage Contingency Plans, which are actions meant to address a 10% to 20% water shortage. Additionally, urban water suppliers are required to fast-track their submissions of supply and demand assessments to plan for potential extended dry conditions. "Level 2" actions vary for each water supplier, but often include things like increasing communication about the importance of water conservation, limiting outdoor irrigation to certain days or hours, increasing patrolling to identify water waste, and enforcing water-use prohibitions.

CALGreen Building Code[14]

The California Building Standards Commission adopted the nation's first green building standards in 2008. The standards code (Part 11, Title 24 CCR, known as "CALGreen") was adopted to apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure, unless otherwise indicated in the CCR, throughout California. CALGreen established planning and design standards for sustainable site development including water conservation. CALGreen provisions became effective on January 1, 2011. The purpose of the CALGreen provisions is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of concepts having reduced negative impact or positive environmental impact and encouraging sustainable construction practices.

[12] State Water Resources Control Board Resolution No. 2022-0002, "To Adopt an Emergency Regulation to Supplement Voluntary Water Conservation," 2022.
[13] State Water Resources Control Board Resolution No. 2022-0018, "To Adopt an Emergency Regulation to Reduce Water Demand and Improve Water Conservation." 2022.
[14] California Green Building Standards Code (CALGreen), Title 24 CCR Part 11.

California Plumbing Code[15]

The California Plumbing Code (Part 5, Title 24 CCR) serves to prevent disorder in the industry and to consolidate plumbing codes utilized by local jurisdictions to reduce confusion and conflicts among varying practices. The Plumbing Code covers water fixtures, potable and non-potable water systems, and recycled water systems, among other topics. Potable water supply and distribution facilities shall comply with all applicable provisions of the current edition of the California Plumbing Code.

2.4 Local Regulations

Fresno General Plan

The City's General Plan contains the following goals, policies, and objectives relevant to the provision of potable water service and facilities (Table 2.1):

Table 2.1 City of Fresno General Plan Objectives and Policies Relevant to Potable Water Supply

Objective/Policy Number	Objective/Policy Text
Objective PU-3	Enhance the level of fire protection to meet the increasing demand for services from an increasing population.
Policy PU-3-f	**Adequate Infrastructure.** Continue to pursue the provision of adequate water supplies, hydrants, and appropriate property access to allow for adequate fire suppression throughout the City.
Objective PU-8	Manage and Develop the City's water facilities on a strategic timeline basis that recognizes the long life cycle of the assets and the duration of the resources, to ensure a safe, economical, and reliable water supply for existing customers and planned urban development and economic diversification.
Policy PU-8-a	**Forecast Need.** Use available and innovative tools, such as computerized flow modeling to determine system capacity, as necessary to forecast demand on water production and distribution systems by urban development, and to determine appropriate facility needs.
Policy PU-8-b	**Potable Water Supply and Cost Recovery.** Prepare for provision of increased potable water capacity (including surface water treatment capacity) in a timely manner to facilitate planned urban development consistent with the General Plan. Accommodate increase in water demand from the existing community with the capital costs and benefits allocated equitably and fairly between existing users and new users, as authorized by law, and recognizing the differences in terms of quantity, quality and reliability of the various types of water in the City's portfolio.
Policy PU-8-c	**Conditions of Approval.** Set appropriate conditions of approval for each new development proposal to ensure that the necessary potable water production and supply facilities and water resources are in place prior to occupancy.
Policy PU-8-d	**CIP Update.** Continue to evaluate Capital Improvement Programs and update them, as appropriate, to meet the demands of both existing and planned development consistent with the General Plan.
Policy PU-8-f	**Water Quality.** Continue to evaluate and implement measures determined to be appropriate and consistent with water system policies, including prioritizing

[15] California Plumbing Code, Title 24 CCR Part 5.

Objective/Policy Number	Objective/Policy Text
	the use of groundwater, installing wellhead treatment facilities, and enhancing transmission grid mains to promote adequate water quality and quantity.
Policy PU-8-g	**Review Project Impact on Supply.** Mitigate the effects of development and capital improvement projects on the long-range water budget to ensure an adequate water supply for current and future users.
Objective RC-6	Ensure that Fresno has a reliable, long-range source of drinkable water.
Policy RC-6-a	**Regional Efforts.** Support cooperative, multi-agency regional water resource planning efforts and activities on developing and implementing the Upper Kings Basin Integrated Regional Water Management Plan.
Policy RC-6-b	**Water Plans.** Adopt and Implement ordinances, standards, and policies to achieve the intent of the City of Fresno Urban Water Management Plan, Fresno-Area Regional Groundwater Management Plan, and City of Fresno Metropolitan Water Resources Management Plan to ensure a dependable supply of water.
Policy RC-6-c	**Land Use and Development Compliance.** Ensure that land use and development projects adhere to the objective of the Fresno Metropolitan Water Resources Management Plan to provide sustainable and reliable water supplies to meet the demand of existing and future customers through 2025.
Objective RC-7	Promote water conservation through standards, incentives and capital investments.

Fresno Municipal Code – Model Water Efficient Landscape Ordinance (MWELO)

As stated, MWELO requires local agencies to implement water efficiency measures as part of its review of landscaping plans. Local agencies can either adopt the MWELO or incorporate provisions of the ordinance into its own code requirements for landscaping. Section 11 of Chapter 11, "Building Permits and Regulations," and Section 23 of Chapter 15, "Citywide Development Code," of the City Municipal Code include requirements for landscape design and incorporates the requirements of the California MWELO, among other state codes and regulations. For new landscaping projects of 2,500 square feet of more that require a discretionary or ministerial approval, the applicant is required to submit a detailed "Landscape Documentation Package" that discusses water efficiency, soil management, and landscape design elements.

City of Fresno Metropolitan Water Resources Management Plan

The City of Fresno Metropolitan Water Resources Management Plan (Metro Plan) was prepared to document the existing conditions of the City's water system, and facilitate future water resources decisions and facilities improvements. Phase 1 consists of a baseline system characterization[16], Phase 2 consists of the development and evaluation of future water supplies[17], Phase 3 consists of implementation of the management plan[18], and Phase 4 included the preparation of an Environmental Impact Report (EIR) for the City. [19] Chapters 4, 5, 6 and 8 of Phase 2 discuss objectives, goals and policies related to potable water, including water conservation (Chapter 4), groundwater (Chapter 5), surface water (Chapter 6), and future water supplies (Chapter 8). It should be noted that this plan was prepared in 2011, and a number of the

[16] City of Fresno, "Metropolitan Water Resources Management Plan, Phase 1 Baseline System Characterization," December 2007.
[17] City of Fresno, "Metropolitan Water Resources Management Plan, Phase 2 Alternative Development and Evaluation of Future Water Supply Plan," January 2011.
[18] City of Fresno, "Metropolitan Water Resources Management Plan, Phase 3 Implementation Plan," January 2011.
[19] City of Fresno, "Metropolitan Water Resources Management Plan Update, Final Environmental Impact Report," May 2014.

stated objectives/goals/policies have already been completed. At the time of preparation of this study, an update to the Metro Plan is being developed by the City.

Urban Water Management Plan[20]

The City's Urban Water Management Plan (UWMP) was prepared as a requirement of the Urban Water Management Planning Act (UWMPA).[21] The UWMP outlines a water supplier's long-term water resource planning to ensure sufficient water supplies for existing and future demands; it essentially sets the roadmap for how the City will utilize water over the coming years. UWMPs are updated and submitted to the Department of Water Resources (DWR) every five (5) years. The UWMPA applies to urban water suppliers with 3,000 or more connections being served, or supplying more than 3,000 acre-feet of water annually. The most recent version of the City's UWMP was prepared for 2020.

City of Fresno Standard Specifications and Plans

The City maintains its own set of standard Specifications and Plans to be followed when designing and constructing City projects. Those related to the water distribution system include, but are not limited to:

- Standard Specifications
    - Section 21 – Domestic Water Facilities Design Criteria
    - Section 22 – Water Facilities
    - Section 25 – Landscape Irrigation Systems
- Standard Plans
    - Plans W-1 through W-45

[20] City of Fresno, "2020 Urban Water Management Plan," July 2021.
[21] Division 6, Part 2.6, California Water Code, §10610-10656.

CHAPTER 3
EXISTING CONDITIONS

3.1 Water Infrastructure

3.1.1 General

The City of Fresno Water Division manages and operates the City's water system. The City provides potable water to over 550,000 customers including residential, commercial, and industrial users, in an approximately 115 square mile (73,500 acre) area that includes many County islands (unincorporated areas within the City), and areas within the City's Sphere of Influence (SOI). Fresno's domestic water supplies include groundwater, surface water, and reclaimed water.

The City's water system consists of approximately 1,860 miles of distribution and transmission pipes, 202 active groundwater wells, three (3) surface water treatment facilities (SWTFs), five (5) water storage facilities with pump stations, and three (3) booster pump facilities. The Service Area declines in elevation generally from the northeast to the southwest; to assist with pressure regulation, the area is divided into five (5) pressure zones: Highway 41, Shepherd, Sierra, Southwest, and Booster Pump 4 (BP04). The zones are separated by a series of closed/partially closed valves to prevent and/or impede flow from one zone to another.

3.1.2 Water Sources

The City is located within the Kings River Subbasin of the San Joaquin Valley Groundwater Basin. Historically, the City has relied heavily on groundwater pumped from the underground basin and aquifers. The City has a network of over 270 municipal water wells and operates approximately 202 active municipal supply wells that access groundwater from said basin.[22] The production capacity from the active wells is approximately 403 MGD (million gallons per day), and the total capacity including inactive wells is approximately 487 MGD. The wells are located around the City, and most are directly connected into the water distribution system. The City's water system depended completely upon groundwater as a water source until 2004 when the first surface water treatment facility (SWTF) was commissioned. Today, groundwater is still heavily relied upon as a primary water source for the City.

Groundwater quality generally meets primary and secondary drinking water standards for municipal water use, however the groundwater basin has been impacted by several chemical contaminant plumes and nitrates that require monitoring and wellhead treatment. Treatment efforts and removal of specific wells from service are conducted as required to maintain drinking water supply quality and standards.

In 2004, the City commissioned the Northeast Surface Water Treatment Facility (NESWTF). The facility, located at Chestnut and Behymer Avenues, is designed for a 30-MGD capacity, and is planned to be expanded to a total of 60 MGD as development in Fresno continues. The NESWTF has reduced the City's dependance on groundwater and allowed an increased degree of groundwater recharge to occur. The City also constructed a water storage and modular surface water treatment facility (T-3 SWTF) in 2015 in southeast Fresno, which has a design capacity of 8 MGD.

[22] City of Fresno, "2020 Urban Water Management Plan," July 2021.

Most recently, the City completed construction of the Southeast Surface Water Treatment Facility (SESWTF) in 2018, which is a 54-MGD facility with an ultimate capacity of 80 MGD. This included a 72-inch raw water transmission main to convey surface water from FID's Fresno Canal to the SESWTF. T-3 was shut down after the SESWTF was activated, however the City has indicated that there are future plans to reactivate the site. With the SESWTF and NESWTF combined, the City provided greater than 50% of its potable water supply through the use of surface water in 2019 and 2020.[23] Moving forward, the City expects to provide half or more of its potable water demand with surface water supplies. According to the 2020 Urban Water Management Plan, groundwater pumping has decreased steadily since Fresno began utilizing surface water; groundwater production decreased from 160,000 acre-feet in 2004 to 55,000 acre-feet in 2020.[23]

A portion of the surface water that is treated at the SWTFs is supplied via agreements that the City maintains with the United States Bureau of Reclamation (USBR) and the FID. In the 1960s, the City contracted with the USBR to receive 60,000 acre-feet of surface water per year to utilize for "intentional recharge" of the groundwater basin. This was completed by constructing recharge basins to store the surface water which was allowed to percolate through the soil to the aquifer. The surface water is conveyed to these basins through FID (Fresno Irrigation District) canals. Historically, the amount of water supplied varies year to year, averaging around 60,000 acre-feet; however, there have been extremely dry years in which no water was supplied. Additionally, the City signed an agreement with FID in 1976 for the delivery of surface water supplies from the Kings River based on the City's pro rata share of FID's water entitlements. The most recent agreement with FID made in 2016 placed a maximum percentage of FID's Kings River water at 29%. The average FID delivery between 1964 and 2019 was 452,541 acre-feet, which equates to an average City supply of 131,237 acre-feet, assuming the maximum 29% City supply percentage. The water supplied from both the USBR and FID agreements is used for groundwater recharge and potable use after treatment at one of the SWTFs.

Fresno is located within the North Kings Groundwater Sustainability Agency (GSA), which is working to reach groundwater sustainability in accordance with SGMA. SGMA requires governments and water agencies of "critically overdrafted" basins to reach sustainability by 2040; the Kings River Subbasin was identified as a critically overdrafted basin. As a result, the City has placed a higher priority on developing its surface water supply and decreasing its reliability on groundwater to allow the basin to recharge. This is being accomplished via intentional groundwater recharge in dedicated recharge basins around Fresno. The City also contracts with FID and FMFCD to utilize some of their facilities as additional recharge basins.

With the completion of various portions of the City's recycled water distribution system, and the upgrades at the Fresno-Clovis RWRF to allow disinfected tertiary-treatment of collected wastewater, the City has been using recycled water for beneficial uses in an effort to reduce reliance on potable water for non-potable uses. Disinfected tertiary treated wastewater can be used for a number of non-potable uses, including but not limited to landscaping irrigation, industrial processes, golf course irrigation, and agricultural irrigation. Additionally, the City discharges undisinfected secondary-treated wastewater into nearby percolation ponds at the Fresno-Clovis RWRF to allow the effluent to percolate through the soil into the aquifer. The City then extracts this water for delivery through FID facilities for agricultural users. The City also owns and operates the NFWRF, which produces recycled water used for irrigation at the Copper River Ranch Golf Course. Flows received at the Fresno-Clovis RWRF have averaged approximately 63,000 acre-feet over the last 5 years, and the City projects that recycled water deliveries will increase to 5,800 acre-feet per year of non-potable demand. These supplies will continue to help reduce potable water demand, and lend themselves to water conservation efforts.

[23] City of Fresno, "2020 Urban Water Management Plan," July 2021.

3.1.3 Water Distribution

The City's water distribution system consists of approximately 1,800 miles of distribution pipeline ranging in size from ¾-inch to 66 inches, 140,000+ service connections, 12,000+ fire hydrants, 18,000+ main line valves, and several booster pumps and storage tanks.

Generally, the Transmission Grid Mains (TGMs) convey water directly from municipal supply wells to customers, and Regional Transmission Mains (RTMs) convey water from surface water treatment plants to TGMs. TGM pipes range in size from 10 to 16 inches in diameter, and RTM pipes are 18 inches and larger. There is also a network of smaller distribution mains that serve individual customers via TGMs. Fire hydrants are located at regular intervals and served from the same distribution mains as all other customers. Main line valves are located at regular intervals and are used to shut down and isolate sections of the distribution system for emergency repairs, regular maintenance, or replacement projects. These valves are also used to regulate flows between the pressure zones as mentioned in Section 3.1.1. Booster pump stations help maintain the pressure within the system. There are a number of other miscellaneous appurtenances associated with the distribution system designed to assist regular operation, including air release/vacuum breaker assemblies, blow-off valves, backflow preventers, and access manways. Figure 3.1 shows the main infrastructure of the existing City water distribution system.

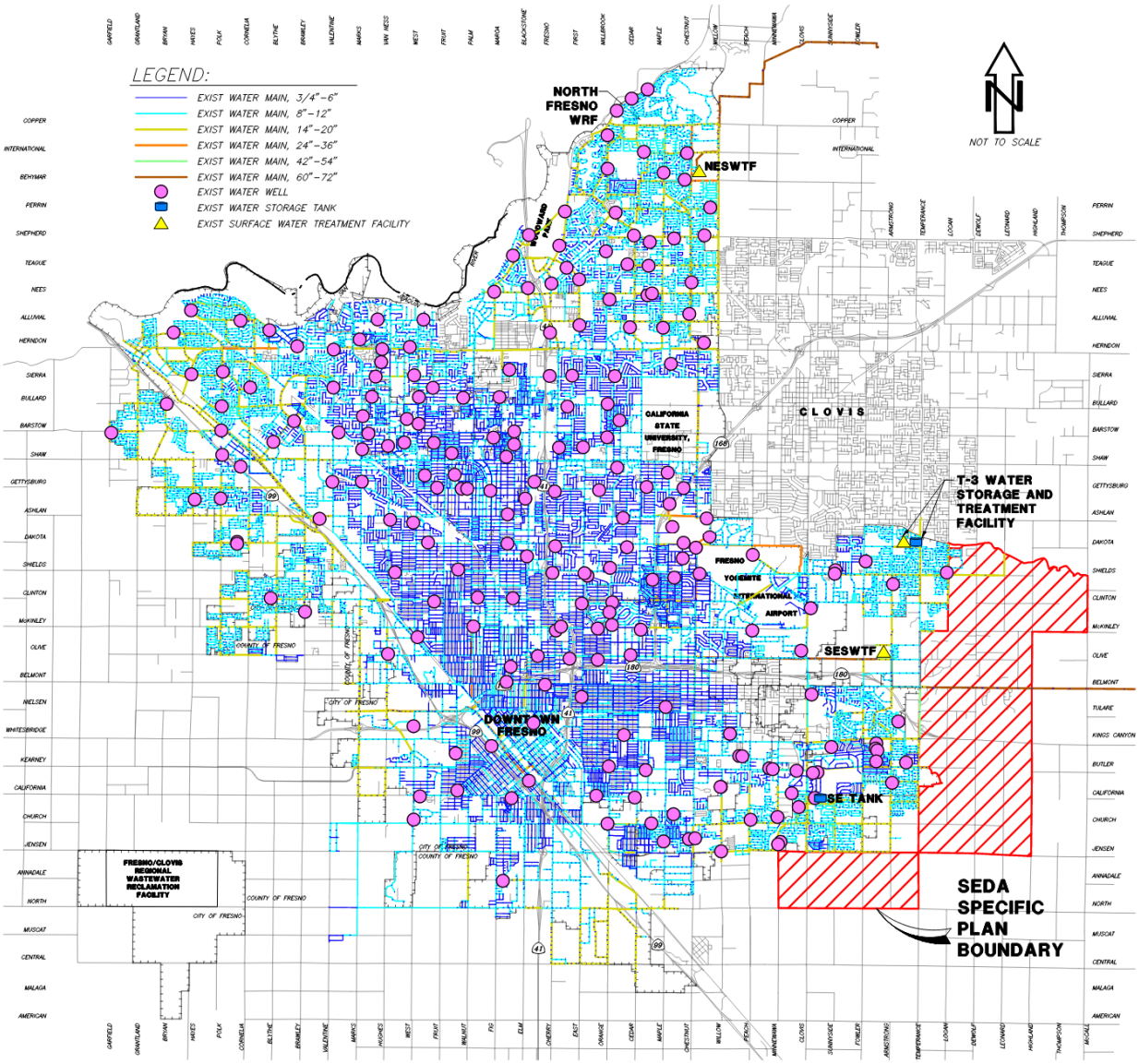


Figure 3.1 Existing City Water Distribution System

CHAPTER 4
FUTURE WATER INFRASTRUCTURE

4.1 General

Future water supply and distribution facilities are included in the City's Metro Plan. The City's General Plan includes developmental policies for water supply and distribution facilities for the City of Fresno, including growth areas such as SEDA.

4.2 General Plan Policies

The General Plan discusses aspects of the water supply and distribution system as they pertain to development in Fresno. As mentioned, the City owns, operates, and maintains the water supply and distribution system that serves Fresno and other participating agencies. See Table 2.1 for a summary of objectives and policies related to water facilities and infrastructure.

4.3 Buildout Improvements

The City Metro Plan analyzed the City's water supplies, treatment, storage, and distribution facilities for the existing conditions at the time the plan was drafted, and future needs based on General Planning policies and goals. The current version of the Metro Plan was completed in four (4) phases – Phase 1, "Baseline System Characterization," covered the existing conditions and analyzed the "Future without Project" alternative, or the impacts of development without additional planning; Phase 2, "Alternative Development and Evaluation of Future Water Supply Plan," analyzed different alternatives for development and infrastructure improvements to meet water resource challenges resulting from future development identified in Phase 1; Phase 3, "Implementation Plan," described the recommended alternative from Phase 2 and the funding and implementation plan for the alternative; and Phase 4, "Project/Programmatic Environmental Impact Report (EIR)," included the preparation of an EIR to evaluate potential impacts from the infrastructure improvements and future development included in the chosen alternative. The Phases were each developed and finalized at different times, with Phase 1 being approved in 2007, Phase 2 and 3 approved in 2011, and Phase 4 approved in 2014.

The Metro Plan and the Urban Water Management Plan (2020) include several objectives, goals, and policies to improve and develop water infrastructure as development progresses in the City. The critical focal points of the water system development are the implementation of further water conservation measures, installation of new municipal groundwater wells, increased groundwater recharge efforts to bring the City's groundwater pumpage into balance with its recharge rate, maximize use of available surface water, increased use of recycled water for landscape irrigation and other non-potable uses, and the acquisition of future water supplies when available.

At the time of preparation of this study, an update to the Metro Plan is being developed by the City. This update is revising the proposed improvements to the City's future water infrastructure, including that for the SEDA Specific Plan Area. There are a number of general improvements for the Plan Area included in the previous Metro Plan that will remain, including new municipal groundwater wells, water storage facilities, expansions to surface water treatment facilities, water booster pumps, and new water distribution mains, including Regional Transmission Mains (RTMs) and Transmission Grid Mains (TGMs). Improvements may include:

- New municipal groundwater wells
    - Municipal wells with wellhead treatment as needed

- Expansion of the NESWTF
- Water storage tanks and booster pump stations
- Extension of 48-inch diameter RTM
- Transmission Grid Mains of various sizes
- Recharge inter-ties to FMFCD basins.

CHAPTER 5
SPECIFIC PLAN WATER DEMAND ANALYSIS

5.1 General

The SEDA Specific Plan revised the General Plan buildout land use classifications in the Plan Area to new SEDA-specific land use classifications – see Figure 5.1 for the General Plan Land Use Map of the Plan Area, and Figure 5.2 for the SEDA Specific Plan Land Use Map for the chosen alternative for the Plan Area. With changes in land use classifications, the Plan Area will need to be evaluated for impacts to the proposed water supply and distribution system due to changes in water demand.

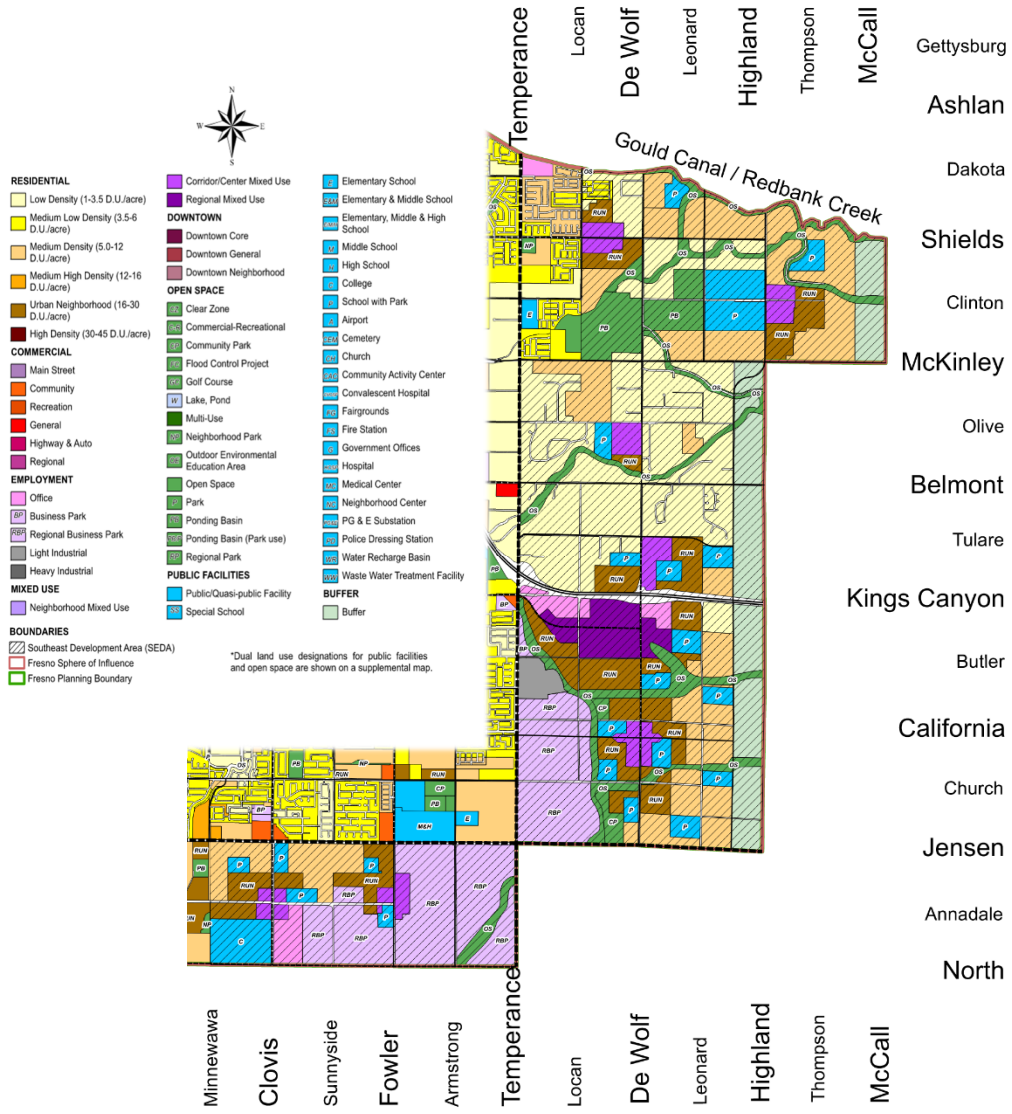
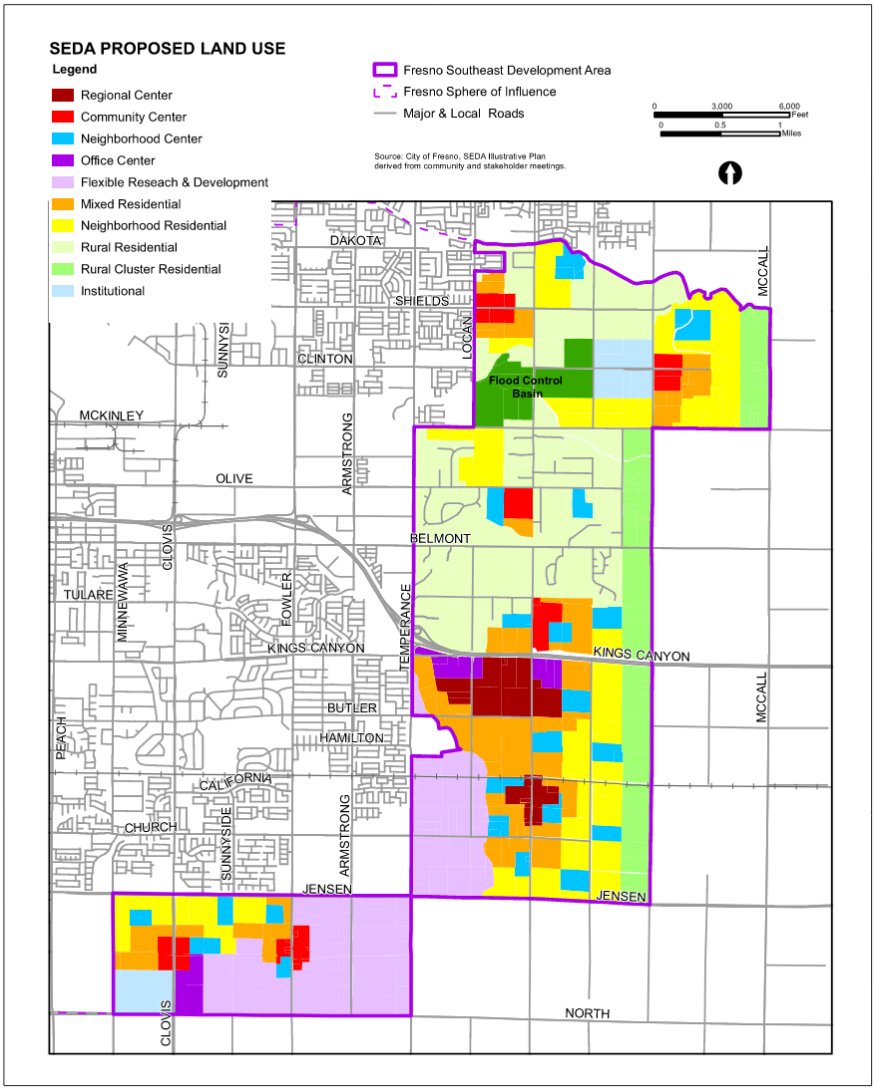


Figure 5.1 General Plan Land Use Map for SEDA Plan Area
Source: City of Fresno General Plan, Figure LU-1, December 2014, Figure Updated 3/2/2021



Source: City of Fresno, SEDA Regulating Districts, 02/10/2022.

Figure 5.2 SEDA Proposed Land Use
Source: Southeast Development Area Specific Plan Notice of Preparation,
First Carbon Solutions, 02/2022

5.2 Analysis Methodology

The technical analysis of the land use changes in the Plan Area was focused on comparing the change in water demand from the General Plan Land Use case to the Specific Plan Land Use case to determine potential impacts to the water supply and distribution system, and to assist in the development of mitigation measures if necessary. General Plan land use classifications and Specific Plan land use classifications were provided by the City of Fresno Planning and Development Department in the form of GIS (Geographic Information System) and Shape files. GIS and Shape files were also obtained from the City of Fresno Department of Public Utilities for the existing water facilities in Fresno.

The SEDA Specific Plan does not use the same land use classifications as defined in the General Plan, and instead utilizes SEDA-specific land use classifications developed as part of the Specific Plan. At the time of preparation of this technical study, the City was developing water demand

factors for the SEDA-specific land uses as was done for the General Plan land uses; these factors were unavailable during the completion of the analysis for this technical study. However, the SEDA-specific land uses are similar in nature to many of the General Plan land uses, and similarities can be drawn between the two land use categories. Thus, a number of reasonable assumptions were made to determine equivalent General Plan land uses for each SEDA-specific land use in order to utilize the water demand factors for General Plan land uses. Table 5.1 shows the equivalent General Plan land uses established for each Specific Plan land use case as described below.

For the General Plan land use case, the technical memorandum prepared for the City of Fresno General Plan Update MEIR[24] was used to obtain projected water demand data for SEDA. In the memorandum, analyses were completed to project water demands for 2035, which is the buildout year for the City's General Plan. The analyses included one completed for the SEDA based on the land uses included in the General Plan; the demand determined for SEDA was 21,834 ac-ft/year.

For the Specific Plan analysis, the water demand factors used were prepared by Akel Engineering as part of the Metro Plan Update.[25] Table 5.1 shows the equivalent General Plan land uses and the associated category included in the Metro Plan updated table of factors, and

Table 5.2 shows the water demand factors used for each equivalent General Plan land use classification that was determined for each SEDA Specific Plan land use. It should be noted that some General Plan land uses did not exactly match up with those listed in the water demand factors, and some assumptions were made to determine approximate water demand factors; see Appendix B for the full list of water demand factors.

The GIS files for the General and Specific Plan land uses were georeferenced to the California State Plane Coordinate System, Zone 4, Foot, NAD83 Datum for analysis. This allowed mapping of the land uses to pull information necessary to complete the analysis, including the area of each land use. The water demand factors were then used with the area of the corresponding land use classification to determine a total water demand for the Plan Area based on the General Plan and the Specific Plan developments. The total water demand for the Plan Area based on the General Plan case was compared to that of the Specific Plan case, resulting in the total change in water demand for the Plan Area.

5.3 Analysis Results

The base water demand for all land uses in the Plan Area was found for both the General Plan and the Specific Plan conditions. The total General Plan base water demand was 21,843 AF/year, or 19.50 MGD,[24] and the Specific Plan base water demand was found to be 19.83 MGD, resulting in an increase in water demand of approximately 0.33 MGD, or 1.7%. See Table 5.3 and Table 5.4 for the results of the analysis and a direct comparison of the General Plan and Specific Plan water demands; see Appendix A for a more detailed version of the analysis.

There may be a number of reasons as to why water demand increased from the General Plan to the Specific Plan. One reason may be that the SEDA boundary increased from that shown in the General Plan, indicated by the increased area of total land uses. The total area of the General

[24] West Yost Associates, "Hydraulic Evaluation of the Proposed 2035 General Plan Land Use Update for the Master Environmental Impact Report," "Table 2. Water Demand Comparison for General Land Use Plan Land Changes," January 21, 2013.
[25] Akel Engineering Group Inc., "Water and Wastewater Unit Factor Update for Metropolitan Water Resources Management Plan Update," October 2020.

Plan land uses is 8,253.76 acres, while the total area of the Specific Plan land uses is 8,325.57 acres – an increase of approximately 72 acres. This increase will lend itself to an increase in water demand based on which land uses increased in area.

Another contributor to increased water demands is changes in land use classifications. For the most part, the land use classifications remained fairly similar in nature and category when transitioning from the General Plan to the Specific Plan. However, a few areas of land uses changed to different land uses that have larger water demand factors; these include "Public Facilities – School with Park," "Buffer," and some low density residential areas. Per the SEDA Specific Plan land use map, all but one area defined as "School with Park" in the General Plan land use map changed to the SEDA "Neighborhood Center" land use. Similarly, the areas denoted as "Buffer" land use in the General Plan changed to "Rural Cluster Residential" in the SEDA Specific Plan. To a lesser extent, some of the "Low Density" residential areas in the General Plan were changed to residential land uses with higher densities in the Specific Plan. These combined changes lead to cumulative increases in the water demand of the Plan Area.

Finally, many SEDA land uses increased in area from their General Plan counterparts seemingly due to the elimination of the "Open Space" land uses included in the General Plan for the Plan Area, which totaled approximately 617 acres. As shown in Figure 5.1 and Table 5.3, "Open Space," and "Community Park," were removed from the Plan Area, and those areas were absorbed by adjacent land uses, including various residential, mixed use, and employment land uses. Several Open Space land uses have a water demand factor of 0 gpd/ac, and many others have significantly smaller demand factors than other land uses; consequently, this means that some portion of the 617 acres were added to other land uses with larger water demand factors, thereby increasing the total water demand of the SEDA Plan Area when compared to the General Plan buildout condition.

Table 5.1 General Plan–SEDA–General Plan Equivalent Land Use Classifications

SEDA Specific Plan Land Use Classifications [A]	Equivalent General Plan Land Use Classification [B]	Water Demand Factor Category [C]
Residential – Mixed Residential	Residential – Urban Neighborhood	Residential – Medium High & High Density
Residential – Neighborhood Residential	Residential – Medium Density	Residential – Medium Density
Residential – Rural Residential	Residential – Low Density	Residential – Low Density
Residential – Rural Cluster Residential	Residential – Low Density	Residential – Rural Density
Employment – Office Center	Employment – Office	Commercial – Office
Employment – Flexible Research & Development	Employment – Business Park	Commercial – Professional Services Office
	Employment – Regional Business Park	Commercial – Regional
Employment – Institutional	Public Facilities – College	Public Facilities – College
Employment – Institutional	Public Facilities – School with Park	Public Facilities – SEGA School with Park
Mixed Use – Regional Center	Mixed Use – Regional Mixed Use	Residential – High Density, Commercial – Regional, & Public Facilities – Community Activity Center
Mixed Use – Community Center	Mixed Use – Corridor/Center Mixed Use	Public Facilities – Community Activity Center

SEDA Specific Plan Land Use Classifications [A]	Equivalent General Plan Land Use Classification [B]	Water Demand Factor Category [C]
Mixed Use – Neighborhood Center	Public Facilities – Neighborhood Center	Residential – Medium High Density, Commercial – Neighborhood, & Public Facilities – Neighborhood Center
Open Space – Flood Control Basin	Open Space – Ponding Basin	Open Space – Ponding Basin
Other	Streets/Railroad/Canals/Etc.	N/A

[A] City of Fresno, "Notice of Preparation of a Program Environmental Impact Report for the Southeast Development Area Specific Plan, Fresno, California," February 22, 2022.

[B] City of Fresno, "Fresno General Plan," December 18, 2014.

[C] Akel Engineering Group Inc., "Water and Wastewater Unit Factor Update for Metropolitan Water Resources Management Plan Update

Table 5.2 Metro Plan Update Water Demand Factors[26]

Water Demand Factor Category	Water Demand Factor (gpd/ac)
Residential	
Medium High & High Density	5,140 [A]
Medium Density	2,810
Low Density	2,050
Rural Density	1,415
Commercial	
Office	2,440
Professional Services Office	2,420
Regional	1,685
Public Facilities	
College	1,665
SEGA School with Park	2,895
High Density Residential, Regional Commercial, & Community Activity Center	2,106 [B]
Community Activity Center	1,930
Medium High Density Residential, Neighborhood Commercial, & Neighborhood Center	1,851 [C]
Open Space	
Ponding Basin	0
Other	
Railroad/Streets/Canals/Etc.	N/A

[A] Average of Medium High and High Density Residential Water Demand Factors

[B] Combination of High Density Residential, Regional Commercial, and Community Activity Center

[C] Combination of Medium High Density Residential, Neighborhood Commercial, and Neighborhood Center

[26] Akel Engineering Group Inc., "Water and Wastewater Unit Factor Update for Metropolitan Water Resources Management Plan Update," October 2020.

Table 5.3 Specific Plan (SP) Anticipated Water Demand per Land Use Classification

GP Land Use Classification	SP Equivalent Land Use Classification	Water Demand Factor [A,B] (GPD/ac)	SP Area (ac)	SP Base Water (MGD)
Residential - Low Density	Residential - Rural Residential	2,050	2,037.69	4.18
Residential - Medium Density	Residential - Neighborhood Residential	2,810	1,434.91	4.03
Residential - Urban Neighborhood	Residential - Mixed Residential	5,140 [A]	1,026.26	5.27
Employment - Office	Employment - Office Center	2,440	154.47	0.38
Employment - Business Park	Employment - Flexible Research and Development	2,420	16.54	0.04
Employment - Regional Business Park		1,685	1,287.53	2.17
Mixed Use -Corridor/Center Mixed Use	Mixed Used - Community Center	1,930	273.88	0.53
Mixed Use - Regional Mixed Use	Mixed Use - Regional Center	2,106 [B]	291.71	0.61
Open Space - Open Space	N/A	865	0	0.00
Open Space - Community Park	N/A	2,620	0	0.00
Open Space - Ponding Basin	Other - Flood Control Basin	0	265.78	0.00
Public Facilities - College	Employment - Institutional	1,665	116.26	0.19
Public Facilities - School with Park		2,895	149.77	0.43
Public Facilities - School with Park	Mixed Use - Neighborhood Center	1,851 [C]	491.38	0.91
Buffer - Buffer	Residential - Rural Cluster Residential	1,415 [D]	766.47	1.08
Other - Street/Rail/ Canal, etc.	Other	0	12.94	0.00
Totals	-	-	8,325.57	19.83

[A] Average of Medium High and High Density Residential Water Demand Factors
[B] Combination of High Density Residential, Regional Commercial, and Community Activity Center
[C] Combination of Medium High Density Residential, Neighborhood Commercial, and Neighborhood Center
[D] Rural Density Water Demand Factor used for Rural Cluster Residential Land Use.

Table 5.4 Difference Between General Plan and Specific Plan Anticipated Water Demand

SEDA General Plan Total Base Water Demand (MGD)	SEDA Specific Plan Total Base Water Demand (MGD)	Usage Δ (MGD)	Usage Δ (%)
19.5	19.83	0.33	1.7%

CHAPTER 6
IMPACTS AND MITIGATION

6.1 SEDA Planning

Improvements within the Plan Area will require modifications to master planned potable water facilities and infrastructure.

A draft policy document has been completed for the SEDA Specific Plan (March 2022), which includes updated policies for the Plan Area, and proposed improvements to meet the chosen alternative for development of the area. Included among these are policies directly related to potable water in the Plan Area.[27] Refer to the SEDA Specific Plan policy document for details on policies related to potable water.

6.2 Impacts of Significance

The proposed Specific Plan would result in a significant impact if it would:

1. Require or result in the relocation or construction of new or expanded water or wastewater treatment facilities, the construction of which could cause significant environmental effects.

   The potential long-term impacts related to water supply, treatment, and distribution requirements of the General Plan versus the Specific Plan differ by 1.7%; the implementation of the proposed Specific Plan may result in the need for expansion of water supply and treatment facilities, and will require construction of new distribution facilities to serve future land uses in the Plan Area. Thus, development of the Plan Area could result in significant impacts to the existing water supply and distribution system. A summary of master planned proposed water supply, treatment, and distribution infrastructure that may accommodate future development associated with the Specific Plan include:

   - New municipal groundwater wells
     - Municipal wells with wellhead treatment as needed
   - Expansion of the NESWTF
   - Water storage tanks and booster pump stations
   - Extension of 48-inch diameter RTM
   - Transmission Grid Mains of various sizes
   - Recharge inter-ties to FMFCD basins.

   Potential environmental impacts associated with such improvements include but are not limited to: traffic, air emissions, noise, water quality, aesthetics, agricultural resources, biological resources, and cultural resources. The Specific Plan establishes mitigation measures for impacts in these areas associated with construction of expanded or new water infrastructure. These may include traffic control/management plans to address traffic impacts during construction, various capital improvement plans, and the reevaluation of water master plan documents. Without mitigation, the impacts would be significant.

2. Have insufficient water supplies available to serve the project reasonably for the foreseeable future development during normal, dry and multiple dry years.

[27] City of Fresno, "Southeast Development Area Specific Plan Policy Draft," March 2022.

As shown by the 1.7% increase in water demand, existing City of Fresno water supplies could be sufficient to supply the future development in SEDA in addition to the existing demands. Current City water supply sources are as follows:

Groundwater – The City owns and operates 270 municipal water wells with 202 active wells; projected groundwater supply for the City of Fresno in 2035 is 149,100 AFY (acre-ft per year).[28]

Surface Water – The City owns and operates two (2) surface water treatment facilities – the NESWTF and the SESWTF. The NESWTF has a design capacity of 30 MGD expandable to 60 MGD, and the SESWTF has a design capacity of 54 MGD expandable to 80 MGD. The surface water is obtained from the Kings River via an agreement with FID, and from the Friant-Kern Canal through an agreement with the USBR. Treated surface water is used for potable uses and groundwater recharge. The projected surface water supply for the City of Fresno in 2035 is 191,600 AFY (60,000 via USBR, 131,600 via FID).[28]

Recycled Water – The City owns and operates the Fresno-Clovis RWRF and the NFWRF, which collect and treat wastewater from City users to various levels of treatment for non-potable uses. The Fresno-Clovis RWRF produces undisinfected secondary-treated effluent for use as restricted irrigation water for farmland and for groundwater recharge via discharge into adjacent percolation ponds, and disinfected tertiary-treated effluent for distribution through the City's recycled water distribution system for non-potable uses, including landscape irrigation and industrial processes. The NFWRF collects and treats wastewater to a disinfected tertiary-treated level for use as landscape irrigation supply for the Copper River Ranch Golf Course. The projected supply of recycled water for the City of Fresno in 2035 is 5,910 AFY.[28]

The UWMP presents actual data available for water supply and demand for the year 2020, as well as projected water usage. For 2020, the actual total potable water demand for the City was 121,993 AF[28], and the projected potable water demand for the City in 2035 is 154,210 AF.[28] Additionally, the projected non-potable water demand for the City for groundwater recharge is 68,100 AF for 2035.[28]

The estimated groundwater yield for the City in 2035 was projected to be 149,100 AF[28], assuming groundwater characteristics are not altered due to climatic events or regulatory influences from SGMA, indicating that groundwater alone will not be sufficient to meet future City demands, including those for SEDA. However, estimated surface water supplies for the City are projected to be 191,600 AF for 2035 (60,000 via USBR, 131,600 via FID) during normal water years, as well as 5,910 AF of recycled water.[28] Total projected water supply for the City in 2035 is 346,610 AF during normal water years and assuming groundwater characteristics are not altered due to climatic events or regulatory influences from SGMA, and total projected demand is 222,310 AF. The estimated increase in total water use for SEDA in accordance with the Specific Plan selected alternative is 0.33 MGD, or 1.03 AF. This results in a modified projected potable demand for the City of 154,211 AF, with a total water demand (potable and non-potable) of 222,311 AF.

In the event of a single dry year, the projected water supply for 2035 is 200,862 AF assuming groundwater characteristics are not altered due to climatic events or regulatory influences from SGMA, and the projected demand is 184,174 AF; Table 7-3 of the UWMP shows the projected water supplies and demands for multiple dry years.[28]

[28] City of Fresno, "2020 Urban Water Management Plan," July 2021.

The City Metro Plan Update will include proposed infrastructure improvements necessary to sustain development in SEDA, including the construction of new groundwater wells, surface water treatment plant expansions, and expansion of the Regional Transmission water distribution system. Impacts would be significant without mitigation measures. Since the increase in water demand for the Specific Plan Area is 1.7% from the General Plan condition, the impacts to water supply could be potentially significant; upon compliance with regulatory requirements, proposed policies for full implementation of the proposed Specific Plan, proposed mitigation measures, and construction of proposed water supply and distribution system infrastructure, the impact could be reduced. The normal water year supply projected for the City of Fresno in 2035 is 346,610 AF, and total projected demand is 222,310 AF. All water supply scenarios for dry years for 2035 are sufficient to accommodate the increase in water demand for the Specific Plan Area of 1.03 AF assuming groundwater characteristics are not altered due to climatic events or regulatory influences from SGMA.

The City shall develop and implement water conservation measures to reduce the per capita water use, and continue to refine and implement water saving and conservation standards for new developments approved under the Specific Plan. The City shall complete these measures and standards prior to approving any new project applications for future development in the Plan Area that require a discretionary approval and shall confirm that each project has incorporated the refined measures and standards prior to issuing approval. The City shall also continue to implement the City of Fresno Water Conservation Program, as may be updated, and periodically update restrictions on water uses, and evaluate the feasibility of the conservation target identified as part of the Fresno General Plan MEIR. The City shall complete these measures prior to approving any new project applications for future development in the Plan Area that require a discretionary approval and shall confirm that each project has incorporated any resulting standards prior to issuing approval.

The City shall refine landscape water conservation standards that will apply to new development installed landscapes, building on the State Model Water Efficient Landscape Ordinance (MWELO) and other state regulations. The City shall complete these standards prior to approving any new project applications for future development in the Plan Area that require a discretionary approval and shall confirm that each project has incorporated any resulting standards prior to issuing approval.

Additionally, the City shall evaluate the water supply system at the time that discretionary projects are submitted for approval by the City, and the City shall not approve development that would demand additional water until additional water sources are secured and provided. The City shall evaluate proposed water supply improvements for potential environmental impacts, and shall construct such improvements prior to exceedance of demand to accommodate full buildout of the Specific Plan.

6.3 Conclusions

City planning documents, including but not limited to the General Plan and the Metro Plan, will need to be updated to account for the development of the SEDA, and account for the policies and revisions present in the Specific Plan.

Mitigations for SEDA from the General Plan to the SEDA Specific Plan include:

a) Develop an update to the City General Plan
b) Develop an update to the City Metro Plan

c) Develop additional water conservation measures in accordance with the City Metro Plan
d) Construct new water supply infrastructure in the Plan Area
e) Construct new water distribution infrastructure in the Plan Area
f) Construct new water storage facilities in the Plan Area
g) Construct groundwater recharge facilities in the Plan Area
h) Construct water treatment facilities in the Plan Area
i) Expand water treatment facilities
j) Secure additional water sources for the City to support development in the Plan Area

Appendix A

Supporting Calculations

GP Land Use Classification	Abbrv.	GP Area (ac)	SP Equivalent Land Use Classification	Abbrv.	Water Demand Factor (GPD/ac)	SP Area (ac)	SP Base Water (MGD)
Residential - Low Density	RL	1,700.92	Residential - Rural Residential	RR	2,050	2,037.69	4.18
Residential - Medium Density	RM	1,473.32	Residential - Neighborhood Residential	NR	2,810	1,434.91	4.03
Residential - Urban Neighborhood	RUN	891.47	Residential - Mixed Residential	MR	5,140	1,026.26	5.27
Employment - Office	O	144.37	Employment - Office Center	OC	2,440	154.47	0.38
Employment - Business Park	BP	12.78	Employment - Flexible Research and Development	F	2,420	16.54	0.04
Employment - Regional Business Park	RBP	1,219.71	Employment - Flexible Research and Development	F	1,685	1,287.53	2.17
Mixed Use -Corridor/Center Mixed Use	CMX	315.41	Mixed Used - Community Center	CC	1,930	273.88	0.53
Mixed Use - Regional Mixed Use	RMX	209.77	Mixed Use - Regional Center	RC	2,106	291.71	0.61
Open Space - Open Space	OS	569.53	N/A	N/A	865	0	0.00
Open Space - Community Park	CP	47.46	N/A	N/A	2,620	0	0.00
Open Space - Ponding Basin	PB	263.32	Other - Flood Control Basin	POF	0	265.78	0.00
Public Facilities - College	C	116.26	Employment - Institutional	I	1,665	116.26	0.19
Public Facilities - School with Park	P	149.77	Employment - Institutional	I	2,895	149.77	0.43
Public Facilities - School with Park	P	413.45	Mixed Use - Neighborhood Center	NC	1,851	491.38	0.91
Buffer - Buffer	BUFFER	715.04	Residential - Rural Cluster Residential	RCR	1,415	766.47	1.08
Other - Street/Rail/ Canal, etc.	N/A	11.21	Other	N/A	0	12.94	0.00
Totals		8,253.76				8,325.57	19.83

SEDA Projected 2035 General Plan Water Demand [A]	21,843 AF/yr 19.50 MGD
SEDA Specific Plan Total Base Water Demand	19.83 MGD
Usage Δ	0.33 MGD
Usage Δ (%)	1.7%

[A] West Yost Associates, "Hydraulic Evaluation of the Proposed 2035 General Plan Land Use Updated for the Master Environmental Impact Report," Technical Memorandum, Table 2, "Water Demand Comparison for General Plan Land Use Changes," January 21, 2013.

Appendix B

City of Fresno Water and Wastewater Unit Factor Update for Metropolitan Water Resources Management Plan Update (Prepared by Akel Engineering, Inc.)

CITY OF FRESNO

Water and Wastewater Unit Factor Update

FOR

Metropolitan Water Resources Management Plan Update

PRELIMINARY

October 2020

AKEL
ENGINEERING GROUP, INC.

City of Fresno

Water and Wastewater Unit Factor Update

TABLE OF CONTENTS

Table 1 Water Demand Factors by Land Use Classification

Metropolitan Water Resources Management Plan Update

City of Fresno

PRELIMINARY

(Revised October 2020)

	Land Use Classifications	Water Service Area[1,2,3] (acres)	2018 Water Demands[4] (mgd)	Recommended Water Demand Factors[5] (gpd/acre)	(ac-ft/yr/acre)
Residential					
1	Rural Density	746	0.85	1,415	1.59
2	Low Density	1,283	2.12	2,050	2.30
3	Medium Low Density	10,139	23.18	2,845	3.19
4	Medium Density	11,033	24.91	2,810	3.15
5	Medium High Density	1,953	6.94	4,425	4.96
6	High Density	1,314	6.19	5,855	6.56
	Subtotal - Residential	**26,467**	**64.18**		
Commercial					
7	Community	558	1.04	2,330	2.61
8	General Heavy	1,124	2.11	2,340	2.62
9	Neighborhood	530	1.08	2,525	2.83
10	Neighborhood Limited	0	0.00	-	-
11	Office	932	1.83	2,440	2.73
12	Professional Services Office	89	0.17	2,420	2.71
13	Regional	294	0.40	1,685	1.89
14	Recreational	109	0.23	2,575	2.88
15	Storage	273	0.07	335	0.38
	Subtotal - Commercial	**3,909**	**6.93**		
Public Facilities					
16	Airport	1,147	0.12	130	0.15
17	College	304	0.41	1,665	1.87
18	High School	505	0.60	1,485	1.66
19	Elementary and High School	141	0.21	1,825	2.04
20	Middle School	305	0.43	1,765	1.98
21	Elementary and Middle School	191	0.30	1,930	2.16
22	Elementary School	792	1.53	2,405	2.69
23	Special School	52	0.05	1,110	1.24
24	SEGA School with Park	6	0.01	2,895	3.24
25	Cemetery	159	0.10	810	0.91
26	Church	662	0.81	1,525	1.71
27	Community Activity Center	11	0.02	1,930	2.16
28	Neighborhood Center	10	0.01	795	0.89
29	Convention Center	17	0.03	1,955	2.19
30	Fairgrounds	90	0.09	1,290	1.45
31	Fire Station	15	0.02	1,855	2.08
32	Government Offices	162	0.26	1,985	2.22
33	Court House Central Area	19	0.15	9,590	10.74
34	Hospital	189	0.76	5,005	5.61
35	Medical Center	20	0.02	1,385	1.55
36	Convalescent Hospital	119	0.39	4,080	4.57
37	Military	55	0.01	170	0.19
38	Mobile Home Park	274	0.49	2,225	2.49
39	Municipal Service Center	37	0.07	2,200	2.46
40	Post Office	30	0.02	750	0.84
41	Public Facility	7	0.01	1,010	1.13
42	Public/Quasi-Public Facility	46	0.10	2,670	2.99
43	Fresno County Jail	3	0.19	80,765	90.47

Table 1 Water Demand Factors by Land Use Classification

Metropolitan Water Resources Management Plan Update

City of Fresno

PRELIMINARY

(Revised October 2020)

Land Use Classifications		Water Service Area[1,2,3] (acres)	2018 Water Demands[4] (mgd)	Recommended Water Demand Factors[5] (gpd/acre)	(ac-ft/yr/acre)
44	Pump Station	9	0.01	805	0.90
	Subtotal - Public Facility	**5,376**	**7.19**		
Industrial					
45	Light Industrial	2,301	3.42	1,850	2.07
46	Heavy Industrial	1,905	5.91	3,860	4.32
	Subtotal - Industrial	**4,206**	**9.34**		
Open Space					
47	Open Space	177	0.12	865	0.97
48	Recreational Use/Clear Zone	15	0.00	-	-
49	Ag	1,531	0.00	-	-
50	Canal	20	0.00	-	-
51	Community Park	24	0.05	2,620	2.93
52	Golf Course	662	0.23	435	0.49
53	Lake or Pond	54	0.00	-	-
54	Multi-Use	0	0.00	-	-
55	Neighborhood Park	218	0.62	3,510	3.93
56	Recreational Park	97	0.15	1,980	2.22
57	Recreational Use	17	0.02	1,235	1.38
58	Regional Park	436	0.18	525	0.59
59	Recreational Commercial	0	0.00	-	-
60	Environmental Education Area	0	0.00	-	-
61	Gravel Mining	0	0.00	-	-
62	Parking	48	0.00	-	-
63	PGE Sub Station	102	0.00	-	-
64	Ponding Basin	236	0.00	-	-
65	Ponding Basin/Park	128	0.16	1,535	1.72
	Subtotal - Open Space	**3,764**	**1.53**		
Total					
	Subtotal - Residential	**26,467**	**64.18**		
	Subtotal - Commercial	**3,909**	**6.93**		
	Subtotal - Public Facility	**5,376**	**7.19**		
	Subtotal - Industrial	**4,206**	**9.34**		
	Subtotal - Open Space	**3,764**	**1.53**		
	Total	**43,722**	**89.17**		

AKEL ENGINEERING GROUP, INC.

10/2/2020

Notes:

1. Source: Land use and acreages based on City of Fresno parcel shapefile downloaded July 16, 2019.
2. Acreages exclude Bakman, Pinedale, and CSU Fresno service areas.
3. Acreages reflect demand generating parcels only.
4. Demand based on 2018 annual metered consumption records.
5. Recommended Water Demand Factors include the following adjustments:
   - Demand Factors normalized to 2018 production to account for system losses
   - Demand Factors increased to account for City-wide vacancy rate of 8.1% based on CA Department of Finance population estimat

Table 2 Sewer Flow Factors by Land Use Classification

Metropolitan Water Resources Management Plan Update
City of Fresno

PRELIMINARY

	Land Use Classifications	Sewer Service Area[1,2,3] (acres)	Return to Sewer Ratio	Unadjusted Wastewater Unit Factor[4] (gpd/acres)	Estimated Sewer Flow (mgd)	Recommended Wastewater Unit Factor[5] (gpd/acres)
Residential						
1	Rural Density	714	0.20	227	0.16	250
2	Low Density	1,063	0.35	577	0.61	625
3	Medium Low Density	9,875	0.40	915	9.03	990
4	Medium Density	11,001	0.50	1,129	12.42	1,225
5	Medium High Density	1,950	0.55	1,956	3.81	2,115
6	High Density	1,314	0.60	2,825	3.71	3,055
				Subtotal - Residential Flow	**29.75**	
Commercial						
7	Community	558	0.80	1,497	0.84	1,620
8	General Heavy	1,124	0.80	1,504	1.69	1,630
9	Neighborhood	530	0.80	1,623	0.86	1,755
10	Neighborhood Limited	0	0.00	0	0.00	0
11	Office	932	0.80	1,567	1.46	1,695
12	Professional Services Office	89	0.80	1,556	0.14	1,685
13	Regional	294	0.80	1,084	0.32	1,175
14	Recreational	109	0.30	621	0.07	675
15	Storage	273	0.80	213	0.06	235
				Subtotal - Commercial Flow	**5.43**	
Public Facility						
16	Airport	1,147	0.80	81	0.09	90
17	College	304	0.70	937	0.29	1,015
18	High School	505	0.70	835	0.42	905
19	Elementary and High School	141	0.70	1,026	0.14	1,110
20	Middle School	305	0.70	993	0.30	1,075
21	Elementary and Middle School	191	0.70	1,087	0.21	1,175
22	Elementary School	792	0.70	1,354	1.07	1,465
23	Special School	52	0.70	625	0.03	680
24	SEGA School with Park	6	0.80	1,860	0.01	2,015
25	Cemetery	159	0.25	163	0.03	180
26	Church	662	0.80	981	0.65	1,065
27	Community Activity Center	11	0.80	1,241	0.01	1,345
28	Neighborhood Center	10	0.80	510	0.00	555
29	Convention Center	17	0.80	1,258	0.02	1,360
30	Fairgrounds	90	0.80	827	0.07	895
31	Fire Station	15	0.80	1,192	0.02	1,290
32	Government Offices	162	0.80	1,277	0.21	1,385
33	Court House Central Area	19	0.80	6,169	0.12	6,670
34	Hospital	189	0.80	3,219	0.61	3,480
35	Medical Center	20	0.80	889	0.02	965
36	Convalescent Hospital	119	0.80	2,624	0.31	2,840
37	Military	55	0.80	109	0.01	120
38	Mobile Home Park	274	0.60	1,072	0.29	1,160
39	Municipal Service Center	37	0.80	1,415	0.05	1,530
40	Post Office	30	0.80	480	0.01	520
41	Public Facility	7	0.80	649	0.00	705
42	Public/Quasi-Public Facility	46	0.80	1,716	0.08	1,855
43	Fresno County Jail	3	0.80	51,972	0.15	56,185
44	Pump Station	9	0.00	0	0.00	0
				Subtotal - Public Facility Flow	**5.24**	

Table 2 Sewer Flow Factors by Land Use Classification

Metropolitan Water Resources Management Plan Update
City of Fresno

PRELIMINARY

	Land Use Classifications	Sewer Service Area[1,2,3] (acres)	Return to Sewer Ratio	Unadjusted Wastewater Unit Factor[4] (gpd/acres)	Estimated Sewer Flow (mgd)	Recommended Wastewater Unit Factor[5] (gpd/acres)
Industrial[6]						
45	Light Industrial	2,301	0.80	1,190	2.74	1,290
46	Heavy Industrial	1,905	0.80	2,484	4.73	2,690
				Subtotal - Industrial Flow	**7.47**	
Open Space						
47	Open Space	177	0.00	0	0.00	0
48	Recreational Use/Clear Zone	15	0.00	0	0.00	0
49	Ag	1,531	0.00	0	0.00	0
50	Canal	20	0.00	0	0.00	0
51	Community Park	24	0.00	0	0.00	0
52	Golf Course	525	0.30	104	0.05	115
53	Lake or Pond	54	0.00	0	0.00	0
54	Multi-Use	0	0.00	0	0.00	0
55	Neighborhood Park	218	0.00	0	0.00	0
56	Recreational Park	97	0.00	0	0.00	0
57	Recreational Use	17	0.00	0	0.00	0
58	Regional Park	436	0.00	0	0.00	0
59	Recreational Commercial	0	0.00	0	0.00	0
60	Environmental Education Area	0	0.00	0	0.00	0
61	Gravel Mining	0	0.00	0	0.00	0
62	Parking	48	0.00	0	0.00	0
63	PGE Sub Station	102	0.00	0	0.00	0
64	Ponding Basin	236	0.00	0	0.00	0
65	Ponding Basin/Park	128	0.00	0	0.00	0
				Subtotal - Open Space Flow	**0.05**	
Non-Metered[7,8,9]						
	Pinedale Public Utilities	-	-	-	0.63	
	Pinedale County Water District	-	-	-	0.46	
	Tarpey Village	-	-	-	0.37	
	Bakman	-	-	-	1.82	
	Clovis	-	-	-	0.20	
	City of Clovis	-	-	-	5.12	
	CSU Fresno	-	-	-	0.13	
				Subtotal - Non-Metered Flow	**8.73**	
Total						
				Subtotal - Residential Flow	**29.75**	
				Subtotal - Commercial Flow	**5.43**	
				Subtotal - Public Facility Flow	**5.24**	
				Subtotal - Industrial Flow	**7.47**	
				Subtotal - Open Space Flow	**0.05**	
				Subtotal - Non-Metered Flow	**8.73**	
				Total Balanced WWTP Flow	**56.68**	
				2018 WWTP Average Annual Flow[10]	**56.81**	

AKEL ENGINEERING GROUP, INC.

10/2/2020

Notes:

1. Source: Land use and acreages based on City of Fresno parcel shapefile downloaded July 16, 2019.
2. Acreages exclude Bakman, Pinedale, and CSU Fresno service areas.
3. Acreages reflect flow generating parcels only and do not account for Septic Users.
4. Demand based on 2018 annual metered consumption records.
5. Wastewater Unit Factors increased to account for City-wide vacancy rate of 8.1% based on CA Department of Finance population estimates.
6. Industrial flow does not exclude the City's top industrial users (Foster Farms, Cal Dairies, Gallo, and Cargil Beef).
7. Development information for non-metered areas provided by City Staff.
8. City of Clovis BWF extracted from City of Fresno Wastewater Collection System Master Plan Update (September 2015).
9. CSU Fresno flows extracted from flow meter data provided by City Staff on April 30, 2019.
10. Historical WWTP flows provided by City Staff on February 13, 2019.

Appendix C

Water Technical Report for the City of Fresno General Plan Update MEIR (Prepared by Blair, Church & Flynn), City of Fresno Hydraulic Evaluation of the Proposed 2035 General Plan Land Use Updated for the Master Environmental Impact Report Technical Memorandum (Prepared by West Yost Associates)

Water Technical Report

for the

City of Fresno General Plan Update MEIR

June 18, 2013

Introduction

The City of Fresno (City) is in the process of developing their General Plan Update. The last update to the City's General Plan was in 2002. The General Plan Update, in part, encourages infill projects and facilitates revitalization. The Master Environmental Impact Report evaluates the impacts associated with the General Plan Update and proposes mitigation measures. West Yost Associates (West Yost) has analyzed the impacts associated with the General Plan Update and prepared recommendations to meet increased demand and additional storage requirements. West Yost's analysis is summarized in their Technical Memorandum entitled "Hydraulic Evaluation of the Proposed 2035 General Plan Land Use Update for the Master Environmental Impact Report" (Technical Evaluation), attached as Appendix A. The recommendations included in the Technical Evaluation are based on general land use data available as part of the General Plan Update. See Figure 5 in the Technical Report for proposed water infrastructure improvements. As actual development projects are proposed with more specific information, additional evaluation will be required to confirm that the local distribution system and infrastructure are sufficient to meet the City minimum service requirements for service to the end users.

Summary of Analysis

The Technical Evaluation used the land use data obtained from the City's General Plan Update as contained in Geographic Information System geodatabase files provided by the City's Planning and Development Department. These General Plan Update land uses were used, together with appropriate water duty factors to calculate the water demand. Tables 1 and 2 in the Technical Evaluation include the water duty factors per customer class and the calculated water demand, respectively. The calculated water demand as a result of the General Plan Update is 243,570 acre-feet per year (af/yr) and exceeds the water demand projected in the 2012 City of Fresno Metropolitan Water Resources Management Plan by 10,170 af/yr. In order to meet this higher water demand, additional groundwater pumpage or combination of groundwater pumpage and increased surface water treatment capacity will be required. An additional 10,170 af/yr of intentional groundwater recharge, via an additional 210 acres of new recharge basins, would be required to balance the additional groundwater pumpage.

Potable water storage requirements were considered in the Technical Evaluation. The total storage required to meet the daily water demand that is projected to be generated by the 2035 General Plan Update land uses is 250.7 million gallons, see Table 4 in the Technical Evaluation. The storage requirement exceeds the 2025 general plan update storage requirement by 10.1 million gallons. The Technical Evaluation, in Figure 5, indicates proposed locations for the additional storage. The next water master plan update should include recommendations for overall water system improvements, including recommendations for storage improvements.

The West Yost Technical Evaluation indicates that the water infrastructure recommended in the 2012 City of Fresno Metropolitan Water Resources Management Plan is adequate to convey the peak hourly plus fire flow for the General Plan Update land uses and meets the City's service criteria. Therefore, no previously unplanned conveyance or pump systems are needed for that reason.

Additionally, West Yost has analyzed the impacts to the downtown area. West Yost's analysis is summarized in their Technical Memorandum entitled "Hydraulic Evaluation of the Proposed Fulton Corridor Specific Plan Project", attached as Appendix B.

Mitigations (Existing Condition to 2025 General Plan)

a. Construct an 80 million gallon per day (MGD) surface water treatment plant near the intersection of Fowler and Olive Avenues, in accordance with Chapter 9 and Figure 9-1 of the City of Fresno Metropolitan Water Resources Management Plan Update Phase 2 Report, January 2012 (2012 Metro Plan Update).

b. Construct a 30 MGD expansion of the existing northeast surface water treatment plant for a total capacity of 60 MGD, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

c. Construct a 20 MGD surface water treatment plant in the southwest portion of the City, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

d. Construct 65 new groundwater wells, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

e. Construct a 2.0 million gallon potable water reservoir (Reservoir T2) near the intersection of Clovis and California Avenues, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

f. Construct a 3.0 million gallon potable water reservoir (Reservoir T3) near the intersection of Temperance and Dakota Avenues, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

g. Construct a 3.0 million gallon potable water reservoir (Reservoir T4) in the downtown area, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

h. Construct a 4.0 million gallon potable water reservoir (Reservoir T5) near the intersection of Ashlan and Chestnut Avenues, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

i. Construct a 4.0 million gallon potable water reservoir (Reservoir T6) near the intersection of Ashlan Avenue and Highway 99, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

j. Construct 50.3 miles of regional water transmission mains ranging in size from 24-inch to 48-inch, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

k. Construct 95.9 miles of 16-inch transmission grid mains, in accordance with Chapter 9 and Figure 9-1 of the 2012 Metro Plan Update.

l. Develop additional water conservation measures in accordance with Chapter 4 of the 2012 Metro Plan Update.

m. Implement groundwater objectives, goals and policies as described in Chapter 5 of the 2012 Metro Plan Update.

n. Implement surface water objectives, goals and policies as described in Chapter 6 of the 2012 Metro Plan Update.

o. Implement recycled water objectives, goals and policies as described in Chapter 7 of the 2012 Metro Plan Update.

Mitigations (2025 General Plan to General Plan Update)

a. Construct a 4.0 million gallon potable water reservoir (SEGA Reservoir 1) within the northern part of the Southeast Growth Area.

b. Construct a 4.0 million gallon potable water reservoir (SEGA Reservoir 2) within the southern part of the Southeast Growth Area.

c. Develop an update to the water master plan.

Appendix A

WEST YOST
ASSOCIATES
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: January 21, 2013 Project No.: 439-00-12-11

TO: Brock Buche, City of Fresno Water Division Project Manager

CC: Martin Querin, City of Fresno Assistant Public Utilities Director—Water Division
Keith Bergthold, City of Fresno Assistant Director of Development and Resource Management

FROM: Brenda Estrada, Project Engineer, R.C.E. #67062

REVIEWED BY: Charles Duncan, Project Manager, R.C.E. #55498

SUBJECT: Hydraulic Evaluation of the Proposed 2035 General Plan Land Use Update for the Master Environmental Impact Report

INTRODUCTION

The purpose of this technical memorandum (TM) is to present West Yost Associates' (West Yost's) evaluation of the potential hydraulic impacts on the City of Fresno (City) water system of the proposed 2035 General Plan Land Use Update (2035 GP) for the Master Environmental Impact Report (MEIR). As described in this TM, West Yost has used the City's water system hydraulic model to evaluate the ability of the City's existing and proposed water system to provide minimum required pressures and flows under the future, projected demands associated with the update to land use. Our evaluation findings and recommendations to serve the 2035 GP are described below.

PROJECT BACKGROUND AND DESCRIPTION

The City has begun the process of updating their General Plan which was last updated in 2002. The previous General Plan included land use development projections to the year 2025. The 2035 GP will create a blueprint for development over the next 20 years to 2035. The changes in the 2035 GP look to facilitate revitalization, infill, transit-oriented development and more sustainable development practices. The MEIR evaluates the impacts to City infrastructure associated with the proposed changes to development.

The City has performed extensive planning for the future water system as documented in the Metropolitan Plan Update (Metro Plan Update). The Metro Plan Update used the City's 2025 General Plan Land Use Update (2025 GP) land use to project future water demands. These demands are the basis for the City's proposed supply portfolio and transmission pipeline grid developed in the Metro Plan Update to meet the City's future needs. Updates to the proposed land use impacts the City's overall system demands. This TM evaluates how the changes to demands impact the planned infrastructure for the City's water system.

PROJECTED WATER DEMANDS

The City has been using water demands developed in the Metro Plan Update to plan for the future water system infrastructure and supply needs. As described in detail in the Metro Plan Update, West Yost obtained future land use data from the City's GIS, which used land use designation adopted as part of the City's 2025 GP. West Yost consolidated the various land use designations from the City's 2025 GP into the City's Water Division's five existing customer classes (single family residential, multi-family residential, commercial/institutional, industrial, and landscape irrigation) to facilitate development of unit factors. In addition to these five existing customer classes, West Yost had added a sixth customer class category for the Southeast Growth Area (SEGA) which had recently been added to the City's Sphere of Influence (SOI) at the time the Metro Plan Update was developed.

The 2035 GP updates the land use designation for several locations within the City's SOI including detailed land use information for the SEGA. The 2035 GP also includes new land use designations which include mixed use for areas outside of the Downtown Central Area. The main change to the land use designations occur along Blackstone Avenue corridor, Shaw Avenue corridor, SEGA, and the southwest section of the City SOI. Figure 1 shows the parcels within the City's SOI where the planned land use designations were updated in the 2035 GP.

The new mixed use designations required the development of new water customer classes to account for the change in anticipated water use. The mixed use designations combine commercial, office and residential land uses on a single parcel. For the downtown mixed use designated parcels, the water duty factor is higher than for the areas outside of downtown. The mixed use planned in the Downtown Central Area is expected to be high densification of residential, commercial, and office in multiple story buildings. It is anticipated the mixed use downtown will include greater square footage of office and commercial as well as higher density residential than the areas outside of downtown and therefore, different water duty factors were developed for the two areas.

The Metro Plan Update used the assumption that open space land designations did not require irrigation. Since the Metro Plan Update, additional evaluation on how open space area is irrigated within the City has resulted in the development of water duty factors to account for irrigation of turf areas within an open space designated parcel. Depending on the primary purpose of the open space, new park, nature preserve, flood control, or greenbelt, a percentage of the parcel is now assumed to be irrigated.

Table 1 provides a summary of the water duty factors used for the different water customer classes and the land use code for the evaluation.

Table 1. Summary of Unit Water Use Factors

Water Customer Class	Land Use Code	Water Duty Factor[(a)], afa/ac
Single Family Residential	rl, rm, rml, run	3.2
Multi-Family Residential	rh, rmh	6.2
Commercial/Institutional	cbp, cc, cgh, cms, co, cr, crbp, hwy, il, pf, pfs, pqch, pse, psm, psp, pss	1.9
Industrial	Ih	1.9
Landscape Irrigation	ccr, orbp, orp, orpr	2.9
Open Space[(b)] • New parks • Nature preserve park • Ponding basin/Regional flood control • SEGA open space	obp, os	 3.4 (80% of area) 3.4 (15% of area) 0 3.4 (47% of area)
Mixed Use Downtown	Cce	7.5
Mixed use Outside of Downtown	cmx, nmx, rmx	6.6
No Water Use[(c)]	ag, rail, road	0

(a) Assumes water conservation achieved through water conservations implemented by the City and single family meter implementation program.
(b) Open space designations assumed to have a percentage of area irrigated based on type of open space use.
(c) No water use includes roadways, railroads, and agricultural land use designations. The eastside agricultural buffer for SEGA is assumed to have no water use.

Demands were calculated for the parcels with a change in land use. Table 2 provides a comparison of the calculated water demand for the 2025 GP land use and the 2035 GP land use for parcels with a change to its land use designation. Parcels without a land use designation change are assumed to have no change in demands. Demand changes to the downtown area are based on work West Yost has conducted based on densification of the proposed mixed use parcels in the downtown area, as well as specific demand for the Fulton Corridor Specific Plan developed by Sherwood Design Engineers.

For purposes of West Yost's hydraulic evaluation of the demand changes due to the 2035 GP, the water demands associated with the parcels having a change in land use were updated in the hydraulic model. The projected demands for the SEGA are decreased from what was projected as part of the Metro Plan Update. However, the downtown area and the remainder of the City demands increase. The calculated demands show an overall increase for the City due to the changes in the 2035 GP land use of 10,170 acre-feet/year (afa). Figure 2 shows how the changes to demands are spatially located throughout the City.

Table 2. Water Demand Comparison for General Plan Land Use Changes[a]

Water Customer Category	Water Duty Factor	2025 General Plan		2035 General Plan		Difference (2035-2025)	
		Area, acres	Annual Water Demand, afa	Area, acres	Annual Water Demand, afa	Area, acres	Annual Water Demand, afa
Downtown Area[b]							
Commercial/Institutional	1.9	2,179	4,140	1,699	3,229	-480	-911
Commercial/Mixed Use[c]	7.5	0	0	480	3,600	480	3,600
Industrial	1.9	237	450	237	450	0	0
Landscape Irrigation	2.9	185	537	185	537	0	0
Multi-Family Residential	6.2	367	2,278	367	2,278	0	0
No Water Use	0.0	83	0	83	0	0	0
Open Space[d]	2.9	65	0	65	188	0	188
Single Family Residential	3.2	1,851	5,923	1,851	5,923	0	0
Increase for Fulton Corridor[e]	-	-	0	-	1,020	-	1,020
Subtotal Downtown Area		*4,967*	*13,329*	*4,967*	*17,225*	*0*	*3,896*
SEGA							
South East Growth Area	3.2	8,227	26,328	0	0	-8,227	-26,328
Commercial/Institutional	1.9	0	0	1,715	3,258	1,715	3,258
Irrigated School Parks	3.4	0	0	354	1,204	354	1,204
Industrial	1.9	0	0	0	0	0	0
Landscape Irrigation	2.9	0	0	34	97	34	97
Multi-Family Residential	6.2	0	0	0	0	0	0
No Water Use	0.0	0	0	733	0	733	0
Open Space[d]	0.0	0	0	0	0	0	0
Regional Flood Control[f]	0.0	0	0	269	0	269	0
SEGA Open Space[g]	3.4	0	0	564	901	564	901
Single Family Residential	3.2	0	0	4,039	12,924	4,039	12,924
Mixed Use[h]	6.6	0	0	524	3,460	524	3,460
Subtotal SEGA		*8,227*	*26,328*	*8,230*	*21,843*	*3*	*-4,485*
Remainder of City							
Commercial/Institutional	1.9	6,131	11,650	3,309	6,287	-2,822	-5,362
Industrial	1.9	3	7	121	230	118	223
Landscape Irrigation	2.9	157	455	257	745	100	290
Multi-Family Residential	6.2	884	5,482	372	2,307	-512	-3,175
No Water Use	0.0	8	0	31	0	23	0
Open Space[d]	0.0	280	0	0	0	-280	0
New Parks[i]	3.4	0	0	359	977	359	977
Nature Preserve[j]	3.4	0	0	135	69	135	69
Ponding Basin[k]	0.0	0	0	56	0	56	0
Regional Flood Control(f)	0.0	0	0	32		32	
Single Family Residential	3.2	3,699	11,838	3,874	12,397	175	558
Mixed Use[h]	6.6	0	0	2,603	17,180	2,603	17,180
Subtotal Remainder of City		*11,163*	*29,431*	*11,150*	*40,192*	*-13*	*10,761*
Total		***24,358***	***69,088***	***24,348***	***79,260***	***-10***	***10,172***

[a] Demands shown for parcels with a change in Land Use from the 2025 General Plan to the 2035 General Plan Update.

[b] Demands for the Downtown Area based on increase in densification to mixed use land use designation and Fulton Corridor Specific Plan detailed demand use.

[c] Downtown Commercial/Mixed Use water duty factor based on densification of mixed use within the downtown area and proposed population increases. Downtown Area commercial/mixed use assumed to contain a greater building square footage than mixed use in other parts of the City and therefore, a larger water duty factor is applied to the Downtown Commercial/Mixed Use land categories.

[d] Open Space water duty factor developed for original Metro Plan demand projections assumed 0 water usage. Additional research on the type of irrigation needs for various open space uses has resulted in new water duty factors for the 2035 General Plan land use.

[e] Demands for Fulton Corridor Specific Plan are based on building type and proposed square footage as provided by Sherwood Engineering. Demands for Fulton Corridor are not tied to a specific land use type.

[f] The water duty for the Open Space land use areas planned to be used as Regional Flood Control facilities is assumed to be 0 afa. A total of 300.7 acres is planned with a majority of the land use within SEGA.

[g] SEGA open space/mixed vegetation area is assumed to be approximately 47 percent irrigated. This assumes 263.6 acres of the total 563.6 acres of open space will require irrigation.

[h] Mixed Use land designations outside of the downtown area are assumed to contain less square footage than mixed use within the Downtown Area. Mixed use water duty factor is based on assumptions for building and population projections for SEGA.

[i] Open Space land uses assumed to be used as new parks are assumed to be 80 percent irrigated. A total of 359.3 acres of new park is planned for the remainder area of the City.

[j] The water duty for the Open Space land use area planned to be used as a nature preserve type park located in the northwest part of the City is assumed to be 15 percent irrigated. A total of 135.1 acres is currently planned.

[k] The water duty for the Open Space land use areas planned to be used as Ponding Basis facilities is assumed to be 0 afa. A total of 56.4 acres is currently planned.

WATER SUPPLY

As described in the City's Metro Plan Update, the City's Water Master Plan, the City's 2010 Urban Water Management Plan (2010 UWMP) and West Yost's March 2009 TM "Hydraulic Evaluation of the Downtown Central Area," the City's available water supplies are confined to a finite quantity and are extremely limited. Therefore, water supplies to meet the projected increase in water demand must come from within the City's existing, limited water supply portfolio. The availability and reliability of the City's water supplies to meet the City's projected water demands under various hydrologic conditions were evaluated in the City's 2010 UWMP which was adopted by City Council in November 2012.

The projected water demands in the 2010 UWMP were based on the City's anticipated compliance with adopted per capita water use targets in accordance with the Water Conservation Act of 2009 (SBx7-7) and the projected City population in 2035[1]. As documented in the 2010 UWMP, the City population in 2035 is projected to be 786,000 (this is based on the Fresno Council of Governments estimate of 1,290,000 people countywide in 2035, with 61 percent of the population residing in the City of Fresno). Assuming that the land use changes proposed for the 2035 General Plan do not result in an increase in the total projected City population, but instead result in an increased densification of population in some parts of the City and reduced densification in other parts of the City, the projected water demand per SBx7-7, based on per capita consumption, in 2035 (220,100 af) would be unchanged as a result of the proposed land use changes.

The projected water supplies in the 2010 UWMP were calculated using land-use based water demand projection using the 2025 General Plan land uses (shifted out 10 years to 2035 to account for the slowdown in development in the City) and assuming water conservation by all users. This land use-based water demand projection (233,400 af) is higher than the SBx7-7 water demand projection (220,100 af) and is more conservative for water supply planning purposes as it provides for additional water supplies in the event that the City were not able to comply with the SBx7-7 requirements. With the land use changes proposed for the 2035 General Plan, this 2035 water demand estimate would increase to 243,570 af (233,400 af + 10,170 af). This increased land use-based water demand projection is shown on Figure 3.

To meet this higher land use-based water demand projection in 2035, additional water supplies would be required. The City's water supply portfolio in 2035 is projected to include treated surface water supplies, groundwater supplies and recycled water supplies (see Figure 3). Supplies to meet additional water demands would likely be derived from additional groundwater pumpage in conjunction with additional intentional groundwater recharge. The groundwater pumpage projected for 2035 in the 2010 UWMP (85,000 af) would increase to 95,170 af (85,000 af + 10,170 af) with the land use changes proposed for the 2035 General Plan. This increase in groundwater pumpage would require a like amount of additional intentional groundwater recharge to keep the City's groundwater operations in balance. As described in the City's 2010 UWMP, the projected future increase in intentional groundwater recharge is assumed to occur due to the increased use of existing recharge basins, construction of new recharge basins, and/or development of a groundwater bank and maximizing the use of available surface water supplies[2].

[1] See Chapter 6 of the City of Fresno 2010 Urban Water Management Plan dated November 2012.
[2] See Section 4.2.3 of the City's 2010 Urban Water Management Plan dated November 2012.

An additional 210 acres[3] of new recharge basins (beyond those previously identified) would be required to balance the additional required groundwater pumpage of 10,170 af associated with the 2035 General Plan.

EVALUATION CRITERIA

The planning and modeling criteria used for this evaluation are based on West Yost's recent work with the City. The August 2008 verified hydraulic model of the City's water distribution system was used as the basis for the evaluation. The hydraulic model has been updated since 2008 to account for the updates to demand within the Downtown Central Area.

Planning and Modeling Criteria

The criteria used to evaluate the potential impacts to the City's existing water system are as follows:

- Minimum peak hour demand pressure 40 pounds per square inch (psi);
- Maximum allowable velocity is 7 feet per second (fps) during a peak hour condition for distribution pipelines and 5 fps during a peak hour condition for transmission pipelines;
- Maximum allowable head loss rate is 10 feet per 1,000 feet during any condition[4];
- Any new, required pipelines will be modeled with a roughness coefficient (C-factor) of 130; and
- Assumed peaking factors for maximum day and peak hour demand conditions are consistent with the City's adopted peaking factors and are as follows:
  - Maximum Day Demand = 2.0 times Average Day Demand
  - Peak Hour Demand = 2.9 times Average Day Demand

Fire Flow Requirements

As a purveyor of water, the City is responsible for providing a realistic water supply to meet fire flow requirements. The City's Fire Department establishes minimum water flows and pressures required for firefighting purposes. The Fire Department uses the 2007 California Fire Code (CFC) (*Table B105.1 – Minimum Required Fire-Flow and Flow Duration for Buildings*) to assist them in establishing minimum fire flows and durations for individual structures.

The fire flow requirements based on land use type are presented in Table 3. Fire flow requirements do not change significantly due to the 2035 GP land use change. Figure 4 shows how the land use changes impact the required fire flow. The most significant change is to the SEGA area. Prior to having a land use plan for SEGA, the area was assigned a conservative fire flow requirement of 4,000 gpm. Therefore, the fire flow in SEGA have been adjusted to reflect

[3] Based on a recharge rate of 0.2 acre-feet per acre per day over a 10-month per year operational cycle (per the Metropolitan Water Resources Management Plan Phase 2 Report (Chapter 5), January 2011) plus 25 percent to account for inactive portions of the recharge area (setbacks and roadways within the recharge areas).

[4] This criteria was developed primarily for new development; ability to meet this criteria within existing distribution systems (such as that in the City's downtown area) can be difficult due to existing small diameter pipelines and aging pipelines.

the proposed land use designations and results in a reduction to projected fire flow requirements for most of the area.

Although these criteria have been established, and used to size new pipelines, the existing system should be evaluated using pressure as the primary criterion. Secondary criteria, such as velocity, head loss, age, and material type, are used as indicators for areas of the water system that also may need improvements, but may not be required as part of this evaluation.

Table 3. Recommended Fire Flow Requirements[a,b]

Designation	Non-Sprinklered		Sprinklered[c,d,e]	
	Fire Flow, gpm	Duration, hours	Fire Flow, gpm	Duration, hours
Single Family Residential	2,000	2	—	—
Multi-Family Residential	3,000	3	—	—
Commercial/Institutional	6,000	4	3,500	4
Industrial	8,000	4	4,500	4

(a) Construction type and fire area are not generally known during the development of a master plan; consequently, fire flow requirements set forth in this table are based on previous estimates for these land use types and similar communities.
(b) Unique projects or projects with alternate materials may require higher fire flows and will be reviewed by the City's Fire Marshal on a case-by-case basis (e.g., proposed commercial/industrial areas and schools).
(c) The City's Fire Marshal normally allows up to a 50 percent reduction in fire flows if a building is sprinklered. However, the CFC also requires that no fire flow be less than 1,000 gpm for single family residential or 1,500 gpm for all other building types. For a more conservative fire flow estimate, single family and multiple family buildings were considered non-sprinklered for this evaluation.
(d) Specific fire flows were determined from Table B105.1 of the 2007 CFC, and depend on construction type and fire area. These fire flow requirements are based on buildings being fully sprinklered.
(e) Fire flow includes a 500 gpm demand for on-site sprinkler flow.

WATER SYSTEM FACILITY ASSUMPTIONS

The City's hydraulic model was verified for August 2008 operating conditions. Since the initial verification and allocation of existing and proposed demands, West Yost has prepared several evaluation of the proposed infrastructure required to meet future demands.

Recommendations from Previous Evaluations

In March 2009, West Yost completed a hydraulic evaluation of the Downtown Central Area to evaluate available supplies in the City's downtown area and address the loss of supply in the downtown area due to aging wells and water quality issues[5]. This evaluation also considered changes to demands in the downtown area based on densification of the mixed use land designations. Based on population projections, projected per capita water demand factors, and proposed land use designations for the downtown Central Area, a unit water demand factor was calculated for mixed use designations. The calculated mixed use water duty factor is used in the evaluation for 2035 GP land use changes.

[5] "Hydraulic Evaluation of the Downtown Central Area", TM, prepared by West Yost, March 12, 2009.

In May 2011, West Yost conducted a re-evaluation of the Downtown Central Area to determine what potential alternatives existed other than the March 2009 recommendation for increasing the pumping capacity of Well 172[6]. The recommendations of the May 2011 evaluation were to make distribution pipeline improvements to improve flow from Well 172 (as recommended in the March 2009 evaluation), but instead of upgrading the pumping capacity of Well 172, distribution system improvements should be made to convey supplies from Well 313 to the Downtown Central Area.

In July 2011, West Yost conducted additional evaluation of the downtown area to determine the impacts of proposed demands for the Fulton Corridor Specific Plan Project.

For purposes of this evaluation, it has been assumed that the pipeline and storage infrastructure recommendations from these prior hydraulic evaluations will be implemented by the City and will be available to serve the 2035 GP requirements.

Specific System Assumptions

The following specific assumptions have been made related to available water system facilities within the City's service area:

- The Northeast Surface Water Treatment Facility (SWTF) has a future production capacity of 60 million gallons per day (mgd) and a firm capacity of 54 mgd to serve maximum day and peak hour demands;
- The proposed Southeast SWTF has a production capacity of 80 mgd and a firm capacity of 72 mgd to serve maximum day and peak hour demands;
- The City's proposed future groundwater production capacity is assumed to be approximately 549 mgd with a firm capacity of 439 mgd to supplement the surface water supplies during maximum day and peak hour demand conditions, as calculated in the Metro Plan Update Phase 2;
- For peak hour demands, the City will supplement surface and groundwater supplies with existing and proposed storage tank capacity;
    - Northeast SWTF Clearwell (1.5 MG existing + 4.5 MG proposed)
    - T-1 and T-2 Southeast Tanks (2.0 MG existing + 2.0 MG proposed)
    - T-3 Tank (3.0 MG existing)
    - Southeast SWTF Clearwell (8.0 MG proposed)
    - T-4 Downtown Tank (3.0 MG proposed)
    - SEGA Tanks (2- 4.0 MG proposed)
    - T-5 Tank (3.0 MG proposed)
    - T-6 Tank (3.0 MG proposed)

[6] "Hydraulic Re-Evaluation of the Downtown Central Area Water Distribution System", TM, prepared by West Yost, May 10, 2011.

- Major regional transmission mains and transmission grid mains (TGMs) as recommended in the Metro Plan Update Phase 3 report are assumed to be active for the 2035 GP evaluation.

The City's planned water system facilities based on the 2025 GP are shown on Figure 5.

EVALUATION SCENARIOS

To evaluate the adequacy of the City's water system to serve the Proposed 2035 GP land use changes, West Yost has evaluated the City's system at buildout (2035) under the following two demand conditions:

- A future maximum day demand condition concurrent with fire flow demand while maintaining a minimum residual system pressure of 20 psi along the corridors with significant changes to future demands; and
- A peak hour demand condition while maintaining a minimum system pressure of 40 psi.

Figure 6 shows how the demands are changed based on the proposed 2035 GP land use for maximum day demands for the City. Figure 7 shows how the demands are changed based on the proposed 2035 GP land use for peak hour demands for the City.

EVALUATION FINDINGS

Storage Capacity Evaluation

Treated water storage capacity requirements for the City were evaluated based on the following three components: operational storage, emergency storage and fire storage. The principal advantage that storage provides is to equalize demands on supply sources and production facilities.

Table 4 shows the storage requirement calculated for the 2025 GP land use demands, the incremental increase to storage requirements based on the demand changes for the 2035 GP land use designations, and the available system storage and storage credits.

Table 4. City of Fresno Storage Requirements

Storage Component	Required Storage, MG
Required Storage - 2025 GP Land Use Demands	
Operational[(a)]	62.5
Emergency[(b)]	177.1
Fire Flow[(c)]	1.0
Subtotal 2025 GP Land Use	**240.6**
Required Storage - 2035 GP Incremental Increase	
Operational[(d)]	2.7
Emergency[(e)]	7.4
Fire Flow[(f)]	—
Subtotal 2035 GP Incremental Increase	10.1
Total System Storage 2035 GP Land Use	**250.7**
Available Storage and Storage Credits	
Planned Reservoir Capacity[(g)]	38.0
Emergency Storage Credit[(h)]	92.6
Operational Storage Credit[(i)]	60.9
Surface Storage Credit[(j)]	60.0
Total Available Storage and Storage Credits	**251.6**
Future System Storage Needs	
Total System Storage 2035 GP Land Use	250.7
Total Available Storage and Storage Credit	251.6
Future Storage Surplus (Deficit)[(k)]	**0.9**

(a) Based on 15 percent maximum day demand (MDD = 416.7 million gallons per day (mgd).
(b) Based on 85 percent of an average day demand (ADD = 208.4 mgd).
(c) Based on a fire flow of 4,000 gallons per minute (gpm) multiplied by a 4 hour duration.
(d) Based on 15 percent of maximum day demand resulting from change in demand due to 2035 General Plan Land Use update (MDD = 12,605 gpm).
(e) Based on 85 percent of an average day demand resulting from change in demand due to 2035 General Plan Land Use update (ADD = 6,033 gpm).
(f) Fire flow already accounted for in City-wide storage calculations and not needed for the incremental land use change.
(g) Assumes the following for reservoir capacity: 6.0 Million Gallons (MG) Northeast SWTF (1.5 MG existing + 4.5 MG future); 4.0 MG T-1 and T-2 Southeast Tank (2.0 MG existing + 2.0 MG future); 3.0 MG T-4 Downtown Tank; 8.0 MG SEGA Proposed; 8.0 MG Southeast SWTF; 3 MG Existing T-3; 3.0 MG Proposed T-5; and, 3.0 MG Proposed T-6.
(h) Equal to the sum of the groundwater pumping capacity of active wells with backup power. Minimum credit is zero, and the maximum credit is the recommended emergency storage capacity.
(i) 56 percent of the difference between the firm groundwater capacity and a maximum day demand. Minimum credit is zero and the maximum credit is the recommended operational storage capacity. Firm groundwater pumping capacity assumes 20 percent of groundwater production capacity is out of service (FPC = 522 mgd) Draft Chapter 4 in the Water Master Plan further defines operational storage credit assumptions.
(j) Equal to the capacity of the smallest surface water treatment facility.
(k) Equal to the difference between total available storage and storage credits, and the total required storage.

MG = Million Gallons

The City's Water Master Plan is evaluating the overall system and will make recommendations for overall system improvements, including recommendations for storage improvements. As shown in Table 4, the preliminary storage calculations indicate the City has planned for adequate storage to include the proposed 2035 GP land use changes.

Distribution System Evaluation

The impacts from the 2035 GP land use changes on the water system infrastructure proposed for the 2025 GP land use was evaluated using the City's hydraulic model. Scenarios were run for 2025 GP demands and 2035 GP demands under maximum day plus fire flow and peak hour conditions. The ability to maintain system pressure, velocity, and available fire flow criteria for the increase in demands due to the land use changes was evaluated. The evaluation results are described below.

Maximum Day Plus Fire Flow for 2025 GP Land Use

As discussed under the fire flow requirements section, the SEGA area was initially evaluated using a conservative fire flow of 4,000 gpm prior to a detailed land use plan being available. The required fire flow for the land use plan for the 2035 GP shows a reduction in the required fire flow for this area. Due to this conservative approach taken initially, it is assumed, for this evaluation, that the SEGA area has been adequately planned to meet fire flow requirements. In addition, the downtown area has been evaluated for fire flow requirements as part of the densification in the Central Area and the Fulton Corridor Specific Plan hydraulic analysis performed. Therefore, the maximum day plus fire flow evaluation for this TM examines the corridors along Blackstone Avenue, Shaw Avenue, and the southwest section of the City where demands are shown to increase due to the proposed change in land use.

The results of the maximum day demand plus fire flow condition for the system with the 2025 GP land use are shown on Figure 8. The available flow at nodes along Blackstone Avenue, Shaw Avenue, and the southwest corridors in the hydraulic model are shown assuming that a minimum system pressure residual of 20 psi is maintained. Nodes that are shown in "green" have available flows of 3,500 gpm or more, indicating that they meet the fire flow requirement. Nodes shown in "red" have available flows that are less than 3,500 gpm, indicating that they do not meet the fire flow requirement for the 2025 GP land use. As shown, a node along Blackstone Avenue near Shields Avenue does not meet the minimum of 3,500 gpm (see "red" node on Figure 8). The inability of this node to meet the required 3,500 gpm fire flow is due to the age and small diameter of the pipeline at this location. Therefore, specific infrastructure improvements to meet required fire flow in older areas of the City with small diameter pipelines are addressed as part of the system's rehab and replacement program for aging infrastructure.

It should be noted that the City's pipeline velocity criteria of a maximum of 10 fps during a simulated fire flow condition was not used as a constraint for this evaluation. Typically, the pipeline velocity criteria for fire flow conditions is used for planning and design of new pipelines, and not for evaluation of existing pipeline systems due to the fact that new criteria standards might have been put in place since the construction of these existing pipelines.

Maximum Day Plus Fire Flow for 2035 GP Land Use

The hydraulic model was used to run the maximum day plus fire flow for the updated demands based on the 2035 GP land use changes. The initial run for this scenario assumed no changes to infrastructure or operations of the City's system to assess whether required fire flow was impacted by the increased system demands. Results indicated additional locations were not able to meet the 3,500 gpm fire flow. However, the reduction in available fire flow was mitigated in the hydraulic model by adjusting the operational settings for wells. An additional six wells in the vicinity of Blackstone Avenue and Shaw Avenue were assumed to be active for the maximum day plus fire flow scenario with the increased demands. As shown on Figure 9, the changes to operational settings were able to mitigate the reduction in available fire flow.

The results for the maximum day plus fire flow scenarios for the change in demands indicate the infrastructure recommendations for the 2025 GP land use is adequate to convey the additional demand. Mitigation through operation of system wells addresses any reduction in available fire flow.

Peak Hour Demands for 2025 GP Land Use

The results of the peak hour demand condition for the buildout with the 2025 GP demands are shown on Figure 10. Figure 10 shows the system pressure at each node in the hydraulic model based on peak hour demand conditions. As shown, system pressures throughout most of the City are above the minimum pressure criteria of 40 psi (indicated by the "green" nodes). One location, in the northwest part of the City indicates pressures drop below the minimum pressure of 40 psi (indicated by the "red" nodes). This location is a subzone within the City's system and there are constraints to how water is conveyed to this area. Improvement options are being evaluated to determine how to best improve pressures to this area. The City's minimum peak hour pressure criterion is being met throughout the rest of the City with the infrastructure being proposed for the 2025 GP land use demands.

Peak Hour Demands for 2035 GP Land Use

The results of the peak hour demand condition for the buildout with the 2035 GP demands are shown on Figure 11. Figure 11 shows the system pressure at each node in the hydraulic model based on peak hour demand conditions. As shown, system pressures throughout most of the City are able to meet the minimum pressure criterion. The results indicate the area in the northwest is still below criteria but the remainder of the City is above the minimum criterion of 40 psi. Like the maximum day demand plus fire flow scenario, operational adjustments were made for the peak hour demand scenario to mitigate areas where pressure in the system had dropped due to the increase demands. An additional five wells were activated in the southwest area of the City to ensure the minimum pressure criterion was being met for this area. The operation of these additional wells was confirmed to be within the firm pumping capacity for groundwater for the City's supply availability. Therefore, no specific improvements are required for the peak hour demand condition based on the increase in demands due to the 2035 GP changes.

EVALUATION RECOMMENDATIONS

As indicated through the results from the system evaluations, the infrastructure recommended in the Metro Plan Update reports is adequate to convey the increased demands throughout the system. However, operational changes are needed to maintain system pressure and velocity criteria. In order to maintain pressure in the southwest area during peak hour conditions, the City will need to operate additional wells without exceeding the firm production capacity of their groundwater supply. For maximum day demand plus fire flow conditions the City will also need to rely on additional wells to provide required fire flow to the corridors where demands have been increased.

This evaluation looked at the impact of the increased demands due to the 2035 GP land use changes on the City's infrastructure's ability to maintain minimum system service standards. The evaluation did not look at specific recommendations for distribution system infrastructure improvements to address localized pressure or available fire flow conditions. The City's Water Master Plan is evaluating the overall system and will make recommendations for overall system improvements, including recommendations to address localized areas of concern such as pipeline rehab and replacement for older areas of the City. Generally, however, the existing and planned infrastructure improvements are capable of meeting 2035 GP demands.

The recommendations in this TM are based on the general land use data available for the 2035 GP. As projects develop with more specific information, additional evaluation will need to be conducted to confirm the local distribution system and infrastructure is adequate to maintain the City system criteria.

2035 GENERAL PLAN LAND USE

Residential
- Low Density (1-3 D.U./acre)
- Medium Low Density (3.5-6 D.U./acre)
- Medium Density (5.0 - 12 D.U./acre)
- Medium High Density (12-16 D.U./acre)
- Urban Neighborhood (16-30 D.U./acre)
- High Density (30-45 D.U./acre)

Industrial
- Light Industrial
- Heavy Industrial

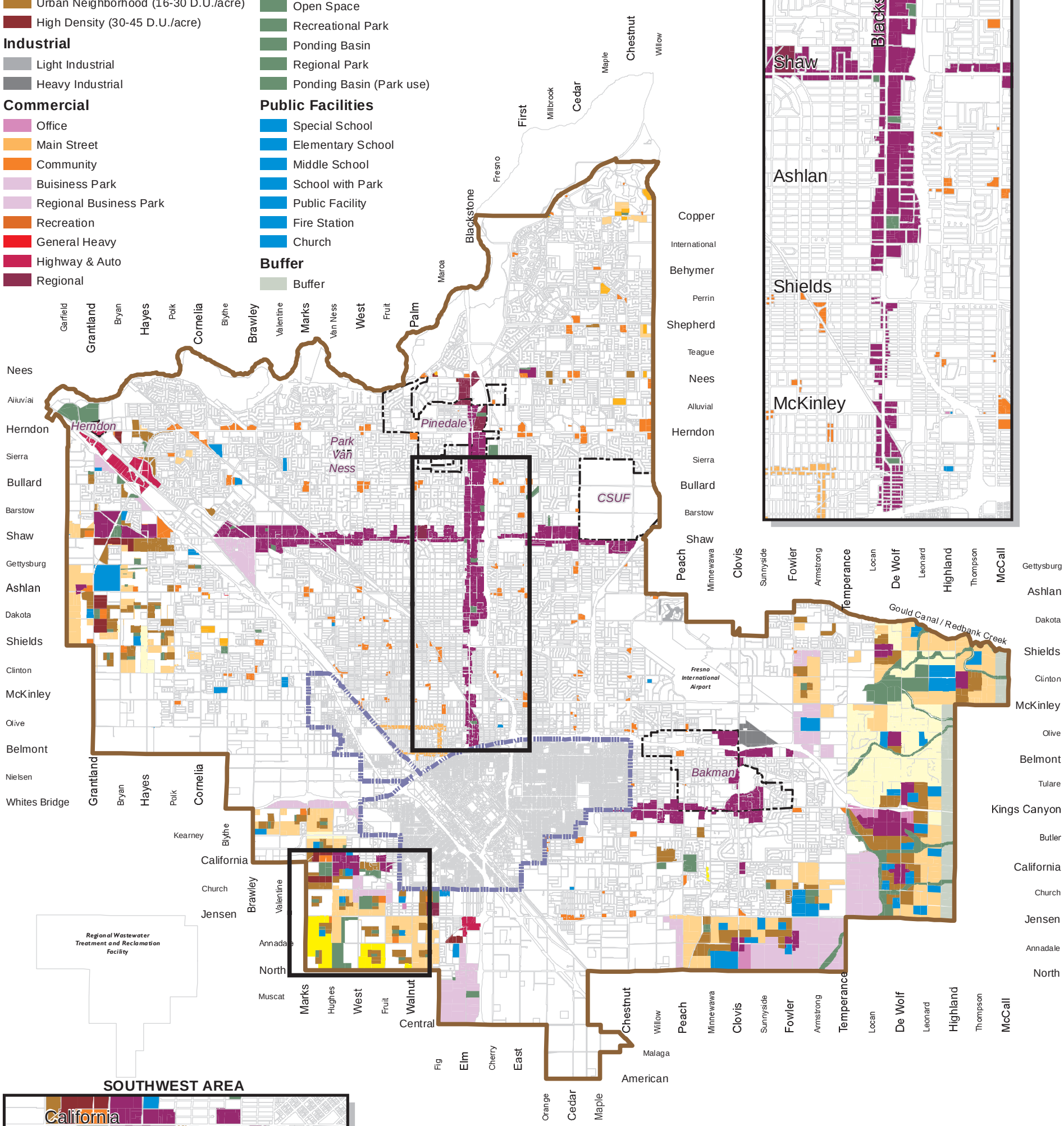
Commercial
- Office
- Main Street
- Community
- Buisiness Park
- Regional Business Park
- Recreation
- General Heavy
- Highway & Auto
- Regional

Mixed Use
- Corridor/Center Mixed Use
- Regional Mixed Use
- Neighborhood Mixed Use

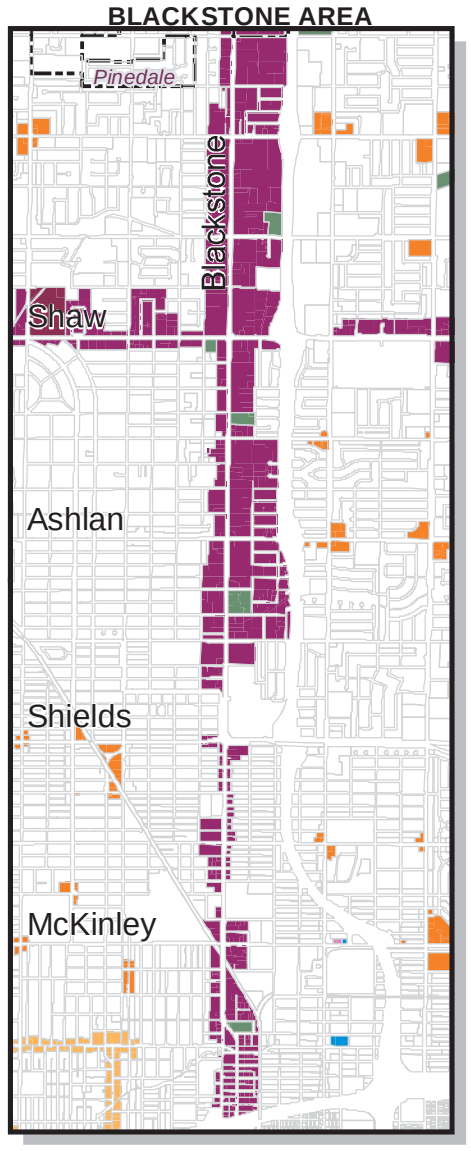
Open Space
- Open Space
- Recreational Park
- Ponding Basin
- Regional Park
- Ponding Basin (Park use)

Public Facilities
- Special School
- Elementary School
- Middle School
- School with Park
- Public Facility
- Fire Station
- Church

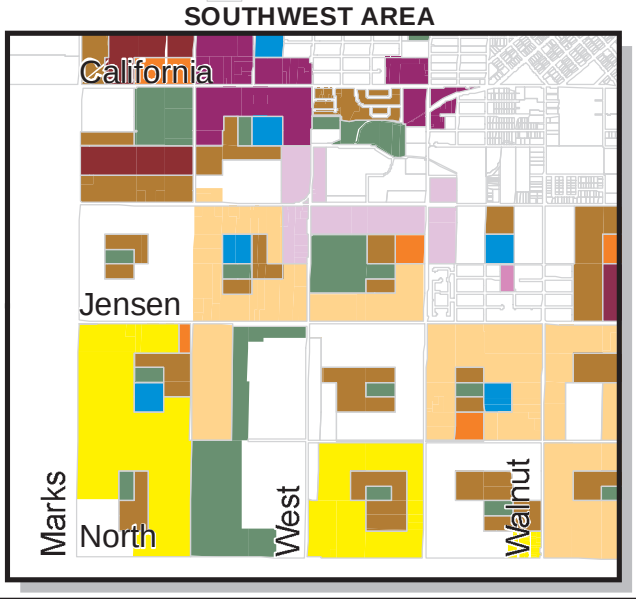
Buffer
- Buffer



BLACKSTONE AREA



SOUTHWEST AREA



Note:
- Land use only shown for areas where 2035 General Plan Update is proposing a change to the 2025 General Plan Land use.
- Downtown Area land use expected to be refined through specific and community plans.
- Areas with land use change based on GIS data provided by the City.

LEGEND
- Independent Water System
- Downtown Boundary
- Sphere of Influence

N

0 1 2
Miles

FIGURE 1

City of Fresno
General Plan Land Use Change Evaluation

2035 GENERAL PLAN LAND USE CHANGE AREAS

City of FRESNO

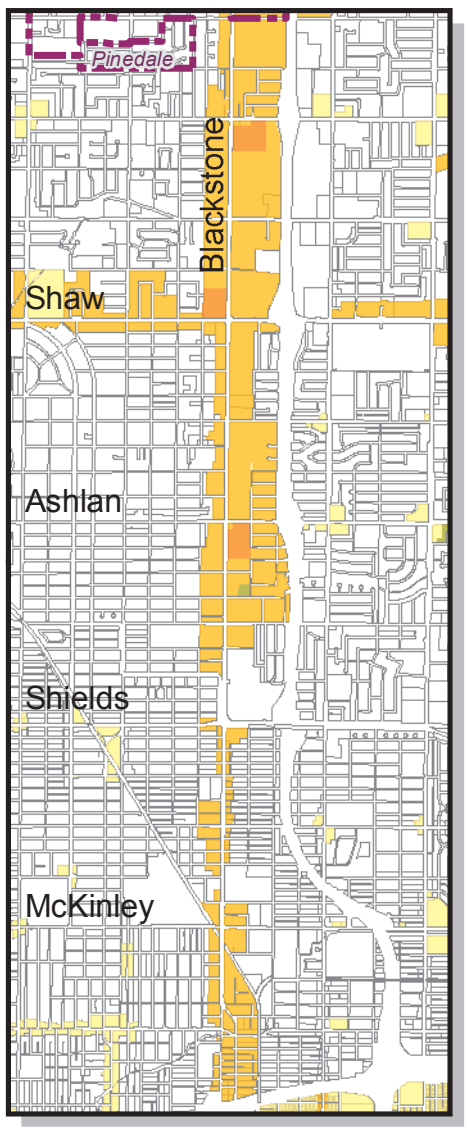
WEST YOST ASSOCIATES
Consulting Engineers

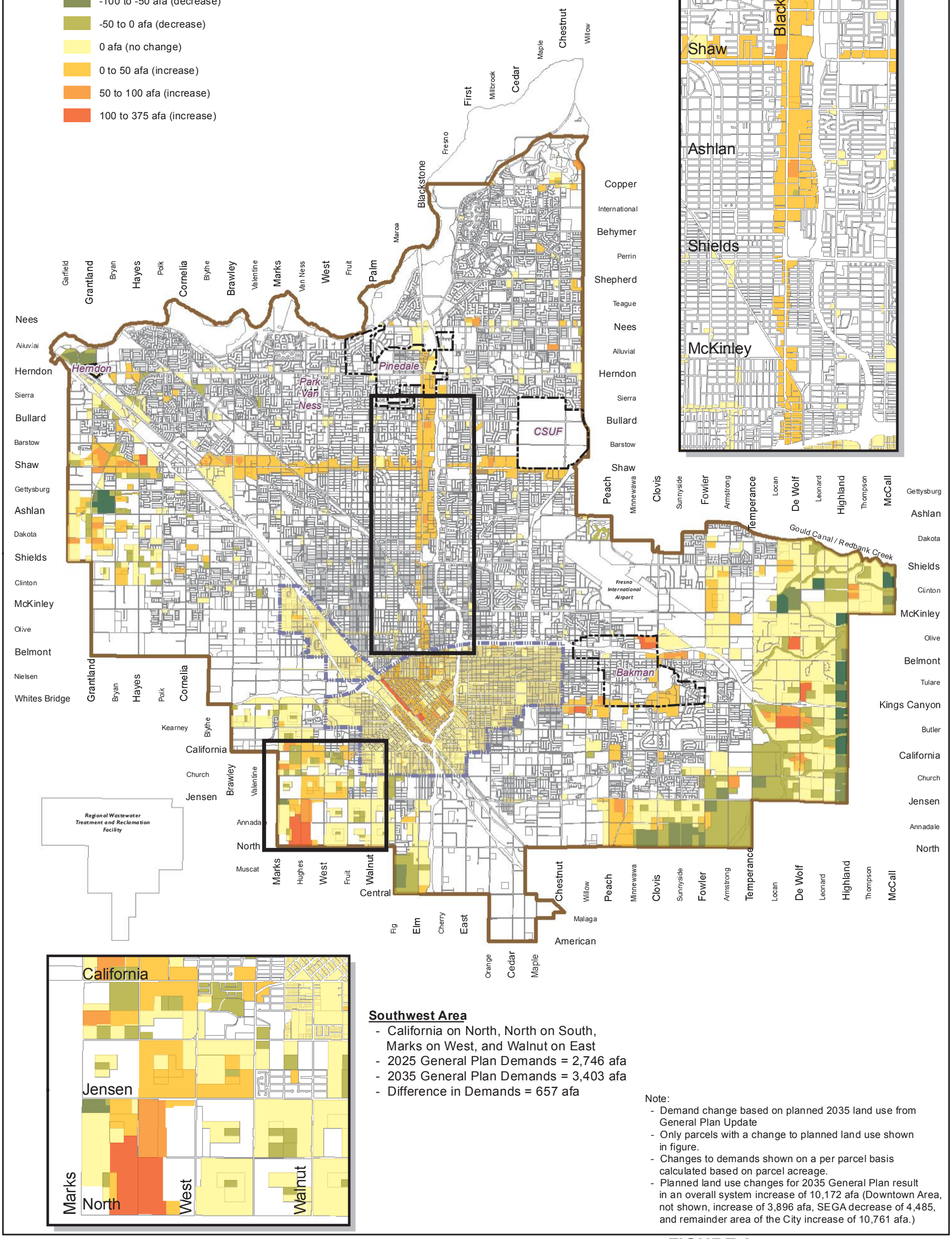
Annual Demand Comparison

- -232 to -100 afa (decrease)
- -100 to -50 afa (decrease)
- -50 to 0 afa (decrease)
- 0 afa (no change)
- 0 to 50 afa (increase)
- 50 to 100 afa (increase)
- 100 to 375 afa (increase)

Blackstone Area

- 2025 General Plan Demands = 1,567 afa
- 2035 General Plan Demands = 4,410 afa
- Difference in Demands = 2,844 afa





Southwest Area

- California on North, North on South, Marks on West, and Walnut on East
- 2025 General Plan Demands = 2,746 afa
- 2035 General Plan Demands = 3,403 afa
- Difference in Demands = 657 afa

Note:

- Demand change based on planned 2035 land use from General Plan Update
- Only parcels with a change to planned land use shown in figure.
- Changes to demands shown on a per parcel basis calculated based on parcel acreage.
- Planned land use changes for 2035 General Plan result in an overall system increase of 10,172 afa (Downtown Area, not shown, increase of 3,896 afa, SEGA decrease of 4,485, and remainder area of the City increase of 10,761 afa.)

LEGEND

- Independent Water System
- Downtown Boundary
- Sphere of Influence

N

0 1 2

Miles

FIGURE 2

City of Fresno General Plan Land Use Change Evaluation

CHANGES TO ANNUAL DEMANDS

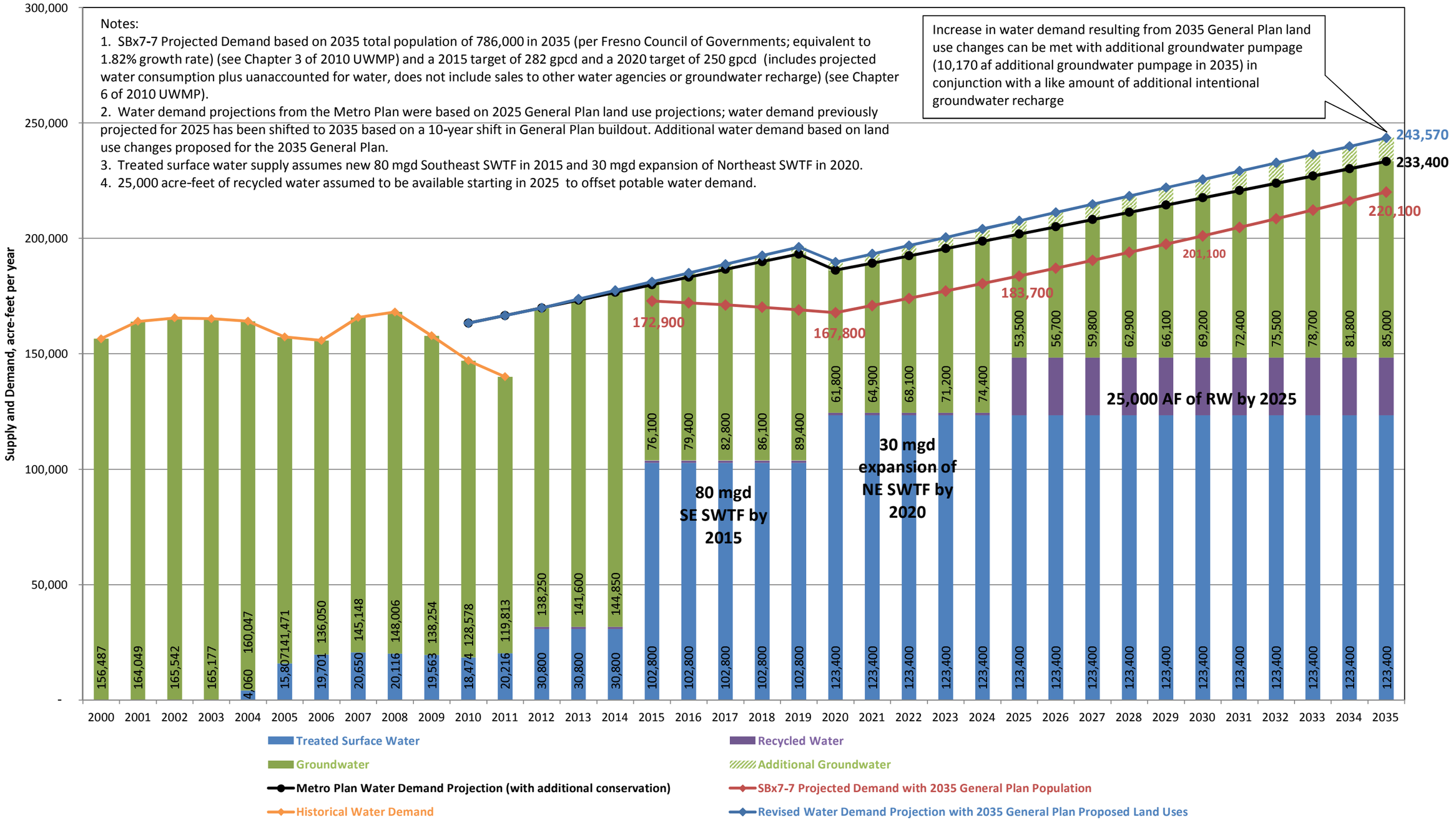
City of FRESNO

WEST YOST ASSOCIATES
Consulting Engineers

Figure 3. Changes to Future Supply and Demand

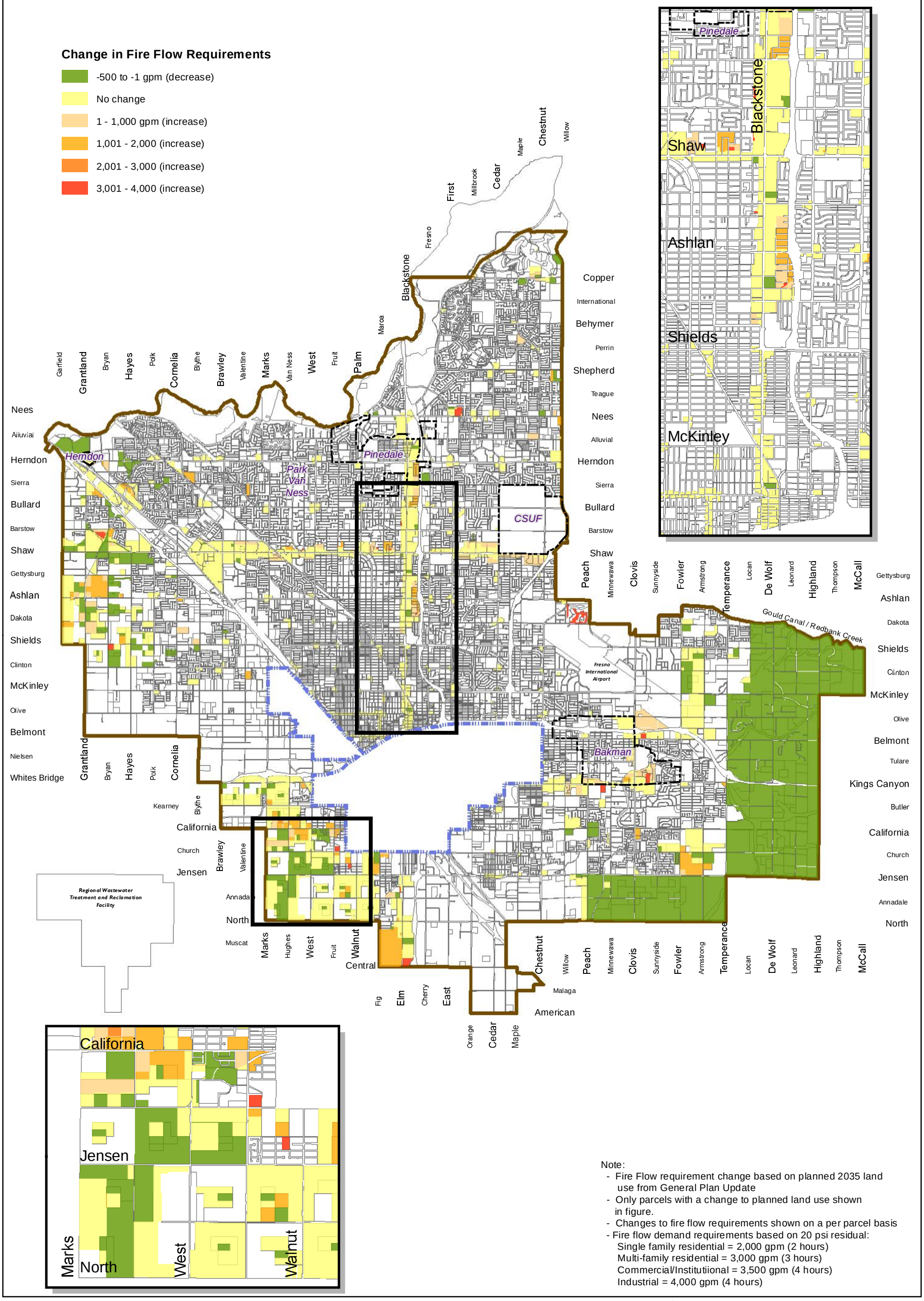
Notes:
1. SBx7-7 Projected Demand based on 2035 total population of 786,000 in 2035 (per Fresno Council of Governments; equivalent to 1.82% growth rate) (see Chapter 3 of 2010 UWMP) and a 2015 target of 282 gpcd and a 2020 target of 250 gpcd (includes projected water consumption plus uanaccounted for water, does not include sales to other water agencies or groundwater recharge) (see Chapter 6 of 2010 UWMP).
2. Water demand projections from the Metro Plan were based on 2025 General Plan land use projections; water demand previously projected for 2025 has been shifted to 2035 based on a 10-year shift in General Plan buildout. Additional water demand based on land use changes proposed for the 2035 General Plan.
3. Treated surface water supply assumes new 80 mgd Southeast SWTF in 2015 and 30 mgd expansion of Northeast SWTF in 2020.
4. 25,000 acre-feet of recycled water assumed to be available starting in 2025 to offset potable water demand.

Increase in water demand resulting from 2035 General Plan land use changes can be met with additional groundwater pumpage (10,170 af additional groundwater pumpage in 2035) in conjunction with a like amount of additional intentional groundwater recharge



Change in Fire Flow Requirements

- -500 to -1 gpm (decrease)
- No change
- 1 - 1,000 gpm (increase)
- 1,001 - 2,000 (increase)
- 2,001 - 3,000 (increase)
- 3,001 - 4,000 (increase)



Note:
- Fire Flow requirement change based on planned 2035 land use from General Plan Update
- Only parcels with a change to planned land use shown in figure.
- Changes to fire flow requirements shown on a per parcel basis
- Fire flow demand requirements based on 20 psi residual:
  Single family residential = 2,000 gpm (2 hours)
  Multi-family residential = 3,000 gpm (3 hours)
  Commercial/Institutiional = 3,500 gpm (4 hours)
  Industrial = 4,000 gpm (4 hours)

FIGURE 4

LEGEND

- Independent Water System
- Downtown Boundary
- Sphere of Influence

N

0 1 2

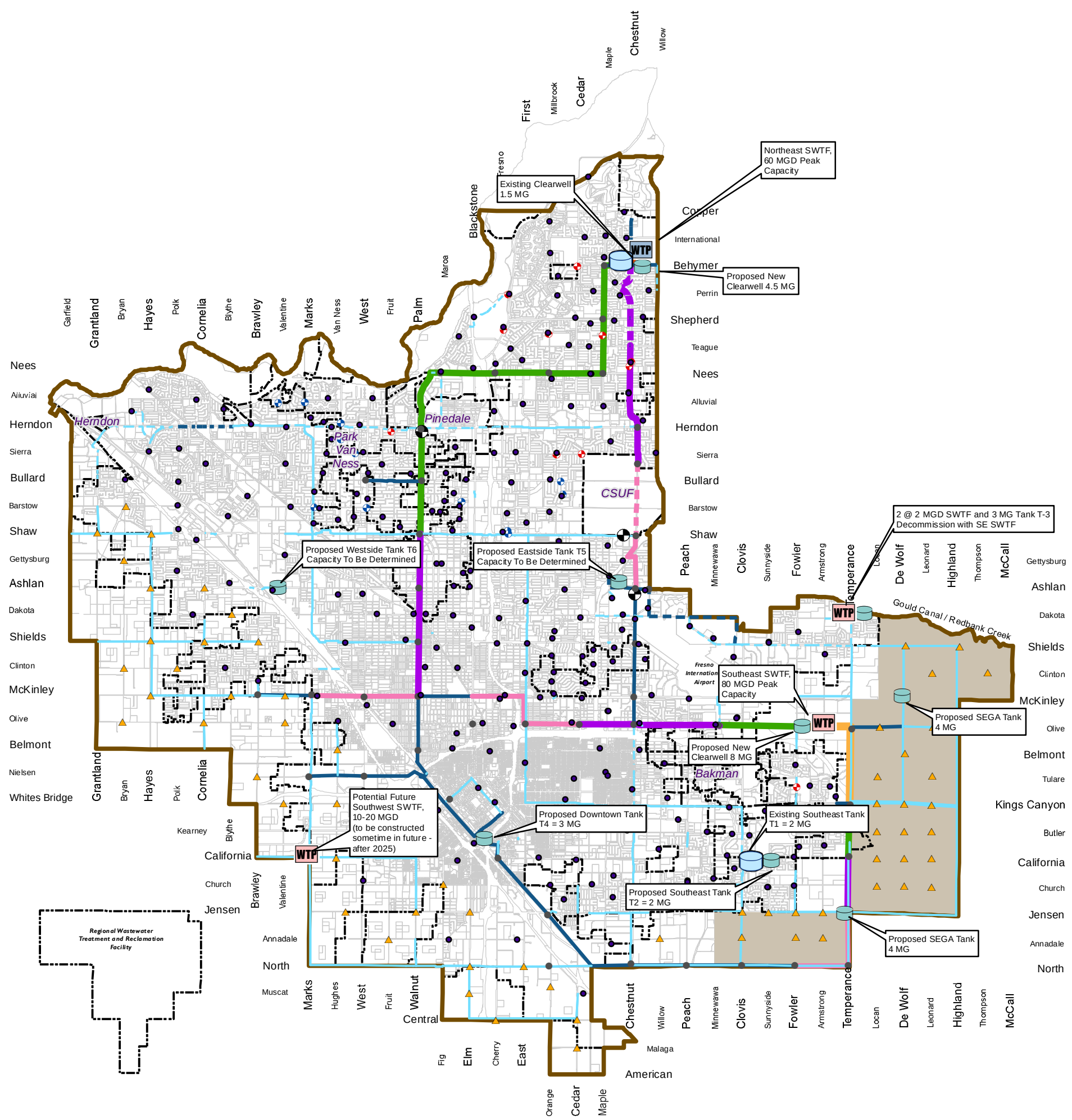
Miles

City of Fresno
General Plan Land Use Change Evaluation

CHANGES TO FIRE FLOW REQUIREMENTS

City of FRESNO

WEST YOST ASSOCIATES
Consulting Engineers



LEGEND

- WTP — Existing Water Treatment Plant
- Proposed Tank Site
- WTP — Future Water Treatment Plant
- Future Pressure Reducing Valve
- TGM Tie-in Location
- Existing Well
- Future Well 2010-2025
- Existing City Limit
- Sphere of Influence
- Independent Water System
- Southeast Growth Area
- 16-inch Diameter
- 24-inch Diameter
- 30-inch Diameter
- 36-inch Diameter
- 42-inch Diameter
- 48-inch Diameter

Note:
- Dashed line indicates an existing pipeline
- Infrastructure shown proposed in the Metro Plan Update Phase 3.
- New well locations shown are for display purposes. The City will conduct well siting studies to determine actual well locations.

N

0 1 2
Miles

FIGURE 5

City of Fresno General Plan Land Use Change Evaluation

2025 PROPOSED REGIONAL AND TGM INFRASTRUCTURE

City of FRESNO

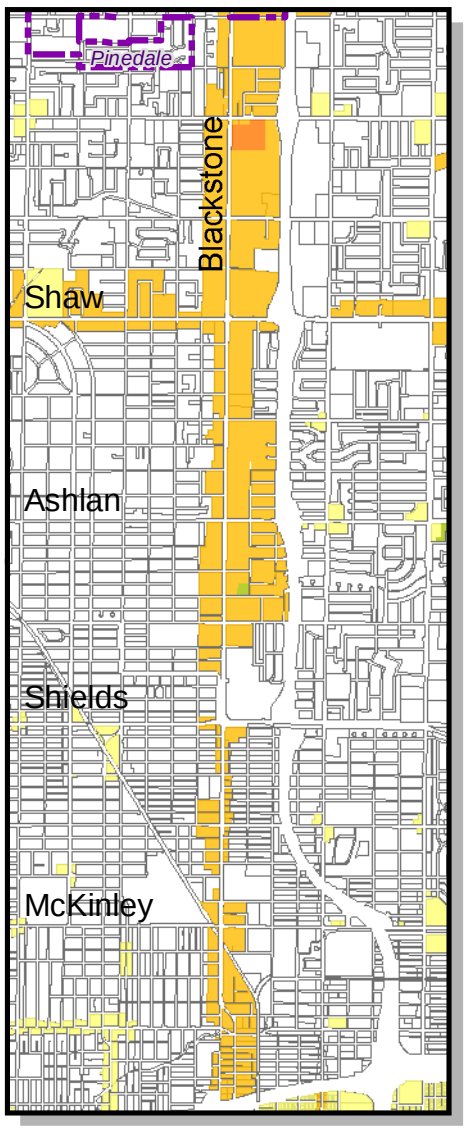
WEST YOST ASSOCIATES
Consulting Engineers

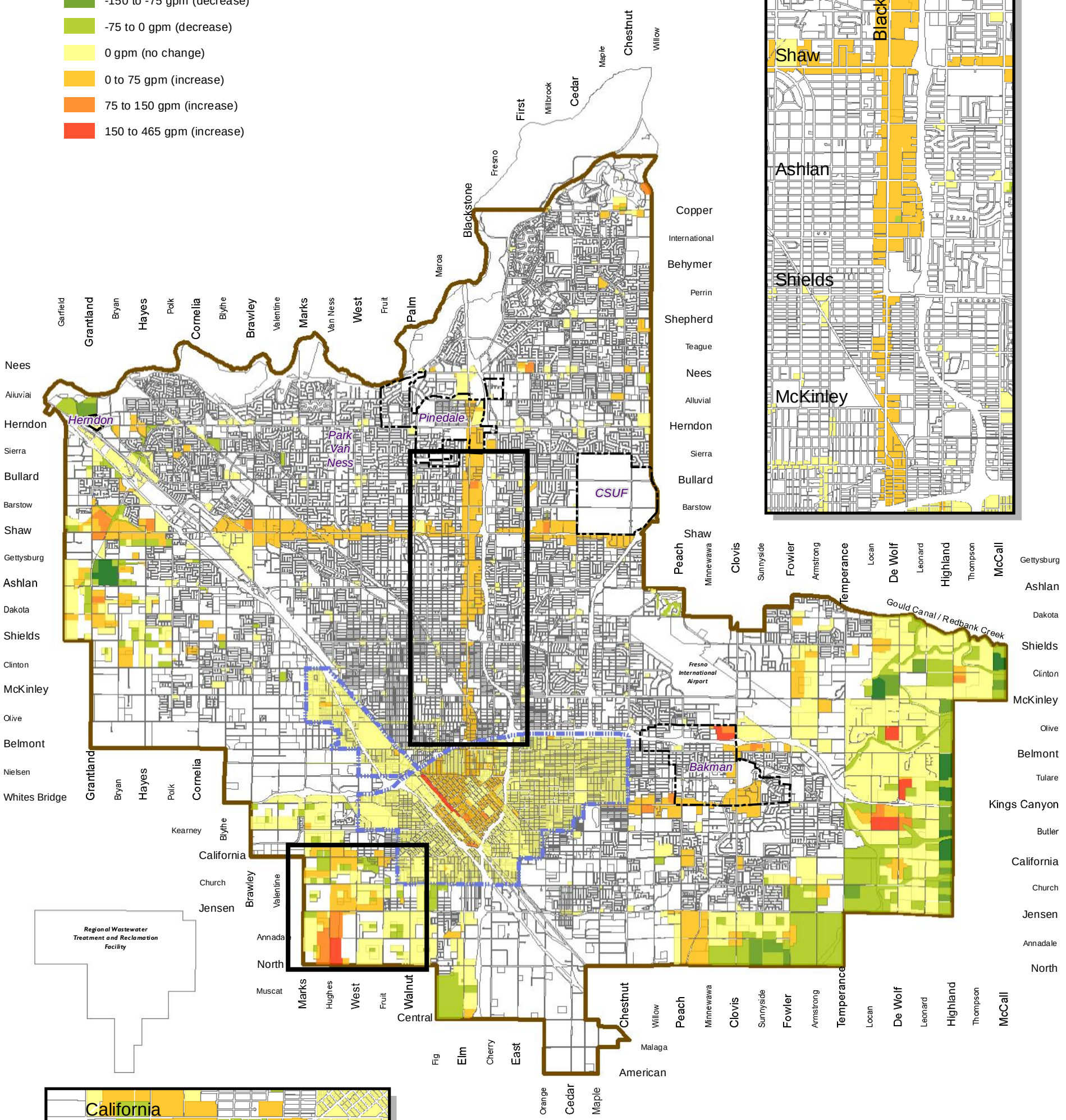
Maximum Day Demand Comparison

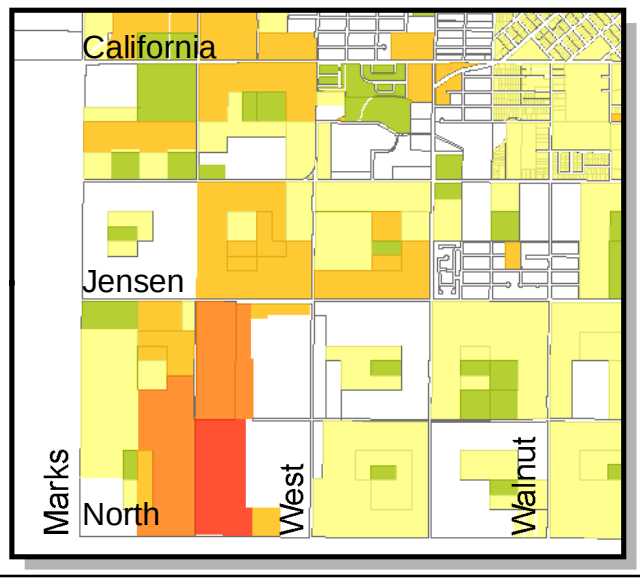
- -288 to -150 gpm (decrease)
- -150 to -75 gpm (decrease)
- -75 to 0 gpm (decrease)
- 0 gpm (no change)
- 0 to 75 gpm (increase)
- 75 to 150 gpm (increase)
- 150 to 465 gpm (increase)

Blackstone Area

- 2025 General Plan Demands = 1,942 gpm
- 2035 General Plan Demands = 5,466 gpm
- Difference in Demands = 3,524 gpm







Southwest Area

- 2025 General Plan Demands = 3,403 gpm
- 2035 General Plan Demands = 4,216 gpm
- Difference in Demands = 813 gpm

Note:

- Demand change based on planned 2035 land use from General Plan Update
- Only parcels with a change to planned land use shown in figure.
- Changes to demands shown on a per parcel basis calculated based on parcel acreage.
- Planned land use changes for 2035 General Plan result in an overall system increase of 12,605 gpm for maximum day demands.

LEGEND

- Independent Water System
- Downtown Boundary
- Sphere of Influence

N

0 1 2

Miles

FIGURE 6

City of Fresno
General Plan Land Use Change Evaluation

CHANGES TO MAX DAY DEMANDS

City of FRESNO

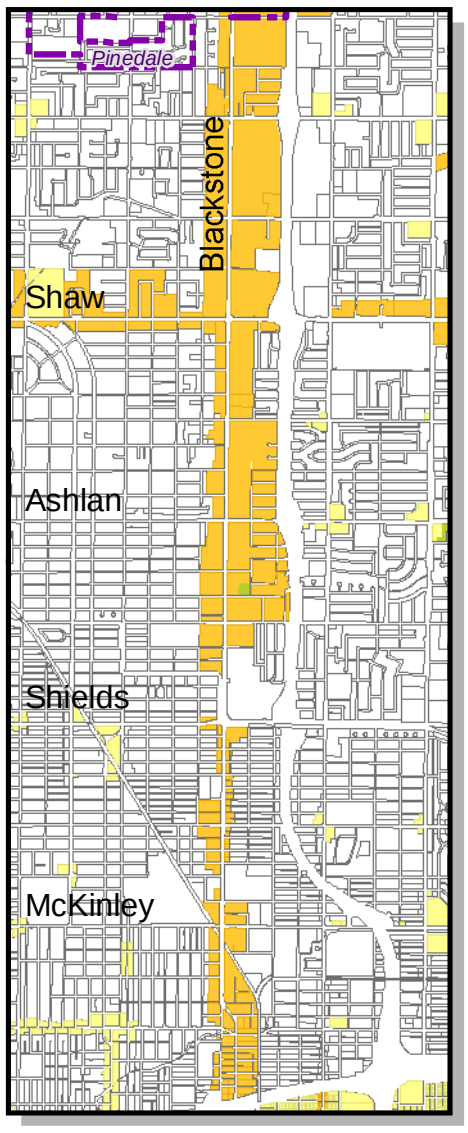
WEST YOST ASSOCIATES
Consulting Engineers

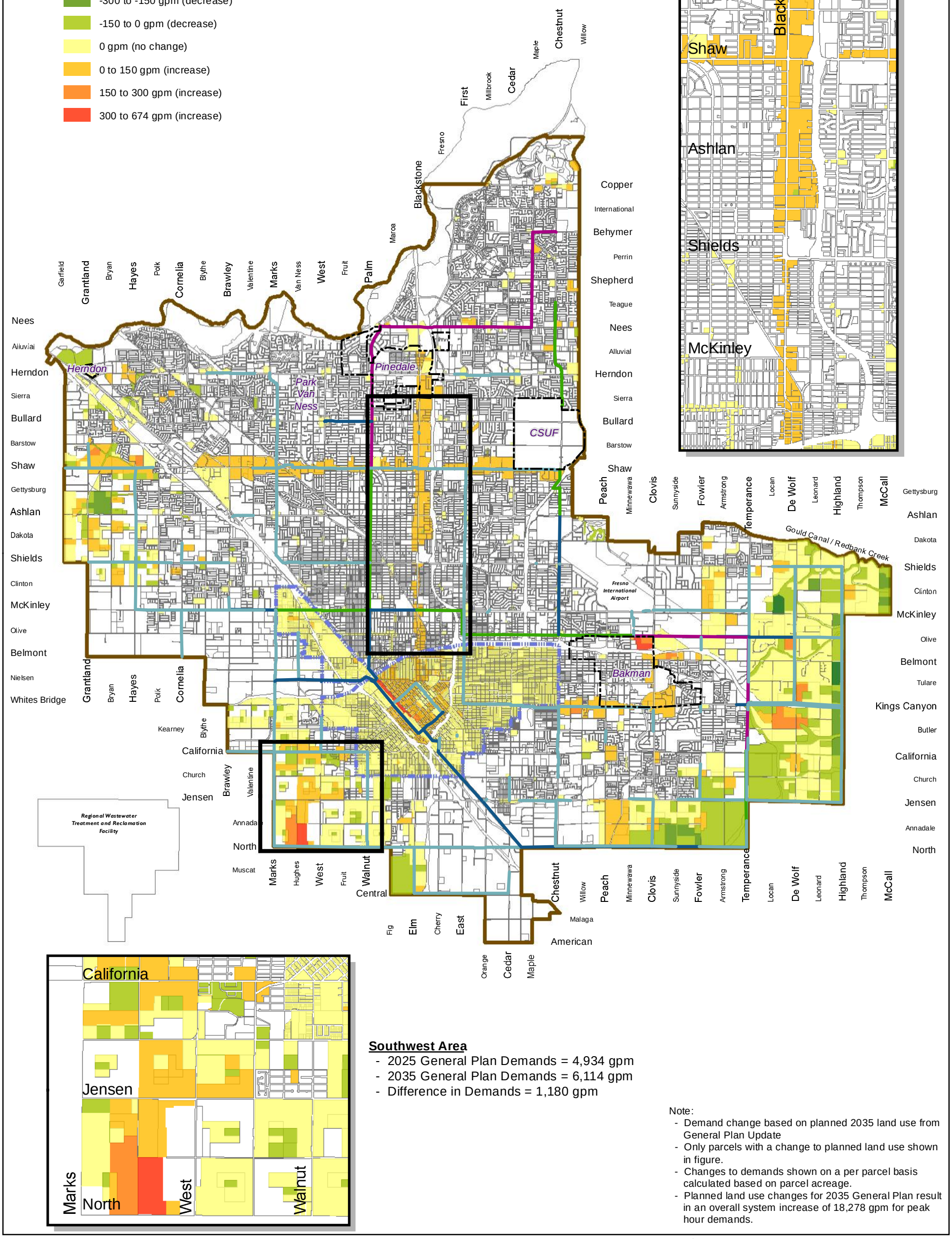
Peak Hour Demand Comparison

- -418 TO -300 gpm (decrease)
- -300 to -150 gpm (decrease)
- -150 to 0 gpm (decrease)
- 0 gpm (no change)
- 0 to 150 gpm (increase)
- 150 to 300 gpm (increase)
- 300 to 674 gpm (increase)

Blackstone Area

- 2025 General Plan Demands = 2,816 gpm
- 2035 General Plan Demands = 7,926 gpm
- Difference in Demands = 5,110 gpm





Southwest Area

- 2025 General Plan Demands = 4,934 gpm
- 2035 General Plan Demands = 6,114 gpm
- Difference in Demands = 1,180 gpm

Note:

- Demand change based on planned 2035 land use from General Plan Update
- Only parcels with a change to planned land use shown in figure.
- Changes to demands shown on a per parcel basis calculated based on parcel acreage.
- Planned land use changes for 2035 General Plan result in an overall system increase of 18,278 gpm for peak hour demands.

LEGEND

- Independent Water System
- Downtown Boundary
- Sphere of Influence

Proposed Transmission Pipelines

- 16-inch Diameter
- 24-inch Diameter
- 30 to 36-inch Diameter
- 42 to 48-inch Diameter

N

0 1 2

Miles

FIGURE 7

City of Fresno
General Plan Land Use Change Evaluation

CHANGES TO PEAK HOUR DEMANDS

City of FRESNO

WEST YOST ASSOCIATES
Consulting Engineers

Note:
- Demand based on proposed 2025 General Plan land use
- Availalbe fire flow shown for 20 psi residual

3189 gpm

WTP

WTP

Pinedale

Park Van Ness

CSUF

Bakman

Fresno International Airport

Regional Wastewater Treatment and Reclamation Facility

Herndon

Gould Canal / Redbank Creek

Nees
Alluvial
Herndon
Sierra
Bullard
Barstow
Shaw
Gettysburg
Ashlan
Dakota
Shields
Clinton
McKinley
Olive
Belmont
Nielsen
Whites Bridge
Kearney
California
Church
Jensen
Annadale
North
Muscat
Central
American
Malaga

Garfield Grantland Bryan Hayes Polk Cornelia Blythe Brawley Valentine Marks Van Ness West Fruit Palm Maroa Blackstone Fresno First Millbrook Cedar Maple Chestnut Willow

Copper
International
Behymer
Perrin
Shepherd
Teague
Nees
Alluvial
Herndon
Sierra
Bullard
Barstow
Shaw
Gettysburg
Ashlan
Dakota
Shields
Clinton
McKinley
Olive
Belmont
Tulare
Kings Canyon
Butler
California
Church
Jensen
Annadale
North

Peach Minnewawa Clovis Sunnyside Fowler Armstrong Temperance Locan De Wolf Leonard Highland Thompson McCall

Grantland Bryan Hayes Polk Cornelia Blythe Brawley Valentine Marks Hughes West Fruit Walnut Fig Elm Cherry East Orange Cedar Maple Chestnut Willow Peach Minnewawa Clovis Sunnyside Fowler Armstrong Temperance Locan De Wolf Leonard Highland Thompson McCall

LEGEND

Required Fire Flow (2025 GP)
- No Fire Flow
- 2,000 gpm
- 3,000 gpm
- 3,500 gpm
- 4,000 gpm

Available Fire Flow
- Less than 3,500 gpm
- 3,500 gpm and Greater
- Distribution Pipeline
- Transmission Pipeline

N

0 1 2
Miles

FIGURE 8

City of Fresno General Plan Land Use Change Evaluation

2025 GENERAL PLAN AVAILABLE FIRE FLOW

City of FRESNO

WEST YOST ASSOCIATES Consulting Engineers

Note:
- Required Fire Flow based on proposed 2035 General Plan land use
- Availalbe fire flow shown for 20 psi residual

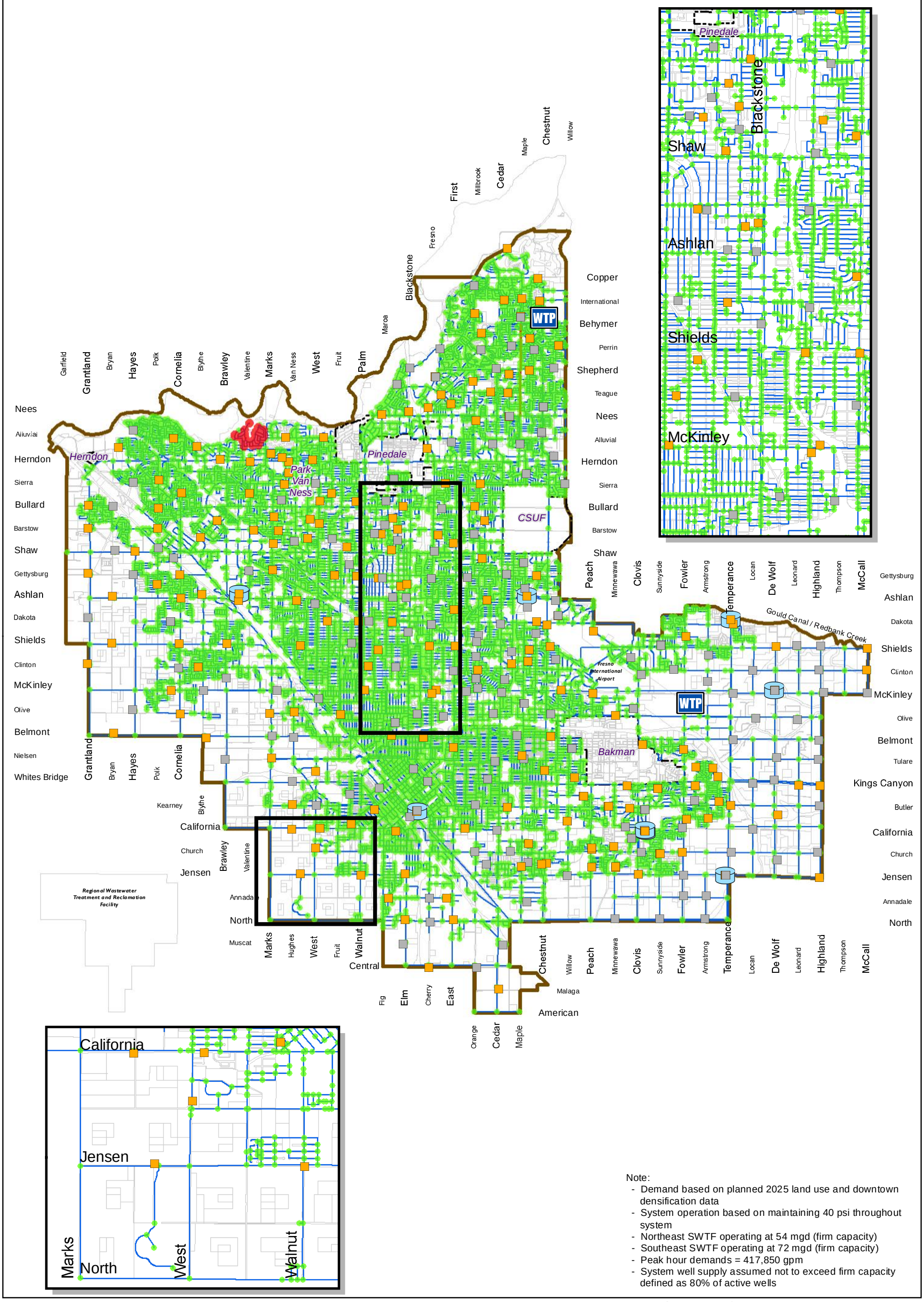
FIGURE 9

City of Fresno
General Plan Land Use Change Evaluation

2035 GENERAL PLAN AVAILABLE FIRE FLOW

City of FRESNO

WEST YOST ASSOCIATES
Consulting Engineers



Note:
- Demand based on planned 2025 land use and downtown densification data
- System operation based on maintaining 40 psi throughout system
- Northeast SWTF operating at 54 mgd (firm capacity)
- Southeast SWTF operating at 72 mgd (firm capacity)
- Peak hour demands = 417,850 gpm
- System well supply assumed not to exceed firm capacity defined as 80% of active wells

LEGEND

System Pressure
- Less than 40 psi (Below Criteria)
- 40 psi and Greater

Pump Status
- Inactive
- Active

Distribution Pipeline (Less than 18")
- 7 fps or Less
- Greater than 7 fps

Transmission Pipeline (18" and greater)
- 5 fps or Less
- Greater than 5 fps

N

0 1 2
Miles

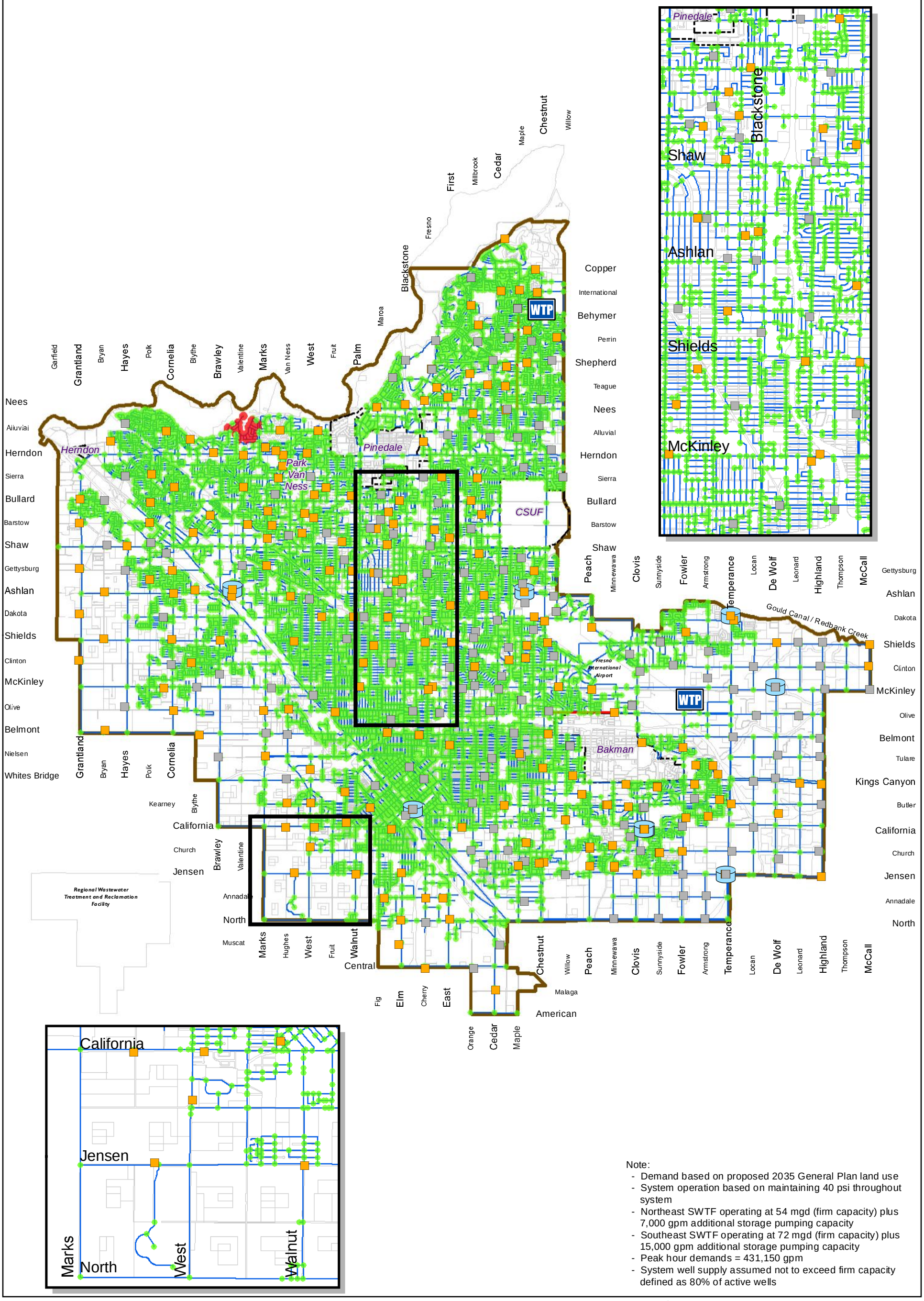
FIGURE 10

City of Fresno General Plan Land Use Change Evaluation

2025 GENERAL PLAN PEAK HOUR RESULTS

City of FRESNO

WEST YOST ASSOCIATES
Consulting Engineers



Note:
- Demand based on proposed 2035 General Plan land use
- System operation based on maintaining 40 psi throughout system
- Northeast SWTF operating at 54 mgd (firm capacity) plus 7,000 gpm additional storage pumping capacity
- Southeast SWTF operating at 72 mgd (firm capacity) plus 15,000 gpm additional storage pumping capacity
- Peak hour demands = 431,150 gpm
- System well supply assumed not to exceed firm capacity defined as 80% of active wells

LEGEND

System Pressure
- Less than 40 psi (Below Criteria)
- 40 psi and Greater

Pump Status
- Inactive
- Active

Distribution Pipeline (Less than 18")
- 7 fps or Less
- Greater than 7 fps

Transmission Pipeline (18" and greater)
- 5 fps or Less
- Greater than 5 fps

N

0 1 2
Miles

FIGURE 11

City of Fresno General Plan Land Use Change Evaluation

2035 GENERAL PLAN PEAK HOUR RESULTS

City of FRESNO

WEST YOST ASSOCIATES
Consulting Engineers

Appendix B

WEST YOST ASSOCIATES

TECHNICAL MEMORANDUM

DATE: July 22, 2011 Project No.: 439-02-10-07

TO: Brock Buche, City of Fresno Water Division Project Manager
Martin Querin, City of Fresno Assistant Public Utilities Director—Water Division

FROM: Brenda Estrada, Project Engineer, R.C.E. #67062
Elizabeth Drayer, Project Engineer, R.C.E. #46872

REVIEWED BY: Charles Duncan, Project Manager, R.C.E. #55498

SUBJECT: Hydraulic Evaluation of the Proposed Fulton Corridor Specific Plan Project

INTRODUCTION

The purpose of this memorandum is to present West Yost Associates' (West Yost's) evaluation of the potential hydraulic impacts on the City of Fresno (City) water system of the proposed Fulton Corridor Specific Plan Project (Proposed Project) located in the City's downtown area. As described in this memorandum, West Yost has used the City's water system hydraulic model to evaluate the ability of the City's existing water system to provide minimum required pressures and flows under the future, projected demands associated with the buildout of the Proposed Project. Our findings and recommendations for water system infrastructure improvements to serve the Proposed Project are described below.

PROJECT DESCRIPTION

The Proposed Project is located in the City's Downtown area and encompasses several distinct center city areas (districts) including the Central Business District, the Cultural Arts District, the South Stadium zone, and Chinatown. As shown on Figure 1, the approximate boundaries of the Proposed Project are East Divisadero Street to the north, N and O Streets to the east, Highway 41 to the south, and Highway 99 to the west. In all, the combined Proposed Project area comprises approximately 440 acres and includes a mix of multi-family residential, industrial mixed use, office and retail land uses.

As described below, three different land use development scenarios for the Proposed Project have been evaluated by Sherwood Design Engineers (Sherwood) based on a range of Floor Area Ratio (FAR) assumptions. The total building area for the three development scenarios ranges from 5.2 million square feet for the minimum proposed FAR scenario to 14.1 million square feet for the maximum proposed FAR scenario.

PROJECTED WATER DEMANDS

The analysis of the potable water demand within the Proposed Project was performed by Sherwood[1]. The demand analysis utilized the proposed building areas and FARs as developed by Moule & Polyzoides (M&P) and the Project planning team. The water demands were calculated for each development scenario using water demand rates based on built area per land use types. Unit water use factors were based on the increased densification and proposed land uses for underutilized parcels included in each district within the Proposed Project area and were taken from Sherwood's existing internal data/research and cross-referenced with the City of Oakland's land use demand values[2]. Proposed average daily flow rates per district were calculated as weighted averages based on M&P's distribution of land uses within each district.

Table 1 provides a summary of the unit water use factors used by Sherwood for each district for the evaluation.

Table 1. Summary of Unit Water Use Factors Used for Proposed Project

District	Unit Water Use Factor, gallons per day per 1,000 square feet
Central Business District 1 (CBD1)	204
Central Business District 2 (CBD2)	202
Civic Center	210
Chinatown District	196
Cultural Arts/South Stadium District	192
Chinatown Industrial District	150
Town Center	210
Neighborhood General	200
Neighborhood General Preservation	200
Special District	130

Source: Sherwood Design Engineers Water Demand Calculations received May 23, 2011 (FCSP_Water_Analysis_110513.pdf) (Water_Flow_SP.xlsx).

Three development scenarios were evaluated by Sherwood:

- A minimum buildout scenario (minimum FAR),
- A median buildout scenario (median FAR), and
- A maximum buildout scenario (maximum FAR).

1 Sherwood Design Engineers Water Demand Calculations received May 23, 2011 (FCSP_Water_Analysis_110513.pdf) (Water_Flow_SP.xlsx).

2 The data available for the City of Oakland was based on estimated wastewater flows for various types of development. To back-calculate water use based on this data, the estimated wastewater flows were multiplied by a factor of 1.20 to account for consumptive water uses which do not result in wastewater flows.

Table 2 provides a summary of the calculated water demands for the three development scenarios evaluated by Sherwood for the Proposed Project. Demands were calculated for underutilized parcels within the Proposed Project area, such that the calculated additional demand represents the projected demand associated with the Proposed Project for various FAR scenarios. Based on the current land use of the underutilized parcels, the existing demand was estimated at 170,822 gallons per day (gpd), or 191 acre-feet per year (af/yr). The estimated water demands on other parcels within the Proposed Project were assumed not to change. A copy of Sherwood's water demand calculation spreadsheet showing the calculated water demand for each underutilized parcel for each development scenario is provided in Attachment 1.

Table 2. Summary of Projected Water Demand for Various Development Scenarios

Development Scenario	Total Projected Building Area on Underutilized Parcels, square feet	Existing Demand on Underutilized Parcels, gpd	Additional Demand on Underutilized Parcels as a result of Proposed Project, gpd	Total Demand on Underutilized Parcels within Proposed Project Area, gpd	Total Existing Demand on All Parcels within Proposed Project Area, gpd	Total Demand within Proposed Project Area, gpd
		[1]	[2]	[3] = [1] + [2]	[4]	[5] = [2] + [4]
Minimum Buildout Scenario (Minimum FAR)	5,240,428	170,822	870,835	1,041,656	683,983	1,554,818
Median Buildout Scenario (Median FAR)	9,572,280	170,822	1,733,744	1,904,565	683,983	2,417,727
Maximum Buildout Scenario (Maximum FAR)[(a)]	14,123,642	170,822	2,637,503	2,808,324	683,983	3,321,486

Source: Sherwood Design Engineers Water Demand Calculations received May 23, 2011 (FCSP_Water_Analysis_110513.pdf) (Water_Flow_SP.xlsx).

[(a)] The Maximum Buildout Scenario (Maximum FAR) is the basis for West Yost's analysis.

For purposes of West Yost's hydraulic evaluation of the Proposed Project, West Yost has evaluated the water demands associated with only the maximum buildout (maximum FAR) development scenario which equate to an additional average day demand of approximately 2.6 million gallons per day, which equals an additional annual demand of 2,955 af/yr.

Figure 2 shows the projected demands by parcel within the Proposed Project area for the maximum buildout development scenario.

WATER SUPPLY

As described in the City's Metro Plan Update, the City's Water Master Plan, and West Yost's March 2009 Technical Memorandum "Hydraulic Evaluation of the Downtown Central Area," the City's available water supplies are limited to a finite quantity and are extremely limited. As shown in Table 2, the estimated annual demand for the maximum buildout scenario for the Proposed Project will further increase required water supplies by an additional 2,955 af/yr. Water supplies to meet this estimated additional demand must come from within the City's existing, limited water supply portfolio and may need to be "imported" from other parts of the City and/or require reduced water use (additional water conservation) in other parts of the City.

Water supplies for the Proposed Project will probably need to be evaluated as part of an SB 610 Water Supply Assessment to evaluate the availability and reliability of the City's water supplies to meet the projected increased water demands of the Proposed Project under various hydrologic conditions and whether these demands were anticipated as part of the City's most recent Urban Water Management Plan.

EVALUATION CRITERIA

Planning and Modeling Criteria

The planning and modeling criteria used for this evaluation are based on West Yost's recent work with the City. The August 2008 verified hydraulic model of the City's water distribution system was used as the basis for the evaluation. The criteria used to evaluate the potential impacts to the City's existing water system are as follows:

- Minimum peak hour demand pressure 40 pounds per square inch (psi);
- Maximum allowable velocity is 7 feet per second (fps) during a peak hour condition;
- Maximum day plus fire flow residual pressure at the flowing hydrant must be equal to or greater than 20 psi;
- Maximum allowable velocity is 10 fps during the simulated fire flow condition[3];
- Maximum allowable head loss rate is 10 feet per 1,000 feet during any condition[4];
- Any new, required pipelines will be modeled with a roughness coefficient (C-factor) of 130;

[3] This criteria was developed primarily for new development; ability to meet this criteria within existing distribution systems (such as that in the City's downtown area) can be difficult due to existing small diameter pipelines and aging pipelines.

[4] This criteria was developed primarily for new development; ability to meet this criteria within existing distribution systems (such as that in the City's downtown area) can be difficult due to existing small diameter pipelines and aging pipelines.

- Assumed peaking factors for maximum day and peak hour demand conditions are consistent with the City's adopted peaking factors and are as follows:
  - Maximum Day Demand = 2.0 times Average Day Demand
  - Peak Hour Demand = 2.9 times Average Day Demand

Fire Flow Requirements

Fire flow requirements based on proposed land use for each parcel were determined by Sherwood and were based on the California Building Code (CBC) and the 2007 California Fire Code (CFC) (Table B105.1). Sherwood assumed maximum potential building footprints for each parcel and assumed CBC construction type (IA, IIIB, etc.) for each land use zone based on the building type with the maximum FAR. Based on this methodology, fire flow requirements of up to 6,250 gallons per minute (gpm) for a four-hour duration were identified for some of the parcels. The projected fire flow requirements by parcel are shown on Figure 3. A copy of Sherwood's fire flow calculation spreadsheet showing the calculated fire flow requirement by parcel is provided in Attachment 2.

Some of the larger buildings included in the Proposed Project will be fully sprinklered which results in a reduction of the required fire flow. Therefore, based on direction received from Byron Beagles (City of Fresno Fire Prevention Engineer), a fire flow requirement of 3,500 gpm for a four-hour duration with a minimum 20 psi residual pressure will be assumed for the Proposed Project[5].

It should be noted that evaluated fire flows and residual pressures are based on ground surface elevations, and do not account for required minimum water service pressures on higher floors in multi-story buildings. As such, utility system designs for some buildings within the Proposed Project may require the provision of booster pumps to provide adequate water service pressures on higher floors and for fire suppression systems.

Although these criteria have been established, and used to size new pipelines, the existing system in the City's downtown area should be evaluated using pressure as the primary criterion. Secondary criteria, such as velocity, head loss, age, and material type, are used as indicators for areas of the water system that also may need improvements, but may not be required as part of this evaluation.

[5] February 6, 2011 e-mail from Byron Beagles to Brock Buche, re: Fire Flow Requirements.

WATER SYSTEM FACILITY ASSUMPTIONS

Recommendations from Previous Evaluations

In March 2009, West Yost completed a hydraulic evaluation of the Downtown Central Area to evaluate available supplies in the City's downtown area and address the loss of supply in the downtown area due to aging wells and water quality issues[6]. The following recommendations for water system improvements were made:

- Additional storage to increase system reliability during peak hour and fire flow conditions;
- Replacement or rehabilitation of Wells 1A and 21A;
- Upgrade of Well 172 pumping capacity along with associated distribution system improvements from Well 172 to the City's downtown area; and
- Addition of 24-inch and 16-inch diameter pipelines through the Central Area to support integrating surface water supply from the east and continuing the City's goal of developing opportunities to transition their predominate groundwater supply to a more balanced conjunctive use system.

In May 2011, West Yost conducted a re-evaluation of the Downtown Central Area to determine what potential alternatives existed other than the March 2009 recommendation for increasing the pumping capacity of Well 172[7]. The recommendations of the May 2011 evaluation were to make distribution pipeline improvements to improve flow from Well 172 (as recommended in the March 2009 evaluation), but instead of upgrading the pumping capacity of Well 172, distribution system improvements should be made to convey supplies from Well 313 to the Downtown Central Area.

For purposes of this evaluation, it has been assumed that the pipeline and storage infrastructure recommendations from these prior hydraulic evaluations of the Downtown Central Area without the pumping capacity increase of Well 172 will be implemented by the City and will be available to serve the Proposed Project.

Specific Facility Assumptions

The following specific assumptions have been made related to available water system facilities and other water demands within the City's service area:

- Wells 1A and 21A in the City's downtown area (located just northeast of the Proposed Project) area are assumed to be inactive;

[6] "Hydraulic Evaluation of the Downtown Central Area", Technical Memorandum, prepared by West Yost Associates, March 12, 2009.

[7] "Hydraulic Re-Evaluation of the Downtown Central Area Water Distribution System", Technical Memorandum, prepared by West Yost Associates, May 10, 2011.

- New Well 1B (located just outside the City's downtown area) is assumed to be operational and active (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area as a replacement for Wells 1A and 21A);
- The new 3.0 million gallon (MG) Downtown tank and associated pipelines (along Nielsen Avenue and G Street) (currently under design) are assumed to be operational (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area);
- The distribution system improvements from Well 172 to the Central Area are assumed to be operational. The associated distribution system improvements include a new 16-inch diameter pipeline south along Hughes Avenue and a new 24-inch diameter pipeline along Nielsen Avenue to convey supplies from Well 172 to the Central Area (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area);
- A 12-inch diameter connection at West Avenue to the 24-inch diameter pipeline in Nielsen Avenue to convey supplies from Well 313 to the Central Area is assumed to be operational (recommended as part of West Yost's May 2011 Hydraulic Re-Evaluation of the Downtown Central Area Water Distribution System);
- New 24-inch and 16-inch diameter pipelines through the Central Area along G Street, Ventura Street, O Street and Stanislaus Street are assumed to be operational to support integrating surface water supply from the east and continuing the City's goal of developing opportunities to transition their predominate groundwater supply to a more balanced conjunctive use system (recommended as part of West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area);
- The new Chestnut Avenue transmission pipeline from the City's Northeast Surface Water Treatment Facility (SWTF) is assumed to be operational;
- The regional Transmission Grid Mains (TGMs) are included and assumed to be operational;
- Future water demands in the southwest part of the City service area are included (per June 8, 2011 e-mail from Brock Buche, the City's Development Department has indicated that development in the southwest part of the City will occur concurrently with the Proposed Project);
- The proposed new Southeast SWTF is <u>not</u> included; and
- Future water demands associated with the Southeast Growth Area (SEGA) are <u>not</u> included.

The City's assumed water system facilities available to serve the Proposed Project in the downtown area are shown on Figure 4.

EVALUATION SCENARIOS

As described above, only the maximum buildout (maximum FAR) development scenario of the Proposed Project has been analyzed by West Yost for this evaluation; no other development scenarios or phasing plans were evaluated.

To evaluate the adequacy of the City's water system to serve the Proposed Project, West Yost has evaluated buildout of the Proposed Project under the following two demand conditions:

- A future maximum day demand condition concurrent with a 3,500 gpm fire flow demand while maintaining a minimum residual system pressure of 20 psi; and
- A peak hour demand condition while maintaining a minimum system pressure of 40 psi.

EVALUATION FINDINGS

Storage Capacity Evaluation

Treated water storage capacity requirements for the City were evaluated based on the following three components: operational storage, emergency storage and fire storage. The principal advantage that storage provides is to equalize demands on supply sources and production facilities. The City's Metro Plan Update and Water Master Plan both indicate a need for water storage in the City's downtown area.

West Yost's March 2009 evaluation of the City's Central Area recommended that approximately 3 million gallons (MG) of storage be constructed in the City's Central Area to increase system reliability during peak hour and fire flow conditions. As described above, a new 3 MG Downtown Tank is currently under design and is assumed to be operational for the purposes of this evaluation. However, the required storage capacity previously calculated for the City's Central Area did not take into account the increased densification associated with the Proposed Project. This increased densification will increase the need for storage in the City's Downtown area. Table 3 shows the increased storage requirement attributed to the increased demands associated with the Proposed Project.

Table 3. Additional Storage Required Due to Densification Associated with Proposed Project

Storage Component	Required Storage based on Current Buildout of Fulton Corridor Area without Proposed Project, MG	Required Storage based on Current Buildout of Fulton Corridor Area with Proposed Project, MG	Increased Storage Requirement Attributed to Proposed Project, MG
Operational: Equal to 25% of the Maximum Day Demand	1.17	1.65	0.48
Emergency: Equal to Average Day Demand	2.33	3.30	0.96
Fire Flow: Equal to the highest fire flow demand for an area multiplied by the required duration.	0.84	0.84	0.00
Total	4.34[(a)]	5.78	1.45

[(a)] The storage requirement shown for buildout of the Fulton Corridor Area without the Proposed Project (4.34 MG) is part of required storage previously calculated for the Downtown Central Area. As described in West Yost's March 2009 Hydraulic Evaluation of the Downtown Central Area, required storage within the Downtown Central Area was previously calculated to 8.3 MG, which will be met by a combination of groundwater credits (5.2 MG) and a new Downtown storage tank (3.0 MG). These previous storage calculations for the Downtown Central Area did not include the Proposed Project described in this technical memorandum.

As shown in Table 3, the additional storage requirement resulting from the increased densification associated with the Proposed Project is 1.45 MG.

As described in West Yost's March 2009 evaluation of the City's Central Area, water storage within the City is considered on a regional basis with the water storage requirements for the downtown area being a portion of the overall system requirements. The City's Water Master Plan is evaluating the overall system and will make recommendations for overall system improvements, including recommendations for storage improvements. The 3.0 MG Downtown tank (currently being designed) does not provide adequate capacity for the additional storage required for the Proposed Project, therefore additional operational and emergency storage will need to be provided within the City's overall system to meet the storage needs for the Proposed Project.

Pumping Capacity Evaluation

Along with the increased storage due to the demand densification, the City will require additional pumping capacity for the Proposed Project to meet operational demands. The operational pumping requirements are used to help meet the City's performance criteria during peak demand conditions. The pumping capacity for fire flow has been accounted for on a regional basis and will not increase as a result of the densification. Emergency pumping capacity is based on an average day demand and is generally met by wells and pump stations equipped with auxiliary power. The recommended pumping required to serve the operational needs of the Proposed Project is approximately 1.44 mgd (1,000 gpm). This increased pumping capacity will need to be added within the City's overall system to meet peak demand operations.

Distribution System Evaluation

The City's existing water system hydraulic model was modified by West Yost to be representative of the projected water demands associated with the maximum buildout (maximum FAR) development scenario of the Proposed Project. The estimated future demands were distributed throughout the Proposed Project area, as appropriate, according to the proposed development plans.

The future buildout system with the Proposed Project, and the previously recommended Downtown Central Area water system infrastructure improvements described above, was evaluated under maximum day demand plus fire flow conditions and peak hour demand conditions. The evaluation results are described below.

The results of the maximum day demand plus fire flow condition for the future buildout system with the Proposed Project are shown on Figure 5. Figure 5 shows the available flow at each node in the hydraulic model assuming that a minimum system pressure of 20 psi is maintained. Nodes that are shown in "green" have available flows of 3,500 gpm or more, indicating that they meet the fire flow requirement for the Proposed Project. Nodes shown in "red" have available flows that are less than 3,500 gpm, indicating that they do not meet the fire flow requirement for the Proposed Project. As shown, in the northern part of the Proposed Project area, there are several locations where available flows are below the required minimum of 3,500 gpm (see "red" nodes on Figure 5); the lowest available flow in this area is 1,617 gpm. Similarly, there are several locations in the southern part of the Proposed Project area where available flows are below the required minimum of 3,500 gpm (see "red" nodes on Figure 5); the lowest available flow in this area is 1,497 gpm. It should also be noted that the City's pipeline velocity criteria of a maximum of 10 fps during a simulated fire flow condition is not being met in many locations within the Proposed Project area; however, this is expected due to the age and small diameter size of the existing pipelines in the downtown area. Therefore, infrastructure improvements will be required to meet the City's fire flow pressure and flow criteria (these recommendations are described below).

The results of the peak hour demand condition for the future buildout with the Proposed Project are shown on Figure 6. Figure 6 shows the system pressure at each node in the hydraulic model based on peak hour demand conditions. As shown, system pressures throughout most of the Proposed Project area are between 40 and 50 psi under buildout peak hour demand conditions (indicated by the "green" nodes), and some are between 50 to 60 psi (indicated by the "blue" nodes). Therefore, the City's minimum peak hour pressure criteria of 40 psi is being met throughout the Proposed Project area and no specific improvements are required for the peak hour demand condition.

EVALUATION RECOMMENDATIONS

Figure 7 shows the following recommended infrastructure improvements to resolve the fire flow deficiencies described above as a result of the increased water demands associated with the Proposed Project. The recommended improvements include the replacement of existing smaller diameter pipelines with 8-inch diameter pipelines (approximately 1,400 linear feet in total) and the installation of new 8-inch diameter pipelines where pipelines did not previously exist

(approximately 7,660 linear feet in total). A table listing the proposed pipeline improvements by street is provided as Attachment 3.

Also, as described below, West Yost recommends that an additional 1.5 MG of storage be located within the City's overall water system to meet the operational and emergency storage needs of the Proposed Project.

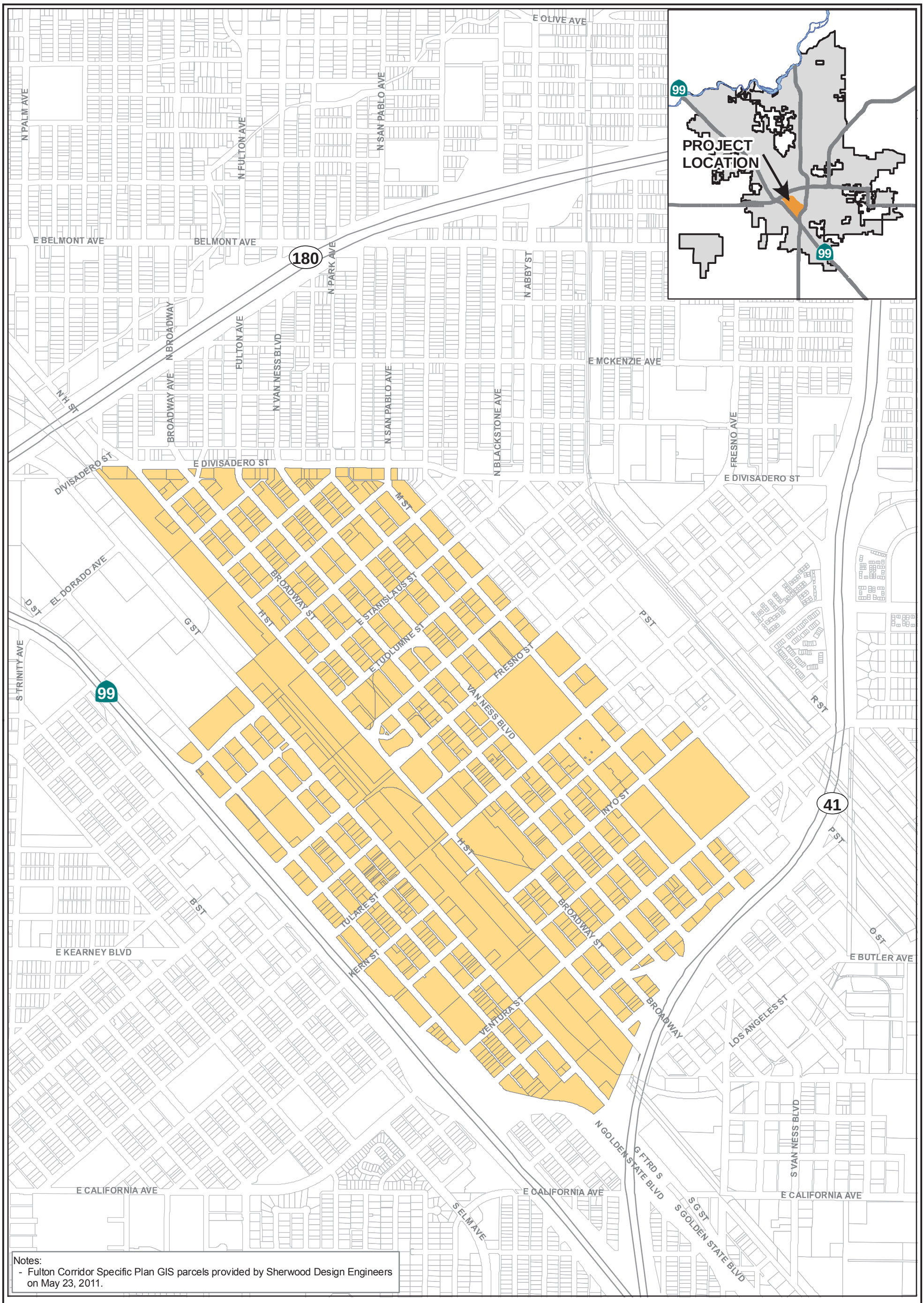
Figure 8 shows the maximum day demand plus fire flow scenario with the Proposed Project with the recommended pipeline improvements as listed above. As shown, with the recommended improvements, the fire flow requirement of 3,500 gpm is met throughout the entire Proposed Project area, with the exception of the following two locations:

- G Street (just north of Stanislaus Street): The available fire flow at this location is 1,972 gpm. This node is located at the end of an approximately 440 foot long, 8-inch diameter pipeline (which appears to be a hydrant lateral). Flows from this location could be combined with flows from other nearby hydrants to provide the fire flow requirement of 3,500 gpm for the Proposed Project.
- Mono Street (just east of E Street): The available fire flow at this location is 2,140 gpm. This location has smaller parcels and no proposed multi-story buildings, therefore, this available fire flow appears to be adequate for this area. Also, flows from this location could be combined with flows from other nearby hydrants to provide the fire flow requirement of 3,500 gpm for the Proposed Project.

It should be noted that the City's pipeline velocity criteria of a maximum of 10 fps during a simulated fire flow condition is still not being met in many locations within the Proposed Project area, even with the recommended improvements described above and shown on Figure 7; however, this is expected due to the age and small diameter size of the existing pipelines in the downtown area. Because fire flow pressure and flow requirements are being met, this velocity criteria, by itself, is not considered as being critical enough to require replacement of additional existing pipelines with larger diameter pipelines in the downtown area.

Figure 9 shows the peak hour demand scenario with the Proposed Project with the recommended improvements. As noted above, no specific improvements were required for the peak hour demand condition for the Proposed Project. Similar to the peak hour results shown in Figure 6, the minimum peak hour system pressure of 40 psi is met throughout the entire Proposed Project area.

An estimation of probable construction costs for these recommended water system infrastructure improvements to serve the Proposed Project was not included in West Yost's Scope of Work for this evaluation. However, these cost estimates can be provided if requested and if a budget augmentation is approved by the City.



Notes:
- Fulton Corridor Specific Plan GIS parcels provided by Sherwood Design Engineers on May 23, 2011.

LEGEND

Fulton Corridor Specific Plan

N

0 500 1,000

Scale in Feet

FIGURE 1

City of Fresno

Fulton Corridor Hydraulic Analysis

PROJECT LOCATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan \Water Infrastructure Evaluation\GIS\Figures\Figure 1 Location.mxd 6/28/2011

Notes:
- Demand projections based on Sherwood Design Engineers provided data (5/13/2011).
- Shown demands are based on the maximum proposed FAR.
- Proposed densification demands are only calculated for underutilized parcels. All other parcels are assumed not to change.

LEGEND

Fulton Corridor Projected Demands

- 0 - 5,000 gpd
- 5,001 - 10,000 gpd
- 10,001 - 20,000 gpd
- 20,001 - 30,000 gpd
- 30,001 - 286,209 gpd

N

0 500 1,000

Scale in Feet

FIGURE 2

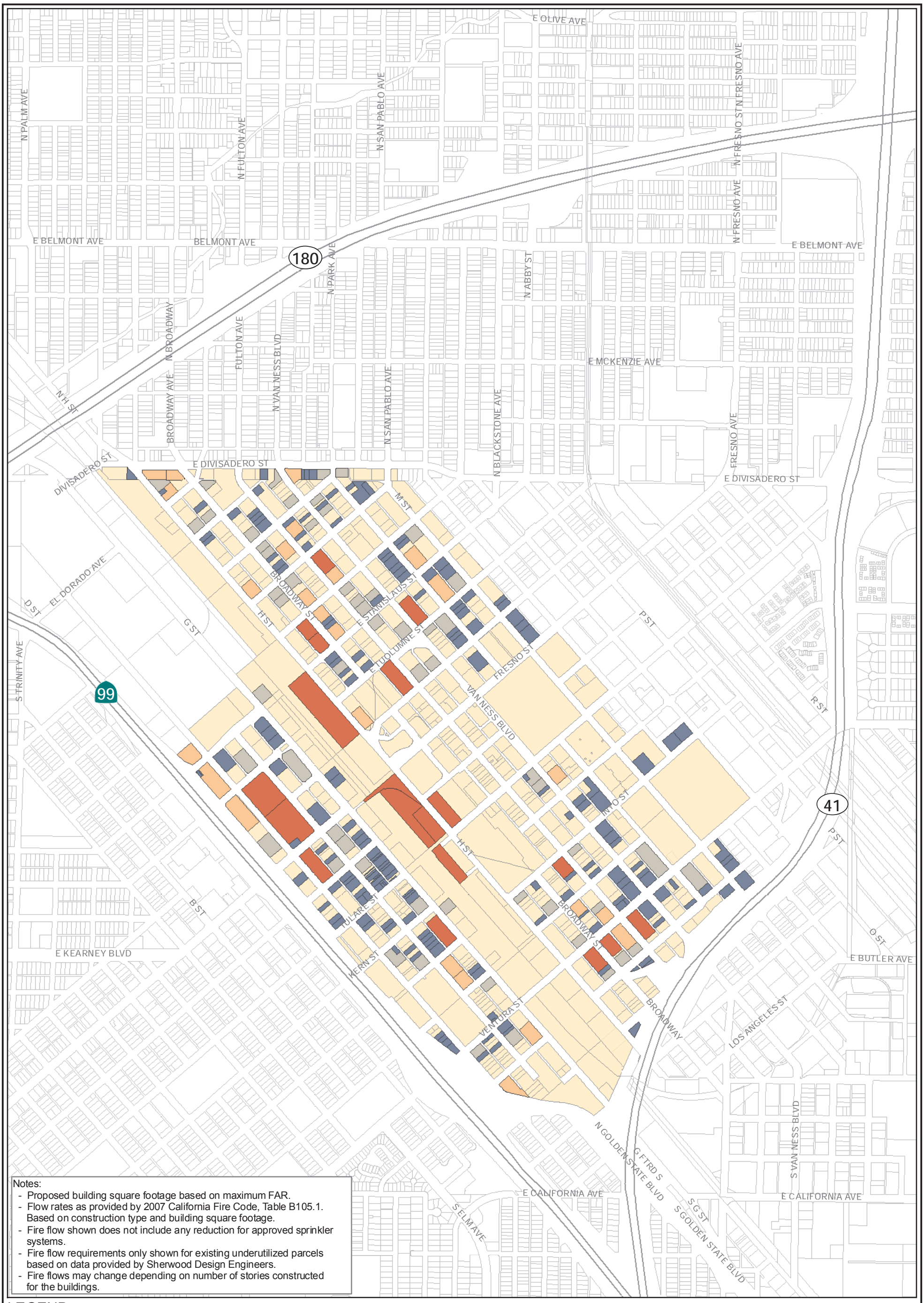
City of Fresno

Fulton Corridor Hydraulic Analysis

PROJECTED DEMAND DENSIFICATION

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan \Water Infrastructure Evaluation\GIS\Figures\Figure 2 Ex System.mxd 6/28/2011



Notes:
- Proposed building square footage based on maximum FAR.
- Flow rates as provided by 2007 California Fire Code, Table B105.1. Based on construction type and building square footage.
- Fire flow shown does not include any reduction for approved sprinkler systems.
- Fire flow requirements only shown for existing underutilized parcels based on data provided by Sherwood Design Engineers.
- Fire flows may change depending on number of stories constructed for the buildings.

LEGEND

Underutilized Parcel Fire Flow

- 1,500 - 3,000 gpm
- 3,001 - 4,000 gpm
- 4,001 - 5,000 gpm
- 5,001 - 6,500 gpm
- Fire Flow not updated

N

0 500 1,000

Scale in Feet

FIGURE 3

City of Fresno

Fulton Corridor Hydraulic Analysis

PROJECTED FIRE FLOW REQUIREMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan \Water Infrastructure Evaluation\GIS\Figures\Figure 3 Projected Fire Flow.mxd 6/28/2011

WELL 010A
WELL 018A
WELL 066
WELL 002B
WELL 050A
WELL 021A
WELL 001A
WELL 022A
WELL 009A
WELL 003A
WELL 16A
3 MG Downtown Storage Tank and Booster Pump Station
E BELMONT AVE
BELMONT AVE
N PALM AVE
N FULTON AVE
N SAN PABLO AVE
N FRESNO ST
N PARK AVE
N ABBY ST
E MCKENZIE AVE
N BROADWAY
FULTON AVE
N VAN NESS BLVD
N H ST
E DIVISADERO ST
FRESNO AVE
M ST
BROADWAY ST
EL DORADO AVE
D ST
G ST
P ST
E LUDLOW ST
FRESNO ST
VAN NESS BLVD
R ST
S TRINITY AVE
99
41
O ST
E KEARNEY BLVD
TULARE ST
KERN ST
VENTURA ST
E BUTLER AVE
LOS ANGELES ST
N GOLDEN STATE BLVD
GOLDEN STATE BLVD
S VAN NESS BLVD
E CALIFORNIA AVE
S ELM AVE
S G ST
180

Notes:
- Downtown tank and transmission pipeline along G Street currently under design.
- Planned transmission pipeline recommendations based on the City of Fresno Metropolitan Plan to supply surface water throughout the City.

LEGEND

- Existing Pipelines
- **Planned Transmission Pipelines**
  - 12 inch diameter
  - 16 inch diameter
  - 24 inch diameter
  - 30 inch diameter
- Well/Pump Station
- Inactive Well
- Storage Tank
- Fulton Corridor SP

N

0 500 1,000

Scale in Feet

FIGURE 4

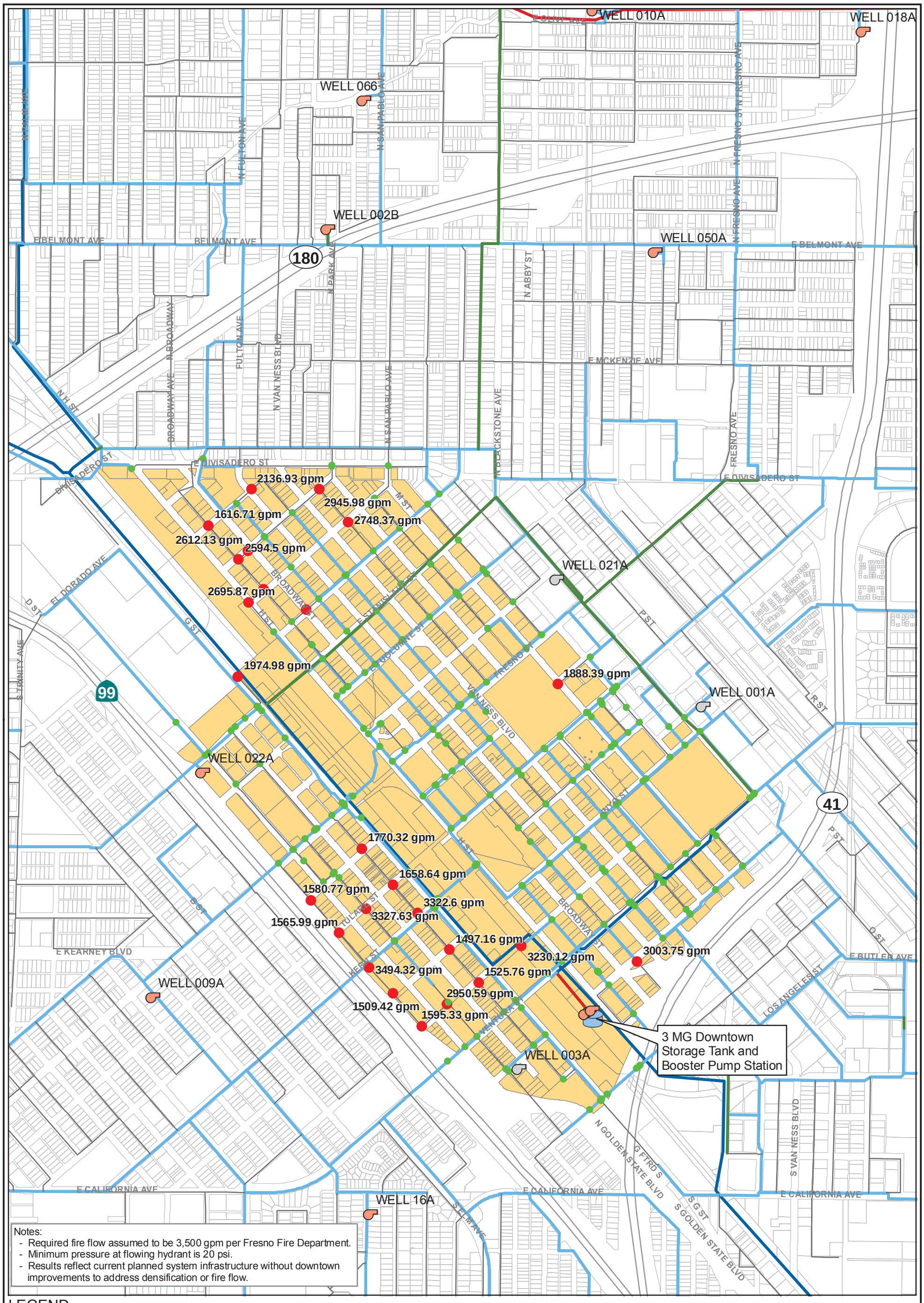
City of Fresno

Fulton Corridor Hydraulic Analysis

PLANNED BUILDOUT FACILITIES

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 4 Bo System.mxd 7/1/2011



Notes:
- Required fire flow assumed to be 3,500 gpm per Fresno Fire Department.
- Minimum pressure at flowing hydrant is 20 psi.
- Results reflect current planned system infrastructure without downtown improvements to address densification or fire flow.

LEGEND

Available Flow @ 20 psi
- Less than 3,500 gpm
- Greater than 3,500 gpm
- Well/Pump Station
- Inactive Well
- Storage Tank

Pipe Diameters
- 6 to 8 inch
- 10 to 12 inch
- 14 to 16 inch
- 24 inch
- 30 inch

N

0 500 1,000

Scale in Feet

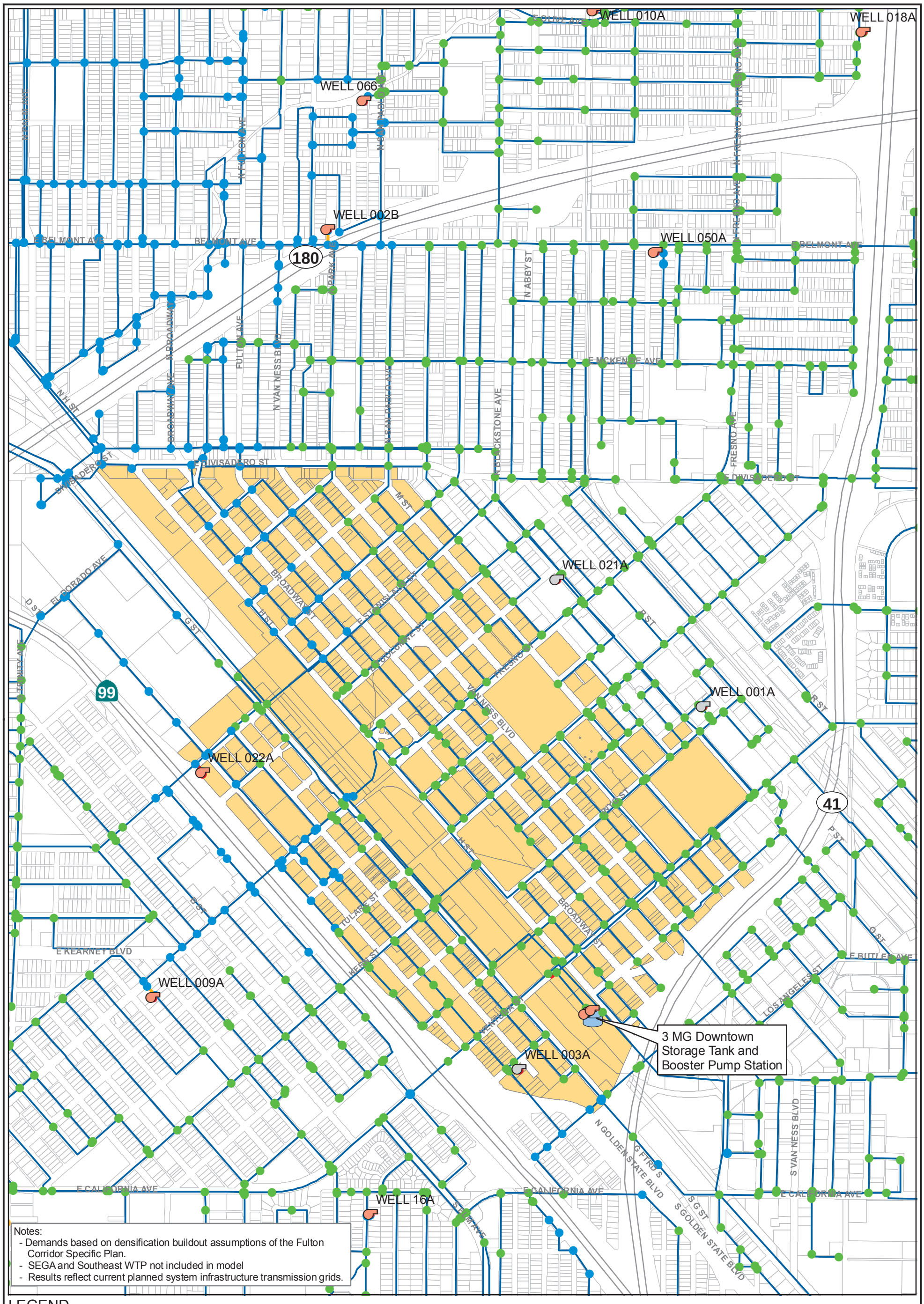
FIGURE 5

City of Fresno

Fulton Corridor Hydraulic Analysis

PROPOSED Ddensification FIRE FLOW

WEST YOST ASSOCIATES
Consulting Engineers



Notes:
- Demands based on densification buildout assumptions of the Fulton Corridor Specific Plan.
- SEGA and Southeast WTP not included in model
- Results reflect current planned system infrastructure transmission grids.

LEGEND

System Pressure
- Less than 35 psi
- 35 to 40 psi
- 40 to 50 psi
- 50 to 60 psi
- 60 psi and Greater

Pipeline Velocity
- Less than 6 fps
- 6 to 7 fps
- 7 fps and Greater
- Well/Pump Station
- Inactive Well

- Storage Tank
- Fulton Corridor SP

N

0 500 1,000

Scale in Feet

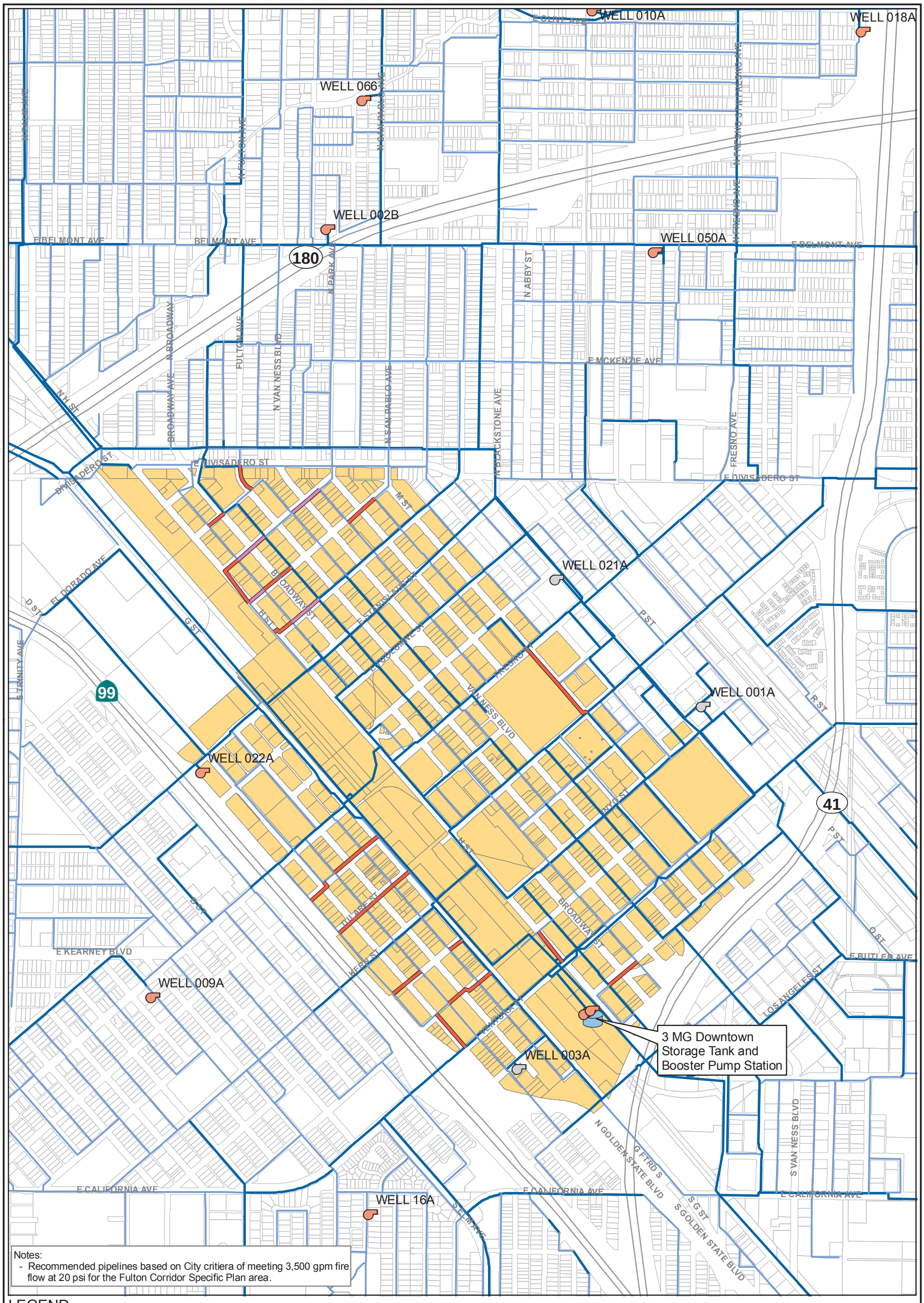
FIGURE 6

City of Fresno

Fulton Corridor Hydraulic Analysis

PROPOSED Ddensification PEAK HOUR

WEST YOST ASSOCIATES
Consulting Engineers



Notes:
- Recommended pipelines based on City critiera of meeting 3,500 gpm fire flow at 20 psi for the Fulton Corridor Specific Plan area.

LEGEND

Recommended Improvements
- New Pipeline (8 inch)
- Replacement Pipeline (8 inch)
- Well/Pump Station
- Inactive Well
- Storage Tank

Existing/Planned Pipeline
- Distribution (less than 12 inch)
- Transmission (12 inch and greater)

N

0 500 1,000

Scale in Feet

FIGURE 7

City of Fresno

Fulton Corridor Hydraulic Analysis

RECOMMENDED PIPELINE IMPROVEMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan \Water Infrastructure Evaluation\GIS\Figures\Figure 7 Sw System Improvements.mxd 6/30/2011

WELL 010A
WELL 018A
WELL 066
WELL 002B
WELL 050A
WELL 021A
WELL 001A
WELL 022A
WELL 009A
WELL 003A
WELL 16A
1,972 gpm
2,140 gpm
3 MG Downtown Storage Tank and Booster Pump Station
E BELMONT AVE
N FULTON AVE
N SAN PABLO AVE
N FRESNO ST
N ABBY ST
N PARK AVE
N BROADWAY
FULTON AVE
N VAN NESS BLVD
E MCKENZIE AVE
N BLACKSTONE AVE
FRESNO AVE
E DIVISADERO ST
M ST
BROADWAY ST
EL DORADO AVE
D ST
G ST
H ST
I ST
P ST
R ST
O ST
TRINITY AVE
E KEARNEY BLVD
E BUTLER AVE
LOS ANGELES ST
N GOLDEN STATE BLVD
S VAN NESS BLVD
E CALIFORNIA AVE
S GOLDEN STATE BLVD
S G ST
SELMA AVE
180
99
41

Notes:
- Required fire flow assumed to be 3,500 gpm per Fresno Fire Department.
- Minimum pressure at flowing hydarnt is 20 psi.
- Results reflect current planned system infrastructure plus the recommended improvements to address densification fire flow.

LEGEND

Available Flow @ 20 psi
- Less than 3,500 gpm
- Greater than 3,500 gpm
- Well/Pump Station
- Inactive Well
- Storage Tank

Pipe Diameters
- 6 to 8 inch
- 10 to 12 inch
- 14 to 16 inch
- 24 inch
- 30 inch

N

0 500 1,000
Scale in Feet

FIGURE 8

City of Fresno
Fulton Corridor Hydraulic Analysis
DENSIFICATION FIRE FLOW IMPROVEMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 8 Sw System FF Improvements.mxd 6/30/2011

WELL 010A
WELL 018A
WELL 066
WELL 002B
WELL 050A
WELL 021A
WELL 001A
WELL 022A
WELL 009A
WELL 003A
WELL 16A
3 MG Downtown Storage Tank and Booster Pump Station
180
99
41
E BELMONT AVE
N FULTON AVE
N PARK AVE
N ABBY ST
N FRESNO ST
E OLIVE AVE
N VAN NESS BLVD
N BROADWAY
FULTON AVE
E MCKENZIE AVE
N H ST
E DIVISADERO ST
M ST
BROADWAY ST
E STANISLAUS ST
H ST
P ST
R ST
G ST
D ST
EL DORADO AVE
TRINITY AVE
E KEARNEY BLVD
E CALIFORNIA AVE
S VAN NESS BLVD
N GOLDEN STATE BLVD
S GOLDEN STATE BLVD
LOS ANGELES ST
E BUTLER AVE
O ST

Notes:
- Demands based on densification buildout assumptions of the Fulton Corridor Specific Plan.
- SEGA and Southeast WTP not included in model.
- Results reflect current planned system infrastructure transmission grids plus recommended improvements in the Fulton Corridor Specific Plan.

LEGEND

System Pressure
- Less than 35 psi
- 35 to 40 psi
- 40 to 50 psi
- 50 to 60 psi
- 60 psi and Greater

Pipeline Velocity
- Less than 6 fps
- 6 to 7 fps
- 7 fps and Greater
- Well/Pump Station
- Inactive Well

Storage Tank

N

0 500 1,000
Scale in Feet

FIGURE 9

City of Fresno
Fulton Corridor Hydraulic Analysis
DENSIFICATION PEAK HOUR IMPROVEMENTS

WEST YOST ASSOCIATES
Consulting Engineers

O:\Clients\439_Fresno\02-10-07 Fulton Corridor Specific Plan Water Infrastructure Evaluation\GIS\Figures\Figure 9 Sw System Peak hour Improvements.mxd 6/30/2011

Appendix D

City of Fresno 2020 Urban Water Management Plan

City of FRESNO
Department of Public Utilities

2020 Urban Water Management Plan

Final

JULY 2021

CITY OF FRESNO

Photo Credit: Downtown Fresno Partnership

City of FRESNO
Department of Public Utilities

CITY OF FRESNO

Final 2020 Urban Water Management Plan

JULY 2021

Prepared by Water Systems Consulting, Inc.

WSC

ACKNOWLEDGMENTS

The 2020 Urban Water Management Plan prepared by Water Systems Consulting, Inc. The primary authors are listed below.

Jeff Szytel, PE
Rob Morrow, PE
Heather Freed, PE
Lauren Cetin, EIT
Michael Cruikshank, PG, CHG
Spencer Waterman

Water Systems Consulting, Inc. would like to acknowledge the significant contributions of the City of Fresno, including the following staff.

Director of Public Utilities Michael Carbajal

Utilities Planning & Engineering Division

Assistant Director Brock Buche, PE, PLS
Supervising Professional Engineer Glenn Knapp, PE
Professional Engineer Peter Maraccini, PE

Water Division

Assistant Director Bud Tickel
Water System Manager Chris Carroll
Water System Manager Russell Guilliams
Business Manager Henry McLaughlin
Water Conservation Supervisor Conrad Braganza

Wastewater Division

Wastewater Manager Rosa Staggs
Operations Supervisor Cory Asher
Reclamation Coordinator Setrag Cherchian

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ACRONYMS & ABBREVIATIONS

°F	degrees Fahrenheit
1,2,3-TCP	1,2,3-trichloropropane
AF	acre-feet
AFY	acre-feet per year
AMI	advanced metering infrastructure
AWE	Alliance for Water Efficiency
AWWA	American Water Works Association
BP04	Booster Pump 4
CII	Commercial, Institutional, and Industrial
CIMIS	California Irrigation Management Information System
City	City of Fresno
COG	Council of Governments
CPC	California Plumbing Code
CSUF	California State University Fresno
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVWAC	Central Valley Water Awareness Committee
CWC	California Water Code
CY	Calendar Year
DBCP	1,2-dibromo-3-chloropropane
DMM	Demand Management Measures
DDW	Department of Drinking Water
DPU	Department of Public Utilities
DRA	Drought Risk Assessment
DWR	Department of Water Resources
EDB	ethylene dibromide or 1,2-dibromoethane
ETo	Evapotranspiration
FID	Fresno Irrigation District
FMFCD	Fresno Metropolitan Flood Control District
GIS	Geographic Information System
GPCD	gallons per capita per day
GSA	Groundwater Sustainability Agency

GSP	Groundwater Sustainability Plan
HCF	hundred cubic feet
IGSM	Integrated Groundwater and Surface Water Model
Metro Plan	Fresno Metropolitan Water Resource Management Plan
mgd	million gallons per day
NESWTF	Northeast Surface Water Treatment Facility
NFWRF	North Fresno Wastewater Reclamation Facility
NKGSP	North Kings Groundwater Sustainability Plan
NRDC	Natural Resources Defense Council
PCE	perchloroethylene or tetrachloroethylene
PEIR	Programmatic Environmental Impact Report
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
RHNA	Regional Housing Needs Allocation
RWMP	Recycled Water Master Plan
RWRF	Regional Wastewater Reclamation Facility
SB	Senate Bill
SBx7-7	Senate Bill x 7-7
SESWTF	Southeast Surface Water Treatment Facility
SGMA	Sustainable Groundwater Management Act
SOI	Sphere of Influence
sq mi	square miles
SWTF	Surface Water Treatment Facility
T-3 SWTF	T-3 Water Storage and Modular 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
UWMP Act	Urban Water Management Planning Act
WSCP	Water Shortage Contingency Plan
WSIP	Water Storage Investment Program
WY	Water Year

CITY OF FRESNO

Executive Summary

This section summarizes the 2020 Urban Water Management Plan (UWMP) for the City of Fresno (City). It provides a lay description of the 2020 UWMP in a manner that is accessible to non-technical readers. This summary describes the fundamental purposes of the UWMP, including water service reliability, future challenges, and strategies for managing water reliability risks.

UWMPs are updated every five years and outline each suppliers' long-term water resource planning to ensure there is enough water to meet both existing and future demands. They set the roadmap for how the City will use water over the coming years.

The original Fresno water system began operations in 1876 as a non-profit organization established by a group of public-minded citizens. Today, the City covers approximately 115 square miles (sq mi) (73,500 acres) consisting largely of single-family residential, commercial, public, and industrial development. The City's General Plan projects buildout of the 106,000 acres planning area in 2056. This UWMP addresses the City's water service reliability, future challenges, and strategies for managing risks to water reliability through 2045. The City's Fresno Metropolitan Water Resource Management Plan (Metro Plan), which is currently being prepared, addresses a 50-year horizon – through 2070.

IN THIS SECTION

Purpose and Organization of the Plan

This plan comprises the 2020 UWMP for the City, as required by the California Urban Water Management Planning Act, which requires all urban water suppliers with more than 3,000 connections or distributing more than 3,000 acre-feet per year (AFY) to complete an UWMP every five years. As of the close of the 2020 calendar year, the City has over 139,500 residential, commercial, industrial, and institutional water service connections and produced nearly 122,000 acre-feet (AF) of water. As a result, the City is required to prepare and adopt an UWMP and submit it to the Department of Water Resources (DWR) by the July 1, 2021, due date.

Requirements for the UWMP include:

- Assessment of current and projected water supplies
- Evaluation of demand and customer types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan, in the event of a water shortage
- Comparison of demand and supply projections

The UWMP is a valuable planning document used for multiple purposes:

- Serves as a valuable resource to the community and other interested parties regarding water supply and demand, conservation, and water related information
- Meets a statutory requirement of the California Water Code (CWC)
- Provides a key source of information for water supply assessments and written verifications of water supply
- Supports regional long-range planning, including City and County General Plans
- Provides a standardized methodology for water utilities to assess their water resource needs and availability
- Provides a resource for regional involvement in the California Water Plan
- Provides for a plan during water drought situations

Outreach and Engagement

The City has coordinated the preparation of its 2020 UWMP with its water suppliers, Fresno County, the City of Clovis, nearby water agencies, and community members to develop a UWMP that adheres to the requirements of the CWC and plans for a resilient water future. In total, the City has coordinated preparation of the 2020 UWMP and solicited participation and comments with the following agencies**:**

- Bakman Water Company
- City of Clovis
- County of Fresno
- Fresno Irrigation District
- Fresno Metropolitan Flood Control District
- Friant Water Authority
- Garfield Water District
- Malaga County Water District
- Pinedale County Water District
- North Kings Groundwater Sustainability Agency
- US Bureau of Reclamation

Service Area Description

The City's General Plan planning area covers approximately 106,000 acres comprised of approximately 73,500 acres of incorporated land and 32,500 acres of unincorporated land. The City's water service area covers 70,400 acres consisting largely of single-family residential, commercial, public, and industrial development, shown in **Figure ES-6** (located at the end of the Executive Summary). The service area excludes areas served by the Bakman Water Company, Pinedale County Water District, Park Van Ness Mutual Water Company, California State University Fresno, and private groundwater users located within Fresno County islands. The City will eventually serve out to the Sphere of Influence (SOI) boundary adopted in the 2014 General Plan and includes all lands planned to be annexed by the City at the projected 2056 buildout of the General Plan, summarized in **Table ES-1**.

Table ES-1. Existing and Future Water Service Area

LAND USE CATEGORY	2020 WATER SERVICE AREA		2056 WATER SERVICE AREA	
	ACRES	PERCENT	ACRES	PERCENT
Single-Family Residential	27,700	39.3%	40,000	47.4%
Multifamily Residential	3,700	5.3%	3,800	4.5%
Commercial	4,500	6.4%	8,600	10.2%
Public Facility	5,600	8.0%	7,200	8.5%
Industrial	4,500	6.4%	9,300	11.0%
Open Space/ Landscape Irrigation	13,100	18.6%	11,000	13.0%
Mixed Use	0	0%	3,900	4.6%
Downtown	0	0%	600	0.7%
Vacant / Partially Vacant	11,300	15.9%	0	0%
TOTAL	**70,400**	**100%**	**84,400**	**100%**

Note: Acreage from City GIS Shapefile of Land Uses and aligns with the General Plan for buildout in year 2056.

Population Projections

The City experienced rapid growth since it was founded by the Central Pacific Railroad in 1872 up through the mid-1990s, when the City's annual growth rate was typically greater than 2%. From 1995 to 2015, the annual growth rate has decreased to an average of 1.3%, and since 2015, the rate has not surpassed 1.0%. Achieving General Plan buildout population estimates requires an average annual growth rate of 1.44% from 2020 to 2056. The City's water service area population is anticipated to continue to grow along with the City, with some slightly higher growth years anticipated in the next 10 years due to multiple large developments planned for completion in the near term. As a result, population growth, shown in **Figure ES-1** on the following page, occurs at an annual rate of ranging from 1.1–2.1% between 2020 and 2056.

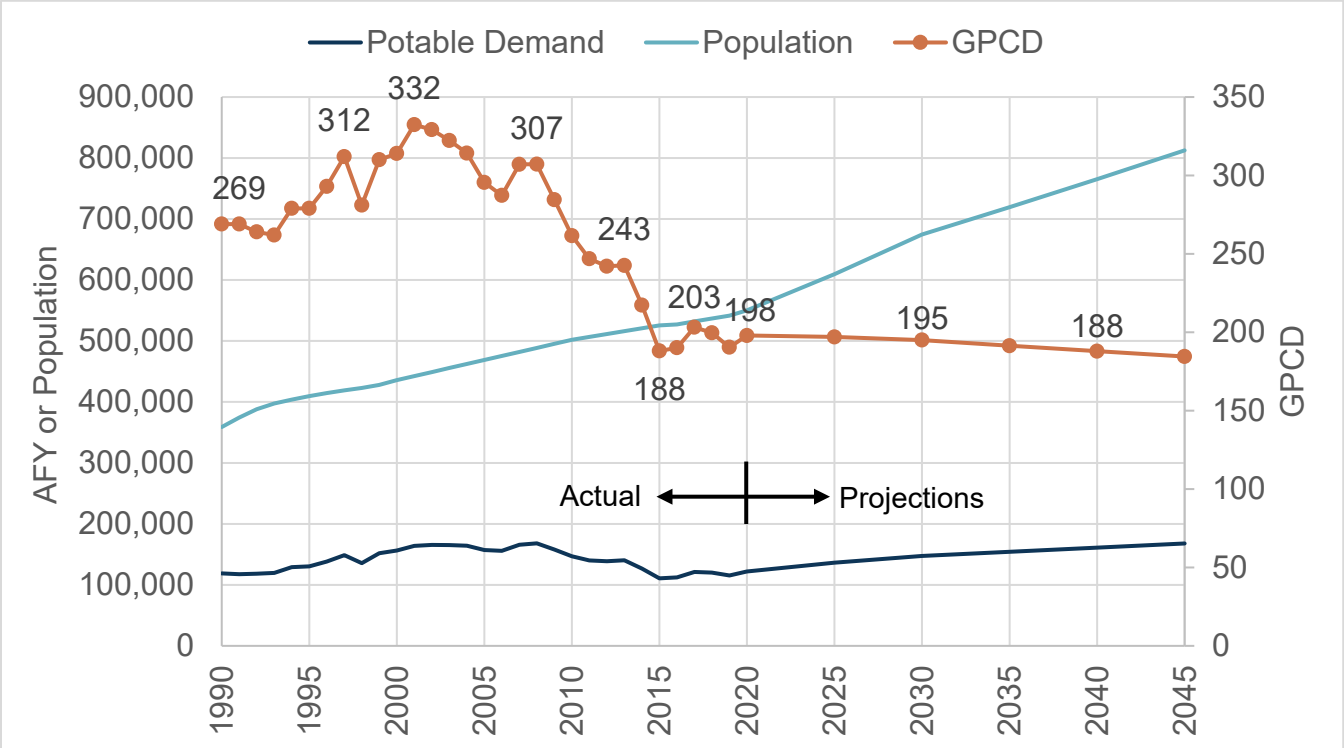
Water Use

Water consumption in the City is characterized by the typical demand sectors of residential, commercial, institutional, industrial, and irrigational. The difference between production and consumption is losses, which may be attributed to system leaks, meter inaccuracies, fire flows, theft, unmetered use, or other factors.

As shown in **Figure ES-1**, the City's water demand has decreased even as the City has grown over the past several decades, and demands are projected to grow slower than population growth. This trend is captured by the City's daily per capita water use, measured as gallons per capita per day (GPCD). For 2020, the City's water use averaged 198 GPCD based on 121,993 AF of water production and a service area population of 550,217. The City is far below its 2020 daily per capita water use target of 247 GPCD due to the extensive conservation efforts implemented by the City in the past decade.

The City also diverts raw surface water obtained from the United States Bureau of Reclamation (USBR) and the Fresno Irrigation District (FID) to recharge basins throughout the service area. The City coordinates with FID for the delivery of the recharge water, utilizing FID's existing system of channels and pipelines to covey the raw water, and with Fresno Metropolitan Flood Control District (FMFCD) to deliver water to FMFCD's stormwater retention and recharge basins or the City's own recharge basins. The raw surface water recharges the groundwater basin to sustain the groundwater supply for the City. The groundwater recharge volume can vary based on surface water supply availability and is represented as an addition to annual groundwater supplies. In addition, the City serves a limited number of customers secondary treated or tertiary treated and disinfected recycled water for agricultural irrigation or landscape irrigation, respectively.

Figure ES-1. City of Fresno Demand Projections



The City's per capita water usage is projected to continue to decline through 2045 due to more water efficiency in future construction and passive conservation; however, due to the increase in population the demand is expected to slowly increase in the next 25 years. The potable demand projections for normal water use are based on land use where future land use areas 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. Demand for existing land uses is also expected to slowly reduce over time due to passive conservation, which includes the replacement of older water fixtures and appliances with more efficient types now required as part of the CPC.

Water Sources

The City relies on groundwater from the North Kings Subbasin; surface water from Central Valley Project (CVP), through a contract with the USBR; Kings River water, through a contract with FID; and recycled water. Water production in the City has consisted of 100% groundwater prior to the commissioning of the City's first surface water treatment facility (SWTF) in 2004. Since 2004, the City has invested in expanding its surface water treatment capabilities and now has three SWTFs that provide approximately half of all potable water demands in the service area.

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.

The City was a founding member of the North Kings Groundwater Sustainability Agency (North Kings GSA), which was formed following passage of the Sustainable Groundwater Management Act (SGMA) of 2014. 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 by DWR and the North Kings GSA is working within the SGMA framework to reach groundwater sustainability.

Due to the City's investments in other supplies – surface water, recycled water, and conservation – groundwater levels beneath the City have already begun to recover from low levels experienced during the recent drought. The City plans to continue to use groundwater within a larger conjunctive use program that maximizes its existing water rights and surface water supply sources.

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 the City. The City contracts with FID for Kings River water and with 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 City has historically not used all its available FID 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, through an agreement originally executed in 1961, secured a surface water supply from USBR CVP Friant Division for an annual water supply of 60,000 AF of Class 1 water. The agreement was last renewed in 2010 as a Section 9(d) contract that provides water from the San Joaquin River in perpetuity. Class 1 water has historically been very reliable until the 2006 San Joaquin River Restoration Settlement Agreement, which ended an 18-year legal dispute over the operation of Friant Dam brought by a coalition of conservation and fishing groups. The projected surface water available for the City from USBR is based on USBR simulations for the 2006 Settlement Agreement. Average simulated delivery is 53,680 AFY and the median simulated delivery is 60,000 AFY. However, very dry years have previously resulted in substantial reductions as demonstrated by the zero allocations that occurred in 2014 and 2015.

FID is one of 28 agencies that receives an entitlement of water from the Kings River through the Kings River Water Association. The City executed its most recent agreement with FID in 2016. The 2016 agreement identifies the City's contracted percentage of FID's Kings River water based on the City's water service area located within 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, and is roughly 200,000 acres. As the City incorporates new users and the water service area expands, the percentage of FID supply increases. However, the 2016 FID Agreement sets the City's maximum percentage of FID's Kings River water as 29.0%, which is expected to be reached between 2025 and 2030.

The City's potential supply from FID was projected using actual Kings River deliveries for 1964–2019. The average FID Kings River delivery over that time was 452,541 AF, which equates to an average potential City supply of 131,237 AF, assuming the maximum 29.0% City supply percentage. The projected City percentage of FID supplies was estimated based on City's water service area growth projections through buildout in 2056.

Recycled Water

The Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) has developed from what was once a sewer farm to what is now a state-of-the-art wastewater treatment facility. The RWRF treats flows from not only the City, 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 five years.

The City has three primary means of effluent disposal from the RWRF:

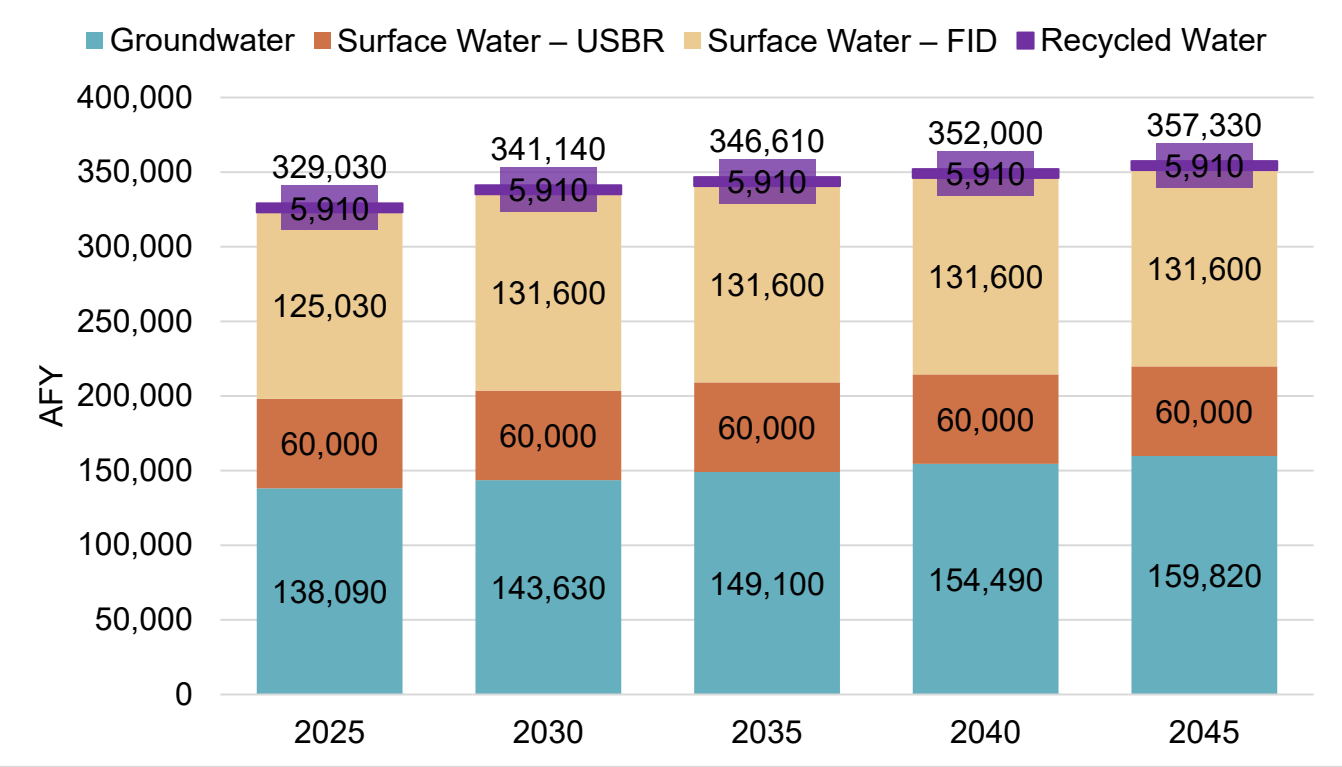
1. Undisinfected secondary effluent to on-site and off-site farmland for restricted irrigation
2. Undisinfected secondary effluent to percolation ponds
3. Disinfected tertiary effluent to the recycled water distribution system

The percolated effluent has been deemed equivalent to tertiary treated water by the State and 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 City recently constructed the Tertiary Treatment and Disinfection Facility (TTDF) at the RWRF and has constructed most of the southwest recycled water system, which is projected to increase deliveries from roughly 1,000 AFY today to eventually meet 5,800 AFY of non-potable demands. In addition, the City uses recycled water from the North Fresno Wastewater Reclamation Facility (NFWRF) to irrigate Copper River Ranch Golf Course.

Summary of Supplies

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. **Figure ES-2** shows the City's annual average projected water supplies through 2045.

Figure ES-2. Projected Water Supplies



Water Supply Reliability

The City currently manages its surface water and groundwater supply by maximizing surface water for potable use and intentional recharge during wet and normal years, while relying on groundwater during dry years. The City is currently updating its Metro Plan, which will recommend projects and programs to optimize the use of its supply portfolio and further improve supply resilience. Supply management tools are an expected outcome of the Metro Plan update; however, the City's ongoing supply management is intended to maximize local supplies and improve the groundwater basin storage. Current actions include enhanced groundwater management and intentional recharge, increased recycled water use, and continued conservation through the implementation of demand management measures.

Normal water year, single dry water year, and five-year consecutive drought period supply projections were made based on historic water allocations for surface water supplies, sustainable yield for groundwater, and projected utilization for recycled water. For surface water, the single dry year is based on 2015 allocations and the five-year drought is based on 2012 to 2016. Groundwater supplies, due to intentional recharge augmentation, remain reliable in all hydrologic conditions.

Despite severe reductions of surface water supplies during recent dry years, sufficient good-quality water was available to operate the SWTFs. The projected supplies and demands for a normal year, single dry year, and five-year consecutive drought, shown in **Figure ES-3** through **Figure ES-5** on the next page and in **Table 7-1** through **Table 7-3** in **Section 7.1.4**, demonstrate that the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years; 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; and the City is projected to meet all demands during a five-year drought with its existing supplies with reduced groundwater recharge in years three and four of a five-year drought to accommodate low surface water allocations.

Managed recharge of surface water is an essential component of the City's groundwater supply and the City must average 60,000 AFY to 70,000 AFY of recharge with surface water to meet the projections. This highlights the City's priority of recharging available surface water in the coming years.

Figure ES-3. Normal Year Supply vs. Demand

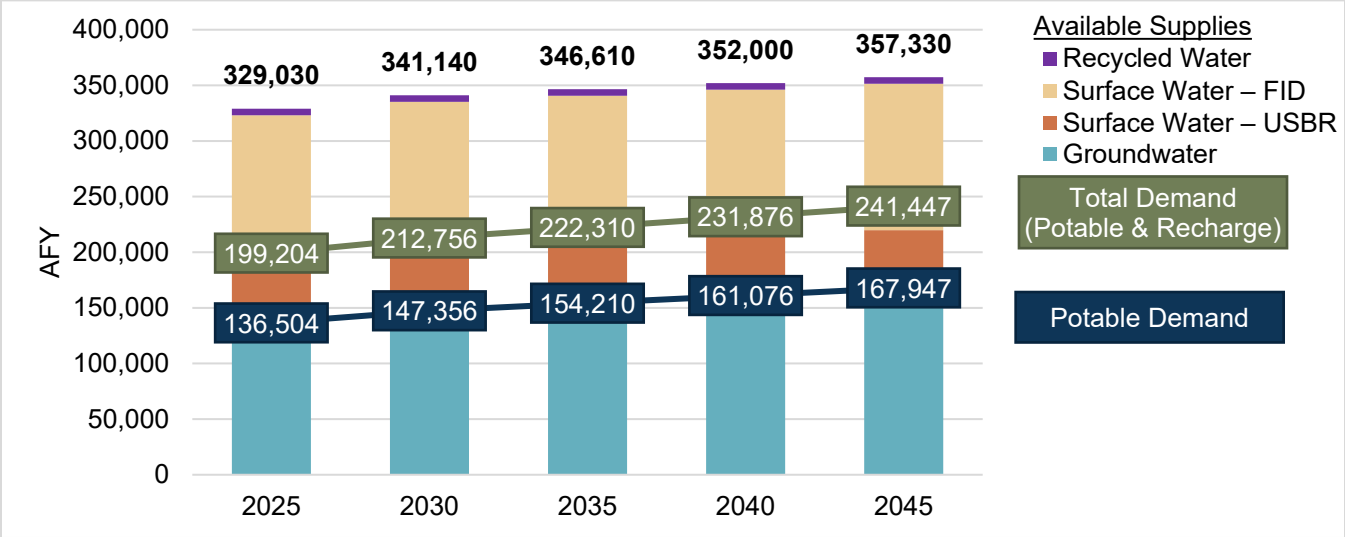


Figure ES-4. Single Dry Year Supply vs. Demand

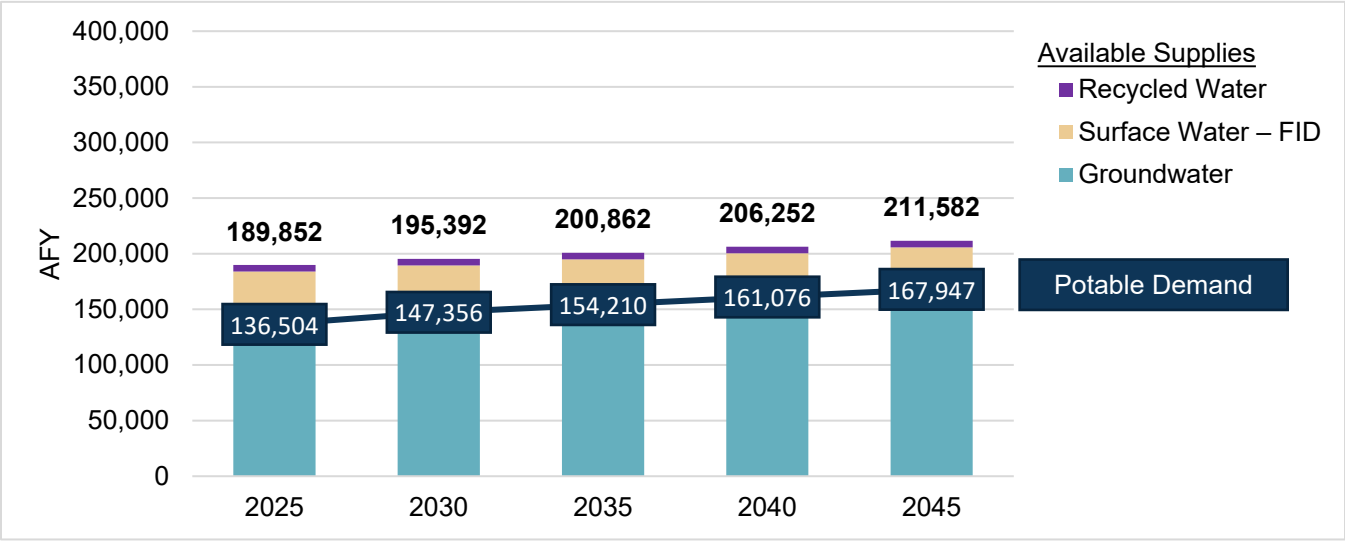
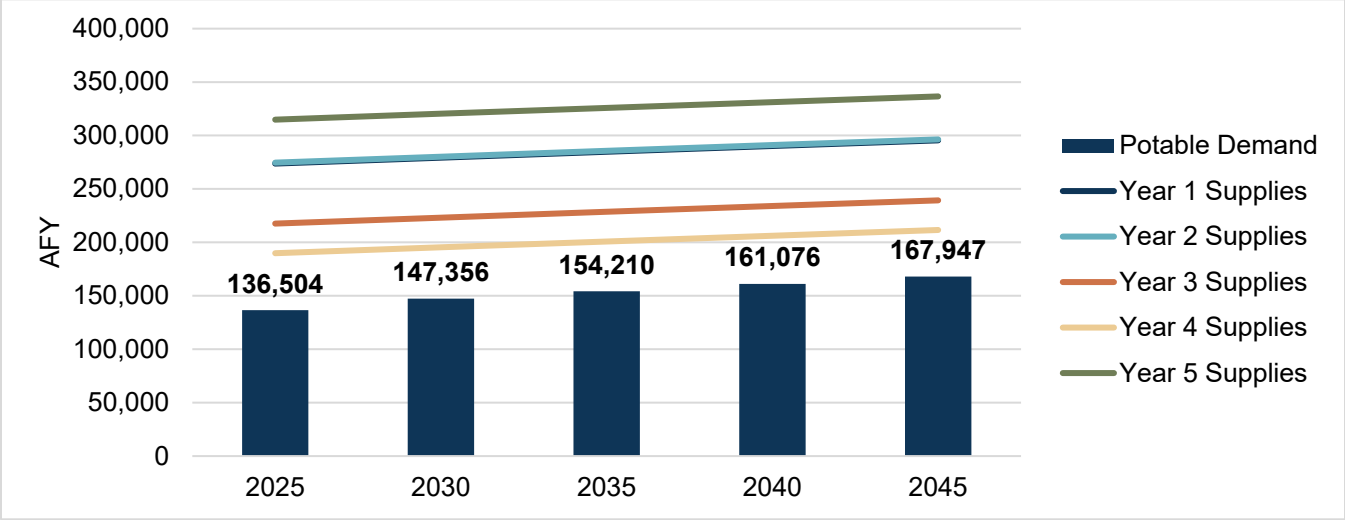


Figure ES-5. Multiple Dry Years Supply vs. Demand



2021-2025 Drought Risk Assessment

A new provision of the Water Code directs Suppliers to prepare a Drought Risk Assessment (DRA), assuming a drought period lasting five consecutive years, starting from the year following the year when the assessment is conducted. The DRA analysis allows the City to examine the management of its supplies during stressed hydrologic conditions and an opportunity to evaluate whether the City may need to enact its Water Shortage Contingency Plan (WSCP) during the next actual drought period lasting at least five years. The projected gross water use for the five-year DRA is based on unrestricted potable demand, a reduction in raw-water demand for intentional recharge in years three and four of the five-year drought, and unrestricted recycled water demand. Surface water supply availability is based on actual allocations during the previous drought – from 2012 to 2016.

Table ES-2 compares the total projected supply and demand for the five-year DRA for 2021 through 2025. As shown, the City does not expect to enact its WSCP for a five-consecutive-year drought based on the unrestricted potable demand projections and the reliability of the current supply portfolio. Available surface water supplies during this period would be utilized for groundwater recharge to sustain the groundwater basin.

Table ES-2. Five-Year Drought Risk Assessment

WATER USE TYPE	2021	2022	2023	2024	2025
Groundwater	133,602	134,724	135,846	136,968	138,090
Surface Water – USBR	30,000	37,200	0	0	45,000
Surface Water – FID	93,354	83,085	65,425	40,776	111,911
Recycled Water	1,912	2,911	3,911	4,910	5,910
TOTAL SUPPLY	**258,868**	**257,920**	**205,181**	**182,655**	**300,911**
Potable Demand	124,910	127,827	130,745	133,662	136,504
Non-Potable Demand	60,000	60,000	48,287	22,260	60,000
TOTAL DEMAND	**184,910**	**187,827**	**179,032**	**155,922**	**196,504**
AVAILABLE SUPPLIES	**73,958**	**70,093**	**26,149**	**26,732**	**104,407**

Water Shortage Contingency Plan

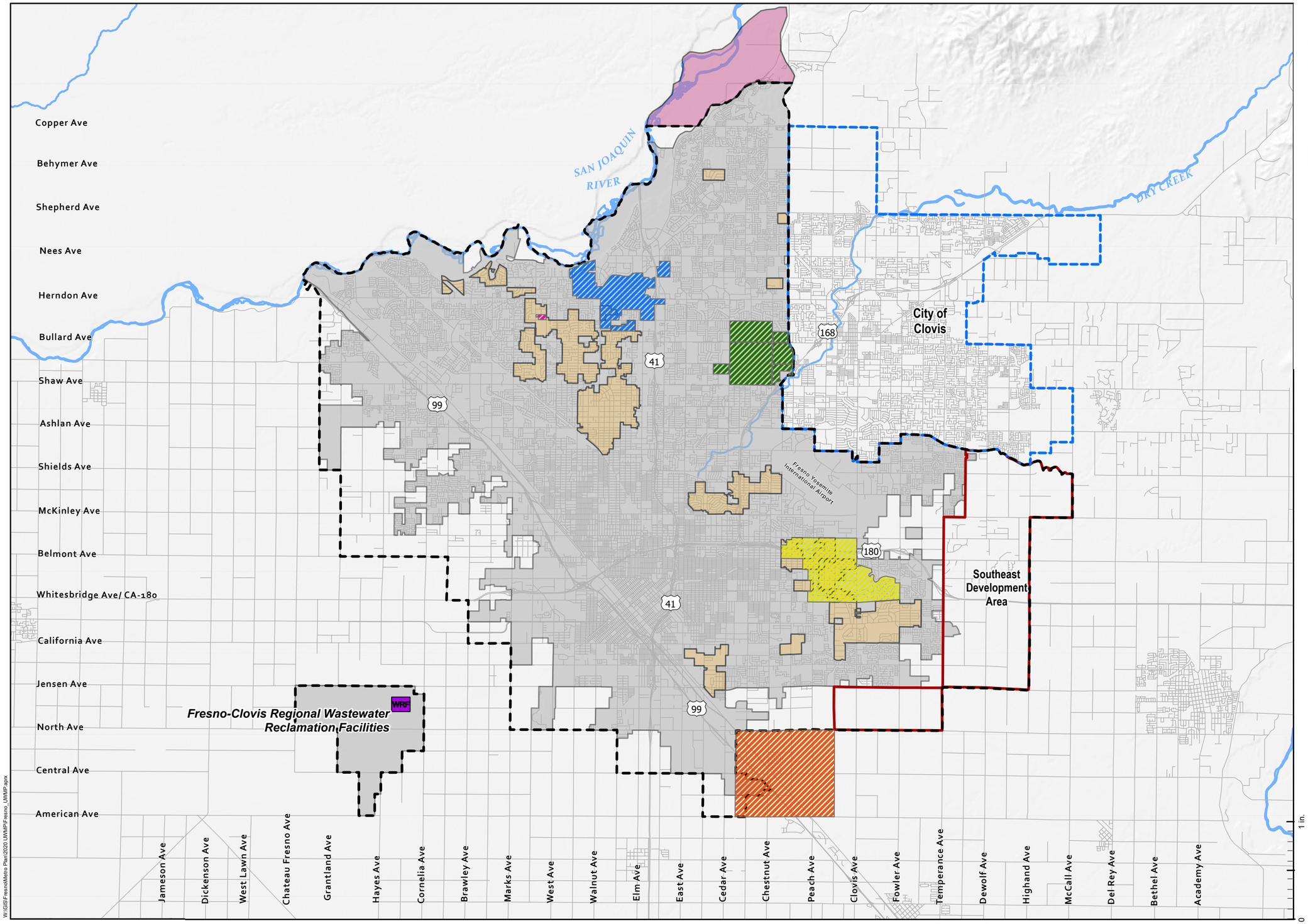
This WSCP is a detailed plan for how the City intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time.

The WSCP is used to provide guidance to the City's governing body, 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 describes the following:

- Water Supply Reliability Analysis
- Annual Water Supply and Demand Assessment Procedures
- Six Standard Shortage Stages
- Shortage Response Actions
- Communication Protocols
- Compliance and Enforcement
- Legal Authority
- Financial Consequences of WSCP Implementation
- Monitoring and Reporting
- WSCP Refinement Procedures
- Special Water Features Distinctions
- Plan Adoption, Submittal, and Availability

The 2020 WSCP is a standalone document that can be modified as needed and is included as **Appendix J** in the 2020 UWMP.



Legend

- Fresno Sphere of Influence
- Clovis Sphere of Influence
- Fresno City Limits
- County Islands
- North Area
- Southeast Development Area
- WRF Wastewater Reclamation Facility
- Streets

Areas Served Water by Others

- Bakman Water District
- Malaga Water District
- Park Van Ness Mutual Water District
- Pinedale County Water District
- CA State University, Fresno

Prepared by: WSC

N

1:140,000

0 0.75 1.5 3 Mi

0 3,750 7,500 15,000 US Feet

References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure ES-6. City Service Area

1 CITY OF FRESNO Introduction

This plan comprises the 2020 Urban Water Management Plan (UWMP) for the City of Fresno (City), as required by the California Urban Water Management Planning Act (UWMP Act).

The UWMP Act requires all urban water suppliers with more than 3,000 connections or distributing more than 3,000 acre-feet per year (AFY) to complete an UWMP every five years.

As of the close of the 2020 calendar year, the City has over 139,500 residential, commercial, industrial, and institutional water service connections and produced nearly 122,000 AF of water. As a result, the City is required to prepare and adopt an UWMP and submit it to DWR by the July 1, 2021, due date.

IN THIS SECTION

The UWMP is a valuable planning document used for multiple purposes:

- Serves as a valuable resource to the community and other interested parties regarding water supply and demand, conservation, and water related information
- Meets a statutory requirement of the California Water Code (CWC)
- Provides a key source of information for water supply assessments and written verifications of water supply
- Supports regional long-range planning documents, including City and County General Plans
- Provides a standardized methodology for water utilities to assess their water resource needs and availability
- Provides a resource for regional involvement in the California Water Plan
- Provides for a plan during water drought situations

1.1 The California Water Code

The UWMP Act is administered by the California Department of Water Resources (DWR), which is responsible for compiling data for statewide and regional analysis and publishing the adopted documents online for public access. This report was prepared according to the requirements of the CWC, UWMP Act, and the 2020 UWMP Guidebook.

CWC Section 10620 (a) of the UWMP Act states, "Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640)." These plans are to be updated every five years and submitted to DWR.

Requirements for the UWMP include:

- Assessment of current and projected water supplies
- Evaluation of demand and customer types
- Evaluation of the reliability of water supplies
- Description of conservation measures implemented by the urban water supplier
- Response plan, in the event of a water shortage
- Comparison of demand and supply projections

In November 2009, the State legislation passed Senate Bill (SB) x 7-7, referred to as SBx7-7 or the Water Conservation Act of 2009. SBx7-7 set the goal of achieving a 20% reduction in urban per capita water use statewide by 2020. Retail water agencies were required to set targets and track progress toward decreasing daily per capita urban water use in their service areas, which would assist the State in meeting its 20% reduction goal by 2020.

This law requires that every UWMP include:

- Baseline per capita water use
- Urban water use target for 2020
- Compliance daily per capita water use

This 2020 UWMP has been prepared to comply with the UWMP Act and SBx7-7. In addition to meeting the requirements of the Act, this report will be used to support water supply assessments and written verifications of water supply required by SB 610 and SB 221 of 2001. These bills require that water supply information be provided to counties and cities for projects of a certain size, prior to discretionary project approval. Both bills allow an UWMP to be used as a source document to fulfill these legislative requirements. The UWMP Act has undergone significant expansion since it was originally passed, particularly since the City's previous UWMP was prepared in 2015. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of each water supplier as well as the statewide water reliability overseen by DWR, the State Water Resources Control Board, and the Legislature. Accordingly, the UWMP Act has grown to address changing conditions, and the current requirements are found in Sections 10610–10656 and 10608 of the CWC.

Since 2015, several amendments have been added to the UWMP Act. These require urban water suppliers to prepare a five-year consecutive drought supply and demand assessment and a five-year drought risk assessment to evaluate the functionality of the Water Shortage Contingency Plan (WSCP) in the event of a continuous five-year drought beginning next year.

There are also new requirements for the WSCP, and it is now required to be adopted as a separate plan from the UWMP. This 2020 UWMP was developed to incorporate these new requirements, under the guidance of DWR's 2020 UWMPs Guidebook for Urban Water Suppliers. A checklist to document compliance of this 2020 UWMP with the Act and the CWC is provided in **Appendix A**.

This 2020 UWMP includes all required DWR standardized tables for **Chapters 1 to 10** compiled in **Appendix B** and all required SBx7-7 tables in **Appendix C**. A selection of these tables is also provided in the body of this Plan, as necessary to present supporting data.

1.2 UWMP Organization

This 2020 UWMP is organized into the following chapters.

- **Chapter 1 - Introduction and Overview:** This chapter provides a discussion of the purpose and content of the 2020 UWMP and the extent of the City's water management planning efforts.
- **Chapter 2 - Plan Preparation:** This chapter provides information on the City's development of the 2020 UWMP, including the basis for plan preparation, planning type, data format, and coordination and outreach to nearby agencies.
- **Chapter 3 - System Description:** This chapter provides a description of the City's water system, including service area maps, climate information, service population and demographic information, and an overview of the City's organizational structure and history.
- **Chapter 4 - Customer Water Use:** This chapter describes the City's historic, current, and projected water uses, system losses, water savings, and water use by lower income households.
- **Chapter 5 - Conservation Target Compliance:** This chapter includes a description of the City's chosen method for calculating baseline per capita water use, the City's calculated baseline, 2015 interim and 2020 per capita demand targets, and compliance with the 2020 target.
- **Chapter 6 - System Supplies:** This chapter includes a discussion of the City's water system supplies, including groundwater, surface water, wastewater, and recycled water, the City's future water projects, and a summary of existing and future water sources.
- **Chapter 7 - Water Supply Reliability Assessment:** This chapter describes the reliability of the City's water supply through a 20-year planning horizon, including a supply and demand assessment and regional reliability evaluation. Supply reliability is presented for a normal, single dry year and five consecutive dry years.
- **Chapter 8 - Water Shortage Contingency Planning:** This chapter provides a description of the City's WSCP, including stages of action, prohibitions, penalties, reduction methods, and catastrophic supply interruption.
- **Chapter 9 - Demand Management Measures:** This chapter explains the City's existing and historic efforts to promote water conservation and the City's plans to use Demand Management Measures to achieve its 2025 water use targets.
- **Chapter 10 - Plan Adoption, Submittal, and Implementation:** This chapter details the steps taken by the City to adopt the 2020 UWMP in accordance with the CWC, make it available to the public, and implement it.

- **Appendices:** These include any additional information to support and clarify any information presented within the 2020 UWMP content.

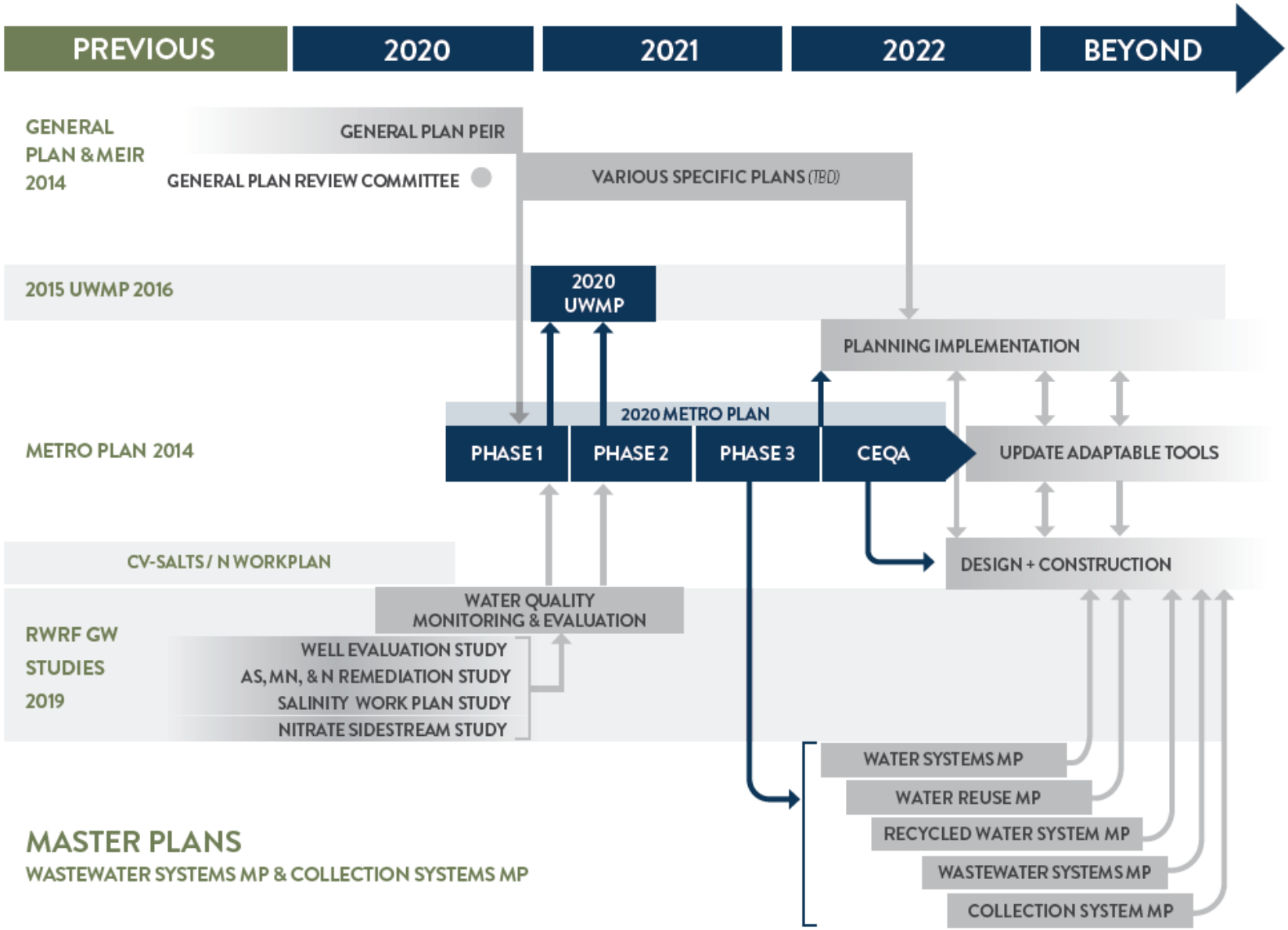
1.3 UWMPs in Relation to Other Efforts

The City previously prepared a 2005 UWMP, 2010 UWMP, and 2015 UWMP. This 2020 UWMP serves as an update to the 2015 UWMP and complies with new requirements and regulations. In addition to completing the 2020 UWMP, the City is presently updating its Fresno Metropolitan Water Resource Management Plan (Metro Plan). The last Metro Plan was completed in 2014, and the current Metro Plan update will prepare a fresh look at the City's water resources and consider new conditions and strategies for planning through 2070. **Figure 1-1** shows the City's ongoing and additional future water resources planning efforts.

1.4 Demonstration of Consistency with the Delta Plan

A new requirement for the 2020 UWMP is that agencies that anticipate participating in, or receiving water from, a proposed project utilizing Sacramento-San Joaquin Delta (Delta) Water or within the Jurisdiction of the Delta Stewardship Council (covered action) should demonstrate consistency with the Delta Plan's policy to reduce reliance on the Delta. Covered actions include, but are not limited to, projects such as multiyear water transfers, conveyance facilities, or new diversions that involve transferring water through, exporting water from, or using water in the Delta, per California Code of Regulations, Title 23, Section 5003. The City of Fresno contracts with the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) Friant Division for an annual supply of 60,000 AF of Class 1 water. Although the Friant Division of the CVP does not directly divert or convey water from the Delta, the project was developed through an exchange with the Delta-Mendota supply. As restrictions on Delta exports have hindered USBR from making deliveries to the Delta-Mendota Canal, the Friant Division Class 1 allocations are reduced, and the water is transferred back to the users that would typically receive water from the Delta-Mendota Canal. As such, the City is required to demonstrate consistency with the Delta Plan's policy to reduce reliance on the Delta. **Appendix D** includes the reporting and calculations that demonstrate Fresno's reduced reliance on supply from their USBR CVP water supply.

Figure 1-1. Previous and Ongoing Water Resources Planning Efforts



2 CITY OF FRESNO
Plan Preparation

The City has coordinated the preparation of its 2020 UWMP with its water suppliers, the County, the City of Clovis, nearby water agencies, and community members to develop a UWMP that adheres to the requirements of the CWC and plans for a resilient water future.

IN THIS SECTION

The City of Fresno provides water service to a variety of customer sector types within the City limits, inclusive of several historic County Waterworks Districts (county islands) which have been incorporated into the City's water system.

The City has approximately 139,500 service connections and produced just under 122,000 AF of potable water in 2020. The City meets the threshold identified in the CWC to be classified as an urban water supplier and in the California Health and Safety Code as a public water system. The City provides water directly to its customers and does not wholesale water to any other agencies for potable uses (defined as sales greater than 3,000 acre-feet per year). Therefore, the City is required to prepare and update a Retail UWMP every five years. This report was prepared on a calendar year basis.

2.1 Coordination and Outreach

The City has water supply contracts with USBR and Fresno Irrigation District (FID). Each of these water suppliers has been notified of the plan update and provided water supply projections for the time period covered by this plan. Additionally, the preparation of this 2020 UWMP was coordinated with other appropriate agencies to ensure regional stakeholders had the opportunity to provide input to this plan. The City has coordinated preparation of the 2020 UWMP and solicited participation and comments with the agencies indicated in **Table 2-1**. The City has also published notices in local newspaper and encouraged the active involvement of the population within the water service area to provide feedback on the UWMP and the WSCP during the public review period, as discussed in **Section 10.1**.

Table 2-1. Agency Coordination and Outreach

AGENCY	NOTIFIED 60 DAYS PRIOR TO PUBLIC HEARING	NOTIFIED OF PUBLIC DRAFT 14 DAYS PRIOR TO PUBLIC HEARING
Bakman Water Company	✓	✓
City of Clovis	✓	✓
County of Fresno	✓	✓
Fresno Irrigation District	✓	✓
Fresno Metropolitan Flood Control District	✓	✓
Friant Water Authority	✓	✓
Garfield Water District	✓	✓
Malaga County Water District	✓	✓
Pinedale County Water District	✓	✓
North Kings Groundwater Sustainability Agency	✓	✓
US Bureau of Reclamation	✓	✓

3 CITY OF FRESNO System Description

This chapter describes the history of the City's water system, its current service area, climate, population, and demographics.

IN THIS SECTION

- Service Area
- Land Uses
- Water System
- Population and Demographics

The original Fresno water system began operations in 1876 as a non-profit organization inaugurated by a group of public-minded citizens. Initially, the water system consisted of one pumping station composed of small pumps and two storage tanks located above the second floor of one of the early store buildings. This building was located on Fresno Street between "J" and "K" Streets, presently known as Broadway and Fulton.

By 1888, the town had grown to a small city, which demanded an improved water distribution system. This was necessary because of several large fires, including the destruction of the first permanent courthouse. In 1888, the first pumping station and water tower were constructed at Fresno and "O" Street. These facilities were designed to be an integral part of a larger and continually expanding water system. This No. 1 station was in continuous use until 1959, when it was retired having served its useful purpose. Today, this building is known as the "Water Tower" and has been declared a historic structure.

Between the years of 1887 and 1890, 4-inch and 2½-inch cast iron pipe, as well as 4-inch wrought iron water mains were laid out. Most of these original “permanent pipes” have since been replaced in the present water supply system. The owner and operator of the system in 1888 was the Fresno Water Company. In 1904, the Fresno Water Company was purchased by Balch, Kerckhoff & Wishon, and was reorganized as the Fresno City Water Company. In 1926, the facilities were purchased by the California Water Service Company. This company then sold the water system to the City of Fresno in 1931, which operated as a municipal utility. It was first managed under an appointed water board, but currently is a division of the Department of Public Utilities.

Historically, the City’s supply of water consisted of direct pumping from wells drilled into the underground aquifer. Today, groundwater remains one of the City’s primary water supply sources, including 202 active and 56 inactive groundwater wells. The production capacity from the active wells is approximately 403 million gallons per day (mgd) and the total production capacity is 487 mgd, including inactive wells. The wells are located around the City to provide equitable distribution throughout the City’s water system, as described below. Most wells are connected directly into the transmission grid main system (14- to 20-inch diameter pipelines) to convey water throughout the system.

In the 1960s, the City secured a surface water contract made available from the United States Bureau of Reclamation (USBR). The City contracted with USBR for 60,000 acre-feet of water per year from the Friant Division (Millerton Lake) and developed a system to recharge the groundwater basin by “intentional recharge,” percolating the imported surface water supplies in constructed recharge basins. The City’s USBR supplies are conveyed to the City via FID canals. In 1976, the City signed a contract with FID for delivery of surface water supplies from the Kings River based on the City’s pro rata share of FID’s water entitlements. The Kings River water is used for groundwater recharge and treated for potable use.

In 2004, the City also began treating surface water supplies for direct potable use at its first surface water treatment facility located in northeast Fresno (NESWTF). For the period of 2005–2014, this 30 mgd-rated facility provided 10–15% of the City’s potable water supplies. From 2016–2020, this facility produced 15% of the City’s potable water supply, an increase largely attributed to transmission system improvements, which permitted conveying water further into the City’s distribution system, and the City’s lower overall system demands. Also, in 2015, the City commenced operations of its new T-3 Water Storage and modular Surface Water Treatment Facility (T-3 SWTF) in southeast Fresno. In January 2013, the City completed the installation of meters on all single-family residences.

In 2018, the City completed construction of its new 54 mgd surface water treatment facility in southeast Fresno (SESWTF) and large diameter water mains that serve nearly one-half of the City. Production from this facility may ultimately be 80 mgd with the City demonstrating to the Division of Drinking Water (DDW) that the facility is capable of safely running at higher filter loading rates. With the SESWTF operational, along with the NESWTF and T-3 SWTF, the City provided greater than 50% of its potable supply through using surface water for the first time in 2019 and 2020. The City expects to provide half or more of its potable demand using its surface water supply sources going forward.

3.1 Service Area

The City of Fresno presently covers approximately 115 square miles (sq mi) (73,500 acres) consisting largely of single-family residential, commercial, public, and industrial development. It also includes several areas not within the City limits (e.g., County islands), as shown in **Figure 3-1**. With the exception of the Bakman Water Company (Bakman), Pinedale County Water District (Pinedale), Park Van Ness Mutual Water Company (Park Van Ness), California State University Fresno (CSUF), and private groundwater users located within County islands, the City currently serves water to the entire area encompassed by its City limits and will eventually serve out to the Sphere of Influence (SOI) boundary. The SOI is coincident with the City of Fresno General Plan Land Use and Circulation Map, which was adopted in the 2014 General Plan and therefore, includes all lands planned to be annexed by the City at the projected 2056 buildout of the General Plan (City of Fresno Development and Resource Management Department, 2014).

3.1.1 Land Uses within Service Area

According to the General Plan and the City's Planning and Development Department, the City's planning area covers approximately 106,000 acres (165.6 sq mi) comprised of approximately 73,500 acres (115 sq mi) of incorporated land and 32,500 acres (50.8 sq mi) of unincorporated land based on the City's current shapefiles. The total 106,000-acre planning area includes approximately 84,300 acres of developed or planned to be developed land, approximately 18,500 acres of roads, highways, and railroads with no corresponding water demand, and about 2,500 acres outside of the SOI north of the City's most northwesterly portion referred to as the North Area and shown on **Figure 3-1**.

Of the 106,000 acres within the City's planning area, the City's water service area covers 70,400 acres (110 sq mi) of land within the SOI, which includes most of the 73,500 acres of incorporated area and the unincorporated County Islands not within the City limits. As shown in **Table 3-1**, approximately 59,100 acres of the 70,400 acres within the water service area are developed and served water by the City. The remainder consists of vacant land that will be served by the City when it is developed. Residential units make up the largest portion of water demand served by the City, consisting of over 40% of the total served area and almost 90% of the total service connections.

The remaining areas within the City's SOI are served by other systems or are unserved by a water system, consisting of open space and agricultural land, land used by roads, highways, and railroads, as well as the North Area.

Table 3-1. Current Service Area Characteristics

LAND USE TYPE	AREA (ACRES)	% OF TOTAL AREA	SERVICE CONNECTIONS	% OF TOTAL CONNECTIONS
Single-Family Residential	27,700	39.3%	118,775	85.1%
Multifamily Residential	3,700	5.3%	6,087	4.4%
Commercial	4,500	6.4%	11,982	8.6%
Public	5,600	8.0%	2,504	1.8%
Industrial	4,500	6.4%	175	0.1%
Open Space/ Landscape Irrigation	13,100	18.6%	Note 1	
Total	**59,100**		**139,523[2]**	**100%**
Vacant / Partially Vacant[3]	11,300	15.9%	N/A	
Total	**70,400**	**100%**		

Source: Acreage from City of Fresno Geographic Information System Shapefile of Land Uses provided 8/12/20. Number of connections provided by the City for 2020.

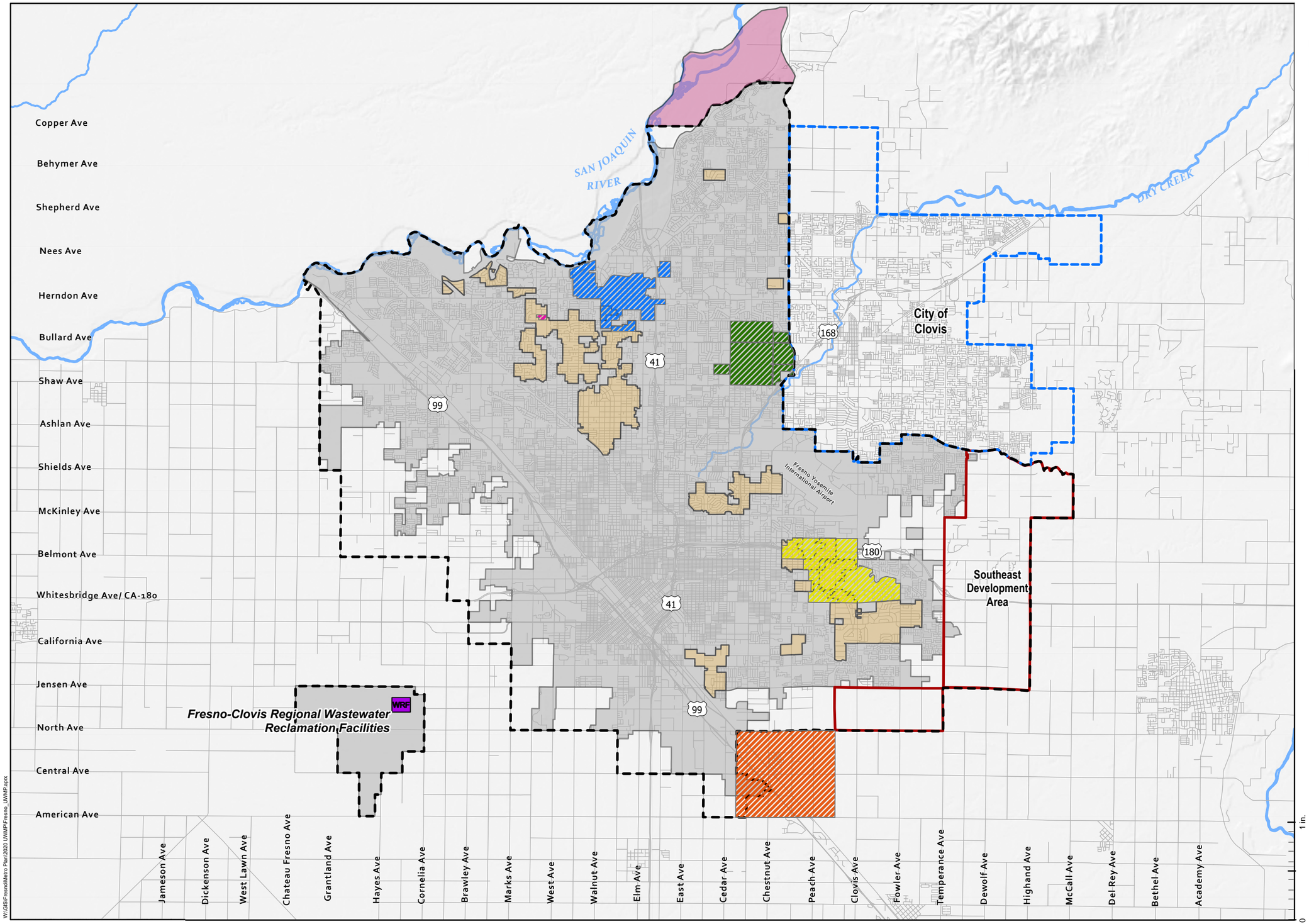
Notes:

1. Dedicated irrigation meters are included in commercial and public meter total.
2. Approximately 3,633 dedicated fire service connections are included in the total services connections, most of which are included in the commercial and public meter total.
3. For partially vacant land, half of the area is included in the zoned land use type and the other half is assumed vacant.

3.1.2 Water System

The City's water system consists of about 1,860 miles of distribution and transmission mains, 202 active municipal groundwater wells, three surface water treatment facilities (SWTFs) with current rated capacities ranging from 4 to 54 mgd, five water storage facilities with pump stations, including one at each of the SWTFs plus two in the distribution system, and three booster pump facilities.

The City's service area spans an approximate 120 feet of elevation difference, declining from northeast to southwest. To help regulate pressure throughout the water distribution system, the City utilizes five pressure zones, as shown on **Figure 3-2**: Highway 41, Shepherd, Sierra, Southwest, and Booster Pump 4 (BP04). The pressure zones are separated by a series of closed or partially closed valves between each zone to prevent or impede flow from one zone to the next, referred to as gate systems. There are four gate systems — Shepherd, Sierra, Southwest, and BP04 — separating the five pressures zones. The Highway 41 Pressure Zone was previously split into two pressure zones divided by a series of 26 gate valves closely following the alignment along Highway 41. However, these zones were combined into a single zone in 2015 by fully opening the Highway 41 gate valves, and as a result are not shown on **Figure 3-2**.



Legend

- Fresno Sphere of Influence
- Clovis Sphere of Influence
- Fresno City Limits
- County Islands
- North Area
- Southeast Development Area
- WRF Wastewater Reclamation Facility
- Streets

Areas Served Water by Others

- Bakman Water District
- Malaga Water District
- Park Van Ness Mutual Water District
- Pinedale County Water District
- CA State University, Fresno

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Prepared by: WSC

N

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0 0.75 1.5 3 Mi

0 3,750 7,500 15,000 US Feet

References:

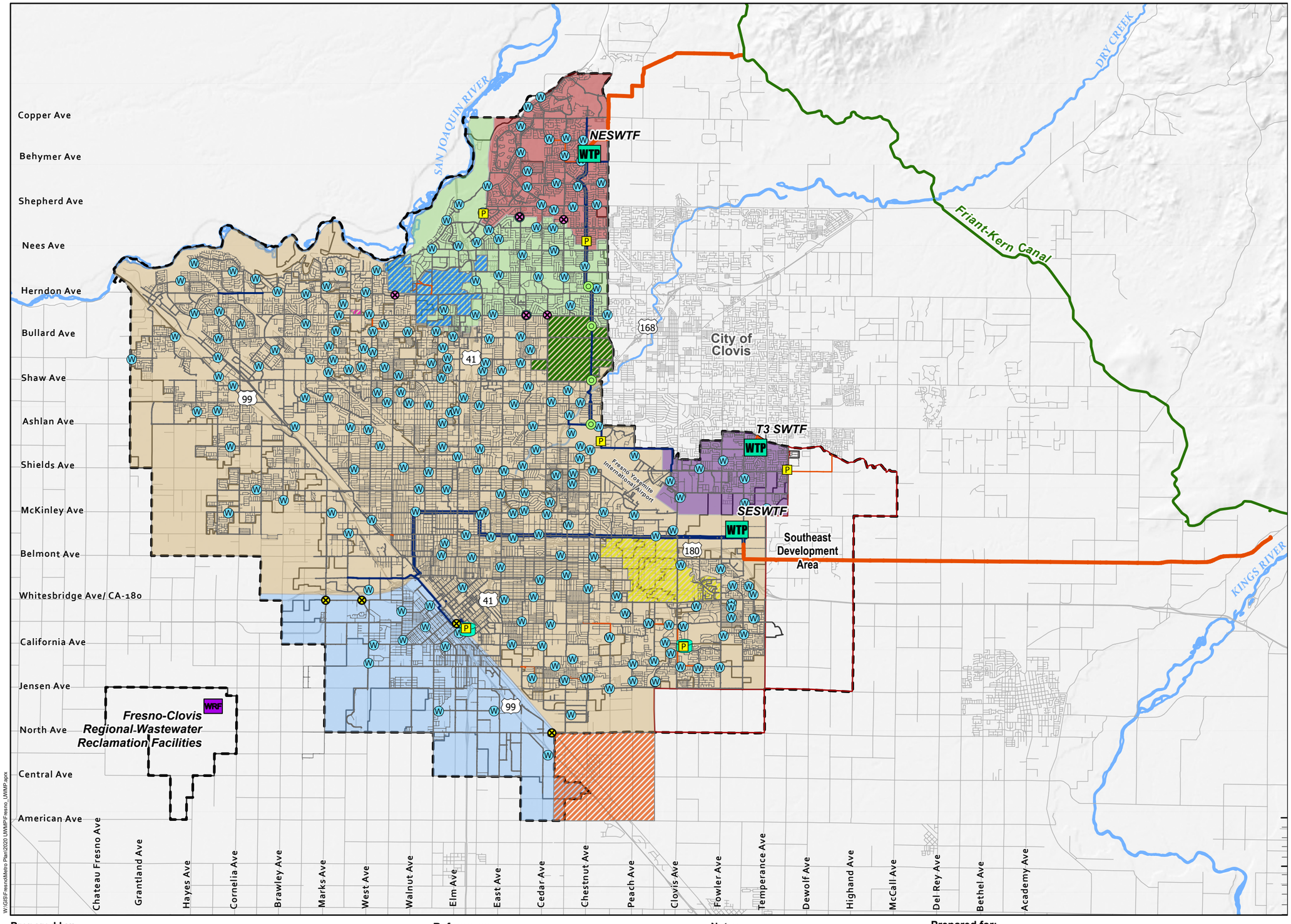
1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 3-1. City Service Area



Legend

City Facilities

- WTP — Water Treatment Plant
- P — Booster Pump Station
- Storage Facility
- W — Active Well
- Existing Turnout
- WRF — Wastewater Reclamation Facility

Gate System Valves

- Pressure Relief Valve
- Pressure Sustaining Valve

Water Mains by Diameter (inch)

- <10
- 10 - 16
- 16 - 30
- 30 - 72

Raw Water Mains by Diameter (inch)

- <10
- 10 - 16
- 16 - 30
- 30 - 72
- Friant-Kern Canal

Areas Served Water by Others

- Bakman Water District
- Malaga Water District
- Park Van Ness Mutual Water District
- Pinedale County Water District
- CA State University, Fresno

Pressure Zones

- Highway 41
- Booster Station 4
- Shepherd
- Sierra
- Southwest

City Features

- Southeast Development Area
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

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Prepared by: WSC

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0 3,500 7,000 14,000 US Feet

References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 3-2. Water System

3.2 Service Area Climate

The City's service area is in California's San Joaquin Valley in Fresno County along Highway 99. The climate of the area is best described as Mediterranean, characterized by hot dry summers and cool winters. Precipitation in the area averages around 11 inches per year, as shown in **Table 3-2**. However, rainfall can significantly vary year to year, with over 18 inches received in 2011 and less than 4 inches received in 2014. The recent drought was marked by four consecutive years (2012 to 2015) of less than 10 inches of rainfall. As shown by the average evapotranspiration (ET_o) and temperature values in **Table 3-2**, the City's water use in the summer months is significantly higher than in the winter, reflecting increased water use for irrigation purposes during the hot, dry summers.

Table 3-2. Average Climate Characteristics

MONTH	ET_o (INCHES)	RAINFALL (INCHES)	TEMP-HIGH (°F)	TEMP-LOW (°F)
Jan	1.17	2.33	56.9	37.4
Feb	1.98	1.8	62.6	39.8
Mar	3.73	1.99	68.4	43.6
Apr	5.43	0.99	73.7	46.9
May	7.33	0.54	81.3	53.2
Jun	8.41	0.19	89.6	59.1
Jul	8.8	0.02	95.7	63.8
Aug	7.82	0.01	94.6	62.5
Sep	5.69	0.07	89.6	57.9
Oct	3.68	0.59	79.3	49.3
Nov	1.85	0.98	66.2	40.6
Dec	1.10	1.83	56.5	36.1
Total/ Average	**56.99**	**11.34**	**76.2**	**49.2**

Source: CIMIS Website: http://www.cimis.water.ca.gov, Station 80 Fresno State (1988 to 2020) Monthly Average Report, October 2020 (downloaded November 30, 2020)

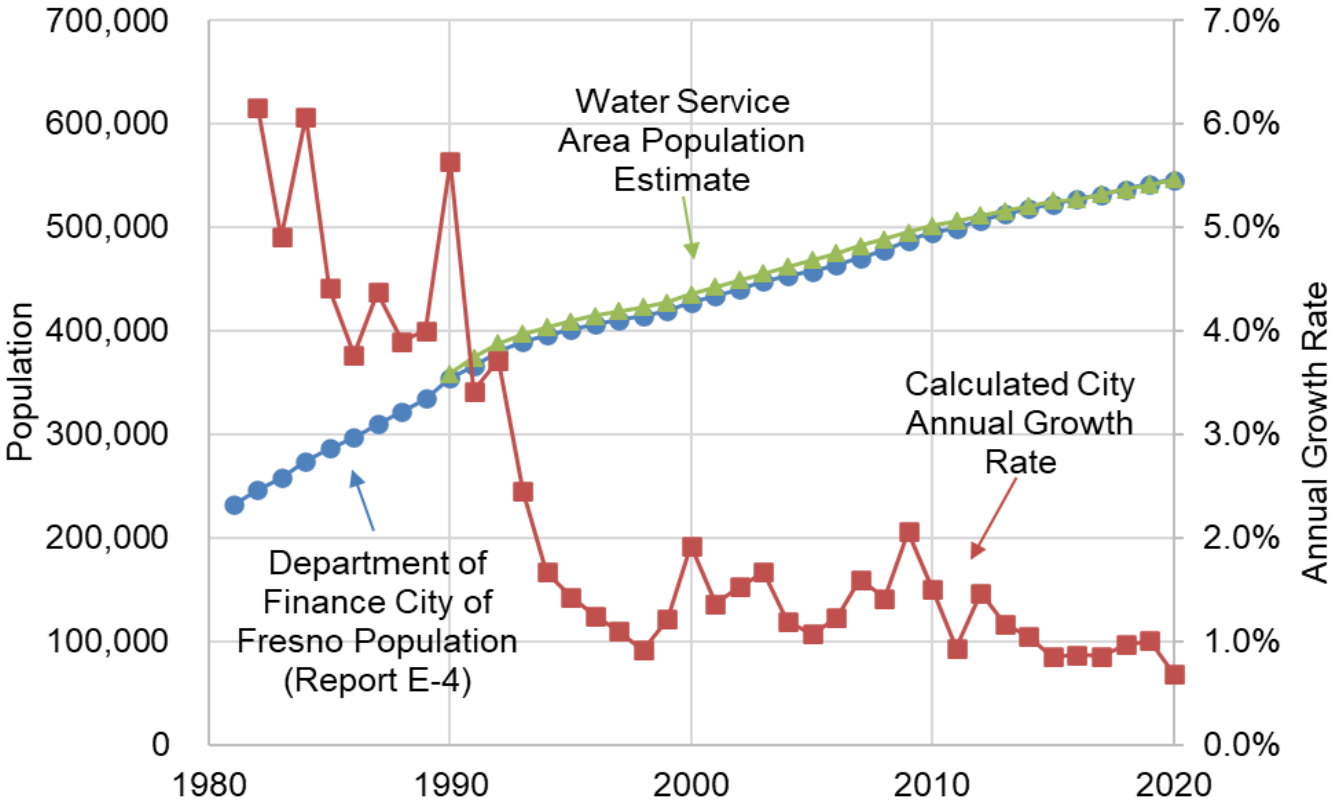
3.3 Service Area Population and Demographics

The City experienced rapid growth since it was founded by the Central Pacific Railroad in 1872 up through the mid-1990s, when the City's annual growth rate was typically greater than 2%. From 1995 to 2015, the annual growth rate has decreased to an average of 1.3%, and since 2015, the rate has not surpassed 1.0%.

The population served by the City Water Division is slightly higher than the City's population after adding unincorporated areas served by the City and removing areas within the City limits served by private water companies, special districts, or private wells. The City acquired County service areas and facilities in 1989, which increased the service area population to slightly greater than the City population since 1990.

Figure 3-3 compares the historic City population to the water service area population since 1990. Water service area population estimates prior to 1990 were unavailable for comparison to the City's population. The City Water Division's methodology for calculating the population of the City's water service area involves summing all the Census tract data for the City's overall service area and subtracting out tracts not served by the City. These tracts included areas served by Pinedale, Bakman, and CSUF, as well as areas outside the City service area, unserved areas within County areas, unserved areas within City areas, and areas with only partial service (i.e., straddling City service areas). Based on the City's methodology, the water service area population was estimated to be 546,502 in 2020, compared to 545,769 for the total City population in January 2020 (California Department of Finance, 2020). For comparison, in the 2015 UWMP, the City Water Division population served was 525,575 compared to the total City population of 522,369 (California Department of Finance, 2020). The City's water service area population in 2020 using the DWR Population Tool is 550,217 and is similar to the population estimate using the City's methodology.

Figure 3-3. City of Fresno and Water Service Area Historic Population



The City's General Plan is the City's primary growth planning document from which the baseline water service area population projection for this UWMP was developed. The General Plan includes population estimates for the City planning area, which includes all areas within City limits and unincorporated areas outside of City limits within the City's SOI, based on projections developed by the Fresno Council of Governments and estimates a buildout population of 921,057 in 2056. In 2017 the Fresno Council of Governments developed population projections in 5-year increments through 2050 for all cities within Fresno County (Applied Development Economics, Inc. and Mintier Harnish Associates, 2017). The Fresno Council of Governments' 2017 report projects the City's population will grow at an annual growth rate ranging from 0.92–1.44%, with an average annual growth rate between 2020 and 2056 (buildout) of 1.03% per year. These population projections and growth rate have been incorporated in the City's General Plan population projections.

According to the City's Planning and Development Department, the City's water service area population is anticipated to continue to grow along with the City, with some slightly higher growth years anticipated within the next 10 years due to multiple large developments planned for completion in the near term. For planning purposes, this UWMP assumes the City will slowly incorporate areas served by others within the City's SOI by buildout in year 2056. As such, the long-term water service area population annual growth rate is expected to be 1.44% between 2020 and 2056 to account for absorbing these areas into the City's water system.

The baseline population projection starts with the 2020 water service area population determined using the DWR Population Tool and grows based on areas expected to be developed by 2030,

as provided by the City's Planning Department, and then linearly beyond 2030 to meet the buildout population in 2056. The City's 2020 population estimate includes the entire City planning area, including areas not served water by the City and areas currently outside the City limits but within the SOI, and is higher than the current water service area population. The water service area population projection assumes the City will incorporate all areas currently served by others and grow to provide water service to all areas within the SOI by buildout. Because the water service area has more growth potential than the City planning area, the annual average growth rate as calculated ranges from 1.1–2.1% between 2020 and 2056, with an average annual growth rate of approximately 1.56% between 2020 and 2045 that continues to slow through the buildout. **Table 3-3** shows the water service area population projections through 2045 in five-year increments.

Table 3-3. Current and Projected Population (DWR 3-1R)

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**550,217**	**609,433**	**674,677**	**719,327**	**765,278**	**812,529**

3.3.1 Other Social, Economic, and Demographic Factors

Most recently, the City is experiencing significant impacts due to the global pandemic caused by COVID-19 (SARS-CoV-2) virus. In March 2020, the State issued a stay-at-home order that forced many businesses to close and other businesses to require residents to continue work only from their home to slow the spread of the virus. Additionally, the forced closure of several businesses caused a historic increase in unemployment across the US and a resulting economic recession. While all the impacts of COVID-19 are not entirely known at this time, it has caused a shift in water use by customer class. In 2020, residential demands increased by over 8% from 2019 demand, while commercial and industrial water use decreased by over 5%. This shift is expected to be temporary with an anticipated return to previous levels once all stay at home orders are lifted and businesses can reopen. However, the economic recession could have longer term impacts to the region.

CITY OF FRESNO

4 Water Use Characterization

This chapter describes and quantifies 2020 water use and projected water use through 2045 within the City's service area.

Water consumption in the City is characterized by the typical demand sectors of residential, commercial, institutional, industrial, and irrigational. The difference between production and consumption is losses, which may be attributed to system leaks, meter inaccuracies, fire flows, theft, unmetered use, or other factors.

IN THIS SECTION

- Distribution System Water Losses
- Past and Current Water Use
- Projected Water Use

4.1 Non-Potable Versus Potable Water Use

The City serves its customers potable water for residential, commercial, institutional, industrial, and landscape irrigational demands through its potable water distribution system.

The City also diverts raw surface water obtained from the United States Bureau of Reclamation (USBR) and Fresno Irrigation District (FID) to recharge basins throughout the service area. The City coordinates with FID for the delivery of the recharge water, utilizing FID's existing system of channels and pipelines to convey the raw water, and with Fresno Metropolitan Flood Control District (FMFCD) to deliver water to FMFCD's stormwater retention and recharge basins or its own recharge basins. The raw surface water recharges the groundwater basin to sustain the groundwater supply for the City. The groundwater recharge volume can vary based on surface water supply availability and is represented as an addition to annual groundwater supplies as discussed in **Chapter 6**. In addition, the City serves a limited number of customers secondary treated or tertiary treated and disinfected recycled water for agricultural irrigation or landscape irrigation, respectively. The recycled water demands are discussed in **Section 6.4**.

4.2 Past, Current, and Projected Water Use by Sector

The following sections document the past and current water use for each sector, and the projected water use through 2045.

4.2.1 Water Use Sectors

Records of historical water consumption serve as the basis for developing water demands by water use sector. Water consumption is the volume of water measured at each metered service.

The City tracks water consumption across different water use sectors listed in the California Water Code (CWC), including:

- Single-Family Residential
- Multifamily Residential
- Commercial and Institutional / Governmental
- Industrial
- Landscape
- Distribution System Losses

In addition to the water uses listed in the CWC, the City participates in exchanges and transfers, provides temporary travel meters for temporary water use, and diverts non-potable surface supplies for groundwater recharge, described below. The City does not provide water for sales to other agencies, saline water intrusion barriers, or agricultural use.

4.2.1.1 Exchanges

Since 1976, the City has had a water exchange agreement with FID for delivery of the City's percolated wastewater effluent — considered equivalent to tertiary treatment — to FID canals. This is not counted as a water use in this chapter and is discussed as a water supply in **Section 6.6.1.2**.

4.2.1.2 Other

A small, quantified water demand has been classified as “other” to account for temporary travel or construction meters for water used for dust control. This use type typically accounts for less than one percent of total water use.

4.2.2 Distribution System Water Losses

Real losses, as defined in the American Water Works Association (AWWA) Water Audit tool are:

“Physical water losses from the pressurized system (water mains and customer service connections) and the utility’s storage tanks, up to the point of customer consumption. In metered systems, this is the customer meter; in unmetered situations, this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks, and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks, and overflows.”

The past five years of distribution system losses are listed in **Table 4-1**, and the results of the 2016-2019 AWWA Water Audit Tool are provided in **Appendix E**. The AWWA Audit Worksheet was not completed for 2020 prior to the submittal of this plan, and the volume of water loss is estimated as the difference between water produced and metered water consumed for each calendar year period.

The overall consumption of water in the system is placed into four different categories:

- Billed Metered Usage
- Billed Unmetered Usage
- Unbilled Metered Usage
- Unbilled Unmetered Usage

The water losses for the system were found by determining the difference between the overall amount of water supplied to the community and the apparent system losses. The City’s system losses have many different possible causes such as hydrant flushing/testing, construction, firefighting, system leaks, water main breaks, and meter error. The estimated loss in 2020 is 9,568 acre-feet (AF), which is the difference between metered production and metered consumption and is approximately 8% of the overall system production. Based on the previous four years of audits, the City has not had to apply meter adjustments in the AWWA Water Audit Tool, and the water losses report is the difference between water produced and metered water consumed each year. It is anticipated that the estimated 2020 water loss volume in **Table 4-1** will be the water losses reported on the 2020 AWWA Audit when it is certified.

Currently, the City does not have a water loss standard but intends to evaluate programs to reduce water losses in their Metro Plan that is currently being updated. The City is also tracking forthcoming water use standards, which will include a water loss standard that is planned to be adopted by the Water Board within the next few years.

Table 4-1. DWR 4-4R 12 Month Water Loss Audit Reporting

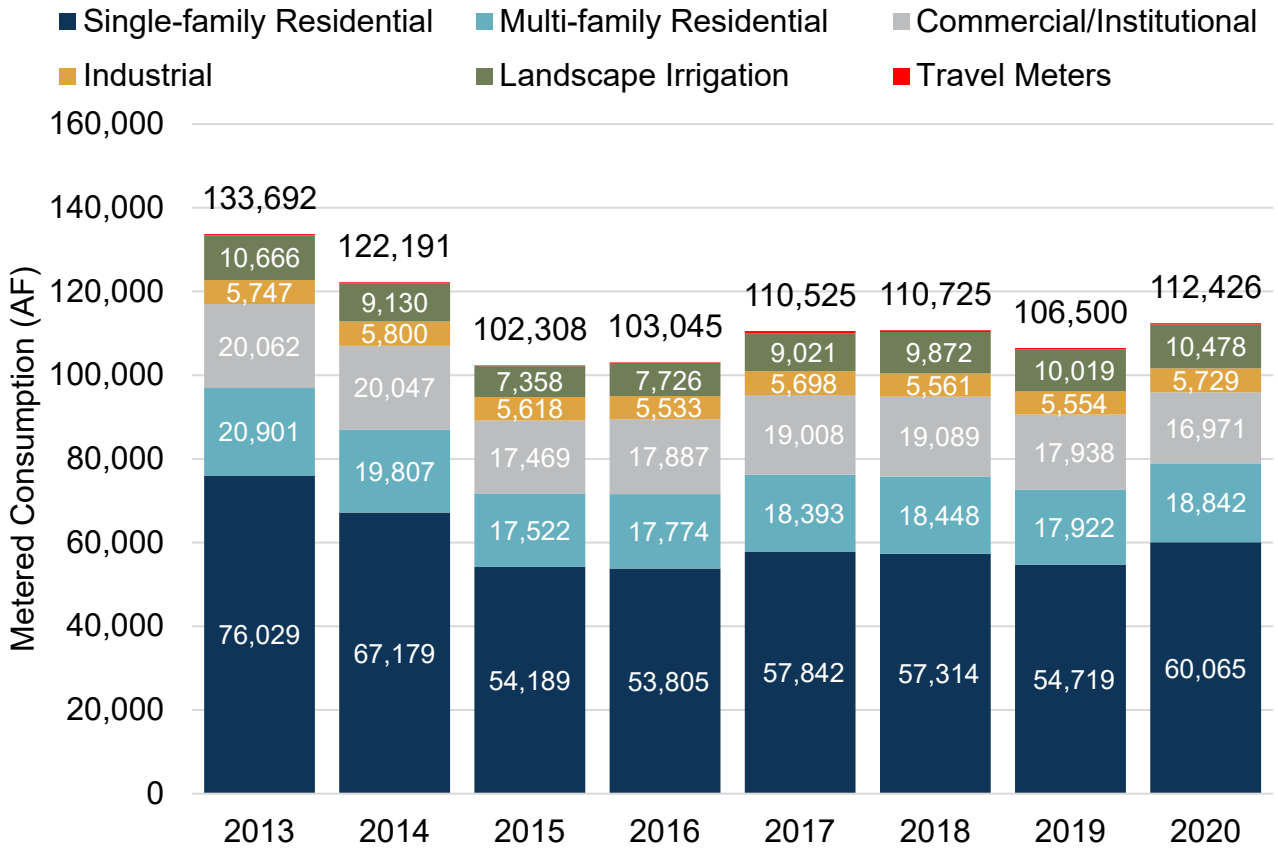
REPORT PERIOD START DATE		VOLUME OF WATER LOSS, AFY	PERCENT LOSS OF PRODUCTION
MM	YYYY		
1	2016	9,036	8.0%
1	2017	10,235	8.5%
1	2018	9,028	7.5%
1	2019	9,059	7.8%
1	2020	9,568	7.8%

For 2016 through 2019, volume of water loss is taken from the AWWA Water Audit Tool. For 2020, the volume of water loss is the difference in metered production and metered consumption.

4.2.3 Past and Current Water Use

Since 2013, all water services in the City's water service area have been metered. Prior to 2013, the City estimated single-family residential water use, since these services were not equipped with meters, by subtracting all other metered uses (commercial, institutional, industrial, and irrigational), plus 10% assumed losses, from production data. Water consumption for the City's water service area by customer type for 2013–2020 is shown on **Figure 4-1**.

Figure 4-1. Historical Consumption by Customer Type (2013–2020)



As shown in the figure, single-family residential water use has decreased more than 20,000 AFY since the Single-Family Metering Program was completed in 2013. Multifamily residential, commercial, and institutional services have historically been metered, and consumption has also decreased since 2013, with industrial users and landscape irrigation consumption at similar levels to 2013 consumption, even as new customers are connected to the City's water system. Landscape irrigation demands did decrease in 2015 and 2016, likely due to the drought restrictions, and continue to recover after the drought ended in 2017.

Table 4-2 provides the breakdown of actual water use by sector type in calendar year 2020. As shown in **Table 4-2**, single-family residential water use is the largest use type in the City and accounted for almost 50% of potable water use in 2020. Multifamily residential use was the second largest, accounting for approximately 15% of water sales in 2020. Together, residential water use accounts for about 65% of all potable water uses in the City's service area. The remaining potable water uses consist of mainly commercial and institutional water use, which are tracked together and included only on the commercial use row on **Table 4-2**, followed by landscape irrigation and industrial usage. Distribution losses accounted for approximately 8% of potable water used in 2020 (per **Section 4.2.2**).

Table 4-2. Actual Demands for Water: Potable (DWR 4-1R)

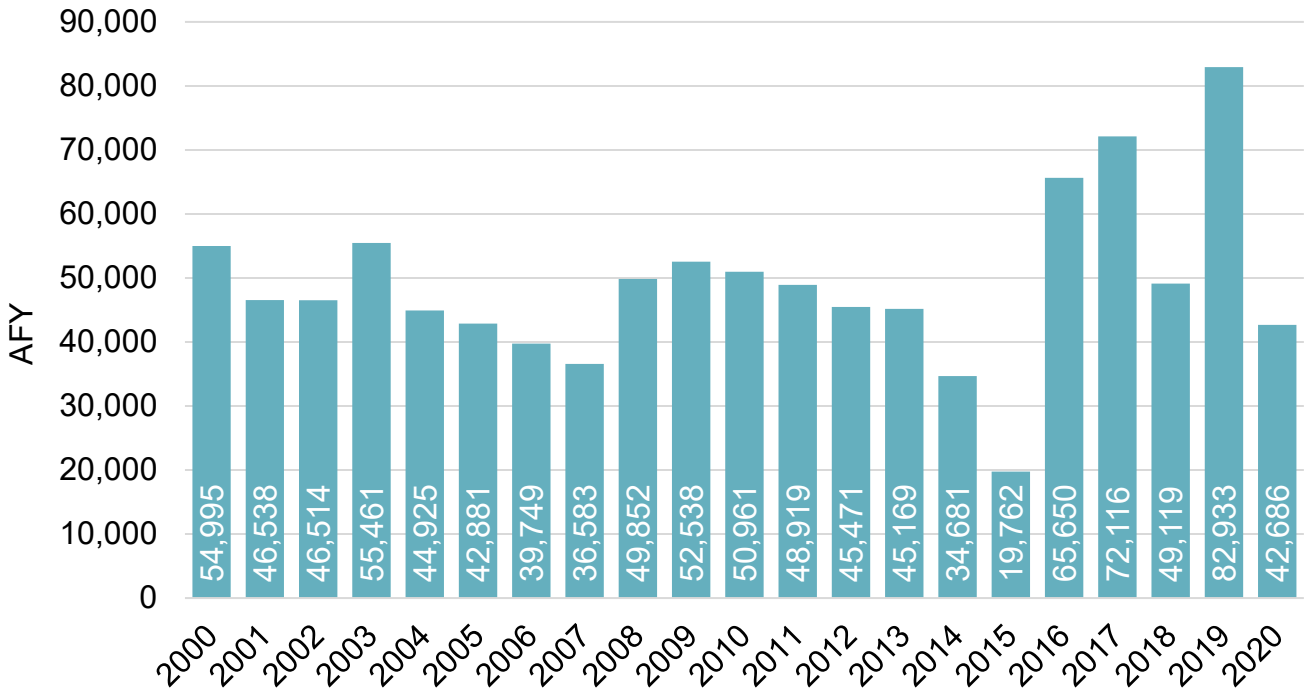
USE TYPE	ADDITIONAL DESCRIPTION	LEVEL OF TREATMENT WHEN DELIVERED	2020 VOLUME	PERCENT OF TOTAL
Single Family		Drinking Water	60,065	49.2%
Multi-Family		Drinking Water	18,842	15.4%
Commercial		Drinking Water	16,971	13.9%
Industrial		Drinking Water	5,729	4.7%
Institutional/ Governmental	See Note 1	Drinking Water	---	---
Landscape		Drinking Water	10,478	8.6%
Other	Travel Meters	Drinking Water	340	0.3%
Losses		Drinking Water	9,568	7.8%
Total:			**121,993**	**100%**

Note:

1. Institutional and Governmental water usage is included in the Commercial use type.

Figure 4-2 shows the historic volume of the City's raw surface water used for groundwater recharge since 2000. Over the last 20 years (2000–2020), the average annual intentional recharge of surface water was 49,240 AFY. Total recharge has ranged from a high of 82,900 AF in 2019 and a low of 19,700 AF in 2015. Also, total recharge volumes in 2016, 2017, and 2019 were three of the highest volumes in the last 20 years. The increases were due to over 30% increase in recharge at City basins from the addition of several basins (Nielsen, Fancher) and proactive maintenance of basins to maximize percolation capacity. The annual variability between years is caused by several factors, including basin availability, water delivery season, pond maintenance, or length of wet seasons.

Figure 4-2. Historic Recharge of City Surface Water



4.2.4 Projected Water Use

4.2.4.1 Land Use Projections

The potable demand projections through 2045 for normal water use follow the methodology for land use-based projections described in Appendix K of the 2020 Urban Water Management Plan (UWMP) Guidebook. Under this methodology, existing land use and demand is 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 Sphere of Influence (SOI) were assumed to be served by the City by buildout for conservative planning purposes. **Table 4-3** lists the land use acreage by land use category for the 2020 and buildout 2056 water service areas.

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 4-3** shows the existing and projected land use by customer class used to develop the projections.

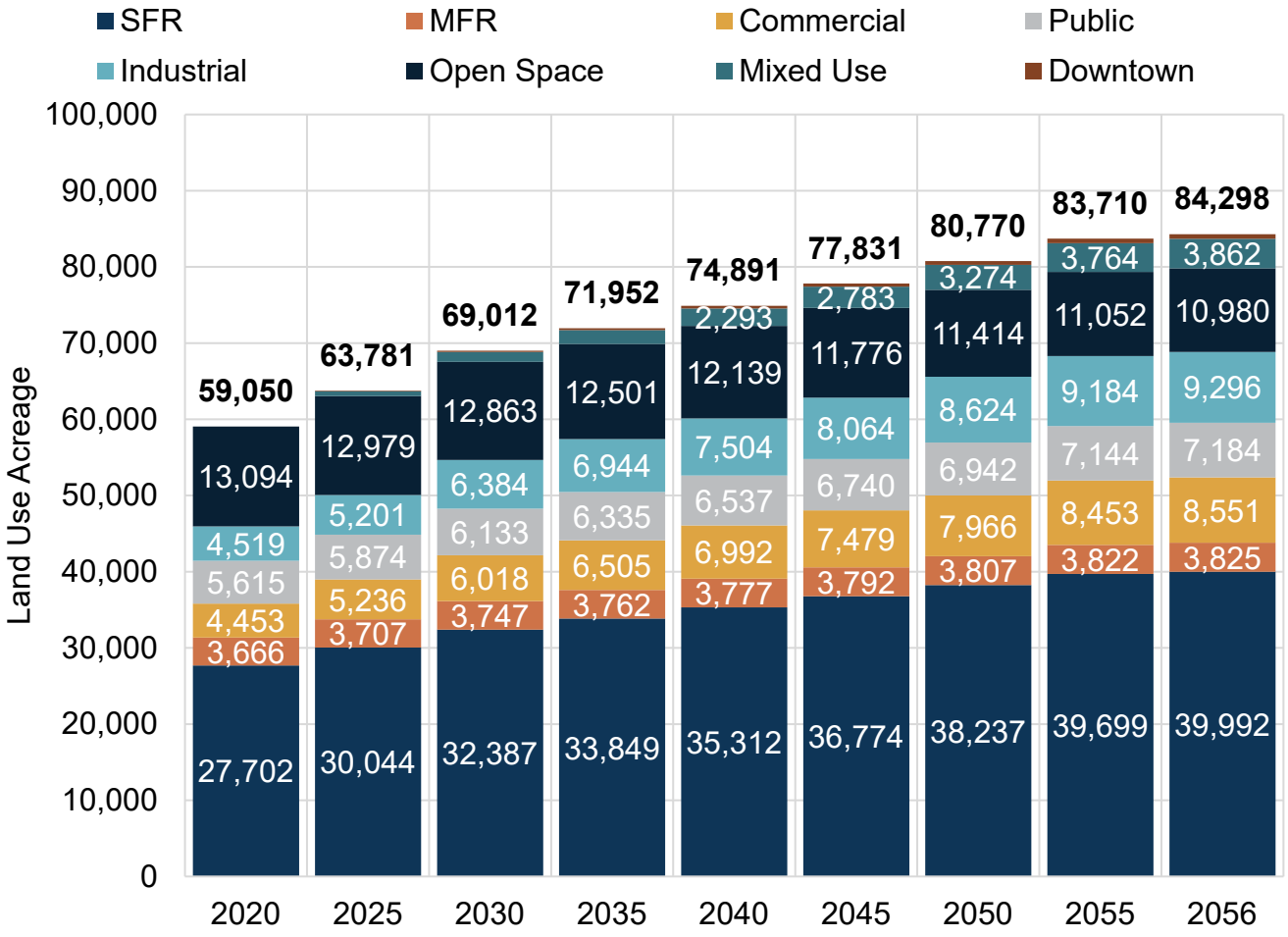
Table 4-3. Existing and Future Water Service Area Acreage

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%**

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 and unserved areas outside the City limit 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.

Figure 4-3. Existing and Projected Land Use



Note: Acreage for Mixed-use and Downtown land use types are not shown every year for clarity, but are included in the total acreage value.

4.2.4.2 Demand Factors and Future Savings

Land use-based water demand factors were developed using 2018 metered consumption data matched to 72 categories of land use 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 now required as part of the CPC. The passive conservation savings are projected to be greater for existing customers than future customers because future customers are already assumed to have a lower water demand factor and meet the plumbing code.

Future savings due to passive conservation were developed using the Alliance for Water Efficiency (AWE) Water Conservation Tracking Tool. The Tracking Tool is an Excel tool that can

incorporate water service area-specific data to estimate natural replacement rates of fixtures and future savings based on the CPC.

Table 4-4 lists the passive conservation savings assumption incorporated in the potable demand projections. Existing unit demand factors are reduced by the percentages listed to develop the future development unit demand factors. As shown in the table, this assumes future residential and non-residential dwelling units are 10% and 5% more water efficient, respectively, than existing dwelling units due to changes in the plumbing code and ever-increasing new water efficient technology. **Table 4-5** compares the total potable demand projections without the estimated savings due to passive conservation from 2025–2045.

Table 4-4. Passive Conservation Savings Assumptions

LAND USE TYPE	FUTURE DEVELOPMENT UNIT DEMAND FACTOR REDUCTION[1]	EXISTING DEVELOPMENT ANNUAL PASSIVE CONSERVATION SAVINGS[2]	FUTURE DEVELOPMENT ANNUAL PASSIVE CONSERVATION SAVINGS[3]
Residential/Mixed Use	10%	0.20% per year	0.04% per year
Commercial/Downtown	5%	0.05% per year	0.01% per year
Public	5%	0.05% per year	0.01% per year
Industrial	5%	0.05% per year	0.01% per year
Open Space/ Landscape Irrigation	0%	0% per year	0% per year

Notes:

1. Existing (2020) unit demand factors are reduced by the percentages listed to develop the future development unit demand factors.
2. Existing development annual passive conservation savings were developed using the AWE Water Conservation Tracking Tool.
3. Future development passive conservation savings are assumed to be one-fifth the rate of existing development passive conservation savings.

Table 4-5. Projected Future Savings for Potable Demands, AF

	2025	2030	2035	2040	2045
Total Potable Demand with no conservation	137,521	149,361	157,204	165,047	173,160
Estimated Passive Conservation	1,017	2,005	2,994	3,973	5,213
TOTAL POTABLE DEMAND WITH PASSIVE CONSERVATION	**136,504**	**147,356**	**154,210**	**161,074**	**167,947**

4.2.4.3 Demand Projections

Table 4-6 provides the projected demands by use type based on the methodology described above. **Table 4-7** includes the projected raw surface water used for groundwater recharge through the planning period for normal years. The City intends to recharge an average of 60,000 AFY beyond 2020, corresponding with the average recharge volume from 2016 through 2020, and gradually increase recharge by about 540 AFY each year. In 2025, the normal year groundwater recharge is projected to be 62,700 AFY and will continue to increase to 73,500 AFY by 2045. The actual volume recharged is based on the available surface water supplies each year, as well as available basin capacity and other factors, and may be lower in dry years or higher in wet years.

Table 4-6. Projected Demands for Water: Potable (DWR 4-2R)

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE				
		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		19,052	21,135	22,587	24,041	25,496
Industrial		7,410	9,003	9,922	10,841	11,758
Institutional/ Governmental	See Note 1					
Landscape		4,490	5,035	5,422	5,809	6,196
Other	Travel Meters	200	200	200	200	200
Losses		10,097	10,900	11,408	11,917	12,426
TOTAL:		**136,504**	**147,356**	**154,210**	**161,076**	**167,947**

Note 1: Institutional and Governmental water usage is included in the Commercial use type.

Table 4-7. Projected Demands for Water: Non-Potable (DWR 4-2R)

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE				
		2025	2030	2035	2040	2045
Groundwater Recharge	Raw-Water	62,700	65,400	68,100	70,800	73,500
TOTAL:		**62,700**	**65,400**	**68,100**	**70,800**	**73,500**

4.2.4.4 Future Conservation

In 2018, following the unprecedented drought, California Legislature established a framework centered on "Making Water Conservation a California Way of Life." The goal was to help the State better prepare for droughts and climate change by establishing statewide water efficiency standards and incentivizing recycled water (California Department of Water Resources, State Water Resources Control Board, November 2018). The resulting legislation of Senate Bill 606 and Assembly Bill 1668, along with future regulations, will have impacts on water providers over the coming years, requiring indoor, outdoor, and commercial, industrial, and institutional water use goals, water loss standards, annual water budgets, and documented preparation for long-term water shortages. All the water use goals together will form a total urban water use objective specific for each water agency. The Department of Water Resources (DWR) has provided recommended standards for indoor residential water use, and other urban water use goals are currently being developed and are expected to be released in late 2021. The State Water Resources Control Board is anticipated to adopt the element that includes the total water use objective in 2022, and agencies will begin reporting their water use in accordance with their urban water use objective beginning in 2024, with compliance anticipated by 2027. Because most of the water use goals are unknown, and none has been adopted by the State, the City's total urban water use objective is unknown and was not incorporated into the demand projections herein. However, the City is tracking the water use efficiency standards and goals and is aware it may need to implement additional conservation above what is presented in these projections to meet its total urban water use objective as mandated by the State in the future. The City is considering these higher conservation demand projections within a demand envelope in the current Metro Plan update.

4.2.5 Characteristic Five-Year Water Use

A new component of the UWMP is to prepare a five-year drought risk assessment (DRA) to evaluate water service reliability for a drought lasting five years from 2021–2025. The five-year DRA assumes potable water demand is unconstrained, and the City will continue to meet all projected potable demands. The raw water demand varies based on the availability of surface water supplies for groundwater recharge. The recycled water supply is not impacted by the drought, and recycled water demands are at normal year projections for the five-year drought. Projected water demands for years 2021–2025 for the DRA are included in **Section 7.2**.

4.3 Water Use for Lower Income Households

The Fresno Council of Governments (COG) prepared an update to the Regional Housing Needs Allocation (RHNA) to cover the period of January 1, 2015–December 31, 2023. The City subsequently developed its own Housing Element based on the COG RHNA for the planning period of December 31, 2015–December 31, 2023. The City's current Housing Element was adopted on April 13, 2017.

The City's Housing Element specifies the City will develop 8,955 new housing units through 2023 for extremely low, very low, and low income levels (City of Fresno Development and Resource Management Department, 2017). The City's Planning and Development Department prepares Housing Element Annual Progress Reports to report the progress of the RHNA and housing goals. The City of Fresno 2019 Housing Element Annual Progress Report details that 909 lower income units are approved or permitted (City of Fresno Planning and Development Department,

2020). The remaining number of lower income units needed over the RHNA 2013–2023 period, when subtracting the approved and permitted units, is 8,046.

Table 4-8 includes the Housing Element identified available single-family and multifamily acres to be developed and dwelling units for Extremely Low, Very Low, Low, Moderate, and Above Moderate income levels (City of Fresno Development and Resource Management Department, 2017). This data was used to determine the number of acres of both single-family and multifamily land use that needs to be developed by 2023 to meet the remaining 8,046 lower income units target for RHNA. The identified acres needed for low-income development by 2023 was applied to the average water demand factor for single-family and multifamily land uses to project the lower income water demands through 2023 to meet RHNA, shown in **Table 4-8**.

Table 4-8. Lower Income Dwelling Units and Acres to be Developed through 2023 and Estimated Water Demand

FRESNO HOUSING ELEMENT	SINGLE-FAMILY RESIDENTIAL	MULTIFAMILY RESIDENTIAL	TOTAL
Acres Available for Low-Income Development	3,163.6	1,310.9	4,474.5
Total Dwelling Units	13,457	21,526	34,983
Dwelling Unit per Acre	4.25	16.42	
Dwelling Unit Needed to Meet RHNA	3,095	4,951	8,046
Acres to be developed to Meet RHNA	727.6	301.5	1,029.1
Average Water Demand Factor (AF/ Acre)	2.54	5.13	
Low-Income Demand to meet RHNA from years 2020 – 2023 (AF)	1,847	1,545	3,392
Annual Low-Income Demand to meet RHNA (AFY)	**462**	**386**	**848**

Based on the estimated low-income water demand to meet the RHNA requirements by 2023, the annual projected low-income households demand is 462 AFY for single-family residential and 386 AFY for multifamily residential. For the purposes of this plan, the current RHNA projected low-income growth and water demands was applied through the UWMP planning period of 2045 and is presented in **Table 4-9**. However, lower income demands beyond 2023 will be based on the next Housing Element and RHNA Update expected in 2023 and may change in the future. All housing units and associated population are included in the adopted General Plan, and the demands for these units that occur within the water service area boundaries are included in the future water demands presented in this plan.

Table 4-9. Lower Income Household Projected Water Demands

LOW INCOME DEMAND	2025	2030	2035	2040	2045
Single-Family Residential Demand	2,308	2,308	2,308	2,308	2,308
Multifamily Residential Demand	1,932	1,932	1,932	1,932	1,932
TOTAL (AF)	**4,240**	**4,240**	**4,240**	**4,240**	**4,240**

4.4 Climate Change Considerations

Climate change impacts were considered in the North Kings Groundwater Sustainability Plan (NKGSP) based on DWR's Guidance for Climate Change Data Use during Groundwater Sustainability Plan (Department of Water Resources, 2018) and the related Sustainable Groundwater Management Act climate change website.[1] As documented in the NKGSP, the DWR climate change datasets were developed for the California Water Commission's Water Storage Investment Program (WSIP), are consistent with other DWR programs, are based on the best available science, build on previous efforts, incorporate the latest advances in projections, and follow the Climate Change Technical Advisory Group guidance (Provost & Pritchard, November 2019).

Changing precipitation and evapotranspiration (ETo) rates are expected to have the greatest impact on future demands, especially for outdoor water use. The WSIP climate change data sets estimate minimal changes to precipitation due to climate change from the historic period. The same datasets predict the ETo rate estimates with climate change will increase 3% by 2030 and up to 8% by 2070. More specifically, the ETo rate is predicted to increase the most in typically low ETo months (winter) and when irrigation is limited. The ETo rate is also predicted to be only slightly higher than historic in warmer months during the irrigation season. While higher ETo rates would increase irrigation demands, they are not anticipated to substantially impact the City's urban water use. The climate change impacts to supply sources are discussed in the supply chapter of **Section 6.8.2.1**.

[1] https://data.cnra.ca.gov/dataset/sgma-climate-change-resources

CITY OF FRESNO

5 SBX7-7 Baseline, Targets and 2020 Compliance

Senate Bill x 7-7 (SBx7-7) was signed into law in 2009 and requires the State to achieve a 20% reduction in per capita water use by December 31, 2020, with an interim target of 10% reduction by December 31, 2015.

IN THIS SECTION

- Baselines & Targets
- 2020 Compliance

The legislation requires each urban water supplier to develop and include in its Urban Water Management Plans (UWMPs) estimates of: 1) *baseline* daily per capita water use; 2) daily per capita water use *target*; 3) daily per capita water use *interim target*; and 4) *compliance* daily per capita water use. The UWMP must also include the basis for determining the estimates, with references to supporting data.

The Department of Water Resources (DWR) developed the Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use Guidebook (GPCD Methodologies Guidebook) to provide appropriate methodologies and criteria guidance (California Department of Water Resources, Feb 2016).

The baseline and 2020 per capita water use targets were calculated in the 2015 UWMP and are provided in **Appendix C**. There have not been significant changes in the City's service area since 2015, thus the calculations included in the 2015 Plan are still valid for compliance in this 2020 UWMP.

5.1 General Requirements for Baseline and Target

Methodologies consistent with those described in the GPCD Methodologies Guidebook were used to develop baselines and targets. The selected procedure used to develop the required SBx7-7 estimates includes the following basic steps:

1. Calculate baseline water use, which is the average gross daily water use per capita, reported in gallons per capita per day (GPCD), based on gross water use and service area population for a continuous 10-year period ending no earlier than December 31, 2004.
2. Calculate urban water use target using one of the four methods described below.
3. Check and confirm the urban water use target using the five-year running average.
4. Calculate the interim urban water use target (equal to the average of the baseline and confirmed urban water use target).
5. Calculate the compliance daily per capita water use (equal to the gross daily water use per capita during the final year of the reporting period).

DWR allows the urban water supplier to choose one of four different methods to calculate the urban water use target in Step 2 above.

- **Method 1** involves calculating the target based on 80% of baseline daily per capita water use and the interim target based on 90% of the baseline daily per capita water use.
- **Method 2** involves calculating the per capita daily water use by using the sum of performance standards applied to indoor residential use, landscaped area water use, and commercial, industrial, and institutional uses.
- **Method 3** calculates the water use target as 95% of the applicable state hydrologic region target as stated in the draft 20x2020 Water Conservation Plan.
- **Method 4** is an approach developed by DWR that uses a spreadsheet to calculate estimated water savings factors to estimate targets.

The City selected Method 1 for determining its 2015 Interim and 2020 Final urban water use targets during the preparation of its 2010 UWMP. This selection was made after reviewing the four alternative methods available. Rather than duplicating the evaluation for this plan update, the reader is directed to Appendix I of the City's 2010 UWMP for details, as the previous City adopted evaluation is still applicable and results in the same target method selection.

5.2 Service Area Population

The City's 2020 service area population was estimated using the DWR Population Tool consistent with DWR Methodology 3 (Service Area Population) and the 2015 UWMP. Shapefiles of the City's water service area were loaded into the DWR Population Tool along with available residential service connection numbers to develop service area populations for the corresponding census years. The DWR Population Tool, provided in **Appendix F**, estimated the City's water service area population is 550,217. The DWR Population Tool provides a population based on the 2000 and 2010 census data and, published effective as of April 1 of the census year, the water service area during each census year and the number of water service connections. For the 2020 population, the number of services from December 31, 2020, was used, and the 550,217 population is estimated as of the end of 2020.

5.3 Gross Water Use

The City's gross water use is comprised of surface water contracted for delivery of allocated supplies from USBR and FID and groundwater produced by its municipal wells. The basis of gross water use are the meters installed at the City's North Fresno Wastewater Reclamation Facility, Southeast Surface Water Treatment Facility, and T-3 Water Storage and modular Surface Water Treatment Facility, and each of its municipal groundwater wells, which are equipped with flow meters. DWR Methodology 1 (gross water use) provides the opportunity to make adjustments and deductions in the reported gross water use for factors such as: meter errors, changes in distribution storage, indirect recycled water use, agricultural water use, and process water use. The City's gross water use has not been adjusted for any of these factors. Therefore, the total water use shown in **Table 4-2** is the City's gross water use.

5.4 Baselines and Target Summary

The City's 2015 UWMP reviewed and updated the 10-year and five-year Baseline Daily Per Capita Water Use and 2020 Target, included in **Table 5-1**. The continuous time period used in the 2015 UWMP for the 10-year baseline period is 1999–2008 and has an associated average daily per capita water use of 309 GPCD. The continuous time period that was used in the 2015 UWMP for the five-year target confirmation baseline period was 2003–2007, which has an associated average daily per capita water use of 304 GPCD. The confirmed 2020 target was established as a 20% reduction from the 10-year baseline per capita use and is 247 GPCD. Refer to **Chapter 5** of the City's 2015 UWMP for more information on how the baselines and targets were developed.

Table 5-1. Per Capita Water Use Baseline and 2020 Target

BASELINE PERIOD	TIME PERIOD	AVERAGE BASELINE GPCD (GPCD)	CONFIRMED 2020 TARGET (GPCD)
10 Year	1999 – 2008	309	247
5 Year	2003 – 2007	304	

5.5 2020 Compliance Daily Per-Capita Water Use (GPCD)

This section presents the procedure used to meet the requirements of SBx7-7 as defined in the Water Conservation Act of 2009 as incorporated into Division 6 of the California Water Code, commencing with Section 10608 of Part 2.55.

5.5.1 Meeting the 2020 Target

The determination of 2020 target compliance is based on gross water use for the 2020 calendar year, which was 121,993 acre-feet (see **Table 4-2**), and a service area population of 550,217 as of December 31, 2020 (see **Table 3-1**). The resultant actual per capita water use for the City in 2020 was 198 GPCD. As such, the City has met and exceeded the 2020 target of 247 GPCD.

The overall water usage patterns of the City have been greatly reduced due to its conservation measures and metering of all services. Prior to January 2013, nearly all of the City's single-family residential water customers had been billed on a monthly flat rate structure; they were unaware of the water they actually used and had no real incentive to conserve water. As of January 2013, the City has completed its residential water meter program, which installed approximately

113,000 water meters for single-family homes. With the completion of this program, all the City's water service connections are now metered, and the City and its customers can work more closely together to optimize water use. Since completion of the project, residential water demands have dramatically decreased. Attainment of the 2020 target has been influenced by the City's investments in metering and the proactive conservation education and outreach to customers. These factors have played a significant role in the City's ability to meet and surpass the 2020 target. In the future, the City will need to remain diligent in monitoring water use and continuing incentive programs to further reduce water consumption. These efforts are necessary so when the current strict reduction requirements are lifted, all water users remain diligent in avoiding unnecessary use of water and upgrade fixtures to eliminate water wasting.

5.5.2 2020 Adjustments to 2020 Gross Water Use

No extraordinary events or economic adjustments have taken place that would cause any adverse effects with regards to overall water usage. As was previously mentioned, the City did not make any adjustments to the 2020 gross water use as is permissible with Water Code 10608.24 cited above.

CITY OF FRESNO

6 Water Supply Characterization

This chapter identifies and quantifies, to the extent practicable, the existing and planned sources of water supplies for the City through 2045.

The City relies on groundwater from the North Kings Subbasin; surface water from 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. This chapter also provides a discussion of supply availability and reliability under normal supply conditions (normal water year), during a single dry year, and for a drought lasting five years.

IN THIS SECTION

Water production in the City has consisted of 100% groundwater prior to the commissioning of the City's first surface water treatment facility (SWTF) in 2004. Since 2004, the City has invested in expanding its surface water treatment capabilities and now has three SWTFs that provide approximately half of all potable water demands in the service area.

6.1 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.

6.1.1 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 (sq mi).

6.1.1.1 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 Mountains, 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 (California Department of Water Resources, January 2006). The Kings Subbasin is split into seven Groundwater Sustainability Agency (GSA) management areas, with Fresno located in the North Kings GSA. **Figure 6-1** illustrates the location of the City within the Kings Subbasin.

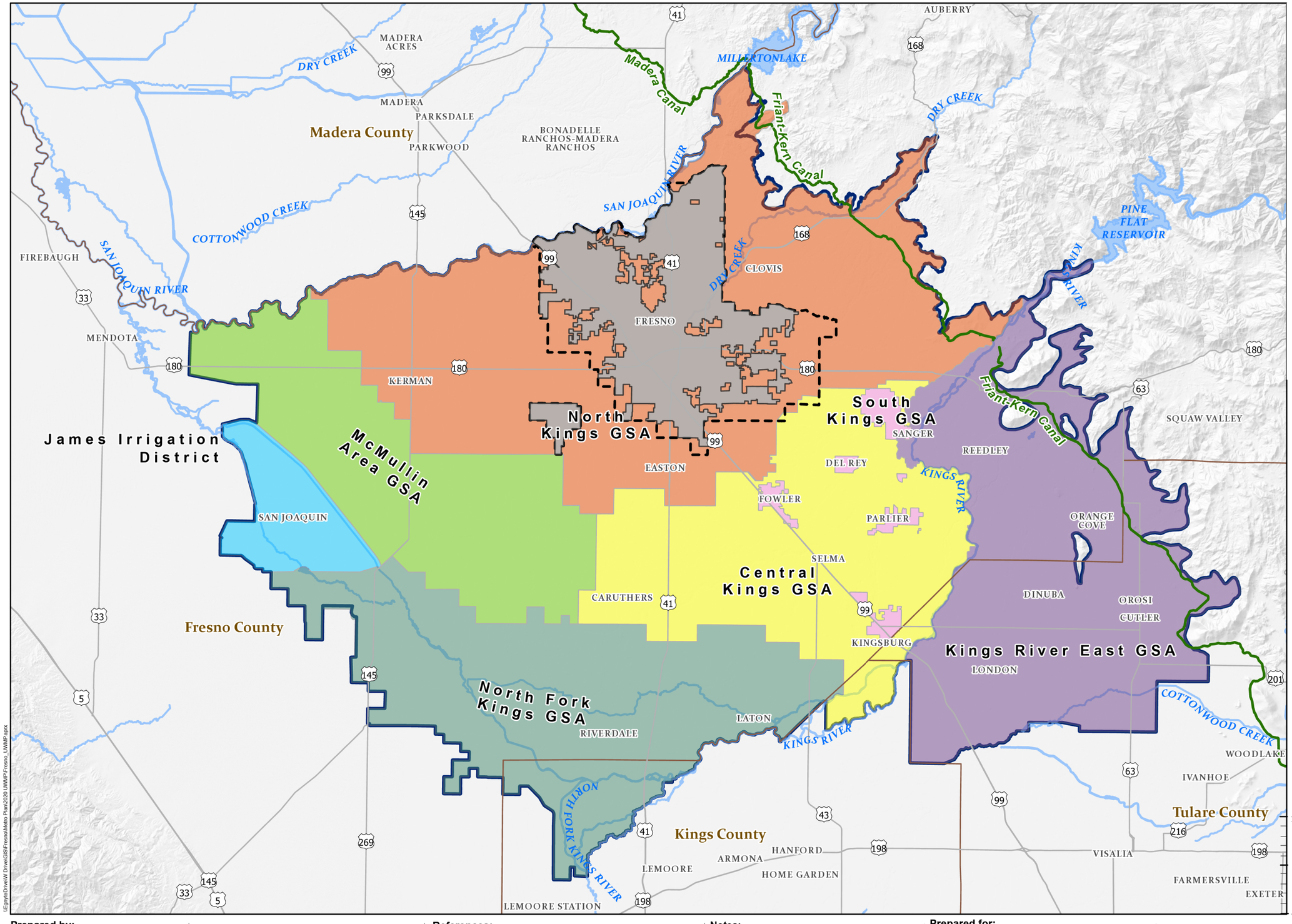
6.1.1.2 Area Geology

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** presents an idealized hydrogeologic cross-section that illustrates the general depth of various lithologic features within the Kings Subbasin, near the City.

Coarse-grained stream channel deposits, associated with deposits by the ancestral San Joaquin and Kings Rivers, underlie much of northwest Fresno (Layer 3 and 4 in **Figure 6-2**). 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 the City.

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 (Layer 5 in **Figure 6-2**). Substantial groundwater has been produced and utilized from these depths by the City. However, deeper deposits located in the southeastern and northern portions of the City have produced less groundwater.

There are also reduced deposits in the northern and eastern portions of the City, 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.

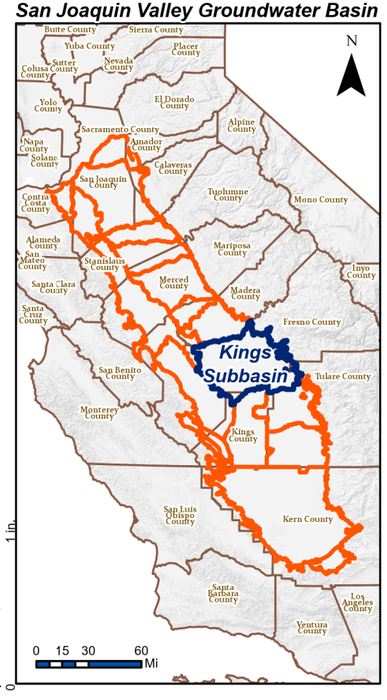


Legend

Groundwater Sustainability Agency

- Central Kings GSA
- James Irrigation District
- Kings River East GSA
- McMullin Area GSA
- North Fork Kings GSA
- North Kings GSA
- South Kings GSA
- Fresno City Limits
- Fresno Sphere of Influence
- Kings Groundwater Subbasin
- Major Watercourses
- Lakes and Reservoirs
- County Boundary
- Canal

San Joaquin Valley Groundwater Basin



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References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum North American 1983

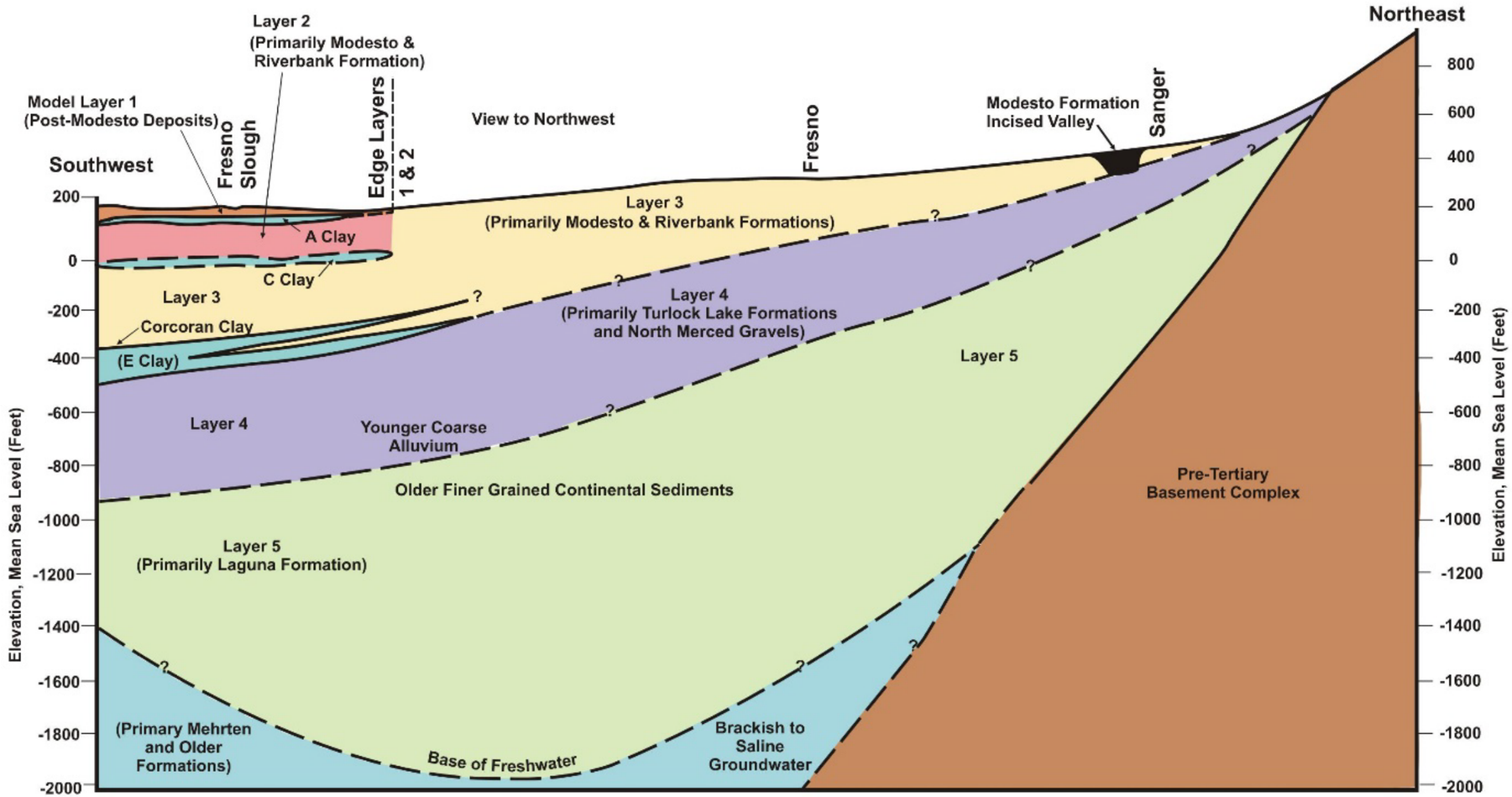
Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-1. Kings Subbasin

Figure 6-2. Kings Groundwater Subbasin Conceptual Hydrogeologic Cross-Section, Southwest-Northeast



Primary Sources

Croft, 1969
Muir, 1977
Lettis, 1982
Page and LeBlanc, 1969
Cehrs, et. al. 1980
Wiseman, et. al: 2002b

Figure from *Kings Basin Integrated Hydrologic Modeling Hydrogeologic Investigation Technical Memorandum*, dated February 2006, prepared by Brown & Caldwell and Wrime.

6.1.1.3 Aquifer Characteristics

The aquifer beneath the City 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 6-3** presents 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 the City have wells with higher specific capacities.

6.1.2 Groundwater Management

In 2014, a three-bill legislative package was signed into law, composed of Assembly Bill 1739, Senate Bill (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 and participating agencies:

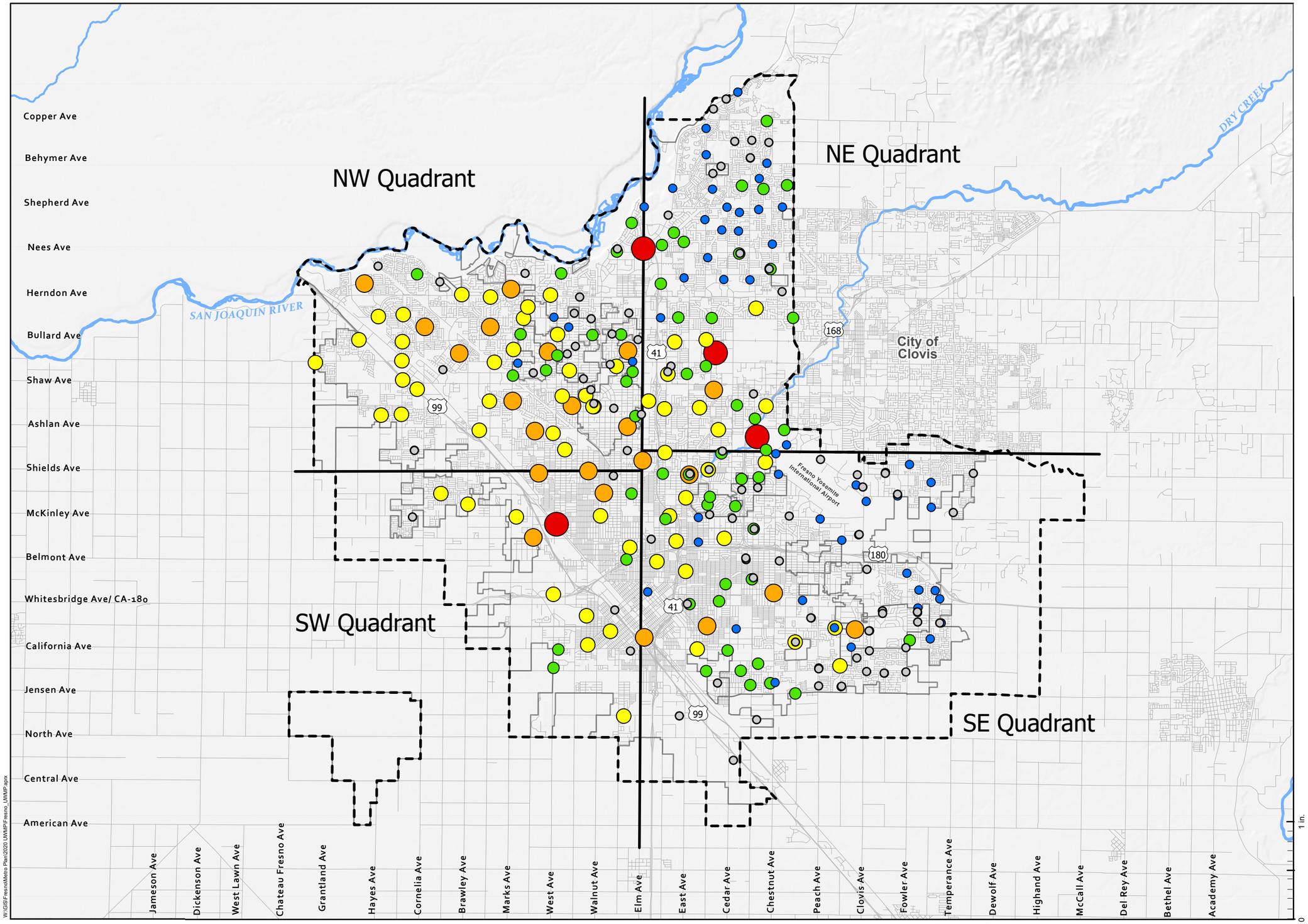
- Fresno Irrigation District (member)
- City of Fresno (member)
- City of Clovis (member)
- City of Kerman (member)
- County of Fresno (member)
- Bakman Water Company (participating agency)
- Biola Community Services District (member)
- Garfield Water District (member)
- International Water District (member)
- Fresno Metropolitan Flood Control District (participating agency)

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

- 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.

The North Kings GSA prepared and submitted its GSP in January 2020 (Provost & Pritchard, November 2019) and is awaiting DWR review by January 2022.



Legend

Well Specific Capacity (gpm/ft)

- Unknown
- < 20
- 20 - 50
- 50 - 100
- 100 - 200
- 200 - 450
- Groundwater Quadrant Divide
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

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Prepared by: WSC

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0 3,500 7,000 14,000 US Feet

References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

1. Well specific capacity was provided by the City and calculated using 2020 data.

Prepared for: City of FRESNO Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-3. City Wells Specific Capacity

As required by SGMA, the North Kings 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 GSP is provided in **Appendix G** of this UWMP[1].

6.1.3 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.

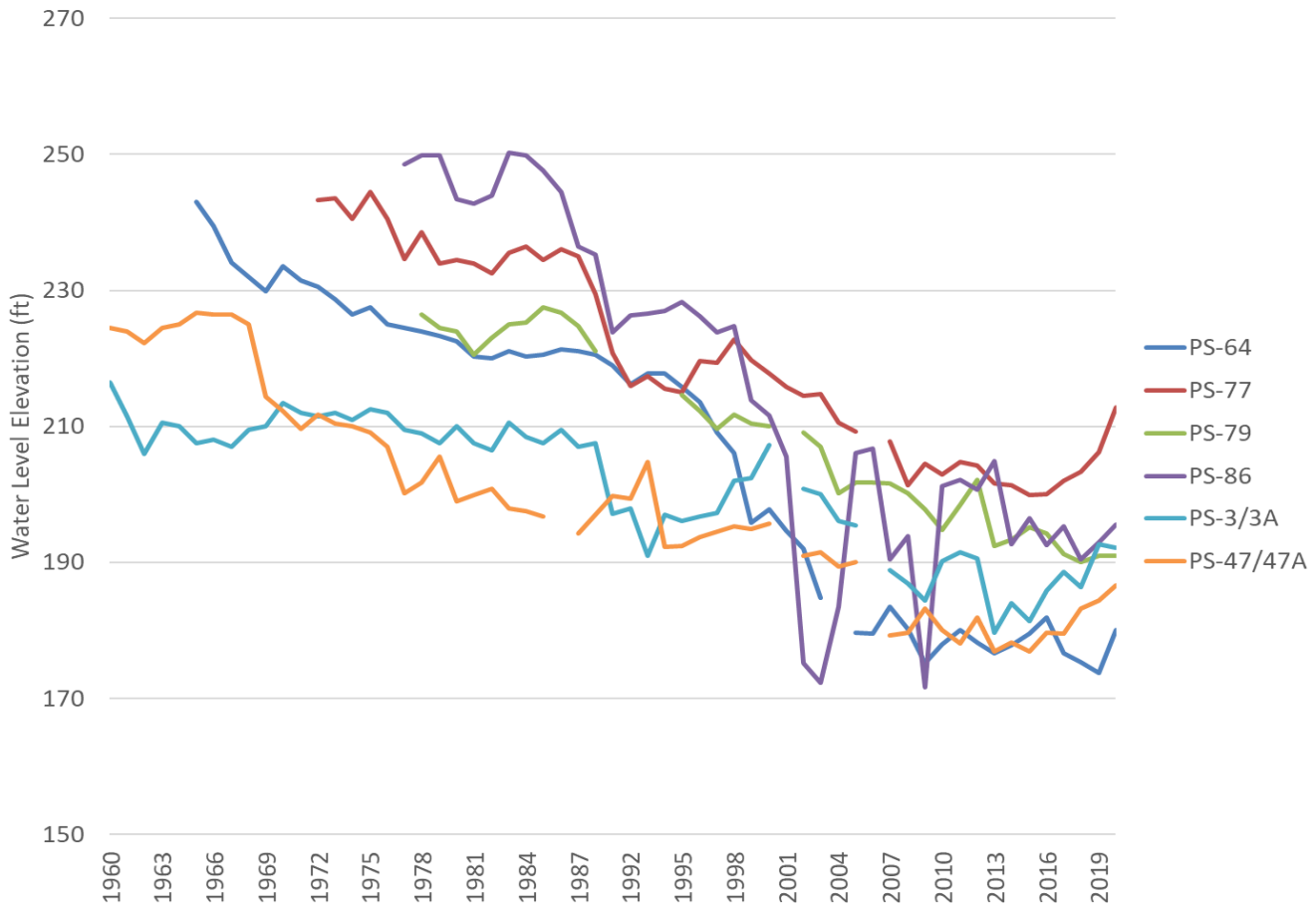
The Kings Subbasin groundwater aquifer supplies the City, other municipalities, agriculture, and rural residential areas with a consistent source of water. Like much of the Kings Subbasin, groundwater levels beneath the City were relatively shallow at 25 feet below ground surface in 1940, prior to the start of World War II (Fresno City Water, Engineering Department, 1940). 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 (John Carollo Engineers, 1969). 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 the City. With the reduced pumping due to higher reliance of surface water, the groundwater levels have begun to increase in certain areas of the City in the last few years. **Figure 6-4** provides a depiction of the City's depth to groundwater for six representative wells across the Sphere of Influence (SOI) since 1960.

The City expects to continue to operate its three SWTFs and pump groundwater at a lower rate than historically so that the groundwater basin can recover. One of the primary objectives for the City as described in its current Metro Plan is to maximize the use of available surface water

[1] Available at https://www.northkingsgsa.org/groundwater-sustainability-plan/

treatment supplies to reduce overall reliance on groundwater. Additionally, as described in **Chapter 4**, the City plans to continue their groundwater recharge program to protect the groundwater basin. **Figure 6-5** shows the active and proposed recharge basins and FID Canals the City utilizes as part of groundwater recharge program.

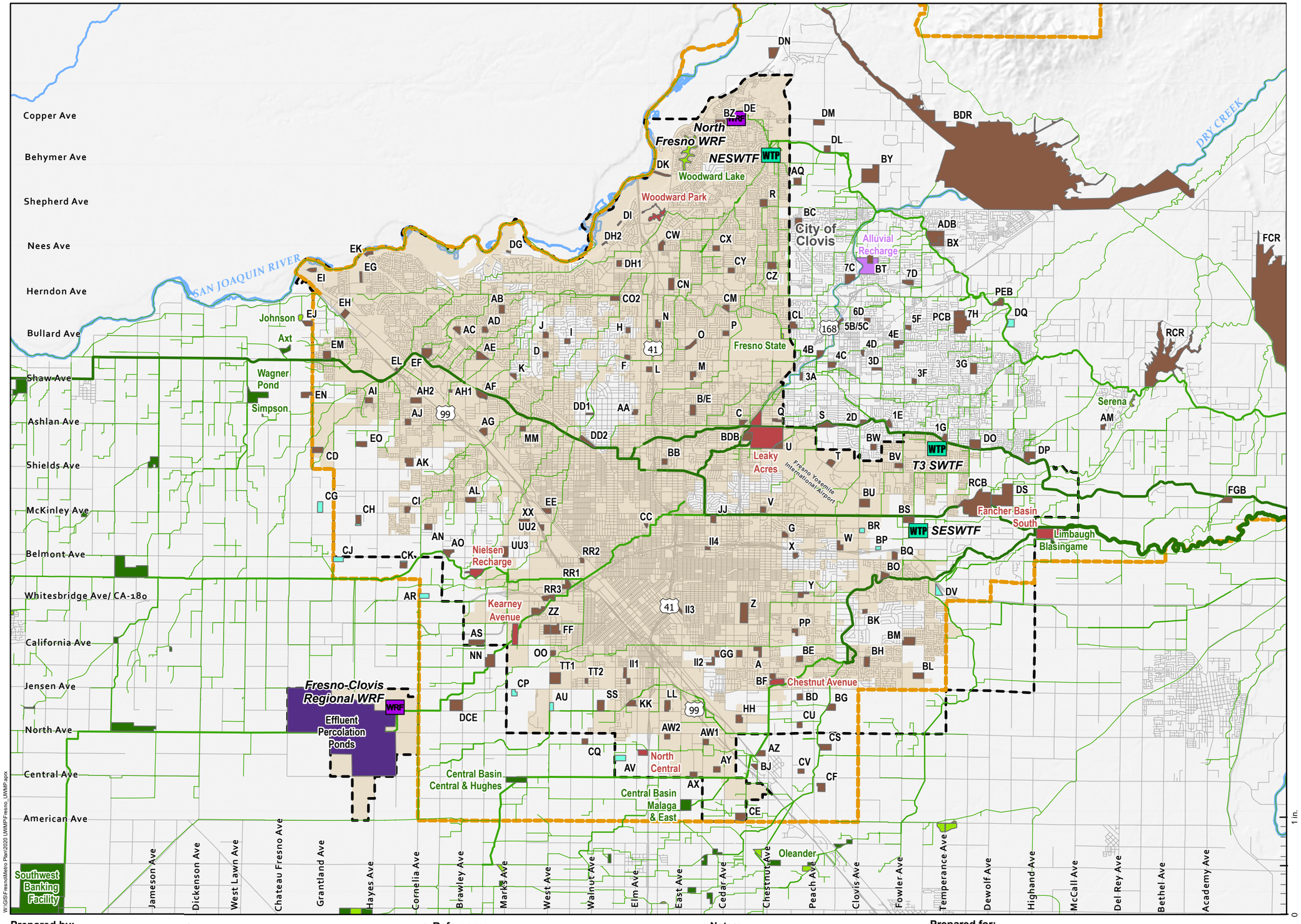
Figure 6-4. Time Series of Groundwater Levels at Representative Wells



6.1.4 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 (California Department of Water Resources, January 2006). Total dissolved solids (TDS) concentrations rarely exceed 600 mg/L and range from 200 to 700 mg/L (California Department of Water Resources, January 2006). 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 presents the general location of regional plumes and major point sources within the City. 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 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.



Legend

Groundwater Recharge Basins

- FID Basin
- Privately Owned Basin
- City of Clovis Basin
- City of Fresno Basin
- RWRF Effluent Percolation Area
- FMFCD Basin
- FMFCD Proposed Basin
- FMFCD Boundary
- WRF Wastewater Reclamation Facility
- WTP Water Treatment Plant

FID Facilities by Capacity

- Less than 35 cfs
- 35 - 150 cfs
- 150 - 350 cfs
- 350 - 900 cfs
- 900 - 1500 cfs

- Fresno Sphere of Influence
- Fresno City Limits
- Streets

Recharge Basin Summary

Owner/ Operator	No. of Basins	Total Area (acres)
FID	25	2,900
Private Owner	8	300
City of Clovis	1	90
City of Fresno	11	450
City of Fresno RWRF	---	2,000
FMFCD (Existing)	166	8,500
FMFCD (Proposed)	12	140

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Prepared by: WSC

N

1:136,886

0 0.75 1.5 3 Mi

0 3,500 7,000 14,000 US Feet

References:

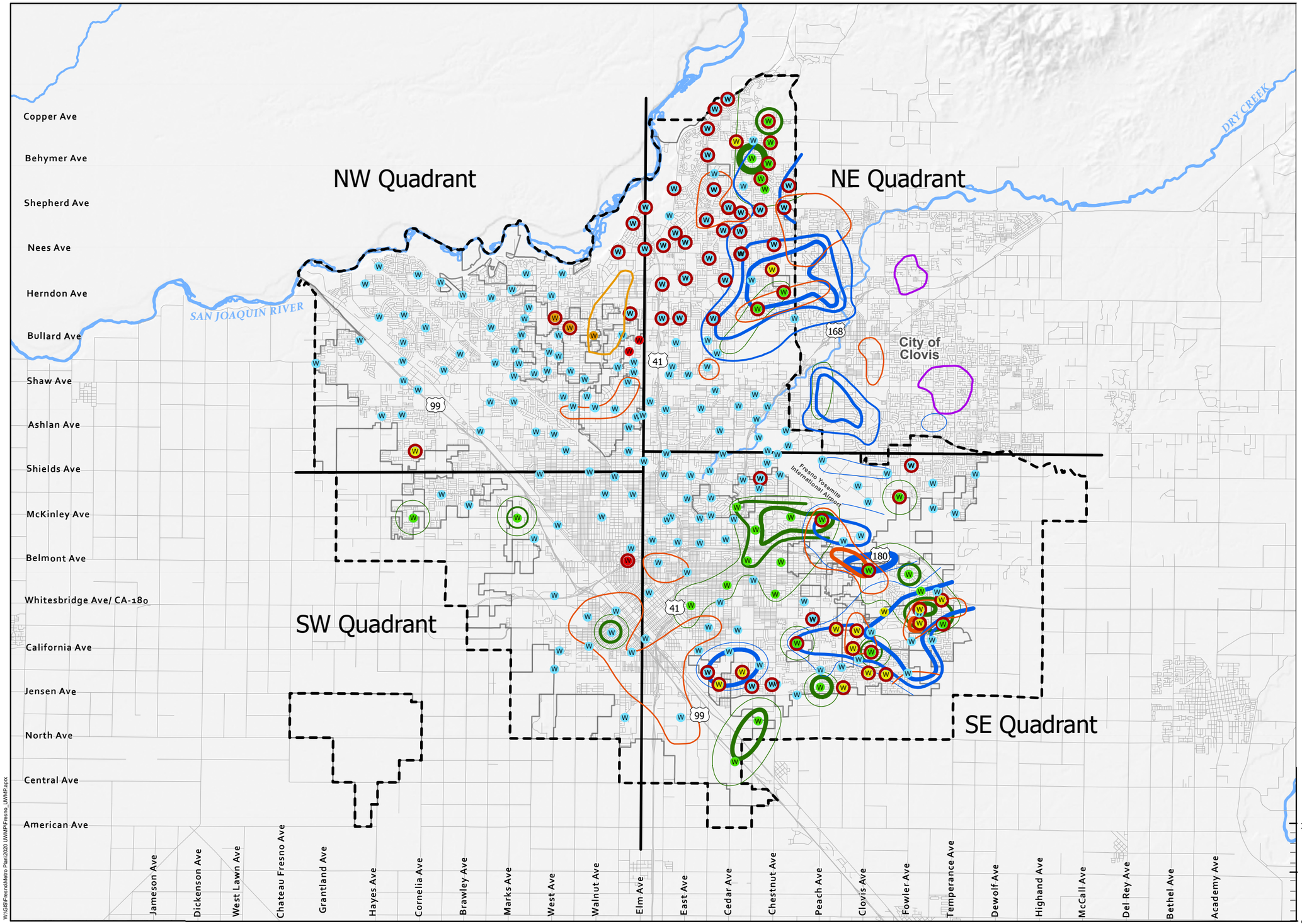
1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-5. Groundwater Recharge System



Legend

Nitrate-Nitrogen Contamination and Concentration

- 5 mg/L
- 10 mg/L

DBCP Contamination and Concentration

- 0.01 ppb
- 0.02 ppb
- 0.05 ppb
- 0.1 ppb
- 0.2 ppb

1,2,3-TCP Contamination and Concentration

- 5 ppt
- 10 ppt
- 20 ppt
- 50 ppt
- 100 ppt

Other Plumes

- TCE Plume
- EDB Plume (old)

Well Pumped to Control Contaminant Plumes

- DBCP
- PCE
- TCE
- TCP
- No Minimum Pumping
- Well Head Treatment
- Groundwater Quadrant Divide
- Fresno Sphere of Influence
- Fresno City Limits
- Streets

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Prepared by:

WSC

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0 3,500 7,000 14,000 US Feet

References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Notes:

1.A list of wells with treatment was provided by the City as of September 2020. Some wells share treatment and convey water via a raw water pipeline to another well's treatment site. Wellhead treatment types includes activated carbon for VOC/SOCs, air stripping for VOCs, blending, degassing tank, corrosion control treatment, H2S odor control, and manganese treatment, or a combination of such.

Prepared for:

City of FRESNO Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-6. Regional Groundwater Contamination

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 the figure, 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 plumes.

6.1.5 Estimated Groundwater Yield

As part of the ongoing 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 well water level readings on a grid basis. This work is ongoing, and the City reserves the right to update this analysis with more recent data when available.

Currently, the best 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 SOI (WRIME, 2007). 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.

6.1.5.1 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 (West Yost Associates, January 2014). 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 new General Plan now 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% urbanization, which would approximate the City's water system service area. **Table 6-1** shows estimated natural recharge through 2045.

6.1.5.2 Net Subsurface Inflow

Again, utilizing information developed from the IGSM, average net subsurface inflow into the SOI was characterized as being 64,800 AF annually for the period of 1964–2004. Applying the

previously described 73% 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 6-1** shows the estimated subsurface inflows for future years based on the land use growth presented in **Figure 4-3**. The City has historically benefitted from the net subsurface inflows and requires these flows for replenishment necessary to maintain the sustainable yield of the groundwater aquifer system.

6.1.5.3 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 (CH2MHill, 1992). Through cooperative agreements with Fresno Metropolitan Flood Control District (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 2000–2019; 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, City recharge of 82,993 AF was the maximum annual recharge attained during this period. The City has averaged over 60,000 AFY the previous five 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 6-1**.

Table 6-1. Components to Groundwater Yield for Normal Years

	QUANTITY (AFY)					
GROUNDWATER COMPONENT	**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**

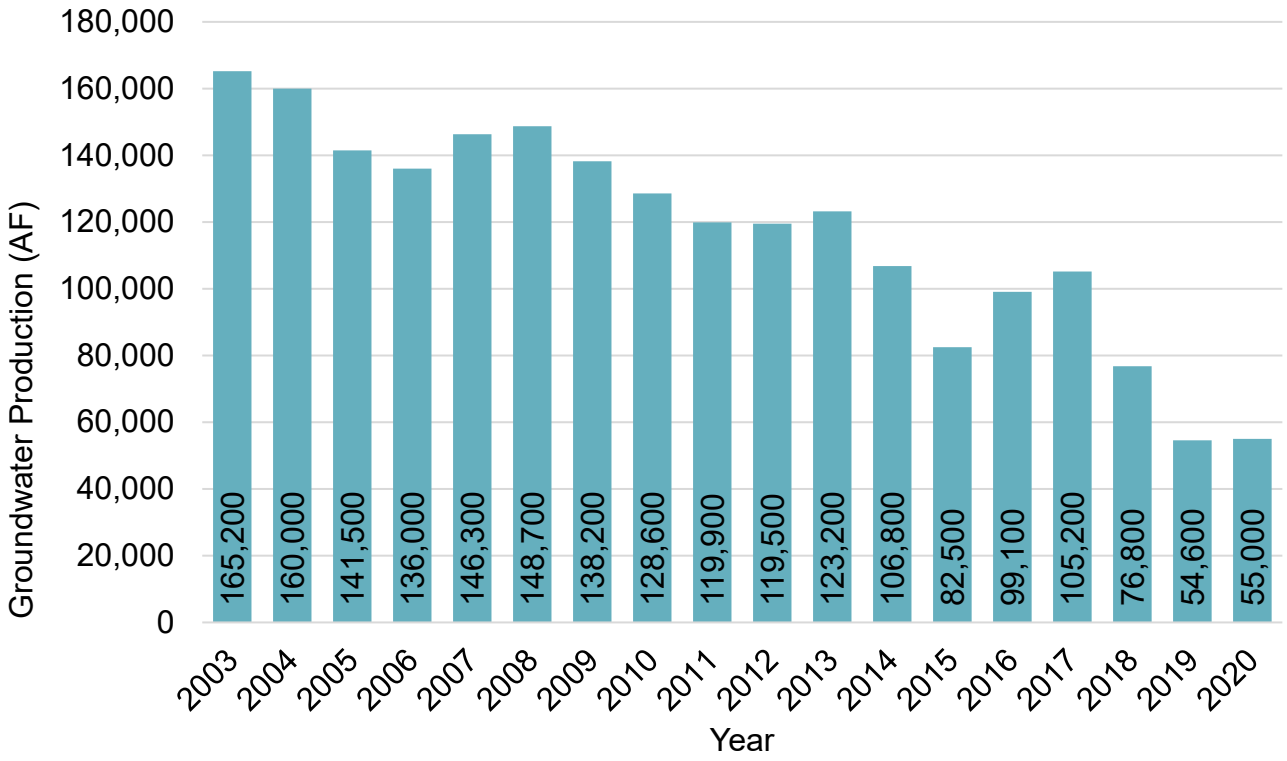
Notes:

1. Based on the Kings Basin IGSM and projected City land growth from **Figure 4-3** as discussed in **Section 3.1.1.**
2. Projected normal year intentional recharge from **Table 4-7**.

6.1.6 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 6-7** shows the historic groundwater pumping since 2003. As shown, pumping has dropped significantly since 2003, the City's peak year for groundwater production.

Figure 6-7. Historic Groundwater Production



6.2 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 the City. 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.

6.2.1 USBR Friant Division Contract Supply

The City, through an agreement originally executed in January 1961, secured a surface water supply from 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 this 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 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 less reliable than Class 1 water.

Class 1 water has historically been very reliable until the 2006 San Joaquin River Restoration Settlement Agreement between the Department 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, 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 6-2**. 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.

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 (History of SJRECWA Exchange Contractors, n.d.).

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 6-8** for CY. The availability and reliability of the City's surface water supplies through its USBR contract are discussed further in **Chapter 7**.

Table 6-2. Available USBR Simulated Allocation (1922–2003)

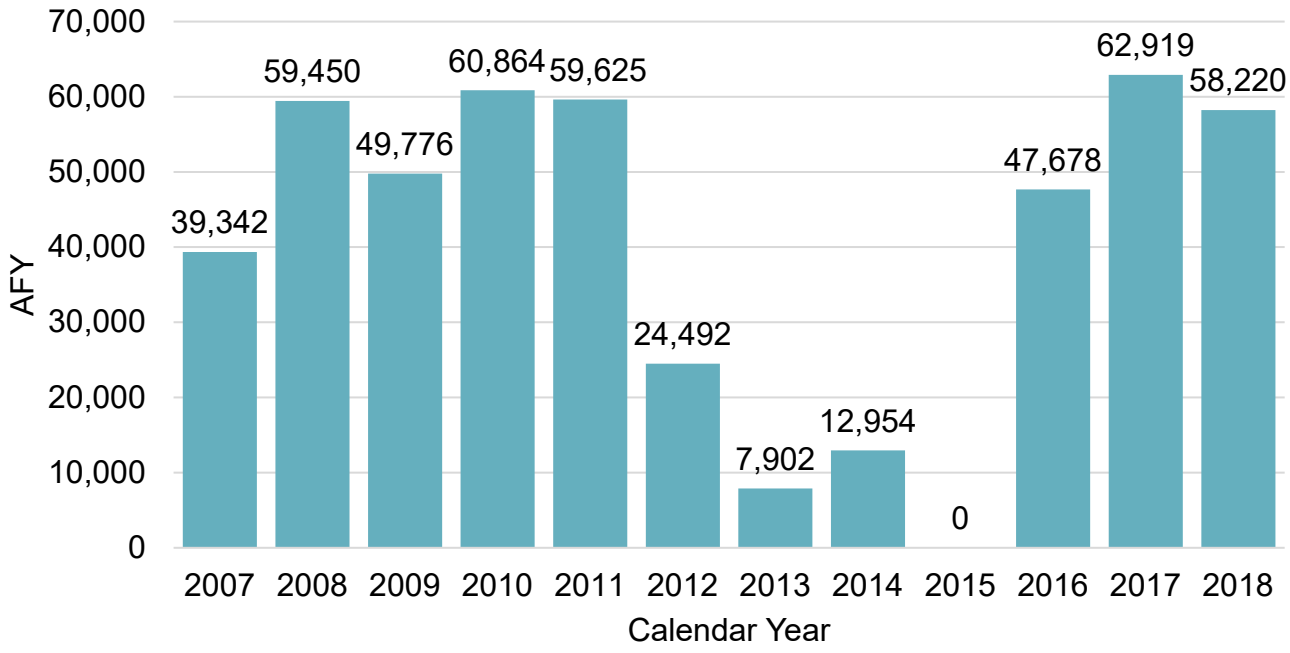
WATER YEAR TYPE	% OF YEARS OVER SIMULATION PERIOD OF DELIVERIES [1]	NUMBER OF YEARS IN THAT YEAR TYPE	RANGE OF ALLOCATION TO CITY (AF)	AVERAGE ALLOCATION TO CITY (AF)
Wet	Highest 20%	16	60,000	60,000
Normal-Wet	50% to 80%	25	60,000	60,000
Normal-Dry	20% to 50%	25	47,500 to 60,000	57,060
Dry	5% to 20%	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: 2006 Settlement Agreement

Notes:

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.

Figure 6-8. USBR Deliveries to City Since 2007



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.

6.2.2 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 is determined based on a methodology that was initially developed in 1917–1919 to established entitlements for early claimed rights holders. The methodology was based on historic mean daily natural flow conditions at Piedra, which is approximately three 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." (Kings River Water Association and Kings River Conservation District, June 2003)

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) (**Appendix I**). 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 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%, although the City's service area is anticipated to expand and encompass more than 29.0% of FID's service area between 2025 and 2030. In 2020, the City's percentage of overall FID Kings deliveries was 25.79%. The FID Agreement identifies that the 29.0% 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% cap, but if the agreement were revised in the future the City's FID allocation percentage could grow beyond 29.0% 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 is shown in **Table 6-3**. 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% City supply percentage. **Table 6-4** 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 at the rate shown in **Figure 4-3**.

Table 6-3. FID Diversions by Water Year Type (1964 to 2019)

WATER YEAR TYPE	% OF YEARS[1]	NUMBER OF YEARS BETWEEN 1964 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**

Notes:

1. As defined in 2006 Settlement Agreement
2. Assigns water year type defined in defined in 2006 Settlement Agreement to FID deliveries from 1964 to 2019
3. Based on maximum 29.0% City supply percentage to provide an example City supply amount

Table 6-4. 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

[1]Projected City Allocation (%) x 453,800 AFY (estimated normal year diversion by FID, per **Table 6-3**)

6.3 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 the City 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/yr to 22,200 AF/yr. Stormwater capture and infiltration are considered an integral component of natural groundwater recharge discussed in **Section 6.1.5.1**.

6.4 Wastewater and Recycled Water

6.4.1 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 the City. The City's last Metro Plan, adopted in 2014, also outlined projects to increase the use of recycled water to offset potable demands (Carollo, 2010). 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: 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. They are described further in **Section 6.4.3**.

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:

	Collection	Treatment
City of Clovis	X	X
Malaga County Water District	X	X
Pinedale County Water District	X	-
Pinedale Public Utility District	X	-

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.

6.4.1.1 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 maintenances 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.

6.4.1.2 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.

6.4.1.3 Malaga County Water District

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

6.4.1.4 Pinedale County Water District

Pinedale County Water District provides water, sewer, and solid waste service to an area of about 2 sq mi, which service area covers an unincorporated County island and a portion of the City. 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.

6.4.1.5 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 the City, 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.

6.4.2 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 facilities at this location continued to be expanded as the City 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 the City, ranging in pumping capacity from 0.25 mgd to 2.2 mgd.

6.4.2.1 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 what is now 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 the City, 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 five 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 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. See **Figure 3-1** for a depiction of the facility's location relative to the metropolitan area.

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 the City. 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 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.

6.4.3 Recycled Water System Description

The 2014 Metro Plan recommended expanding reuse by: 1) using the NFWRF effluent to irrigate Copper River Ranch Golf Course; and 2) 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 the City beyond the southwest system

considering new conditions and regulations, including the potential for potable reuse in the future.

6.4.3.1 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 6-5** provides the annual quantities of recycled water applied to these crops for the period from 2015–2019.

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 (WateReuse Research Foundation, 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 (California Regional Water Qulaity Control Board, 2018). 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 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. More information on the City's FID RWRF Exchange Agreement is discussed in **Section 6.6**.

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.** The southwest recycled water system consists of a 3.2 MG 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 (Carollo, 2019) to identify potential recycled water customers. This recent analysis will be incorporated into the latest Metro Plan update.

6.4.3.2 North Fresno Water Reclamation Facility

As described earlier, the City has an existing recycled water plant in the northern portion of the City 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 properly run at 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 6-5** for the period of 2015–2019.

Table 6-5. Historic Recycled Water Used Within Service Area

	QUANTITY (AFY)					
RECYCLE WATER FACILITY	**2015**	**2016**	**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**

Note: Reuse at the NFWRF was zero in 2017 and 2018 because the recycled water delivery system was offline for system repairs.

6.4.4 Potential, Current, and Projected Recycled Water Uses

The 2020 actual recycled water use, and projected recycled water use in the City's service area is included in **Table 6-6**. 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 the City. The City is also currently updating the Metro Plan that is evaluating recycled water alternatives in the City 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.

Customer ID	Customer Name	MDD (gpm)	PHD (gpm)	Hours of Irrigation
1	Quist Farms	1,300.0	1,300.0	24
2	Fresno Memorial Gardens	131.0	450.0	7
3	Roeding Park	267.0	640.0	10
4	Peelman Farms	650.0	650.0	24
5	Peelman Farms	650.0	650.0	24
6	St Peters Cemetery	152.7	458.2	8
7	Westside Auto	8.0	30.0	6
8-10	Multiple Cemeteries	225.8	677.2	8
11-12	Caltrans-99	100.0	300.0	8
13-16	Multiple Cemeteries	225.8	677.2	8
17	Masis Ararat Cemetery	80.0	240.0	8
18	Belmont Memorial Park	172.3	517.0	8
19	Caltrans 180/ Hughs	33.3	100.0	8
20	Caltrans 180/ Fruit	16.7	50.0	8
21	Fink-White Park	61.0	183.0	8
22	Caltrans 99/ Amador	16.7	50.0	8
23	Columbia Elem	44.3	133.0	8
24	Frank Ball Park	19.3	58.0	8
25	Kearney Triangle	18.3	55.0	8
26	Eaton Plaza	21.0	63.0	8

Customer ID	Customer Name	MDD (gpm)	PHD (gpm)	Hours of Irrigation
27	Veteran's Memorial	27.7	83.0	8
28	City Hall	27.7	83.0	8
29	AmeriPride	67.3	202.0	8
30	Courthouse Park	116.7	350.0	8
31	Community Regional	173.0	519.0	8
32	Chukchansi Park	59.3	178.0	8
33	Caltrans 41/H	16.7	50.0	8
34	McKinley Elem	66.7	200.0	8
35	El Capitan Middle	83.3	250.0	8
36	Polk Elem	74.7	224.0	8
37	Madison Elem	56.1	168.3	8
38	King Elem	44.3	101.6	8
39	Gaston Middle	87.5	350.0	8
40	Computech Middle	63.0	245.5	8
41	Edison High	43.7	166.0	8
42	Fresno City College	639.4	871.9	24
43	Hinton Park	19.3	58.0	8
44	Oasis Residential Development	210.5	631.5	8
	Total	**6,070.0**	**12,013.4**	**---**

Legend

Existing Facilities

- Wastewater Reclamation Facility
- Existing Recycled Water Pipeline
- Recycled Water Reservoir

Recycled Water Pump Station

- Existing
- Future

Future/ Proposed Recycled Water Pipelines

- Oasis Development
- SW1D
- South Pipeline

Recycled Water Customer

- Existing Recycled Water Customer
- Agriculture
- Cemetery
- Central Unified School District
- College
- Fresno Unified School District
- Park
- Private/Commercial
- Residential
- Freeway

City Features

- Fresno Sphere of Influence
- Fresno City Limits
- Streets

Shields Ave
McKinley Ave
Belmont Ave
Whitesbridge Ave/ CA-180
California Ave
Jensen Ave
Brawley Ave
Marks Ave
West Ave
Walnut Ave
Elm Ave
SWPS1
Roeding Park PS
RWRF PS
Fresno-Clovis Regional WRF
3.2 MG Recycled Water Reservoir

Prepared by: WSC

N
1:44,248
0 0.28 0.55 1.1 Mi
0 1,000 2,000 4,000 US Feet

References:

1. Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
2. Figure recreated from Figure 7 Potential Southwest Recycled Water Users from the 2019 City Wide Recycled Water Demand and Southwest Recycled Water System Analysis prepared by Carollo Engineers, Inc.

Notes:

Prepared for: City of Fresno Department of Public Utilities

City of Fresno
2020 Urban Water Management Plan

Figure 6-9. Southwest Recycled Water System

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Table 6-6. Recycled Water within Service Area in 2020 (DWR 6-4R)

The supplier will complete the table.

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

BENEFICIAL USE TYPE	POTENTIAL BENEFICIAL USES OF RECYCLED WATER	AMOUNT OF POTENTIAL USES OF RECYCLED WATER	GENERAL DESCRIPTION OF 2020 USES	LEVEL OF TREATMENT	2020	2025	2030	2035	2040	2045
Agricultural Irrigation[1]	Non-foodcrop 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 courses)	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

Note:

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.

6.4.5 Actions to Encourage and Optimize Future Recycled 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 the City.

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 is completed or planned for 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 the City.

6.5 Desalinated Water Opportunities

The City 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 the City is not brackish in nature and does not require desalination treatment.

6.6 Water Exchanges and Transfers

6.6.1 Exchanges and Transfer Opportunities

6.6.1.1 USBR 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.

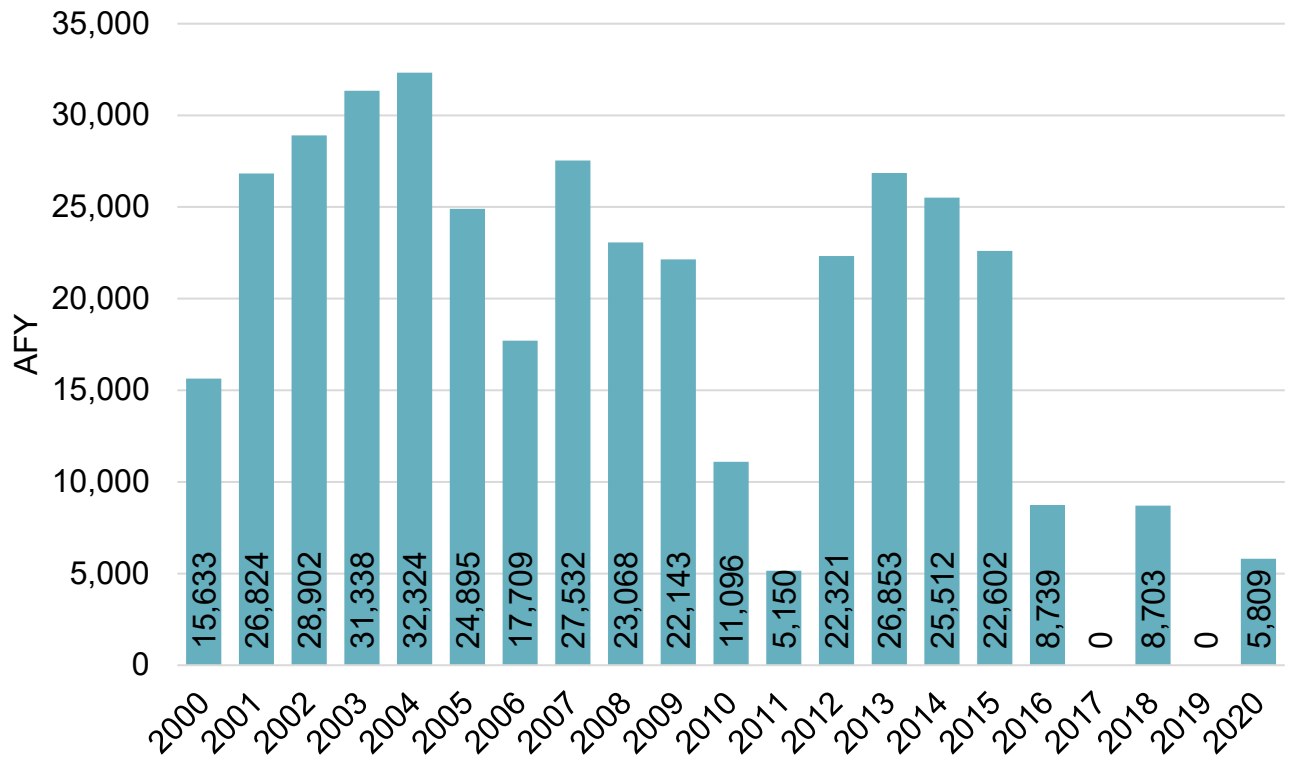
As part of the City's current Metro Plan update, the City is evaluating potential future water transfers and exchanges of its periodically available USBR water. Currently, the City does not have any plans to transfer its USBR water to other California water users.

6.6.1.2 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 the City (**Appendix I**). 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 the City. 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**, 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.

Figure 6-10. Historical RWRF Groundwater Exchange Deliveries



6.6.2 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 connection through 2013. The Leonard 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 connection through 2015. However, the Behymer interconnection has yet to be constructed and, if constructed in the future, would serve only for emergency use.

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

6.7.1 Expand Recycled Water Distribution System

As mentioned in **Section 6.4.5**, the City has made significant improvements to their recycled water system over the last five years and is currently expanding their recycled water distribution system. The City expects to implement construction on the final portion of the Southwest recycled water distribution system this year. The completed distribution system will allow 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.

6.7.2 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 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.

6.7.3 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.

6.7.4 Beneficial Transfers and Exchanges

As mentioned in **Section 6.6.1**, the City is evaluating future beneficial transfers and exchanges of the City's USBR water in normal water years when available water supplies exceeds demands.

6.8 Summary of Existing and Planned Sources of Water

Summaries of the above discussed existing and planned sources of water are provided in **Table 6-7** and **Table 6-8** below.

6.8.1 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.

Table 6-7. Actual Water Supplies (DWR 6-8R)

	2020	
WATER SUPPLY	**ACTUAL VOLUME**	**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**	

Table 6-8. Projected Water Supplies (DWR 6-9R)

	REASONABLY AVAILABLE VOLUME, AFY				
WATER SUPPLY	**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**

6.8.2 Special Conditions

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

6.8.2.1 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 extreme dry year followed by an extreme wet year or vice versa (Persad, 2020) (Partida, 2020)

As discussed in **Section 4.4**, 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, it is 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 (Provost & Pritchard, November 2019). This plan

considers water supply during an extreme dry year or multi-dry year scenario, which may occur more often due to climate change, further in **Chapter 7**.

6.8.2.2 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 to balance while protecting the City's groundwater supply.

Additionally, forthcoming California regulations for per- and polyfluoroalkyl substances (PFAS) may impact certain wells within the City. 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.

6.9 Energy Intensity

Pursuant to CWC 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 6-9** 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 between 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 kWh/ AF.

Table 6-9. Water System Energy Intensity in 2020

	WELLS	NESWTF	SESWTF	T-3 SWTF	TOTAL
Electricity (kWh)	27,667,366	5,848,314	13,416,000	454,470	47,386,150
Treated Water Deliveries (AF)	56,445	20,724	45,367	875	123,411
Energy Intensity (kWh/AF)	490	282	296	520	384

7

CITY OF FRESNO

Water Service Reliability and Drought Risk Assessment

This Section discusses the long-term reliability of surface and groundwater supplies for the City.

A comparison is made of anticipated supplies and demands through 2045 for a normal year, single dry year, and five-year drought. Shorter-term reliability planning that may require immediate action, such as drought or catastrophic supply interruption, is addressed in **Chapter 8**.

IN THIS SECTION

7.1 Water Service Reliability Assessment

This section describes the existing constraints on the City's supply sources and reliability in different hydrologic year types.

7.1.1 Constraints on Water Sources

7.1.1.1 Groundwater

Groundwater has long been the primary water supply source for the City. Before the City's investments to increase its use of surface water with the construction of its NESWTF, T-3 SWTF, and SESWTF, groundwater levels were declining, and the falling levels were a potential constraint. Groundwater levels in some areas of the City have actually been increasing over the last five years as a result of the City's using less groundwater and are expected to continue to increase as the City pumps less in the future.

The North Kings GSP is setting sustainability indicators for groundwater levels and groundwater storage. The current GSP does define a measurable objective and minimum threshold for the basin to allow the North Kings GSA to evaluate its progress for the subject indicator, as defined by SGMA, and determine whether conditions are improving, remaining stable, or degrading.

Another constraint to the use of groundwater stems from the negative impacts from contamination (see **Section 6.1.4**). To ensure the continued beneficial use of the groundwater supply, the City has set minimum pumping requirements for specific wells to prevent the spread of existing groundwater plumes to other areas in the City and to protect the basin. The City will remain proactive in pursuing responsible parties so the proper remediation is conducted to preserve the groundwater system as a viable and sustainable resource in perpetuity. Largely, the City has been able to rely on the relatively good quality of this resource.

7.1.1.2 USBR

The City has a contract for 60,000 AFY of Class 1 water with the USBR. Analysis supporting the 2006 San Joaquin River Settlement is the basis for USBR supply projections. The settlement is based on ensuring flows downstream of Millerton Dam for varying hydrologic conditions, which can constrain surface water supplies available to the CVP Friant Division contractors, such as the City.

Another constraint that affects the consistency of this supply are the restrictions that have been imposed on water diversions from the Delta (see **Section 6.2.1**). The resulting impacts associated with the restrictions from the Delta has been more detrimental to water supplies for the CVP Friant Division contractors than the above-discussed settlement, as the latter has resulted in two years of zero allocations for the CVP Friant Division contractors.

The construction of a raw water pipeline in 2018 to convey USBR water from the Friant-Kern Canal to the NESWTF, referred to as the Friant-Kern Canal Pipeline, has improved the reliability and water quality of deliveries to the NESWTF. The NESWTF is now capable of year-round operation, and the original connection from FID's Enterprise Canal still exists as a backup delivery system if needed.

Every three years, the Friant-Kern Canal is taken down for maintenance, and during these shutdowns the City has the flexibility to deliver its Kings River supply to the NESWTF to allow for its continued use.

7.1.1.3 FID

The City has an agreement with FID providing the City an allocation of approximately 115,000 AFY of Kings River water in normal-year conditions. Water supplied from the FID contract is most susceptible to annual hydrologic conditions. The City's annual FID supply allocation is dependent on annual precipitation, Sierra Nevada mountain snowpack, and natural river flow conditions. The annual variability of these sources results in variable allocations to the City. Based on the foregoing data, FID receives an annually adjusted entitlement, the delivery of which will fluctuate throughout the irrigation delivery season. The City in turn receives its pro rata allocation based on the foregoing entitlement determination.

Another factor that may constrain the availability of Kings River water supply is scheduled maintenance of FID's vast canal network. FID typically terminates water deliveries to the City's water treatment facilities in the months of November and/or December so they can perform necessary infrastructure repairs and maintenance. However, the City constructed a dedicated 13-mile, 72-inch-diameter raw water pipeline to deliver Kings River water to the SESWTF to allow for year-round operations and prevent shutdowns due to FID maintenance. Deliveries to intentional recharge facilities will continue to be supplied through the FID canal system.

7.1.1.4 Recycled Water

At present, the largest constraint for recycled water use is the lack of infrastructure to distribute the water to end users. The City has recently increased recycled water production capabilities and constructed much of the southwest recycled water system, as described in **Section 6.4**. The City plans to complete construction of the southwest recycled water distribution system in the near term and expand its recycled water delivery in the City.

7.1.2 Description of Management Tools and Options

The City currently manages its surface water and groundwater supply by maximizing surface water for potable use and intentional recharge during wet and normal years, while relying on groundwater during dry years. The City is currently updating its Metro Plan, which will recommend projects and programs to optimize the use of its supply portfolio and further improve supply resilience. Supply management tools are an expected outcome of the Metro Plan update; however, the City's ongoing supply management is intended to maximize local supplies and improve the groundwater basin storage. Current actions include enhanced groundwater management and intentional recharge, increased recycled water use, and continued conservation through the implementation of demand management measures.

7.1.3 Year Type Characterization

Normal-water-year, single-dry-water-year, and five-consecutive-year-drought-period supply projections were made based on historic water allocations for surface water supplies, historic municipal water well pumping for groundwater, and projected utilization for recycled water, as described below.

Kings River water supply data was obtained from the Kings River Water Association and FID. USBR CVP Friant Division data was obtained from the USBR website, the City of Fresno, and FID. Groundwater and recycled water supply data was obtained from the City of Fresno.

7.1.3.1 Normal Year

Data for the total water supply for the normal-year condition is provided in **Table 7-1** based on:

- **Groundwater:** estimated sustainable yield from **Table 6-1**.
- **USBR:** long-term average allocation from **Table 6-2**.
- **FID:** long-term average allocation from **Table 6-3**.
- **Recycled Water:** projected supply from **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand.

7.1.3.2 Single Dry Year

The single-dry-year supply availability is based on 2015, during the 2012-2017 drought, because the City had the lowest surface water supply available in 2015. Data for total water supply for the single-dry-year condition is provided in **Table 7-2** based on:

- **Groundwater:** estimated sustainable yield from **Table 6-1**. If necessary, the City would pump beyond its estimated sustainable yield during dry periods and balance out the pumping with recharge in normal or wet periods.
- **USBR:** actual allocation in 2015 (0 AF).
- **FID:** actual total FID allocation in 2015 (42,935 AF) but with the projected City percentage of FID supply for the future years considered (per **Table 6-3**).
- **Recycled Water:** projected supply from **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand.

7.1.3.3 Multiple Dry Years

Data for total water supply for the five-year drought condition is provided in

Table 7-3 based on:

- **Groundwater:** estimated sustainable yield from **Table 6-1**. If necessary, the City would pump beyond its estimated sustainable yield during dry periods and balance out the pumping with recharge in normal or wet periods.
- **USBR:** actual allocations in 2012 to 2016, which ranged from 0 to 45,000 AF.
- **FID:** actual total FID allocations in 2012 to 2016, which ranged from 42,935 to 110,824 but with the projected City percentage of FID supply for the future years considered (per **Table 6-3**).
- **Recycled Water:** projected supply from **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand**.**

Despite severe reductions of surface water supplies during dry years, sufficient good-quality water was available to permit the SWTFs to operate. As mentioned in the previous section, there is some seasonal vulnerability with surface water availability in dry years, which needs to be closely coordinated with surface water suppliers to minimize impacts to the City's SWTF operations. Groundwater supplies, with intentional recharge augmentation, remain reliable in all hydrologic conditions.

7.1.4 Water Service Reliability

This section compares projected supplies and demands for a normal year, single dry year, and five-year consecutive drought. As shown in **Table 7-1**, the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years. As shown in **Table 7-2**, 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 7-3**, the City is projected to meet all demands during a five-year drought with its existing supplies. Potable demands are unrestricted, and non-potable water used for groundwater recharge is reduced in years three and four of a five-year drought.

Table 7-1. Normal Year Supply and Demand Comparison (DWR 7-2R)

	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	5,910	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 (Groundwater Recharge) 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**

Table 7-2. Single Dry Year Supply and Demand Comparison (DWR 7-3R)

	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**	**195,392**	**200,862**	**206,252**	**211,582**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable (Groundwater Recharge) 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**	**16,688**	**14,024**	**11,295**

Table 7-3. Multiple Dry Years Supply and Demand Comparison (DWR 7-4R)

		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
	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**

		2025	2030	2035	2040	2045
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
	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**	**325,850**	**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**	**241,447**
	DIFFERENCE:	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

7.2 Drought Risk Assessment

A new provision of the Water Code directs Suppliers to prepare a DRA. The DRA considers a drought period lasting five consecutive years, starting from the year following the year when the assessment is conducted. For this plan, the DRA considers five consecutive dry years from 2021 through 2025. The City may conduct an interim update or updates to this DRA within the five-year cycle of its UWMP update. The DRA analysis allows the City to examine the management of its supplies during stressed hydrologic conditions and an opportunity to evaluate whether the City may need to enact its Water Shortage Contingency Plan (WSCP) during the next actual drought period lasting at least five years. The projected gross water use for the five-year DRA is based on unrestricted potable demand, a reduction in raw-water demand for intentional recharge in years three and four of the five-year drought, and unrestricted recycled water demand.

The reliability of supplies over a five-consecutive-year drought is described in **Section 7.1.4** and summarized below for 2021 through 2025:

- **Groundwater:** based on interpolating between the 2020 and 2025 values in **Table 6-1**. If necessary, the City would pump beyond its estimated sustainable yield during dry periods and balance out the pumping with recharge in normal or wet periods.
- **USBR:** based on the actual supply allocations from these sources during the driest consecutive five-year drought (2012–2016).

- **FID:** based on the actual supply allocations from these sources during the driest consecutive five-year drought (2012–2016). For this DRA, the City's percentage of FID supplies are conservatively assumed to remain at the existing 25.79%.
- **Recycled Water:** based on interpolating between the 2020 and 2025 values in **Table 6-6**, excluding agricultural irrigation demand that does not offset the City's potable demand.

Table 7-4 compares the total projected supply and demand for the five-year DRA for 2021 through 2025. As shown, the City does not expect to enact its WSCP for a five-consecutive-year drought based on the unrestricted potable demand projections and the current supply portfolio and reliability.

Table 7-4. Five-Year Drought Risk Assessment

WATER USE TYPE	2021	2022	2023	2024	2025
Groundwater	133,602	134,724	135,846	136,968	138,090
Surface Water – USBR	30,000	37,200	0	0	45,000
Surface Water – FID	93,354	83,085	65,425	40,776	111,911
Recycled Water	1,912	2,911	3,911	4,910	5,910
TOTAL SUPPLY	**258,868**	**257,920**	**205,181**	**182,655**	**300,911**
Potable Demand	124,910	127,827	130,745	133,662	136,504
Non-Potable Demand	60,000	60,000	48,287	22,260	60,000
TOTAL DEMAND	**184,910**	**187,827**	**179,032**	**155,922**	**196,504**
AVAILABLE SUPPLIES	**73,958**	**70,093**	**26,149**	**26,732**	**104,407**

8

CITY OF FRESNO

Water Shortage Contingency Plan

This WSCP is a detailed plan for how the City intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time.

The 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.

IN THIS SECTION

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

The 2020 WSCP is a standalone document that can be modified as needed and is included as **Appendix J**.

9 CITY OF FRESNO
Demand Management Measures

This chapter discusses the City's demand management measures including its water waste prevention ordinances, metering program, public outreach, and water loss reduction measures.

The City employs several water conservation programs, in excess of State-mandated restrictions, to promote conservation and reduce the water supply demand. These measures help reduce overdraft of the groundwater aquifer that the City uses and have aided in the City's attainment of the urban water use reduction targets discussed in **Chapter 5**. The following sections provide a description of the Demand Management Measures (DMMs), including the nature and extent of each.

IN THIS SECTION

- Water Waste Prevention
- Metering
- Conservation Pricing
- Public Education and Outreach
- Water Loss Reduction Measures

9.1 Demand Management Measures for Retail

9.1.1 Water Waste Prevention Ordinances

The City prohibits water waste through implementation of the Urban Water Conservation and Excessive Water Use ordinance (see Section 6-520 of the Fresno Municipal Code). The ordinance includes such prohibitions as not washing hardscapes, using a nozzle-controlled hose, and using irrigation practices. The WSCP, included in **Appendix J**, Section 1.5, contains a more in-depth discussion of these prohibitions and consequences associated with them.

The City has a water waste hotline and a reporting form on the City website and keeps records of water waste violations. The City also employs fifteen staff persons year-round to manage and monitor the water conservation programs in place. Communication to the City's diverse customer base is always taken into consideration, so two of the positions require Spanish and Hmong languages. All Water Conservation Representatives use advanced metering infrastructure (AMI) to monitor and confirm excessive or negligent water waste incidents.

The Water Conservation staff can be reached at (559) 621-5300, (559) 621-5480, or (559) 621-CITY for after-hours emergencies. Online forms are also available to the public. Their office is located at 1910 E. University Avenue, Fresno, CA 93703. The Water Conservation Supervisor is Conrad Braganza.

9.1.2 Metering

In 2008, the City embarked on an aggressive project to install meters on all single-family residential service connections throughout its service area. The water meter project was completed at the end of 2012. The City already had water meters on all existing multifamily residential, commercial, industrial, landscape irrigation, and fire services.

With completion of the metering project, the City can now monitor water use more closely and provide its customers an understanding of water use (and its fiscal impacts), which has led to reducing water consumption by approximately 13% since 2013. The City will continue to monitor water use through the metering data and use the data to analyze demand trends and plan for future water shortages.

As part of the analysis of the meter data and through customer complaints or comments, the City is able to identify meters that are not working properly. Once identified, the City can have a maintenance crew visit the property and evaluate whether to repair or replace the meter.

The City also routinely tests and calibrates meters to ensure accuracy in reading and billing. Typically, meters are tested in place in the field or at a test bench in the meter shop. Field testing involves using calibrated flow meters to monitor the flow through a test port on or attached to the meter and comparing the measured flow to the meter reading. The majority of large meters, three inches and above, have a bypass valve that will be turned on during the meter test as not to disrupt water use to the property. In the case where a bypass valve is not in place, the customer is notified at least 48 hours before the test date. The City's service area has a total of approximately 135,000 meters, of which approximately 1,100 are three inches or larger. In 2018, of 157 of these large meters were tested, 10 were repaired, and 15 were replaced.

With the majority of meters being two inches or smaller, testing every single one is not logistically or economically feasible; therefore, a statistical sampling of each size is tested each year based on the following criteria:

- Meters six inches and above are tested annually.
- Meters three inches to four inches are tested at least once every two years.
- Meters three-fourths of an inch to two inches are sample tested as needed.

The City performs more frequent testing on larger meters on the basis that an error in their registration has a greater effect on customer equity and revenue issues. Meters registering larger volumes are given priority regardless of when they were last tested.

The City also shares meter data with the customers through its EyeOnWater tool available on its website or on a mobile app. This allows customers to monitor and better understand their hourly, daily, weekly, and monthly water usage, trends, and how they compare to average users.

9.1.3 Conservation Pricing

The City's customers are subject to the water rate structure adopted by the City Council through the Proposition 218 process. The approved rate structure has a base price designated by meter size and a volumetric rate for water usage. **Table 9-1** shows the rate structure.

The City will investigate the use of alternative rate structures in the future, which could have specific charges for usage to provide a fiscal incentive for customers to conserve water. This approach would permit customers to directly see the impact of water use reduction each month.

Table 9-1. Current Water Rate Structure

	BASE RATE		USAGE CHARGES	
METER SIZE	DOMESTIC	IRRIGATION	100 CUBIC FEET (HCF)	1,000 GALLONS
¾" or smaller	$13.50	$10.70	$1.74 (per each HCF)	$2.33 (per each 1,000 gallons)
1"	$17.90	$13.40		
1.5"	$20.80	$15.20		
2"	$35.30	$24.10		
3"	$52.80	$34.90		
4"	$79.00	$51.00		
6"	$152.00	$96.00		
8"	$705.00	$436.00		
10"	$1,113.00	$687.00		
12"	$1,462.00	$901.00		

9.1.4 Public Education and Outreach

The City has worked diligently to connect with and educate the community it serves. Those efforts include an emphasis on water conservation techniques and the importance of reducing overall water demand, both specifically to the resident (in terms of fiscal impacts) and to the overall water supply.

The City's varied programs to incentivize water savings are frequently discussed, including the following items:

- Water-wise landscape consultation
- EyeOnWater tool
- Irrigation efficiency audit
- Assistance with setting irrigation controllers
- Interior/exterior water leak surveys
- Water meter use information
- Water use rebates, coupons, and permits
- Lawn-to-garden rebates
- Water conservation hotlines

9.1.4.1 Education and Outreach

The City's water conservation public information program is managed in-house with the assistance of JP Marketing. The firm's services include strategic planning, creative concepts, public relations, marketing, promotion, research, advertising, media design, copywriting, event creation, and online services.

The City's public information program has many components, including multimedia campaigns (paid and public service advertising), customer billing inserts, literature, public outreach activities, a speaker's bureau, and inter-agency partnerships. Many of the City's water conservation materials are provided in three languages: English, Hmong, and Spanish.

The City is a member of the Central Valley Water Awareness Committee (CVWAC), which is composed of several cities, water utilities, irrigation districts, and other groups in the Central Valley. The CVWAC was created to increase the public's understanding of how water is treated, managed, and delivered to customers. The City participates in Water Awareness Month activities through its affiliation with the CVWAC.

The City conducted outreach to the community through approximately 50 events between 2015 and 2020, including:

- Setting up outreach booths providing water-saving info and rebate information at local festivals, parades, plant sales, home and garden shows, and fairs
- Participating in Annual Water Wise Plant Exchanges, a large community event to share water-wise plants and information and participate in hands-on activities
- Hosting Kids Water Camp, a large one-day event with hands-on activities for kids in third grade in all elementary schools in the service area
- Hosting workshops and speaker events about water-wise plants, gardening, and landscaping

A full list of specific education and outreach events over the past five years is included in **Appendix K**. The City also maintains a water conservation page on its website with links to many of the flyers and rebates mentioned above.

9.1.4.2 Water Surveys

The City conducted over 24,000 interior and exterior water leak surveys between 2015 and 2020. **Table 9-2** quantifies the number and types of surveys conducted.

Table 9-2. Interior and Exterior Surveys

DESCRIPTION/YEAR	2015	2016	2017	2018	2019	2020	TOTAL
EXTERIOR SURVEYS							
Exterior Audit	942	1,289	1,359	835	2,189	427	7,041
Landscape Consultation	605	382	193	139	149	48	1,516
Large Turf Survey	1	5	1	0	0	0	7
Timer Tutorial	1,644	1,967	1,873	2,170	1,346	518	9,518
INTERIOR SURVEYS							
Interior Audit	835	1,135	1,222	748	2,137	412	6,489
TOTALS	**4,027**	**4,778**	**4,648**	**3,892**	**5,821**	**1,405**	**24,571**

9.1.4.3 Rebate Programs

The City operates 14 rebate programs. Some of those that were active and used during the 2015–2020 reporting period are summarized in **Table 9-3**.

Table 9-3. Rebate Program Results (2015–2020)

	LAWN TO GARDEN		WASHING MACHINE		HIGH EFFIC. TOILET	
YEAR	NO.	REBATE	NO.	REBATE	NO.	REBATE
2015	122	$4,044	358	$46,144	301	$35,344
2016	160	$71,372	247	$27,600	233	$21,124
2017	103	$37,157	255	$19,682	495	$18,937
2018	43	$19,238	57	$5,502	145	$75,721
2019	42	$19,456	84	$8,000	115	$19,091
2020	25	$14,521	121	$6,950	106	$18,033
TOTALS	**495**	**$165,791**	**1,122**	**$113,880**	**1,395**	**$188,253**

9.1.5 Programs to Assess and Manage Distribution System Real Loss

As discussed in **Chapter 4**, the calculated loss was determined to be 8%, illustrating the City's conservative approach in the past. With completed system metering, the City is able to track losses more closely and understand where possible losses are occurring and correct them as necessary.

The AWWA Water Audit Tool suggested the areas the City could improve to reduce system losses, including calibration of source meters, unauthorized consumption, and data handling errors.

The following measures are in place or are being developed to improve the system losses:

- The City installed the remaining source meters on the few unmetered wells within the system in 2017, and now currently all wells and production facilities are fully metered.
- The City has a source meter calibration plan in place.
- The City has implemented meter testing frequency based on service size. This is discussed in more detail in **Section 9.1.2**.
- The City has an online tool as well as a telephone hotline available for the public to report water leaks, either on their property or within the public rights-of-way. This helps reduce detection time and limits the water loss from leaks.
- The City conducted a leak survey on 100 miles of the water system in January 2016. Eight total leaks were pinpointed, one on the main, two on hydrants, two on water service lines, and one at a water meter.
- The City uses meter data to identify any meters not functioning correctly or any leaks in the system so that they can be replaced or repaired. This helps reduce unaccounted for water consumption.

Unauthorized consumption can be determined, at times, through the meter data also. If a meter shows no usage, the City can note the address and schedule a site visit to determine any possible issues.

9.1.6 Other Demand Management Measures

In addition to the water conservation programs, the City has also enacted watering schedules for the community that specify days and times that customers are allowed to water, based on odd or even street addresses. The City has also created an automated courtesy notice program that informs customers when they exceed the excessive water use threshold during days and times when outdoor watering is not allowed.

9.2 Implementation to Achieve Water Use Targets

As discussed in **Chapter 5**, the City has met and exceeded its 2020 water use target. However, the City also realizes a portion of the observed conservation is due to the strict water use restrictions imposed during the drought. If those restrictions are lifted, the City will be diligent in continuing use of the above described DMMs.

The extensive metering program, replacement of turf, and replacement of over 10,000 high-water-use appliances (toilets and washing machines) over the last several years has helped the City maintain overall lower water consumption.

9.3 Water Use Objectives (Future Requirements)

As discussed in **Section 4.2.4.4**, the City is tracking the recommended water use efficiency standards and water use objectives developed due to Senate Bill 606 and Assembly Bill 1668. Currently no water use objectives have been adopted by the State, and are not anticipated to be adopted until 2022, but an indoor residential water use standard has been recommended by DWR, and additional standards are expected to be released in late 2021. The City is aware of the legislation and tracking the forthcoming water use objectives as they are available. The City is currently having ongoing discussions with DWR on clarifying the GIS-based approach for developing the overall water objective for residential customers. Alternatively, the City is also interested in using actual water use data (from the AMI system) to develop these objectives, following discussions and approval from DWR and SWRCB.

10 CITY OF FRESNO
Plan Adoption, Submittal, and Implementation

This section provides guidance in the adoption, submittal, and implementation of the 2020 UWMP and WSCP, as well as processes for amending the adopted plans if needed.

This UWMP update has been prepared on a calendar-year basis and includes all water use and planning data for the 2020 calendar year. Additional details are provided in the preceding chapters.

IN THIS SECTION

10.1 Notice of Public Hearing

The City has notified the County of Fresno, the only city or county in which the City provides water, of its intent to review the UWMP and consider changes to the plan. The City also notified the City of Clovis of plan preparation. Both of these governmental entities as well as a host of local water purveyors and agencies (**Table 2-1**) were notified of the preparation of the UWMP and public hearing and were encouraged to participate in the development of this plan update. Copies of the notification letters are included in **Appendix L**.

Consistent with the legislative requirements for public noticing, the City published two notices in the Fresno Bee, at least five days apart over a two-week period, providing the date and time of the public hearing. The notices were published on July 1, 2021, and July 8, 2021.

10.2 Public Hearing and Adoption

The City held a public hearing and adopted the 2020 UWMP on July 15, 2021. A copy of the adopting resolution is included in **Appendix M**. Before the public hearing, notices were published notifying the public of the date and time of the hearing.

10.3 Plan Submittal

Once the 2020 UWMP and WSCP have been adopted, a copy of the 2020 UWMP and WSCP and any subsequent amendments will be submitted to DWR, the State Library, and the County of Fresno.

10.4 Public Availability

Once the plan has been adopted, a hard copy will be made available for public reference at the City of Fresno Department of Public Utilities office at City Hall (located at 2600 Fresno Street) and the Water Division office (located at 1910 E. University Avenue). Additionally, an electronic copy will be uploaded to the City of Fresno website and made available for public reference.

11 CITY OF FRESNO References

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A

2020 UWMP Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Executive Summary
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Chapter 2, Section 10.2
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.1
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.1, Section 10.1
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	N/A
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3.1 and 3.2
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Table 3-2 Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Table 3-3 Section 3.4.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.3.1
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Table 3-3 Section 3.4.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Table 3-1 Section 3.1.1, Section 4.2.4.1, Table 4-3, Figure 4-3,
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Losses included Section 4.2.2, City has not adopted loss standards

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws.	System Water Use	Table 4-5 Section 4.2.4.2
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.5.2
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Table 4-1 Section 4.2.2
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Table 4-9 Section 4.3
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Table 5-1 Section 5.4 Appendix C
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.5 Appendix C
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	N/A
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	N/A
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Appendix C
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 6.1-6.4 Section 7.1.3
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change*.	System Supplies	Section 6.8.2.1
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.8
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.7
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Table 6-7 and Table 6-8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.1
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.1 Appendix G
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.1.1
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	N/A
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.1.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.1.6 Figure 6-6
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.1.5 Table 6-1
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6-6
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.4.2, Appendix B Table 6-3R
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.4.4 Table 6-5
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.4.4
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.4.4 Table 6-6
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.4.5
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.4.5
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.5
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.4.2, Appendix B Table 6-3R

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.7
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.9
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1.1
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1.2
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1.4
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.1.3.3
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.1.3
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.1.4 Table 7-1, Table 7-2, and Table 7-3
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.1.3 and 7.1.4
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix J
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix J - Section 1.2
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix J - Section 1.10

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix J - Section 1.3
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix J - Section 1.3
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix J - Section 1.4 Table 2
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix J - Section 1.4 Figure 2
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix J - Section 1.5.3 Table 4
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix J - Section 1.5.2 Table 3
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix J - Section 1.5.4
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix J - Section 1.5.1
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix J - Section 1.5.2 Table 3
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix J - Section 1.5.6
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix J - Section 1.6
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix J - Section 1.6
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix J - Section 1.7
x		Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix J - Section 1.8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix J - Section 1.8
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix J - Section 1.8
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix J - Section 1.9
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix J - Section 1.9
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix J - Section 1.9
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix J - Section 1.10
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix J - Section 1.12
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix J - Section 1.13
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix J - Section 1.13
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.1
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.2
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.1, Table 2-1, Appendix L

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Appendix L
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Appendix L
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix M
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	TBD
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	TBD

B

DWR Standardized Tables

2-1R | Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA1010007	CITY OF FRESNO	139,523	121,994
	Total:	**139,523**	**121,994**
Note: Data provided by City of Fresno Water Division			

2-2 | Public Water Systems

Type of Plan	Member of RUWMP	Member of Regional Alliance	Name of RUWMP or Regional Alliance
Individual UWMP	No	No	N/A

2-3 | Agency Identification

Type of Supplier	Year Type	First Day of Year		Unit Type
		DD	MM	
Retailer	Calendar Years			Acre Feet (AF)

Conversion to Gallons: *325851*
Conversion to Gallons per Day: *892.7425*

2-4R | Water Supplier Information Exchange

Wholesale Water Supplier Name
United States Bureau of Reclamation
Fresno Irrigation District

3-1R | Current & Projected Population

Population Served	2020	2025	2030	2035	2040	2045
Total	550,217	609,433	674,677	719,327	765,278	812,529

4-1R | Actual Demands for Water

Use Type	Additional Description	Level of Treatment When Delivered	2020 Volume
Single Family		Drinking Water	60,065
Multi-Family		Drinking Water	18,842
Commercial		Drinking Water	16,971
Industrial		Drinking Water	5,729
Institutional/Governmental	See Note 1	Drinking Water	---
Landscape		Drinking Water	10,478
Other	Travel Meters	Drinking Water	340
Losses		Drinking Water	9,568
Groundwater Recharge		Raw Water	42,686
		Total:	**164,679**

Notes:
1. Institutional and Governmental water usage is included in the Commercial use type.

4-2R | Projected Demands for Water

Use Type	Additional Description	Projected Water Use				
		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		19,052	21,135	22,587	24,041	25,496
Industrial		7,410	9,003	9,922	10,841	11,758
Institutional/Governmental	See Note 1					
Landscape		4,490	5,035	5,422	5,809	6,196
Other	Travel Meters	200	200	200	200	200
Losses		10,097	10,900	11,408	11,917	12,426
Groundwater Recharge	Raw Water	62,700	65,400	68,100	70,800	73,500
Total:		**199,204**	**212,756**	**222,310**	**231,876**	**241,447**

Notes:
1. Institutional and Governmental water usage is included in the Commercial use type.

4-3R | Total Gross Water Use

	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	164,679	199,204	212,756	222,310	231,876	241,447
Recycled Water Demand From Table 6-4R	4,757					
Total Water Use:	**169,436**	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**

Note: Recycled water supply is a potable water offset, thus the recycled water demand in years 2025-2045 is included in the potable and raw water demand total.

4-4R | 12 Month Water Loss Audit Reporting

Report Period Start Date		Volume of Water Loss*
MM	YYYY	
1	2016	9,036
1	2017	10,235
1	2018	9,028
1	2019	9,059
1	2020	9,568

*For years 2016, through 2019, volume of water loss is taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. For 2020 the volume of water loss is estimates as the difference in metered water produced and entered into the distribution system and metered consumption.

4-5R | Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? Refer to Appendix K of UWMP Guidebook.	Yes
Section or page number where the citations utilized in the demand projects can it be found:	Section 4.2.4.2
Are Lower Income Residential Demands Included in Projections?	Yes

5-1R | Baselines & Targets Summary

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target *
10-15 Year	1999	2008	309	247
5 Year	2003	2007	304	N/A

*All values are in Gallons per Capita per Day (GPCD)

5-2R | 2020 Compliance

Actual 2020 GPCD*	Optional Adjustments to 2020 GPCD					2020 GPCD* (Adjusted if applicable)	Supplier Achieved Targeted Reduction in 2020
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	Total Adjustments*	Adjusted 2020 GPCD*		
198	0	0	0	0	0	0	Yes

*All values are in Gallons per Capita per Day (GPCD)

6-1R | Groundwater Volume Pumped

Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	San Joaquin Groundwater Basin: Kings Subbasin	99,107	105,211	76,796	54,609	55,028
	Total:	**99,107**	**105,211**	**76,796**	**54,609**	**55,028**

6-2R | Wastewater Collected within Service Area in 2020

The supplier will complete the table.						
			Percentage of 2020 service area covered by wastewater collection system (optional):			
			Percentage of 2020 service area population covered by wastewater collection system (optional):			
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated**	**Wastewater Volume Collected from UWMP Service Area in 2020**	**Name of Wastewater Agency Receiving Collected Wastewater**	**Wastewater Treatment Plant Name**	**Wastewater Treatment Plant Located within UWMP Area**	**WWTP Operation Contracted to a Third Party**
City of Fresno	Metered	63,652	**City of Fresno**	RWRF	Yes	No
City of Fresno	Metered	325	**City of Fresno**	NFWRF	Yes	No
	Total:	**63,977**				
Note: Wastewater Volume in units of AF						

6-3R | Wastewater Treatment & Discharge Within Service Area in 2020

The supplier will complete the table.											
Wastewater Treatment Plant Name	**Discharge Location Name or Identifier**	**Discharge Location Description**	**Wastewater Discharge ID Number**	**Method of Disposal**	**Plant Treats Wastewater Generated Outside the Service Area**	**Treatment Level**	**2020 Volumes**				
							Wastewater Treated	**Discharged Treated Wastewater**	**Recycled Within Service Area**	**Recycled Outside of Service Area**	**Instream Flow Permit Requirement**
RWRF	Treatment Site	Onsite Percolation Ponds	WDR Order R5-2018-0080	Percolation ponds	Yes	Secondary, Undisinfected	63,652	58,949	-	3,845	-
RWRF	Treatment Site	Onsite Percolation Ponds	WDR Order R5-2018-0080	Percolation ponds	Yes	Tertiary			858	-	-
NFWRF	Treatment Site	Onsite Pond	WDR Order R5-2014-0162	Percolation ponds	No	Tertiary	325	271	54	-	-
						Total:	**63,977**	**59,220**	**912**	**3,845**	**-**

6-4R | Recycled Water Direct Beneficial Uses Within Service Area

The supplier will complete the table.										
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							
Beneficial Use Type	**Potential Beneficial Uses of Recycled Water**	**Amount of Potential Uses of Recycled Water**	**General Description of 2020 Uses**	**Level of Treatment**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Agricultural Irrigation	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 courses)	Landscape Irrigation	5,800	Landscape irrigation, distribtued through the southwest recycled water distribution system	Tertiary	858	5,800	5,800	5,800	5,800	5,800
Agricultural Irrigation	Food crop irrigation	410	Irrigate limited food crops, distribtued 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**
Internal Reuse (Not included in Statewide Recycled Water Volume).					11	30	30	30	30	30

6-5R | 2015 Recycled Water Use Projection Compared to 2020 Actual

The supplier will complete the table.

Use Type	2015 Projection for 2020	2020 Actual Use
Agricultural Irrigation	14,200	3,845
Landscape Irrigation (excludes golf courses)	4,300	858
Golf Course Irrigation		54
Commercial Use		
Industrial Use	1,400	
Geothermal and Other Energy Production		
Seawater Intrusion Barrier		
Recreational Impoundment		
Wetlands or Wildlife Habitat		
Groundwater Recharge (IPR)*	1,300	
Surface Water Augmentation (IPR)*		
Direct Potable Reuse		
Total:	**21,200**	**4,757**

6-6R | Methods to Expand Future Recycled Water Use

The supplier will complete the table below.			
Name of Action	**Description**	**Planned Implementation Year**	**Expected Increase of Recycled Water Use**
Build Infrastructure	Recycled Water Distribution System Expansion	2021	5,000
		Total:	**5,000**

6-7R | Expected Future Water Supply Projects or Programs

Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.						
Page Location for Narrative in UWMP:			Section 6.7			
Name of Future Projects or Programs	**Joint Project with Other Suppliers**	**Agency Name**	**Description**	**Planned Implementation Year**	**Planned for Use in Year Type**	**Expected Increase in Water Supply to Supplier**
Expansion of Tertiary Recycled Water Treatment	No		See Section 6.7		All Year Types	
Expansion of Surface Water Treatment Capacity	No		See Section 6.7		All Year Types	
Expansion of Groundwater Recharge Program	No		See Section 6.7		All Year Types	

6-8R | Actual Water Supplies

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield
Groundwater (not desalinated)		55,028	Drinking Water	
Surface water (not desalinated)	USBR CVP	37,447	Drinking Water	
Surface water (not desalinated)	FID Contract	71,292	Drinking Water	
Recycled Water	RWRF	858	Recycled Water	
Recycled Water	NFWRF	54	Recycled Water	
	Total:	**164,679**		**-**

6-8DS | Source Water Desalination

Neither groundwater nor surface water are reduced in salinity prior to distribution. The supplier will not complete the table.

6-9R | Projected Water Supplies

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield	Reasonably Available Volume	Total Right or Safe Yield
Groundwater (not desalinated)	Kings Subbasin	138,090		143,630		149,100		154,490		159,820	
Surface water (not desalinated)	USBR CVP	60,000		60,000		60,000		60,000		60,000	
Surface water (not desalinated)	FID Contract	125,030		131,600		131,600		131,600		131,600	
Recycled Water	NFWRF Tertiary Disinfected	5,800		5,800		5,800		5,800		5,800	
Recycled Water	RWRF Tertiary Disinfected	110		110		110		110		110	
Total:		**329,030**	**-**	**341,140**	**-**	**346,610**	**-**	**352,000**	**-**	**357,330**	**-**

7-1R | Basis of Water Year Data (Reliability Assessment)

Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.	
Page Location for Narrative in UWMP:	See Section 7.1.3 in the UWMP

7-2R | Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	329,030	341,140	346,610	352,000	357,330
Demand Totals From Table 4-3R	199,204	212,756	222,310	231,876	241,447
Difference:	**129,826**	**128,384**	**124,300**	**120,124**	**115,883**

7-3R | Single Dry Year Supply & Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals	189,852	195,392	200,862	206,252	211,582
Demand Totals	164,092	176,132	184,174	192,228	200,287
Difference:	**25,760**	**19,260**	**16,688**	**14,024**	**11,295**

7-4R | Multiple Dry Years Supply & Demand Comparison

		2025	2030	2035	2040	2045
First Year	**Supply Totals**	273,725	279,265	284,735	290,125	295,455
	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	**Supply Totals**	274,626	280,166	285,636	291,026	296,356
	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	**Supply Totals**	217,568	223,108	228,578	233,968	239,298
	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	**Supply Totals**	189,852	195,392	200,862	206,252	211,582
	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	**Supply Totals**	314,840	320,380	325,850	331,240	336,570
	Demand Totals	199,204	212,756	222,310	231,876	241,447
	Difference:	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

7-5 | Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)

2021	**Gross Water Use**	184,910
	Total Supplies	240,905
	Surplus/Shortfall without WSCP Action	**55,995**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**55,995**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2022	**Gross Water Use**	187,827
	Total Supplies	244,448
	Surplus/Shortfall without WSCP Action	**56,621**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**56,621**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2023	**Gross Water Use**	170,051
	Total Supplies	196,200
	Surplus/Shortfall without WSCP Action	**26,149**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**26,149**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2024	**Gross Water Use**	151,432
	Total Supplies	178,164
	Surplus/Shortfall without WSCP Action	**26,732**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**26,732**
	Resulting Percent Use Reduction from WSCP Action	**0%**
2025	**Gross Water Use**	196,504
	Total Supplies	300,911
	Surplus/Shortfall without WSCP Action	**104,407**
	Planned WSCP Actions (Use Reduction and Supply Augmentation)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	**104,407**
	Resulting Percent Use Reduction from WSCP Action	**0%**

8-1 | Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage[1]	Water Shortage Condition
0		No water shortage condition. Corresponds with year-round water use measures listed in Section 1.5.1 and demand reduction measures listed for "All" stages in Table 3.
1	0-10%	Stage 1 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 100% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 2 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
2	10-25%	Stage 2 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 90% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 3 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
3	25-35%	Stage 3 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 75% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 4 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
4	35-50%	Stage 4 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 65% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or •After having been in a Stage 5 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[2] or higher; or •After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
5	>50%	Stage 5 may be triggered by any of the following conditions: •The available water supplies for the next year are projected to be less than 50% of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment.

[1]Shortage levels indicate the gap between supply and demand compared to normal-year conditions. The Annual Assessment incorporates a 10% buffer on top of projected demands for conservative planning.
[2]Water year types were defined 2006 San Joaquin River Restoration Settlement Agreement for USBR allocations and characterized in Section 6.2 of the City's 2020 UWMP.

8-2 | Demand Reduction Actions

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?[1]	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement[2]
All	Expand Public Information Campaign	Not Applicable	Community outreach includes classroom presentations, outreach educational information, and water tours. Increase communication as drought stages increase.	Not Applicable
All	Improve Customer Billing	Not Applicable	Water bills show customer usage vs. average usage for the customer category. Increase customer notifications of high water use based on advanced metering infrastructure (AMI) data as drought stages increase.	Not Applicable
All	Offer Water Use Surveys	Not Applicable	Use water leak surveys with all community members.	Not Applicable
All	Provide Rebates for Landscape Irrigation Efficiency	Not Applicable	The City offers rebates for micro-irrigation conversions, soil moisture sensors, smart irrigation controller, and rain sensors to improve efficiencies.	Not Applicable
All	Provide Rebates for Turf Replacement	Not Applicable	The City provides rebates for community members who wish to replace their turf with a drought-resistant garden.	Not Applicable
All	Provide Rebates on Plumbing Fixtures and Devices	Not Applicable	The City offers rebates on a variety of high-efficiency plumbing fixtures, such as washers, toilets, and urinals.	Not Applicable
All	Decrease Line Flushing	Not Applicable	The City uses NO-DES for regular pipe flushing to eliminate discharging water.	Not Applicable
All	Reduce System Water Loss	Not Applicable	The City has a comprehensive system water loss reduction program in place. Increase efforts to correct water system losses as drought stages increase.	Not Applicable
1	Decrease Line Flushing	0 to 100% of shortage gap	For dead-end flushing where the NO-DES truck cannot be used, reduce normal flushing time.	Not Applicable
1	Increase Water Waste Patrols	0 to 100% of shortage gap	Increase monitoring of AMI reporting and communication with customers; Conduct patrols based on public input.	Not Applicable
1	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Voluntary limits: Summer: three days/week Winter: one day/week	No
2	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: three days/week Winter: one day/week	Yes
3	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: two days/week Winter: one day/week	Yes
4	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: one day/week Winter: one day/week	Yes
4	Other — Prohibit use of potable water for construction and dust control	0 to 100% of shortage gap	The City provides rebates for community members who wish to replace their turf with a drought resistant garden	No
4	Other — Prohibit use of potable water for construction and dust control	0 to 100% of shortage gap	Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, and building washdowns where non-potable or recycled water is sufficient.	Yes
4	Other — Prohibit vehicle washing except at facilities using recycled or recirculating water	0 to 100% of shortage gap	Prohibit washing cars, boats, trailers, aircraft, or other vehicles, except at commercial or fleet vehicle-washing facilities using water recycling equipment.	Yes
4	Pools and Spas - Require covers for pools and spas	0 to 100% of shortage gap	Require covers for swimming pools when not in use.	No
4	Other	0 to 100% of shortage gap	Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City manager.	Not Applicable
4	Other	0 to 100% of shortage gap	Prohibit use of outdoor misters.	No
5	Landscape — Prohibit all landscape irrigation	0 to 100% of shortage gap	Prohibit outdoor irrigation year-round.	Yes
5	Moratorium or Net Zero Demand Increase on New Connections	0 to 100% of shortage gap	The City will temporarily limit or ban new water service connections within the service area.	Not Applicable

[1]Reduction in the shortage gap is estimated and can vary significantly.
[2]Refer to WSCP Section 1.7 for Penalties for Water Wastage.

8-3R | Supply Augmentation & Other Actions

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
1 to 5	Transfers	As Needed	Purchase or exchange available USBR or FID surface water
1 to 5	Other Purchases	As Needed	Interconnection with City of Clovis for use in emergencies

10-1R | Notification to Cities & Counties

City	60 Day Notice	Notice of Public Hearing	Other
City of Clovis	Yes	Yes	
County	**60 Day Notice**	**Notice of Public Hearing**	**Other**
County of Fresno	Yes	Yes	
Other	**60 Day Notice**	**Notice of Public Hearing**	**Other**
Bakman Water Company	Yes	Yes	
Fresno Irrigation District	Yes	Yes	
Fresno Metropolitan Flood Control District	Yes	Yes	
Friant Water Authority	Yes	Yes	
Garfield Water District	Yes	Yes	
Malaga County Water District	Yes	Yes	
North Kings Groundwater Sustainabilty Agency	Yes	Yes	
Pinedale County Water District	Yes	Yes	
United Stated Bureau of Reclamation South-Central California Area Office	Yes	Yes	

C

SBx7-7 Tables and Verification Form

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
309	247
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target*	Calculated 2020 Target *Fm Appropriate Target Table*	Confirmed 2020 Target
304	288	247	247
** Maximum 2020 Target is 95% of the 5 Year Baseline GPCD*			
NOTES:			

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)*					2015 GPCD *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015?
		Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD		
190	278	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	*From Methodology 8 (Optional)*	0	189.745674	189.745674	YES
NOTES:								

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☑	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	550,217
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	121,994	-	-	-	-	-	**121,994**
*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Groundwater
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	55,028	-	55,028

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Surface Water- NESWTF
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	20,724		20,724

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Surface Water- SESWTF
This water source is *(check one)* **:**	

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	45,367		45,367

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Surface Water- T-3 SWTF

This water source is *(check one)* **:**

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	875		875

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 5

This water source is *(check one)* **:**

☐	The supplier's own water source
☐	A purchased or imported source

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
121,994	550,217	**198**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]	TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
198	-	-	-	-	198	247	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

D

City of Fresno's Reduce Delta Reliance Reporting

Appendix D - Delta Reliance

1. Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action (e.g., a proposed project) in the Sacramento-San Joaquin Delta (Delta), prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.

Anyone may appeal a certification of consistency. If the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency. The covered action may be implemented if either: 1) no appeal is filed; or 2) the Delta Stewardship Council denies the appeal to the revised certification of consistency.

The City of Fresno (City) contracts with the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) Friant Division for an annual supply of 60,000 af of Class 1 water through an agreement originally executed in January 1961. Although the Friant Division of the CVP does not pull water from the Delta, the project was developed through an exchange agreement reached in 1939 with the Delta-Mendota supply that provides water to the Exchange Contractors[1] with historic pre-1914 San Joaquin River water rights. As restrictions on Delta exports have hindered USBR from making deliveries to the Delta-Mendota Canal, the Exchange Contractors can call on their historic rights, which reduces the Friant Division Class 1 allocations. As such, the City is required to demonstrate consistency with the Delta Plan's policy to reduce reliance on the Delta.

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

[1] The Exchange Contractors are the benefactors of the historic pre-1914 water rights established by Miller and Lux. These contracts include: Central California Irrigation District; San Luis Canal Company; Firebaugh Canal Water District; and Columbia Canal Company, per http://www.sjrecwa.net/history.html (accessed March 10, 2021).

(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:

(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);

(2) That failure has significantly caused the need for the export, transfer, or use; and

(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:

(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;

(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and

(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self- reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).

The analysis and documentation provided below include all the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

2. Methodology

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for improved regional self-reliance and measurable reduction in Delta reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta. The expected outcomes for the City's regional self-reliance and reduced Delta reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 issued in March 2020 (Guidebook Appendix C), including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources.

All data were obtained from planning documents adopted by the City Council, including the current and previous UWMPs and Metropolitan Water Resource Management Plan (Metro Plan) and represent average or normal water year conditions. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the UWMP Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

To calculate the expected outcomes for improved regional self-reliance and reduced Delta reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from the City's 2008 UWMP. Consistent with the 2010 baseline data approach, the expected outcomes for improved regional self-reliance and reduced Delta reliance for 2015 and 2020 were taken from the City's 2010 and 2015 UWMPs, respectively. Expected outcomes for 2025-2045 are from the current 2020 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

3. Demonstration of Regional Self-Reliance

3.1 Service Area Demands without Water Use Efficiency

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as the City that do not explicitly quantify water use efficiency savings in their UWMPs can calculate their embedded water use efficiency savings based on changes in forecasted per capita water use since the baseline.

Agencies that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. **Table 1** (included at the end of this appendix) shows the results of this adjustment for the City. Supporting narratives and documentation for all the data shown in Table 1 are provided below.

Service Area Demands with Water Use Efficiency

The service area demands shown in Table 1 represent the total water demands for the City's service area. The demand data shown in Table 1 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 6-5
- 2015: Fresno 2010 UWMP, Table 7-2
- 2020: Fresno 2015 UWMP, Table 4-4
- 2025-2045: Fresno 2020 UWMP, Table 4-6

Non-Potable Water Demands

The non-potable water demands shown in Table 1 represent recycled water use that offsets potable water use in the City's service area. The demand data shown in Table 1 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 10-7
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-14
- 2025-2045: Fresno 2020 UWMP, Table 4-7

Potable Service Area Demands with Water Use Efficiency

Subtract "Non-Potable Water Demands" from "Service Area Demands with Water Use Efficiency."

Service Area Population

The population data shown in Table 1 were collected from the following sources:

- Baseline (2010) and 2015: Fresno 2015 UWMP, Table 5-1
- 2020-2045: Fresno 2020 UWMP, Table 3-3

Estimated Water Use Efficiency Since Baseline

The "Per Capita Water Use" calculated using "Potable Service Area Demands with Water Use Efficiency" divided by "Service Area Population". The "Change in Per Capita Water Use from Baseline" was then calculated by comparing with 2010 Per Capita Water Use. Finally, the "Estimated Water Use Efficiency Since Baseline" was calculated by multiplying the "Change in Per Capita Water Use from Baseline" by the population for one (1) year.

Service Area Water Demands without Water Use Efficiency

Add "Service Area Demands with Water Use Efficiency" to "Estimated Water Use Efficiency Since Baseline."

3.2 Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table 2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in **Table 2** (included at the end of this appendix) represent efforts to improve regional self-reliance for the City's entire service area and include the total contributions of the City and its customers. Supporting narratives and documentation for all of the data shown in Table 2 are provided below.

Estimated Water Use Efficiency Since Baseline

The water use efficiency information shown in Table 2 is taken directly from Table 1.

Water Recycling

The water recycling information shown in Table 2 is taken from the Non-Potable Water Demands row in Table 1.

Local and Regional Water Supply and Storage Programs

The values shown in Table 2 represent groundwater supplies considering both natural recharge and intentional recharge. The supply data shown in Table 2 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 4-9
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-14

- 2025-2045: Fresno 2020 UWMP, Table 6-8

Other Programs and Projects the Contribute to Regional Self-Reliance

The values shown in Table 2 represent Kings River supplies considering both contracted supplies and recycled water exchange supplies. The supply data shown in Table 2 were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 4-11
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-5
- 2025-2045: Fresno 2020 UWMP, Table 6-8

Water Supplies Contributing to Regional Self Reliance

Sum of:

- Estimated Water Use Efficiency Since Baseline
- Water Recycling
- Local and Regional Water Supply and Storage Programs
- Other Programs and Projects the Contribute to Regional Self-Reliance

Percent of Water Supplies Contributing to Regional Self-Reliance

"Water Supplies Contributing to Regional Self Reliance" divided by "Service Area Water Demands without Water Use Efficiency" (from Section 3.1).

3.3 Conclusions

The results shown in Table 2 demonstrate that the City's service area is measurably improving its regional self-reliance. The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for the City's regional self-reliance:

- Near-term (2025): The expected outcome for normal water year regional self-reliance is expected to increase by 129,700 AFY from the 2010 baseline; this represents an increase of about 31 percent of 2025 normal water year demands (Table 2).
- Long-term (2045): The expected outcome for normal water year regional self-reliance is expected to increase by more than 191,600 AFY from the 2010 baseline, this represents an increase of about 14 percent of 2045 normal water year retail demands (Table 2).

The results show that the City is measurably improving regional self-reliance, both as an amount of water used and as a percentage of water used.

4. Demonstration of Reduced Reliance on the Delta

The City's service area reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures.

4.1 Calculation of Reliance on Water Supplies from the Delta Watershed

The calculation of reliance on water supplies from the Delta watershed, shown in **Table 3** (included at the end of this appendix), is based on the following assumptions.

CVP/SWP Contract Supplies

The City water supplies with a connection to the Delta watershed are CVP/SWP Contract Supplies. The supply data shown in Table 3 is for anticipated average yield from the City's USBR contract and were collected from the following sources:

- Baseline (2010): Fresno 2008 UWMP, Table 4-6
- 2015: Fresno 2010 UWMP, Table 7-1
- 2020: Fresno 2015 UWMP, Table 6-14
- 2025-2045: Fresno 2020 UWMP, Table 6-2

Water Supplies from the Delta Watershed

Equal to "CVP/SWP Contract Supplies."

Percent Change in Supplies from the Delta Watershed

Divides "Water Supplies from the Delta Watershed" by "Service Area Demands without Water Use Efficiency" (from Section 3.1) and calculates changes from the 2010 baseline.

4.2 Conclusions

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for the City's Delta reliance on supplies from the Delta watershed:

- Near-term (2025): The expected outcome for normal water year reliance on supplies from the Delta watershed is expected to decrease by 4,520 AF from the 2010 baseline. With Delta water representing 25.5% of service area water demand without water use efficiency, this represents a decrease from the 2010 baseline of 10.1% (Table 3).
- Long-term (2045): The expected outcome for normal water year reliance on supplies from the Delta watershed is expected to decrease by 4,520 AF from the 2010 baseline. With Delta water representing 19.5% of service area water demand without water use efficiency, this represents a decrease from the 2010 baseline of 16.2% (Table 3).

The results shown in Table 3 demonstrate that City is measurably reducing reliance on the Delta, both as an amount of water used and as a percentage of water used.

5. UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta[.]*

In accordance with Water Code Section 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Chapter 6 of the City's 2020 UWMP summarizes the implementation of future water projects and continued progress in developing a diversified water portfolio to meet the City's water needs.

6. 2015 UWMP Appendix L

The information contained in this appendix is also intended to be a new Appendix L attached to the City's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). The City provided notice of the availability of the draft 2020 UWMP, 2020 WSCP, and a new Appendix L to the 2015 UWMP and the public hearing to consider adoption of the documents in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix L to the 2015 UWMP, and the 2020 WSCP were posted on the City's website, fresno.gov, on June 28, 2021, more than 14 days in advance of the public hearing on July 15, 2021. The notice of availability of the documents was sent to the City's customers, as well as cities and counties in the City's service area. Copies of the notification letter sent to the customers and cities and counties in the City's service area are included in the 2020 UWMP Appendix L. Thus, this Appendix D to the City's 2020 UWMP, which was adopted with the City's 2020 UWMP, will also be recognized and treated as Appendix L to the City's 2015 UWMP.

The City held the public hearing for the draft 2020 UWMP, draft Appendix L to the 2015 UWMP, and draft 2020 WSCP on July 15, 2021, at a regular City Council meeting, held online due to COVID-19 concerns. At the meeting, the City Council determined that the 2020 UWMP and the 2020 WSCP accurately represent the water resources plan for the City's service area. In addition, the City Council determined that Appendix L to the 2015 UWMP and Appendix D to the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 2021-196, 2021-197, and 2021-198, the City Council adopted the 2020 UWMP, the 2020 WSCP, and Appendix L to the 2015 UWMP and authorized their submittal to the State of California. Copies of the resolutions are included in the 2020 UWMP Appendix M.

Table 1. Calculation of Service Area Water Demands without Water Use Efficiency (UWMP Table C-1 and Table C-2)

Table C-1: Optional Calculation of Water Use Efficiency -To be completed if Water Supplier does not specifically estimate Water Use Efficiency as a supply

Service Area Water Use Efficiency Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	163,300	172,900	168,200	136,579	147,505	154,434	161,372	168,318
Non-Potable Water Demands	750	1,000	9,500	14,220	14,220	14,220	14,220	14,220
Potable Service Area Demands with Water Use Efficiency Accounted For	162,550	171,900	158,700	122,359	133,285	140,214	147,152	154,098

Total Service Area Population	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Population	505,315	525,575	550,217	609,433	674,677	719,327	765,278	812,529

Water Use Efficiency Since Baseline (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Per Capita Water Use (GPCD)	287	292	257	179	176	174	172	169
Change in Per Capita Water Use from Baseline (GPCD)		5	(30)	(108)	(111)	(113)	(116)	(118)
Estimated Water Use Efficiency Since Baseline		(2,833)	18,294	73,684	83,745	91,180	99,023	107,277

Table C-2: Calculation of Service Area Water Demands Without Water Use Efficiency

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands with Water Use Efficiency Accounted For	163,300	172,900	168,200	136,579	147,505	154,434	161,372	168,318
Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline	-	(2,833)	18,294	73,684	83,745	91,180	99,023	107,277
Service Area Water Demands without Water Use Efficiency Accounted For	163,300	170,067	186,494	210,263	231,250	245,614	260,395	275,595

Table 2. Calculation of Supplies Contributing to Regional Self-Reliance (UWMP Table C-3)

Table C-3: Calculation of Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Estimated Water Use Efficiency since Baseline	-	(2,833)	18,294	73,684	83,745	91,180	99,023	107,277
Water Recycling	750	1,000	9,500	14,220	14,220	14,220	14,220	14,220
Stormwater Capture and Use								
Advanced Water Technologies								
Conjunctive Use Projects								
Local and Regional Water Supply and Storage Projects	88,800	76,100	132,480	138,090	143,630	149,100	154,490	159,820
Other Programs and Projects the Contribute to Regional Self-Reliance	131,750	117,400	116,000	125,030	131,600	131,600	131,600	131,600
Water Supplies Contributing to Regional Self-Reliance	221,300	191,667	276,274	351,024	373,195	386,100	399,333	412,917

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	163,300	170,067	186,494	210,263	231,250	245,614	260,395	275,595

Change in Regional Self Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Supplies Contributing to Regional Self-Reliance	221,300	191,667	276,274	351,024	373,195	386,100	399,333	412,917
Change in Water Supplies Contributing to Regional Self-Reliance		(29,633)	54,974	129,724	151,895	164,800	178,033	191,617

Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Percent of Water Supplies Contributing to Regional Self-Reliance	135.5%	112.7%	148.1%	166.9%	161.4%	157.2%	153.4%	149.8%
Change in Percent of Water Supplies Contributing to Regional Self-Reliance		-22.8%	12.6%	31.4%	25.9%	21.7%	17.8%	14.3%

Table 3. Reliance on Water Supplies from the Delta Watershed (UWMP Table C-4)

Table C-4: Calculation of Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
CVP/SWP Contract Supplies	58,200	58,200	52,600	53,680	53,680	53,680	53,680	53,680
Delta/Delta Tributary Diversions								
Transfers and Exchanges of Supplies from the Delta Watershed								
Other Water Supplies from the Delta Watershed								
Total Water Supplies from the Delta Watershed	58,200	58,200	52,600	53,680	53,680	53,680	53,680	53,680

Service Area Water Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Service Area Water Demands without Water Use Efficiency Accounted For	163,300	170,067	186,494	210,263	231,250	245,614	260,395	275,595

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Water Supplies from the Delta Watershed	58,200	58,200	52,600	53,680	53,680	53,680	53,680	53,680
Change in Water Supplies from the Delta Watershed		-	(5,600)	(4,520)	(4,520)	(4,520)	(4,520)	(4,520)

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045 (Optional)
Percent of Water Supplies from the Delta Watershed	35.6%	34.2%	28.2%	25.5%	23.2%	21.9%	20.6%	19.5%
Change in Percent of Water Supplies from the Delta Watershed		-1.4%	-7.4%	-10.1%	-12.4%	-13.8%	-15.0%	-16.2%

E

AWWA Water Audits

AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition

+ Click to add a comment

Water Audit Report for: City of Fresno (1010007)

Reporting Year: 2016 1/2016 - 12/2016

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

WATER SUPPLIED

	Grading	Value		Master Meter and Supply Error Adjustments: Pcnt:	Value:	
Volume from own sources:	5	112,398.020	acre-ft/yr			
Water imported:	n/a	0.000	acre-ft/yr			
Water exported:	n/a	0.000	acre-ft/yr			

<---------- Enter grading in column 'E' and 'J' ---------->

Enter negative % or value for under-registration

Enter positive % or value for over-registration

WATER SUPPLIED: 112,398.020 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option

	Grading	Value		Pcnt:	Value:	
Billed metered:	9	103,038.468	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	10	42.876	acre-ft/yr			
Unbilled unmetered:	5	280.995	acre-ft/yr		280.995	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 103,362.339 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

9,035.681 acre-ft/yr

Apparent Losses

	Value		Pcnt:	Value:	
Unauthorized consumption:	280.995	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

	Grading	Value		Pcnt:	Value:	
Customer metering inaccuracies:	5	1,041.226	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:		257.596	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,579.817 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 7,455.864 acre-ft/yr

WATER LOSSES: 9,035.681 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 9,359.552 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

	Grading	Value	
Length of mains:	9	1,810.39	miles
Number of active AND inactive service connections:	9	143,916	
Service connection density:		79	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 3 50.0 psi

COST DATA

	Grading	Value		
Total annual cost of operating water system:	10	$71,848,500	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$1.86	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	5	$152.10	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 66 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Customer metering inaccuracies

3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Fresno
Reporting Year: 2017 (1/2017 - 12/2017)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	121,079.641	acre-ft/yr	5			acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr				acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 121,079.641 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	9	110,520.840	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	10	48.124	acre-ft/yr			
Unbilled unmetered:	5	276.052	acre-ft/yr		276.052	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 110,845.016 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

10,234.625 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		302.699	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	1,116.858	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:		276.302	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,695.859 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 8,538.766 acre-ft/yr

WATER LOSSES: 10,234.625 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 10,558.801 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,854.4	miles
Number of active AND inactive service connections:	9	146,212	
Service connection density:		79	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 4 — 50.0 psi

COST DATA

Total annual cost of operating water system:	10	$76,015,350	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$2.01	$/1000 gallons (US)	
Variable production cost (applied to Real Losses):	5	$175.42	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 66 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Fresno
Reporting Year: 2018 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	120,065.780	acre-ft/yr	8			acre-ft/yr
Water imported:	n/a		acre-ft/yr				acre-ft/yr
Water exported:	n/a		acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 120,065.780 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	9	110,710.560	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	8	27.129	acre-ft/yr			
Unbilled unmetered:	5	300.164	acre-ft/yr		300.164	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 111,037.853 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption)

9,027.927 acre-ft/yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		300.164	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	5	1,118.563	acre-ft/yr	1.00%	acre-ft/yr
Systematic data handling errors:		276.776	acre-ft/yr	0.25%	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,695.503 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 7,332.423 acre-ft/yr

WATER LOSSES: 9,027.927 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 9,355.220 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,854.7	miles
Number of active AND inactive service connections:	9	146,608	
Service connection density:		79	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	10	53.3	psi

COST DATA

Total annual cost of operating water system:	10	$82,960,821	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$2.33	$/1000 litres	
Variable production cost (applied to Real Losses):	5	$178.06	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 66 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

AWWA Free Water Audit Software: Worksheet

FWAS v6.0

American Water Works Association.

Water Audit Report for: City of Fresno
Audit Year: 2019 | Jan 01 2019 - Dec 31 2019 | Calendar

Click 'n' to add notes
Click 'g' to determine data validity grade

To edit water system info: go to start page

To access definitions, click the input name

All volumes to be entered as: ACRE-FEET PER YEAR

Water Supplied Error Adjustments

WATER SUPPLIED

choose entry option:

VOS	Volume from Own Sources:	n	g	115,544.090	Acre-ft/Yr	n	g	5.00%	percent	under-registration VOSEA
WI	Water Imported:	n	g	0.000	Acre-ft/Yr					WIEA
WE	Water Exported:	n	g	0.000	Acre-ft/Yr					WEEA
	WATER SUPPLIED:			121,625.358	Acre-ft/Yr					

AUTHORIZED CONSUMPTION

choose entry option:

BMAC	Billed Metered:	n	g	106,485.360	Acre-ft/Yr			
BUAC	Billed Unmetered:	n	g	0.000	Acre-ft/Yr			
UMAC	Unbilled Metered:	n	g	52.635	Acre-ft/Yr			
UUAC	Unbilled Unmetered:	n	g 3	266.213	Acre-ft/Yr	0.25%	default	

Default option selected for Unbilled Unmetered, with automatic data grading of 3

AUTHORIZED CONSUMPTION: 106,804.208 Acre-ft/Yr

WATER LOSSES

14,821.149 Acre-ft/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

choose entry option:

SDHE	Systematic Data Handling Errors:	n	g 3	266.213	Acre-ft/Yr	0.25%	default	
CMI	Customer Metering Inaccuracies:	n	g	1,076.141	Acre-ft/Yr	1.00%	percent	under-registration
UC	Unauthorized Consumption:	n	g 3	266.213	Acre-ft/Yr	0.25%	default	

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: 1,608.568 Acre-ft/Yr

Real Losses

Real Losses: 13,212.581 Acre-ft/Yr

WATER LOSSES: 14,821.149 Acre-ft/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 15,139.998 Acre-ft/Yr

SYSTEM DATA

Lm	Length of mains:	n	g	1,862.2	miles	(including fire hydrant lead lengths)
Nc	Number of service connections:	n	g	147,633		(active *and* inactive)
	Service connection density:			79	conn./mile main	

Are customer meters typically located at the curbstop/property line? Yes

Lp n g 10

Average length of customer service line has been set to zero and a data grading of 10 has been applied

AOP Average Operating Pressure: n g 50.0 psi

COST DATA

CRUC	Customer Retail Unit Charge:	n	g	$2.33	$/1000 gallons (US)	Total Annual Operating Cost	
VPC	Variable Production Cost:	n	g	$230.95	$/acre-ft	$106,528,917	$/yr (optional input)

WATER AUDIT DATA VALIDITY TIER:

Click 'g' for 10 parameter(s), then complete all visible data grading questions to enable the Data Validity Score to calculate

go to dashboard

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

Unit Total Losses:		gal/conn/day
Unit Apparent Losses:		gal/conn/day
Unit Real Losses[^]:		gal/conn/day
Unit Real Losses[=]:		gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

F

DWR Population Tool Output

WUEdata - Fresno City Of

Sign Out

Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Heather Freed	Fresno City Of	8103177726	3/17/2021 12:16:56 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	fresno_1990_processed.kml	517
2000	fresno_2000_processed.kml	516
2010	fresno_2010_processed.kml	515
1990	fresno_1990_processed.kml	517
2000	fresno_2000_processed.kml	516
2010	fresno_2010_processed.kml	515
1990	fresno_1990_processed.kml	517
2000	fresno_2000_processed.kml	516
2010	fresno_2010_processed.kml	515

Baseline Period Ranges

10 to 15-year baseline period

Number of years in baseline period: 10

Year beginning baseline period range: 1996

Year ending baseline period range[1]: 2005

5-year baseline period

Year beginning baseline period range: 2003

Year ending baseline period range[2]: 2007

[1] The ending year must be between December 31, 2004 and December 31, 2010.

[2] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	**364,084**		**4.23**
1991	-	-	4.23
1992	-	-	4.24
1993	-	-	4.24
1994	-	-	4.25
1995	-	-	4.26
1996	-	-	4.26
1997	-	-	4.27
1998	-	-	4.27
1999	-	-	4.28
2000	**439,062**	**102476**	**4.28**
2001	-	-	4.29
2002	-	-	4.29
2003	-	-	4.30
2004	-	-	4.30
2005	-	-	4.31
2006	-	-	4.32
2007	-	-	4.32
2008	-	-	4.33
2009	-	-	4.33
2010	**505,315**	**116373**	**4.34**
2011	-	-	4.28
2012	-	-	4.28
2013	-	-	4.28
2014	-	-	4.28
2015	-	-	4.28
2020	**-**	**-**	**4.41 ****

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	1996		4.26	
Year 2	1997		4.27	
Year 3	1998		4.27	
Year 4	1999		4.28	
Year 5	2000	102476	4.28	**439,062**
Year 6	2001		4.29	
Year 7	2002		4.29	
Year 8	2003		4.30	
Year 9	2004		4.30	
Year 10	2005		4.31	
5 Year Baseline Population Calculations				
Year 1	2003		4.30	
Year 2	2004		4.30	
Year 3	2005		4.31	
Year 4	2006		4.32	
Year 5	2007		4.32	
2020 Compliance Year Population Calculations				
2020		124862	4.41 **	**550,217**

Hide Print Confirmation

QUESTIONS / ISSUES? CONTACT THE WUEDATA HELP DESK
MWELO QUESTIONS / ISSUES? CONTACT THE MWELO HELP DESK

G

North Kings Subbasin Groundwater Sustainability Plan

Reference the North Kings Subbasin Groundwater Sustainability Plan online: https://www.northkingsgsa.org/groundwater-sustainability-plan/

H

City of Fresno's Central Valley Project Contract

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

LONG-TERM RENEWAL CONTRACT BETWEEN THE UNITED STATES
AND
CITY OF FRESNO
PROVIDING FOR PROJECT WATER SERVICE
FROM FRIANT DIVISION

THIS CONTRACT, made this 18 day of August, 2005, in pursuance generally of the Act of June 17, 1902 (32 Stat. 388), and acts amendatory or supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, between the UNITED STATES OF AMERICA, hereinafter referred to as the United States, and the CITY OF FRESNO, hereinafter referred to as the Contractor, a public agency of the State of California, duly organized, existing, and acting pursuant to the laws thereof;

WITNESSETH, That:

EXPLANATORY RECITALS

[1st] WHEREAS, the United States has constructed and is operating the Central Valley Project (Project), California, for diversion, storage, carriage, distribution and beneficial use, for flood control, irrigation, municipal, domestic, industrial, fish and wildlife mitigation, protection and restoration, generation and distribution of electric energy, salinity control, navigation and other beneficial uses, of waters of the Sacramento River, the American River, the Trinity River, and the San Joaquin River and their tributaries; and

[2nd] WHEREAS, the United States constructed Friant Dam (thereby creating Millerton Lake) and the Friant-Kern and Madera Canals, hereinafter collectively referred to as the Friant Division facilities, which will be used in part for the furnishing of water to the Contractor pursuant to the terms of this Contract; and

[3rd] WHEREAS, pursuant to Section 8 of the Act of June 17, 1902 (32 Stat. 388), the United States has acquired water rights and other rights to the flows of the San Joaquin River, including without limitation the permits issued as the result of Decision 935 by the California State Water Resources Control Board and the contracts described in subdivision (n) of Article 3 of this Contract, pursuant to which the Contracting Officer develops, diverts, stores and delivers Project Water stored or flowing through Millerton Lake in accordance with State and Federal law for the benefit of Project Contractors in the Friant Division; and

[3.1] WHEREAS, the water supplied to the Contractor pursuant to this Contract is Project Water developed through the exercise of the rights described in the third Explanatory Recital of this Contract; and

[4th] WHEREAS, the Contractor and the United States entered into Contract No. 14-06-200-8901, which established terms for the delivery to the Contractor of Project Water from the Friant Division from March 1, 1966, to February 28, 2006, hereinafter referred to as the Existing Contract; and

[5th] WHEREAS, the Contractor and the United States have, pursuant to Subsection 3404(c)(3) of the Central Valley Project Improvement Act (CVPIA), subsequently entered into a Binding Agreement identified as Binding Agreement No. 14-06-200-8901-BA, which sets out the terms pursuant to which the Contractor agreed to renew the Existing Contract before its expiration date after completion of the programmatic environmental impact statement and other appropriate environmental documentation and negotiation of a renewal contract, and which also sets out the consequences of a subsequent decision not to renew; and

[6th] WHEREAS, Section 3404(c) of the CVPIA provides for long-term renewal of the Existing Contract following completion of appropriate environmental documentation, including a programmatic environmental impact statement (PEIS) pursuant to the National Environmental Policy Act (NEPA) analyzing the direct and indirect impacts and benefits of implementing the CVPIA and the potential renewal of all existing contracts for Project Water; and

[7th] WHEREAS, the United States has completed the PEIS and all other appropriate environmental review necessary to provide for long-term renewal of the Existing Contract; and

[8th] WHEREAS, the Contractor has requested the long-term renewal of the Existing Contract, pursuant to the terms of the Existing Contract, Federal Reclamation law, and the laws of the State of California, for water service from the Project; and

[9th] WHEREAS, the United States has determined that the Contractor has fulfilled all of its obligations under the Existing Contract; and

[10th] WHEREAS, the Contractor has demonstrated to the satisfaction of the Contracting Officer that the Contractor has utilized the Project Water supplies available to it for reasonable and beneficial use and/or has demonstrated projected future demand for water use such that the Contractor has the capability and expects to utilize fully for reasonable and beneficial use the quantity of Project Water to be made available to it pursuant to this Contract; and

[11th] WHEREAS, water obtained from the Project has been relied upon by urban and agricultural areas within California for more than 50 years, and is considered by the Contractor as an essential portion of its water supply; and

[12th] WHEREAS, the economies of regions within the Project, including the Contractor's, depend upon the continued availability of water, including water service from the Project; and

[13th] WHEREAS, the Secretary intends through coordination, cooperation, and partnerships to pursue measures to improve water supply, water quality, and reliability of the Project for all Project purposes; and

[14th] WHEREAS, the mutual goals of the United States and the Contractor include: to provide for reliable Project Water supplies; to control costs of those supplies; to achieve repayment of the Project as required by law; to guard reasonably against Project Water shortages; to achieve a reasonable balance among competing demands for use of Project Water; and to comply with all applicable environmental statutes, all consistent with the legal obligations of the United States relative to the Project; and

[15th] WHEREAS, the parties intend by this Contract to develop a more cooperative relationship in order to achieve their mutual goals; and

[15.1] WHEREAS, during uncontrolled seasons, Friant Division Project Contractors utilize undependable Class 2 Water in their service areas to, among other things, assist in the management and alleviation of groundwater overdraft in the Friant Division service area, provide opportunities for environmental enhancement, including restoration of the San Joaquin River below Friant Dam, minimize flooding along the San Joaquin River, encourage optimal water management, and maximize the reasonable and beneficial use of the water; and

[15.2] WHEREAS, the parties desire and intend that this Contract not provide a disincentive to the Friant Division Project Contractors continuing to carry out the beneficial activities set out in the Explanatory Recital immediately above; and

[16th] WHEREAS, the United States and the Contractor are willing to enter into this Contract pursuant to Federal Reclamation law on the terms and conditions set forth below;

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby mutually agreed by the parties hereto as follows:

DEFINITIONS

1. When used herein unless otherwise distinctly expressed, or manifestly incompatible with the intent of the parties as expressed in this Contract, the term:

(a) "Calendar Year" shall mean the period January 1 through December 31, both dates inclusive;

(b) "Charges" shall mean the payments required by Federal Reclamation law in addition to the Rates and Tiered Pricing Component specified in this Contract as determined annually by the Contracting Officer pursuant to this Contract;

(b2) "Class 1 Water" shall mean that supply of water stored in or flowing through Millerton Lake which, subject to the contingencies hereinafter described in Articles 3, 11, and 12 of this Contract, will be available for delivery from Millerton Lake and the Friant-Kern and Madera Canals as a dependable water supply during each Year;

(b3) "Class 2 Water" shall mean that supply of water which can be made available subject to the contingencies hereinafter described in Articles 3, 11, and 12 of this Contract for delivery from Millerton Lake and the Friant-Kern and Madera Canals in addition to the supply of Class 1 Water. Because of its uncertainty as to availability and time of occurrence, such water will be undependable in character and will be furnished only if, as, and when it can be made available as determined by the Contracting Officer;

(c) "Condition of Shortage" shall mean a condition respecting the Project during any Year such that the Contracting Officer is unable to deliver sufficient water to meet the Contract Total;

(d) "Contracting Officer" shall mean the Secretary of the Interior's duly authorized representative acting pursuant to this Contract or applicable Federal Reclamation law or regulation;

(e) "Contract Total" shall mean the maximum amount of Class 1 Water, plus the maximum amount of Class 2 Water to which the Contractor is entitled under subdivision (a) of Article 3 of this Contract;

(f) "Contractor's Service Area" shall mean the area to which the Contractor is permitted to provide Project Water under this Contract as described in Exhibit "A" attached hereto, which may be modified from time to time in accordance with Article 35 of this Contract without amendment of this Contract;

(g) "CVPIA" shall mean the Central Valley Project Improvement Act, Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706);

(h-i) Omitted;

(j) "Full Cost Rate" shall mean an annual rate as determined by the Contracting Officer that shall amortize the expenditures for construction properly allocable to the Project irrigation or M&I functions, as appropriate, of facilities in service including all O&M deficits funded, less payments, over such periods as may be required under Federal Reclamation law or applicable contract provisions. Interest will accrue on both the construction expenditures and funded O&M deficits from October 12, 1982, on costs outstanding at that date, or from the date incurred in the case of costs arising subsequent to October 12, 1982, and shall be calculated in accordance with subsections 202(3)(B) and (3)(C) of the RRA. The Full Cost Rate includes actual operation, maintenance, and replacement costs consistent with Section 426.2 of the Rules and Regulations for the RRA;

(k-l) Omitted;

(m) "Irrigation Water" shall mean water made available from the Project that is used primarily in the production of agricultural crops or livestock, including domestic use incidental thereto, and watering of livestock;

(n) Omitted;

(n2) "Long Term Historic Average" shall mean the average of the final forecast of Water Made Available to the Contractor pursuant to this Contract and the contract referenced in the fourth Explanatory Recital of this Contract;

(o) "Municipal and Industrial (M&I) Water" shall mean Project Water, other than Irrigation Water, made available to the Contractor. M&I Water shall include water used for human use and purposes such as the watering of landscaping or pasture for animals (e.g., horses) which are kept for personal enjoyment or water delivered to land holdings operated in units of less than five acres unless the Contractor establishes to the satisfaction of the Contracting Officer that the use of water delivered to any such landholding is a use described in subdivision (m) of this Article;

(p) "M&I Full Cost Water Rate" shall mean the Full Cost Rate applicable to the delivery of M&I Water;

(q) "Operation and Maintenance" or "O&M" shall mean normal and reasonable care, control, operation, repair, replacement (other than capital replacement), and maintenance of Project facilities;

(r) "Operating Non-Federal Entity" shall mean the Friant Water Authority, its successors or assigns, a non-Federal entity which has the obligation to operate and maintain all or a portion of the Friant Division facilities pursuant to an agreement with the United States, and which may have funding obligations with respect thereto;

(s) "Project" shall mean the Central Valley Project owned by the United States and managed by the Department of the Interior, Bureau of Reclamation;

(t) "Project Contractors" shall mean all parties who have water service contracts for Project Water from the Project with the United States pursuant to Federal Reclamation law;

(u) "Project Water" shall mean all water that is developed, diverted, stored, or delivered by the Secretary in accordance with the statutes authorizing the Project and in accordance with the terms and conditions of water rights acquired pursuant to California law;

(v) "Rates" shall mean the payments determined annually by the Contracting Officer in accordance with the then-current applicable water ratesetting policies for the Project, as described in subdivision (a) of Article 7 of this Contract;

(w) Omitted;

(x) "Secretary" shall mean the Secretary of the Interior, a duly appointed successor, or an authorized representative acting pursuant to any authority of the Secretary and through any agency of the Department of the Interior;

(y) "Tiered Pricing Component" shall be the incremental amount to be paid for each acre-foot of Water Delivered as described in subdivision (j) of Article 7 of this Contract;

(z) "Water Delivered" or "Delivered Water" shall mean Project Water diverted for use by the Contractor at the point(s) of delivery approved by the Contracting Officer;

(aa) "Water Made Available" shall mean the estimated amount of Project Water that can be delivered to the Contractor for the upcoming Year as declared by the Contracting Officer, pursuant to subdivision (a) of Article 4 of this Contract;

(bb) "Water Scheduled" shall mean Project Water made available to the Contractor for which times and quantities for delivery have been established by the Contractor and Contracting Officer, pursuant to subdivision (b) of Article 4 of this Contract; and

(cc) "Year" shall mean the period from and including March 1 of each Calendar Year through the last day of February of the following Calendar Year.

TERM OF CONTRACT

2. (a) This Contract supersedes the Existing Contract and shall be effective on the date first hereinabove written through February 28, 2045. In the event the Contractor wishes to renew this Contract beyond February 28, 2045, the Contractor shall submit a request for renewal in writing to the Contracting Officer no later than two years prior to the date this Contract expires.

(b) Omitted.

(c) Provided the Contractor is complying with all terms and conditions of this Contract and all legal obligations of the Contractor, if any, set forth in an enforceable court order, final judgment and/or settlement relating to restoration of the San Joaquin River, this Contract shall be renewed for successive periods of up to 40 years each, which periods shall be consistent with the then-existing Reclamation-wide policy, under terms and conditions mutually agreeable to the parties and consistent with Federal and State law. The Contractor shall be afforded the opportunity to comment to the Contracting Officer on the proposed adoption and application of any revised policy applicable to the delivery of M&I Water that would limit the term of any subsequent renewal contract with the Contractor for the furnishing of M&I Water to less than 40 years.

(d) The Contracting Officer shall make a determination ten years after the date of execution of this Contract, and every five years thereafter during the term of this Contract, of whether a conversion to a contract under subsection 9(c)(1) of the Reclamation Project Act of 1939 can be accomplished. The Contracting Officer anticipates that during the term of this Contract, all authorized Project construction expected to occur will have occurred, and on that basis the Contracting Officer agrees upon such completion to allocate all costs that are properly assignable to the Contractor, and agrees further that, at any time after such allocation is made, and subject to satisfaction of the conditions set out in this subdivision, this Contract shall, at the request of the Contractor, be converted to a contract under subsection 9(c)(1) of the Reclamation Project Act of 1939, subject to applicable Federal law and under stated terms and conditions mutually agreeable to the Contractor and the Contracting Officer. A condition for such conversion to occur shall be a determination by the Contracting Officer that, account being taken of the amount credited to return by the Contractor as provided for under Federal Reclamation law, the remaining amount of construction costs assignable for ultimate return by the Contractor can probably be repaid to the United States within the term of a contract under subsection 9(c)(1). If the remaining amount of costs that are properly assignable to the Contractor cannot be determined during the term of this Contract, the Contracting Officer shall notify the Contractor, and provide the reason(s) why such a determination could not be made. Further, the Contracting Officer shall make such a determination as soon thereafter as possible so as to permit, upon request of the Contractor and satisfaction of the conditions set out above, conversion to a contract under subsection 9(c)(1). In the event such determination of costs has not been made at a time which allows conversion of this Contract during the term of this

Contract or the Contractor has not requested conversion of this Contract within such term, the parties shall incorporate in any subsequent renewal contract as described in subdivision (c) of this Article a provision that carries forth in substantially identical terms the provisions of this subdivision.

WATER TO BE MADE AVAILABLE AND DELIVERED TO THE CONTRACTOR

3. (a) During each Year, consistent with all applicable State water rights, permits, and licenses, Federal law, and subject to the provisions set forth in Articles 11 and 12 of this Contract, the Contracting Officer shall make available for delivery to the Contractor 60,000 acre-feet of Class 1 Water for M&I purposes. Water Delivered to the Contractor in accordance with this subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and 7 of this Contract.

(b) Omitted.

(c) The Contractor shall utilize the Project Water in accordance with all applicable legal requirements.

(d) The Contractor shall make reasonable and beneficial use of all water furnished pursuant to this Contract. Groundwater recharge programs (direct, indirect, or in lieu), groundwater banking programs, surface water storage programs, and other similar programs utilizing Project Water or other water furnished pursuant to this Contract conducted within the Contractor's Service Area which are consistent with applicable State law and result in use consistent with Federal Reclamation law will be allowed: Provided, That any direct recharge program(s) is (are) described in the Contractor's water conservation plan submitted pursuant to Article 26 of this Contract: Provided further, That such water conservation plan demonstrates sufficient lawful uses exist in the

Contractor's Service Area so that using a long-term average, the quantity of Delivered Water is demonstrated to be reasonable for such uses and in compliance with Federal Reclamation law. Groundwater recharge programs, groundwater banking programs, surface water storage programs, and other similar programs utilizing Project Water or other water furnished pursuant to this Contract conducted outside the Contractor's Service Area may be permitted upon written approval of the Contracting Officer, which approval will be based upon environmental documentation, Project Water rights, and Project operational concerns. The Contracting Officer will address such concerns in regulations, policies, or guidelines.

(e) The Contractor shall comply with requirements applicable to the Contractor in biological opinion(s) prepared as a result of a consultation regarding the execution of this Contract undertaken pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended, that are within the Contractor's legal authority to implement. The Existing Contract, which evidences in excess of 39 years of diversions for M&I purposes of the quantities of water provided in subdivision (a) of Article 3 of this Contract, will be considered in developing an appropriate baseline for the biological assessment(s) prepared pursuant to the ESA, and any other needed environmental review. Nothing herein shall be construed to prevent the Contractor from challenging or seeking judicial relief in a court of competent jurisdiction with respect to any biological opinion or other environmental documentation referred to in this Article.

(f) Subject to subdivisions (l) and (n) of Article 3 of this Contract, following the declaration of Water Made Available under Article 4 of this Contract, the Contracting Officer will make a determination whether Project Water, or other water available to the Project, can be made

available to the Contractor in addition to the Contract Total under Article 3 of this Contract during the Year without adversely impacting other Project Contractors. At the request of the Contractor, the Contracting Officer will consult with the Contractor prior to making such a determination. Subject to subdivisions (l) and (n) of Article 3 of this Contract, if the Contracting Officer determines that Project Water, or other water available to the Project, can be made available to the Contractor, the Contracting Officer will announce the availability of such water and shall so notify the Contractor as soon as practicable. The Contracting Officer will thereafter meet with the Contractor and other Project Contractors capable of taking such water to determine the most equitable and efficient allocation of such water. If the Contractor requests the delivery of any quantity of such water, the Contracting Officer shall make such water available to the Contractor in accordance with applicable statutes, regulations, guidelines, and policies.

(g) The Contractor may request permission to reschedule for use during the subsequent Year some or all of the Water Made Available to the Contractor during the current Year referred to as "carryover." The Contractor may request permission to use during the current Year a quantity of Project Water which may be made available by the United States to the Contractor during the subsequent Year referred to as "preuse." The Contracting Officer's written approval may permit such uses in accordance with applicable statutes, regulations, guidelines, and policies.

(h) The Contractor's right pursuant to Federal Reclamation law and applicable State law to the reasonable and beneficial use of Water Delivered pursuant to this Contract during the term thereof and any subsequent renewal contracts, as described in Article 2 of this Contract, during the terms thereof shall not be disturbed so long as the Contractor shall fulfill all of its obligations

under this Contract and any renewals thereof. Nothing in the preceding sentence shall affect the Contracting Officer's ability to impose shortages under Article 11 or subdivision (b) of Article 12 of this Contract or applicable provisions of any subsequent renewal contracts.

(i) Project Water furnished to the Contractor pursuant to this Contract may be delivered for other than M&I purposes upon written approval by the Contracting Officer in accordance with the terms and conditions of such approval.

(j) The Contracting Officer shall make reasonable efforts to protect the water rights and other rights described in the third Explanatory Recital of this Contract necessary for the Project and to provide the water available under this Contract. The Contracting Officer shall not object to participation by the Contractor, in the capacity and to the extent permitted by law, in administrative proceedings related to the water rights and other rights described in the third Explanatory Recital of this Contract: Provided, That the Contracting Officer retains the right to object to the substance of the Contractor's position in such a proceeding: Provided further, That in such proceedings the Contracting Officer shall recognize the Contractor has a legal right under the terms of this Contract to use Project Water.

(k) Project Water furnished to the Contractor during any month designated in a schedule or revised schedule submitted by the Contractor and approved by the Contracting Officer shall be deemed to have been accepted by the Contractor as Class 1 Water to the extent that Class 1 Water is called for in such schedule for such month and shall be deemed to have been accepted as Class 2 Water to the extent Class 2 Water is called for in such schedule for such month. If in any month the Contractor diverts a quantity of water in addition to the total amount of Class 1 Water and

Class 2 Water set forth in the Contractor's approved schedule or revised schedule for such month, such additional diversions shall be charged first against the Contractor's remaining Class 2 Water supply available in the current Year. To the extent the Contractor's remaining Class 2 Water supply available in the current Year is not sufficient to account for such additional diversions, such additional diversions shall be charged against the Contractor's remaining Class 1 Water supply available in the current Year. To the extent the Contractor's remaining Class 1 Water and Class 2 Water supplies available in the current Year are not sufficient to account for such additional diversions, such additional diversions shall be charged first against the Contractor's available Class 2 Water supply and then against the Contractor's available Class 1 Water supply, both for the following Year. Payment for all additional diversions of water shall be made in accordance with Article 7 of this Contract.

(l) If the Contracting Officer determines there is a Project Water supply available at Friant Dam as the result of an unusually large water supply not otherwise storable for Project purposes or infrequent and otherwise unmanaged flood flows of short duration, such water will be made available to the Contractor and others under Section 215 of the RRA pursuant to the priorities specified below if the Contractor enters into a temporary contract with the United States not to exceed one year for the delivery of such water or, as otherwise provided for in Federal Reclamation law and associated regulations. Such water may be identified by the Contractor either (i) as additional water to supplement the supply of Class 1 Water and/or Class 2 Water made available to it pursuant to this Contract or, (ii) upon written notification to the Contracting Officer, as water to be credited against the Contractor's Class 2 Water supply available pursuant to this Contract. The Contracting Officer

shall make water determined to be available pursuant to this subsection according to the following priorities: first, to long-term contractors for Class 1 Water and/or Class 2 Water within the Friant Division; second, to long-term contractors in the Cross Valley Division of the Project. The Contracting Officer will consider and seek to accommodate requests from other parties for Section 215 Water for use within the area identified as the Friant Division service area in the environmental assessment developed in connection with the execution of this Contract.

(m) Nothing in this Contract, nor any action or inaction of the Contractor or Contracting Officer in connection with the implementation of this Contract, is intended to override, modify, supersede, or otherwise interfere with any term or condition of the water rights and other rights referred in the third Explanatory Recital of this Contract.

(n) The rights of the Contractor under this Contract are subject to the terms of the contract for exchange waters, dated July 27, 1939, between the United States and the San Joaquin and Kings River Canal and Irrigation Company, Incorporated, et al., (hereinafter referred to as the Exchange Contractors), Contract No. I1r-1144, as amended. The United States agrees that it will not deliver to the Exchange Contractors thereunder waters of the San Joaquin River unless and until required by the terms of said contract, and the United States further agrees that it will not voluntarily and knowingly determine itself unable to deliver to the Exchange Contractors entitled thereto from water that is available or that may become available to it from the Sacramento River and its tributaries or the Sacramento-San Joaquin Delta those quantities required to satisfy the obligations of the United States under said Exchange Contract and under Schedule 2 of the Contract for Purchase of Miller and Lux Water Rights (Contract No. I1r-1145, dated July 27, 1939).

TIME FOR DELIVERY OF WATER

4. (a) On or about February 20 of each Calendar Year, the Contracting Officer shall announce the Contracting Officer's expected declaration of the Water Made Available. Such declaration will be expressed in terms of both Water Made Available and the Long Term Historic Average and will be updated monthly, and more frequently if necessary, based on then-current operational and hydrologic conditions and a new declaration with changes, if any, to the Water Made Available will be made. The Contracting Officer shall provide forecasts of Project operations and the basis of the estimate, with relevant supporting information, upon the written request of the Contractor. Concurrently with the declaration of the Water Made Available, the Contracting Officer shall provide the Contractor with the updated Long-Term Historic Average.

(b) On or before each March 1 and at such other times as necessary, the Contractor shall submit to the Contracting Officer a written schedule, satisfactory to the Contracting Officer, showing the monthly quantities of Project Water to be delivered by the United States to the Contractor pursuant to this Contract for the Year commencing on such March 1. The Contracting Officer shall use all reasonable means to deliver Project Water according to the approved schedule for the Year commencing on such March 1.

(c) The Contractor shall not schedule Project Water in excess of the quantity of Project Water the Contractor intends to put to reasonable and beneficial use within the Contractor's Service Area or to sell, transfer, or exchange pursuant to Article 9 of this Contract during any Year.

(d) Subject to the conditions set forth in subdivision (a) of Article 3 of this Contract, the United States shall deliver Project Water to the Contractor in accordance with the initial

schedule submitted by the Contractor pursuant to subdivision (b) of this Article, or any written revision(s), satisfactory to the Contracting Officer, thereto submitted within a reasonable time prior to the date(s) on which the requested change(s) is/are to be implemented: Provided, That the total amount of water requested in that schedule or revision does not exceed the quantities announced by the Contracting Officer pursuant to the provisions of subdivision (a) of Article 3, and the Contracting Officer determines that there will be sufficient capacity available in the appropriate Friant Division facilities to deliver the water in accordance with that schedule: Provided further, That the Contractor shall not schedule the delivery of any water during any period as to which the Contractor is notified by the Contracting Officer or Operating Non-Federal Entity that Project facilities required to make deliveries to the Contractor will not be in operation because of scheduled O&M.

(e) The Contractor may, during the period from and including November 1 of each Year through and including the last day of February of that Year, request delivery of any amount of the Class 1 Water estimated by the Contracting Officer to be made available to it during the following Year. The Contractor may, during the period from and including January 1 of each Year (or such earlier date as may be determined by the Contracting Officer) through and including the last day of February of that Year, request delivery of any amount of Class 2 Water estimated by the Contracting Officer to be made available to it during the following Year. Such water shall hereinafter be referred to as preuse water. Such request must be submitted in writing by the Contractor for a specified quantity of preuse water and shall be subject to the approval of the Contracting Officer. Payment for preuse water so requested shall be at the appropriate rate(s) for the following Year in accordance with Article 7 of this Contract and shall be made in advance of delivery of any preuse water. The

Contracting Officer shall deliver such preuse water in accordance with a schedule or any revision thereof submitted by the Contractor and approved by the Contracting Officer, to the extent such water is available and to the extent such deliveries will not interfere with the delivery of Project Water entitlements to other Friant Division contractors or the physical maintenance of the Project facilities. The quantities of preuse water delivered pursuant to this subdivision shall be deducted from the quantities of water that the Contracting Officer would otherwise be obligated to make available to the Contractor during the following Year: Provided, That the quantity of preuse water to be deducted from the quantities of either Class 1 Water or Class 2 Water to be made available to the Contractor in the following Year shall be specified by the Contractor at the time the preuse water is requested or as revised in its first schedule for the following Year submitted in accordance with subdivision (b) of this Article, based on the availability of the following Year water supplies as determined by the Contracting Officer.

POINT OF DIVERSION AND RESPONSIBILITY FOR DISTRIBUTION OF WATER

5. (a) Project Water scheduled pursuant to subdivision (b) of Article 4 of this Contract shall be delivered to the Contractor at a point or points of delivery either on Project facilities or another location or locations mutually agreed to in writing by the Contracting Officer and the Contractor.

(b) The Contracting Officer, either directly or through its written agreement(s) with the Operating Non-Federal Entity, shall make all reasonable efforts to maintain sufficient flows and levels of water in the Friant-Kern Canal to deliver Project Water to the Contractor at specific turnouts established pursuant to subdivision (a) of this Article.

(c) The Contractor shall not deliver Project Water to land outside the Contractor's Service Area unless approved in advance by the Contracting Officer.

(d) All Water Delivered to the Contractor pursuant to this Contract shall be measured and recorded with equipment furnished, installed, operated, and maintained by the United States or the Operating Non-Federal Entity at the point or points of delivery established pursuant to subdivision (a) of this Article. Upon the request of either party to this Contract, the Contracting Officer shall investigate, or cause to be investigated by the appropriate Operating Non-Federal Entity, the accuracy of such measurements and shall take any necessary steps to adjust any errors appearing therein. For any period of time when accurate measurements have not been made, the Contracting Officer shall consult with the Contractor and the responsible Operating Non-Federal Entity prior to making a final determination of the quantity delivered for that period of time.

(e) Neither the Contracting Officer nor any Operating Non-Federal Entity shall be responsible for the control, carriage, handling, use, disposal, or distribution of Water Delivered to the Contractor pursuant to this Contract beyond the delivery points specified in subdivision (a) of this Article. The Contractor shall indemnify the United States, its officers, employees, agents, and assigns on account of damage or claim of damage of any nature whatsoever for which there is legal responsibility, including property damage, personal injury, or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such Project Water Delivered beyond such delivery points, except for any damage or claim arising out of: (i) acts or omissions of the Contracting Officer or any of its officers, employees, agents, or assigns, including the Operating Non-Federal Entity, with the intent of creating the situation resulting in any damage or claim;

(ii) willful misconduct of the Contracting Officer or any of its officers, employees, agents, or assigns, including the Operating Non-Federal Entity; (iii) negligence of the Contracting Officer or any of its officers, employees, agents, or assigns including the Operating Non-Federal Entity; or (iv) damage or claims resulting from a malfunction of facilities owned and/or operated by the United States or responsible Operating Non-Federal Entity.

MEASUREMENT OF WATER WITHIN THE CONTRACTOR'S SERVICE AREA

6. (a) Within five years of the date of Contract execution, the Contractor will have an established measuring program satisfactory to the Contracting Officer. The Contractor shall ensure that all surface water delivered for M&I purposes is measured at each M&I service connection. The water measuring devices or water measuring methods of comparable effectiveness must be acceptable to the Contracting Officer. The Contractor shall be responsible for installing, operating, and maintaining and repairing all such measuring devices and implementing all such water measuring methods at no cost to the United States. The Contracting Officer acknowledges that the Contractor has a metering plan (Exhibit "C") setting forth the milestones and schedule that the Contractor will implement to comply with the requirements of this Article. Beginning January 2006, the Contractor shall provide an annual written report to the Contracting Officer describing the Contractor's metering plan implementation progress. The Contractor shall use the information obtained from such water measuring devices or water measuring methods to ensure its proper management of the water, to bill water users for water delivered by the Contractor; and, if applicable, to record water delivered for M&I purposes by customer class as defined in the Contractor's water conservation plan provided for in Article 26 of this Contract. Nothing herein contained, however, shall preclude the Contractor from

establishing and collecting any charges, assessments, or other revenues authorized by California law. The Contractor shall include a summary of all its annual surface water deliveries in the annual report described in subdivision (c) of Article 26.

(b) To the extent the information has not otherwise been provided, upon execution of this Contract, the Contractor shall provide to the Contracting Officer a written report describing the measurement devices or water measuring methods being used or to be used to implement subdivision (a) of this Article and identifying the M&I service connections or alternative measurement programs approved by the Contracting Officer, at which such measurement devices or water measuring methods are being used, and, if applicable, identifying the locations at which such devices and/or methods are not yet being used including a time schedule for implementation at such locations. The Contracting Officer shall advise the Contractor in writing within 60 days as to the adequacy, and necessary modifications, if any, of the measuring devices or water measuring methods identified in the Contractor's report and if the Contracting Officer does not respond in such time, they shall be deemed adequate. If the Contracting Officer notifies the Contractor that the measuring devices or methods are inadequate, the parties shall within 60 days following the Contracting Officer's response, negotiate in good faith the earliest practicable date by which the Contractor shall modify said measuring devices and/or measuring methods as required by the Contracting Officer to ensure compliance with subdivision (a) of this Article.

(c) All new surface water delivery systems installed within the Contractor's Service Area after the effective date of this Contract shall also comply with the measurement provisions described in subdivision (a) of this Article.

(d) The Contractor shall inform the Contracting Officer and the State of California in writing by April 30 of each Year of the monthly volume of surface water delivered within the Contractor's Service Area during the previous Year.

(e) The Contractor shall inform the Contracting Officer and the Operating Non-Federal Entity on or before the 20th calendar day of each month of the quantity of M&I Water taken during the preceding month.

(f) In the event the provisions of subdivision (a) of this Article or any portion thereof, are challenged in a judicial proceeding, the parties agree to meet and confer promptly and as often as necessary to employ their reasonable best efforts to coordinate their response to the challenge and, as appropriate, develop revisions to this Contract.

RATES AND METHOD OF PAYMENT FOR WATER

7. (a) The Contractor shall pay the United States as provided in this Article for all Delivered Water at Rates, Charges, and the Tiered Pricing Component established in accordance with (i) the Secretary's then-existing ratesetting policy for M&I Water. Such ratesetting policies shall be amended, modified, or superseded only through a public notice and comment procedure; (ii) applicable Federal Reclamation law and associated rules and regulations, or policies; and (iii) other applicable provisions of this Contract. Payments shall be made by cash transaction, electronic funds transfer, or any other mechanism as may be agreed to in writing by the Contractor and the Contracting Officer. The Rates, Charges, and Tiered Pricing Component applicable to the Contractor upon execution of this Contract are set forth in Exhibit "B", as may be revised annually.

(b) The Contracting Officer shall notify the Contractor of the Rates, Charges, and Tiered Pricing Component as follows:

(1) Prior to July 1 of each Calendar Year, the Contracting Officer shall provide the Contractor an estimate of the Charges for Project Water that will be applied to the period October 1, of the current Calendar Year, through September 30, of the following Calendar Year, and the basis for such estimate. The Contractor shall be allowed not less than two months to review and comment on such estimates. On or before September 15 of each Calendar Year, the Contracting Officer shall notify the Contractor in writing of the Charges to be in effect during the period October 1 of the current Calendar Year, through September 30, of the following Calendar Year, and such notification shall revise Exhibit "B."

(2) Prior to October 1 of each Calendar Year, the Contracting Officer shall make available to the Contractor an estimate of the Rates and Tiered Pricing Component for Project Water for the following Year and the computations and cost allocations upon which those Rates are based. The Contractor shall be allowed not less than two months to review and comment on such computations and cost allocations. By December 31 of each Calendar Year, the Contracting Officer shall provide the Contractor with the final Rates and Tiered Pricing Component to be in effect for the upcoming Year, and such notification shall revise Exhibit "B."

(c) At the time the Contractor submits the initial schedule for the delivery of Project Water for each Year pursuant to subdivision (b) of Article 4 of this Contract, the Contractor shall make an advance payment to the United States equal to the total amount payable pursuant to the applicable Rate(s) set under subdivision (a) of this Article, for the Project Water scheduled to be

delivered pursuant to this Contract during the first two calendar months of the Year. Before the end of the first month and before the end of each calendar month thereafter, the Contractor shall make an advance payment to the United States, at the Rate(s) set under subdivision (a) of this Article, for the Water Scheduled to be delivered pursuant to this Contract during the second month immediately following. Adjustments between advance payments for Water Scheduled and payments at Rates due for Water Delivered shall be made before the end of the following month: Provided, That any revised schedule submitted by the Contractor pursuant to Article 4 of this Contract which increases the amount of Water Delivered pursuant to this Contract during any month shall be accompanied with appropriate advance payment, at the Rates then in effect, to assure that Project Water is not delivered to the Contractor in advance of such payment. In any month in which the quantity of Water Delivered to the Contractor pursuant to this Contract equals the quantity of Water Scheduled and paid for by the Contractor, no additional Project Water shall be delivered to the Contractor unless and until an advance payment at the Rates then in effect for such additional Project Water is made. Final adjustment between the advance payments for the Water Scheduled and payments for the quantities of Water Delivered during each Year pursuant to this Contract shall be made as soon as practicable but no later than April 30th of the following Year, or 60 days after the delivery of Project Water carried over under subdivision (g) of Article 3 of this Contract if such water is not delivered by the last day of February.

(d) The Contractor shall also make a payment in addition to the Rate(s) in subdivision (c) of this Article to the United States for Water Delivered, at the Charges and the appropriate Tiered Pricing Component then in effect, before the end of the month following the

month of delivery. The payments shall be consistent with the quantities of M&I Water Delivered as shown in the water delivery report for the subject month prepared by the Operating Non-Federal Entity or, if there is no Operating Non-Federal Entity, by the Contracting Officer. Such water delivery report shall be the basis for payment of Charges and Tiered Pricing Component by the Contractor, and shall be provided to the Contractor by the Operating Non-Federal Entity or the Contracting Officer (as applicable) within five days after the end of the month of delivery. The water delivery report shall be deemed a bill for the payment of Charges and the applicable Tiered Pricing Component for Water Delivered. Adjustment for overpayment or underpayment of Charges shall be made through the adjustment of payments due to the United States for Charges for the next month. Any amount to be paid for past due payment of Charges and the Tiered Pricing Component shall be computed pursuant to Article 20 of this Contract.

(e) The Contractor shall pay for any Water Delivered under subdivision (a), (f), or (g) of Article 3 of this Contract as determined by the Contracting Officer pursuant to applicable statutes, associated regulations, any applicable provisions of guidelines or ratesetting policies: Provided, That the Rate for Water Delivered under subdivision (f) of Article 3 of this Contract shall be no more than the otherwise applicable Rate for M&I Water under subdivision (a) of this Article.

(f) Payments to be made by the Contractor to the United States under this Contract may be paid from any revenues available to the Contractor.

(g) All revenues received by the United States from the Contractor relating to the delivery of Project Water or the delivery of non-Project water through Project facilities shall be

allocated and applied in accordance with Federal Reclamation law and the associated rules or regulations, and the then-current Project ratesetting policies for M&I Water.

(h) The Contracting Officer shall keep its accounts pertaining to the administration of the financial terms and conditions of its long-term contracts, in accordance with applicable Federal standards, so as to reflect the application of Project costs and revenues. The Contracting Officer shall, each Year upon request of the Contractor, provide to the Contractor a detailed accounting of all Project and Contractor expense allocations, the disposition of all Project and Contractor revenues, and a summary of all water delivery information. The Contracting Officer and the Contractor shall enter into good faith negotiations to resolve any discrepancies or disputes relating to accountings, reports, or information.

(i) The parties acknowledge and agree that the efficient administration of this Contract is their mutual goal. Recognizing that experience has demonstrated that mechanisms, policies, and procedures used for establishing Rates, Charges, and Tiered Pricing Components, and/or for making and allocating payments, other than those set forth in this Article may be in the mutual best interest of the parties, it is expressly agreed that the parties may enter into agreements to modify the mechanisms, policies, and procedures for any of those purposes while this Contract is in effect without amending this Contract.

(j) (1) Beginning at such time as the total of the deliveries of Class 1 Water and Class 2 Water in a Year exceed 80 percent of the Contract Total, then before the end of the month following the month of delivery the Contractor shall make an additional payment to the United States equal to the applicable Tiered Pricing Component. The Tiered Pricing Component for the total of the

deliveries of Class 1 Water and Class 2 Water in excess of 80 percent of the Contract Total, but less than or equal to 90 percent of the Contract Total, shall equal one-half of the difference between the Rate established under subdivision (a) of this Article and the M&I Full Cost Water Rate. The Tiered Pricing Component for the total of the deliveries of Class 1 Water and Class 2 Water which exceeds 90 percent of the Contract total shall equal the difference between (i) the Rate established under subdivision (a) of this Article and (ii) the M&I Full Cost Water Rate.

(2) Omitted.

(3) For purposes of determining the applicability of the Tiered Pricing Component pursuant to this Article, Water Delivered shall include Project Water that the Contractor transfers to others but shall not include Project Water transferred and delivered to the Contractor.

(k) For the term of this Contract, Rates under the respective ratesetting policies will be established to recover only reimbursable O&M (including any deficits) and capital costs of the Project, as those terms are used in the then-current Project ratesetting policies, and interest, where appropriate, except in instances where a minimum Rate is applicable in accordance with the relevant Project ratesetting policy. Changes of significance in practices which implement the Contracting Officer's ratesetting policies will not be implemented until the Contracting Officer has provided the Contractor an opportunity to discuss the nature, need, and impact of the proposed change.

(l) Except as provided in subsections 3405(a)(1)(B) and 3405(f) of the CVPIA, the Rates for Project Water transferred by the Contractor shall be the Contractor's Rates adjusted upward or downward to reflect the changed costs, if any, incurred by the Contracting Officer in the

delivery of the transferred Project Water to the transferee's point of delivery in accordance with the then-applicable Project ratesetting policy.

(m) Omitted.

(n) Omitted.

8. Omitted.

SALES, TRANSFERS, OR EXCHANGES OF WATER

9. (a) The right to receive Project Water provided for in this Contract may be sold, transferred, or exchanged to others for reasonable and beneficial uses within the State of California if such sale, transfer, or exchange is authorized by applicable Federal and State laws, and applicable guidelines or regulations then in effect. No sale, transfer, or exchange of Project Water under this Contract may take place without the prior written approval of the Contracting Officer, except as provided for in subdivision (b) of this Article, and no such sales, transfers, or exchanges shall be approved absent all appropriate environmental documentation including, but not limited to, documents prepared pursuant to the NEPA and ESA. Such environmental documentation should include, as appropriate, an analysis of groundwater impacts and economic and social effects, including environmental justice, of the proposed water transfers on both the transferor and transferee.

(b) In order to facilitate efficient water management by means of water transfers of the type historically carried out among Project Contractors located within the same geographical area and to allow the Contractor to participate in an accelerated water transfer program during the term of this Contract, the Contracting Officer shall prepare, as appropriate, all necessary environmental

documentation including, but not limited to, documents prepared pursuant to NEPA and ESA, analyzing annual transfers within such geographical areas, and the Contracting Officer shall determine whether such transfers comply with applicable law. Following the completion of the environmental documentation, such transfers addressed in such documentation shall be conducted with advance notice to the Contracting Officer, but shall not require prior written approval by the Contracting Officer. Such environmental documentation and the Contracting Officer's compliance determination shall be reviewed every five years and updated, as necessary, prior to the expiration of the then-existing five-year period. All subsequent environmental documentation shall include an alternative to evaluate not less than the quantity of Project Water historically transferred within the same geographical area.

(c) For a water transfer to qualify under subdivision (b) of this Article, such water transfer must: (i) be for irrigation purposes for lands irrigated within the previous three years, for M&I use, groundwater recharge, water banking, or fish and wildlife resources; not lead to land conversion; and be delivered to established cropland, wildlife refuges, groundwater basins or M&I use; (ii) occur within a single Year; (iii) occur between a willing seller and a willing buyer; (iv) convey water through existing facilities with no new construction or modifications to facilities and be between existing Project Contractors and/or the Contractor and the United States, Department of the Interior; and (v) comply with all applicable Federal, State, and local or tribal laws and requirements imposed for protection of the environment and Indian Trust Assets, as defined under Federal law.

APPLICATION OF PAYMENTS AND ADJUSTMENTS

10. (a) The amount of any overpayment by the Contractor of the Contractor's O&M, capital, and deficit (if any) obligations for the Year shall be applied first to any current liabilities of the Contractor arising out of this Contract then due and payable. Overpayments of more than $1,000 shall be refunded at the Contractor's request. In lieu of a refund, any amount of such overpayment, at the option of the Contractor, may be credited against amounts to become due to the United States by the Contractor. With respect to overpayment, such refund or adjustment shall constitute the sole remedy of the Contractor or anyone having or claiming to have the right to the use of any of the Project Water supply provided for herein. All credits and refunds of overpayments shall be made within 30 days of the Contracting Officer obtaining direction as to how to credit or refund such overpayment in response to the notice to the Contractor that it has finalized the accounts for the Year in which the overpayment was made.

(b) All advances for miscellaneous costs incurred for work requested by the Contractor pursuant to Article 25 of this Contract shall be adjusted to reflect the actual costs when the work has been completed. If the advances exceed the actual costs incurred, the difference will be refunded to the Contractor. If the actual costs exceed the Contractor's advances, the Contractor will be billed for the additional costs pursuant to Article 25.

TEMPORARY REDUCTIONS--RETURN FLOWS

11. (a) Subject to: (i) the authorized purposes and priorities of the Project and the requirements of Federal law and (ii) the obligations of the United States under existing contracts, or renewals thereof, providing for water deliveries from the Project, the Contracting Officer shall make

all reasonable efforts to optimize Project Water deliveries to the Contractor as provided in this Contract.

(b) The Contracting Officer or Operating Non-Federal Entity may temporarily discontinue or reduce the quantity of Water Delivered to the Contractor as herein provided for the purposes of investigation, inspection, maintenance, repair, or replacement of any of the Project facilities or any part thereof necessary for the delivery of Project Water to the Contractor, but so far as feasible the Contracting Officer or Operating Non-Federal Entity will give the Contractor due notice in advance of such temporary discontinuance or reduction, except in case of emergency, in which case no notice need be given: Provided, That the United States shall use its best efforts to avoid any discontinuance or reduction in such service. Upon resumption of service after such reduction or discontinuance, and if requested by the Contractor, the United States will, if possible, deliver the quantity of Project Water which would have been delivered hereunder in the absence of such discontinuance or reduction.

(c) The United States reserves the right to all seepage and return flow water derived from Water Delivered to the Contractor hereunder which escapes or is discharged beyond the Contractor's Service Area: Provided, That this shall not be construed as claiming for the United States any right to seepage or return flow being put to reasonable and beneficial use pursuant to this Contract within the Contractor's Service Area by the Contractor or those claiming by, through, or under the Contractor.

CONSTRAINTS ON THE AVAILABILITY OF WATER

12. (a) In its operation of the Project, the Contracting Officer will use all reasonable means to guard against a Condition of Shortage in the quantity of water to be made available to the Contractor pursuant to this Contract. In the event the Contracting Officer determines that a Condition of Shortage appears probable, the Contracting Officer will notify the Contractor of said determination as soon as practicable.

(b) If there is a Condition of Shortage because of errors in physical operations of the Project, drought, other physical causes beyond the control of the Contracting Officer, or actions taken by the Contracting Officer to meet legal obligations then, except as provided in subdivision (a) of Article 18 of this Contract, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

(c) The United States shall not execute contracts which together with this Contract, shall in the aggregate provide for furnishing during the life of this Contract or any renewals hereof Class 1 Water in excess of 800,000 acre-feet per Year or Class 2 Water in excess of 1,401,475 acre-feet per Year: Provided, That, subject to subdivision (l) of Article 3 of this Contract, the limitation placed on Class 2 Water contracts shall not prohibit the United States from entering into temporary contracts of one year or less in duration for delivery of Project Water to other entities if such water is not necessary to meet the schedules as may be submitted by all Friant Division long-term water service contractors entitled to receive Class 1 Water and/or Class 2 Water under their water service contracts. Nothing in this subdivision shall limit the Contracting Officer's ability to take actions that result in the availability of new water supplies to be used for Project purposes and

allocating such new supplies: Provided, That the Contracting Officer shall not take such actions until after consultation with the Friant Division Project Contractors.

(d) The Contracting Officer shall not deliver any Class 2 Water pursuant to this or any other contract for water service heretofore or hereafter entered into any Year unless and until the Contracting Officer determines that the cumulative total quantity of Class 1 Water specified in subdivision (c) of this Article will be available for delivery in said Year. If the Contracting Officer determines there is or will be a shortage in any Year in the quantity of Class 1 Water available for delivery, the Contracting Officer shall apportion the available Class 1 Water among all contractors entitled to receive such water that will be made available at Friant Dam in accordance with the following:

(1) A determination shall be made of the total quantity of Class 1 Water at Friant Dam which is available for meeting Class 1 Water contractual commitments, the amount so determined being herein referred to as the available supply.

(2) The total available Class 1 supply shall be divided by the Class 1 Water contractual commitments, the quotient thus obtained being herein referred to as the Class 1 apportionment coefficient.

(3) The total quantity of Class 1 Water under Article 3 of this Contract shall be multiplied by the Class 1 apportionment coefficient and the result shall be the quantity of Class 1 Water required to be delivered by the Contracting Officer to the Contractor for the respective Year, but in no event shall such amount exceed the total quantity of Class 1 Water specified in subdivision (a) of Article 3 of this Contract.

(e) If the Contracting Officer determines there is less than the quantity of Class 2 Water which the Contractor otherwise would be entitled to receive pursuant to Article 3 of this Contract, the quantity of Class 2 Water which shall be furnished to the Contractor by the Contracting Officer will be determined in the manner set forth in paragraphs (1), (2), and (3), of subdivision (d) of this Article substituting the term "Class 2" for the term "Class 1."

(f) In the event that in any Year there is made available to the Contractor, by reason of any shortage or apportionment as provided in subdivisions (a), (d), or (e) of this Article, or any discontinuance or reduction of service as set forth in subdivision (b) of Article 11 of this Contract, less than the quantity of water which the Contractor otherwise would be entitled to receive hereunder, there shall be made an adjustment on account of the amounts already paid to the Contracting Officer by the Contractor for Class 1 Water and Class 2 Water for said Year in accordance with Article 10 of this Contract.

13. Omitted.

RULES AND REGULATIONS

14. (a) The parties agree that the delivery of Project Water or use of Federal facilities pursuant to this Contract is subject to Federal Reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal Reclamation law.

(b) The terms of this Contract are subject to any enforceable order, judgment, and/or settlement in NRDC v. Patterson, No. CIVS 88-1658-LKK-EM and shall be timely modified as necessary to effectuate or facilitate any final order, judgment, or settlement in said litigation.

(c) Omitted.

WATER AND AIR POLLUTION CONTROL

15. The Contractor, in carrying out this Contract, shall comply with all applicable water and air pollution laws and regulations of the United States and the State of California, and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities.

QUALITY OF WATER

16. (a) Project facilities used to deliver Project Water to the Contractor pursuant to this Contract shall be operated and maintained to enable the United States to deliver Project Water to the Contractor in accordance with the water quality standards specified in subsection 2(b) of the Act of August 26, 1937 (50 Stat. 865), as added by Section 101 of the Act of October 27, 1986 (100 Stat. 3050) or other existing Federal laws. The United States is under no obligation to construct or furnish water treatment facilities to maintain or to improve the quality of Water Delivered to the Contractor pursuant to this Contract. The United States does not warrant the quality of Water Delivered to the Contractor pursuant to this Contract.

(b) The O&M of Project facilities shall be performed in such manner as is practicable to maintain the quality of raw water made available through such facilities at the highest level reasonably attainable as determined by the Contracting Officer. The Contractor shall be responsible for compliance with all State and Federal water quality standards applicable to surface and subsurface agricultural drainage discharges generated through the use of Federal or Contractor facilities or Project Water provided by the Contractor within the Contractor's Service Area.

WATER ACQUIRED BY THE CONTRACTOR OTHER THAN FROM THE UNITED STATES

17. (a) Omitted.

(b) Water or water rights now owned or hereafter acquired by the Contractor, other than from the United States, may be stored, conveyed, and/or diverted through Project facilities, subject to the completion of appropriate environmental documentation, with the approval of the Contracting Officer and the execution of any contract determined by the Contracting Officer to be necessary, consistent with the following provisions:

(1) The Contractor may introduce non-Project water into Project facilities and deliver said water within the Contractor's Service Area subject to payment to the United States and/or to any applicable Operating Non-Federal Entity of an appropriate rate as determined by the applicable Project ratesetting policy, the RRA, and the Project use power policy, if such Project use power policy is applicable, each as amended, modified, or superseded from time to time.

(2) Delivery of such non-Project water in and through Project facilities shall only be allowed to the extent such deliveries do not: (i) interfere with other Project purposes as determined by the Contracting Officer; (ii) reduce the quantity or quality of water available to other Project Contractors; (iii) interfere with the delivery of contractual water entitlements to any other Project Contractors; or (iv) interfere with the physical maintenance of the Project facilities.

(3) Neither the United States nor the Operating Non-Federal Entity shall be responsible for control, care, or distribution of the non-Project water before it is introduced into or after it is delivered from the Project facilities. The Contractor hereby releases and agrees to defend

and indemnify the United States and the Operating Non-Federal Entity, and their respective officers, agents, and employees, from any claim for damage to persons or property, direct or indirect, resulting from the acts of the Contractor its officers', employees', agents', or assigns' act(s) in (i) extracting or diverting non-Project water from any source, or (ii) diverting such non-Project water into Project facilities.

(4) Diversion of such non-Project water into Project facilities shall be consistent with all applicable laws, and if involving groundwater, consistent with any groundwater management plan for the area from which it was extracted.

(5) After Project purposes are met, as determined by the Contracting Officer, the United States and the Contractor shall share priority to utilize the remaining capacity of the facilities declared to be available by the Contracting Officer for conveyance and transportation of non-Project water prior to any such remaining capacity being made available to non-Project contractors.

OPINIONS AND DETERMINATIONS

18. (a) Where the terms of this Contract provide for actions to be based upon the opinion or determination of either party to this Contract, said terms shall not be construed as permitting such action to be predicated upon arbitrary, capricious, or unreasonable opinions or determinations. Both parties, notwithstanding any other provisions of this Contract, expressly reserve the right to seek relief from and appropriate adjustment for any such arbitrary, capricious, or unreasonable opinion or determination. Each opinion or determination by either party shall be provided in a timely manner. Nothing in subdivision (a) of Article 18 of this Contract is intended to

or shall affect or alter the standard of judicial review applicable under Federal law to any opinion or determination implementing a specific provision of Federal law embodied in statute or regulation.

(b) The Contracting Officer shall have the right to make determinations necessary to administer this Contract that are consistent with the expressed and implied provisions of this Contract, the laws of the United States and of the State of California, and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the Contractor to the extent reasonably practicable.

COORDINATION AND COOPERATION

19. (a) In order to further their mutual goals and objectives, the Contracting Officer and the Contractor shall communicate, coordinate, and cooperate with each other, and with other affected Project Contractors, in order to improve the operation and management of the Project. The communication, coordination, and cooperation regarding operations and management shall include, but not be limited to, any action which will or may materially affect the quantity or quality of Project Water supply, the allocation of Project Water supply, and Project financial matters including, but not limited to, budget issues. The communication, coordination, and cooperation provided for hereunder shall extend to all provisions of this Contract. Each party shall retain exclusive decision making authority for all actions, opinion, and determinations to be made by the respective party.

(b) Within 120 days following the effective date of this Contract, the Contractor, other affected Project Contractors, and the Contracting Officer shall arrange to meet with interested Project Contractors to develop a mutually agreeable, written Project-wide process, which may be amended as necessary, separate and apart from this Contract. The goal of this process shall be to

provide, to the extent practicable, the means of mutual communication and interaction regarding significant decisions concerning Project operation and management on a real-time basis.

(c) It is the intent of the Secretary to improve water supply reliability. To carry out this intent:

(1) The Contracting Officer will, at the request of the Contractor, assist in the development of integrated resource management plans for the Contractor. Further, the Contracting Officer will, as appropriate, seek authorizations for implementation of partnerships to improve water supply, water quality, and reliability.

(2) The Secretary will, as appropriate, pursue program and project implementation and authorization in coordination with Project Contractors to improve the water supply, water quality, and reliability of the Project for all Project purposes.

(3) The Secretary will coordinate with Project Contractors and the State of California to seek improved water resource management.

(4) The Secretary will coordinate actions of agencies within the Department of the Interior that may impact the availability of water for Project purposes.

(5) The Contracting Officer shall periodically, but not less than annually, hold division level meetings to discuss Project operations, division level water management activities, and other issues as appropriate.

(d) Without limiting the contractual obligations of the Contracting Officer under the other Articles of this Contract, nothing in this Article shall be construed to limit or constrain the Contracting Officer's ability to communicate, coordinate, and cooperate with the Contractor or other

interested stakeholders or to make decisions in a timely fashion as needed to protect health, safety, or the physical integrity of structures or facilities.

CHARGES FOR DELINQUENT PAYMENTS

20. (a) The Contractor shall be subject to interest, administrative, and penalty charges on delinquent installments or payments. When a payment is not received by the due date, the Contractor shall pay an interest charge for each day the payment is delinquent beyond the due date. When a payment becomes sixty (60) days delinquent, the Contractor shall pay an administrative charge to cover additional costs of billing and processing the delinquent payment. When a payment is delinquent ninety (90) days or more, the Contractor shall pay an additional penalty charge of six (6%) percent per year for each day the payment is delinquent beyond the due date. Further, the Contractor shall pay any fees incurred for debt collection services associated with a delinquent payment.

(b) The interest charge rate shall be the greater of the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of one-half of one (0.5%) percent per month prescribed by Section 6 of the Reclamation Project Act of 1939 (Public Law 76-260). The interest charge rate shall be determined as of the due date and remain fixed for the duration of the delinquent period.

(c) When a partial payment on a delinquent account is received, the amount received shall be applied, first to the penalty, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

EQUAL OPPORTUNITY

21. During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination, rates of payment or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without discrimination because of race, color, religion, sex, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the said labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by said amended Executive Order and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Contracting Officer and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in said amended Executive Order, and such other sanctions may be imposed and remedies invoked as provided in said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include the provisions of paragraphs (a) through (g) in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of said amended Executive Order, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

GENERAL OBLIGATION--BENEFITS CONDITIONED UPON PAYMENT

22. (a) The obligation of the Contractor to pay the United States as provided in this Contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligations to the Contractor.

(b) The payment of charges becoming due hereunder is a condition precedent to receiving benefits under this Contract. The United States shall not make water available to the Contractor through Project facilities during any period in which the Contractor may be in arrears in the advance payment of water rates due the United States. The Contractor shall not furnish water made available pursuant to this Contract for lands or parties which are in arrears in the advance payment of water rates levied or established by the Contractor.

(c) With respect to subdivision (b) of this Article, the Contractor shall have no obligation to require advance payment for water rates which it levies.

COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

23. (a) The Contractor shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d), Section 504 of the Rehabilitation Act of 1975 (P.L. 93-112, as amended), the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.) and any other applicable civil rights laws, as well as with their respective implementing regulations and guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

(b) These statutes require that no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation. By executing this Contract, the Contractor agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(c) The Contractor makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Contractor recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this Article, and that the United States reserves the right to seek judicial enforcement thereof.

24. Omitted.

CONTRACTOR TO PAY CERTAIN MISCELLANEOUS COSTS

25. In addition to all other payments to be made by the Contractor pursuant to this Contract, the Contractor shall pay to the United States, within 60 days after receipt of a bill and detailed statement submitted by the Contracting Officer to the Contractor for such specific items of direct cost incurred by the United States for work requested by the Contractor associated with this Contract plus indirect costs in accordance with applicable Bureau of Reclamation policies and procedures. All such amounts referred to in this Article shall not exceed the amount agreed to in writing in advance by the Contractor. This Article shall not apply to costs for routine contract administration.

WATER CONSERVATION

26. (a) Prior to the delivery of water provided from or conveyed through Federally constructed or Federally financed facilities pursuant to this Contract, the Contractor shall be implementing an effective water conservation and efficiency program based on the Contractor's water conservation plan that has been determined by the Contracting Officer to meet the conservation and efficiency criteria for evaluating water conservation plans established under Federal law. The water conservation and efficiency program shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives. Continued Project Water delivery pursuant to this Contract shall be contingent upon the Contractor's continued implementation of such water conservation program. In the event the Contractor's water conservation plan or any revised water conservation plan completed pursuant to subdivision (d) of Article 26 of this Contract have not yet been determined by the Contracting Officer to meet such

criteria, due to circumstances which the Contracting Officer determines are beyond the control of the Contractor, water deliveries shall be made under this Contract so long as the Contractor diligently works with the Contracting Officer to obtain such determination at the earliest practicable date, and thereafter the Contractor immediately begins implementing its water conservation and efficiency program in accordance with the time schedules therein.

(b) Should the amount of M&I Water delivered pursuant to subdivision (a) of Article 3 of this Contract equal or exceed 2,000 acre-feet per Year, the Contractor shall implement the Best Management Practices identified by the time frames issued by the California Urban Water Conservation Council for such M&I Water unless any such practice is determined by the Contracting Officer to be inappropriate for the Contractor.

(c) The Contractor shall submit to the Contracting Officer a report on the status of its implementation of the water conservation plan on the reporting dates specified in the then-existing conservation and efficiency criteria established under Federal law.

(d) At five-year intervals, the Contractor shall revise its water conservation plan to reflect the then-current conservation and efficiency criteria for evaluating water conservation plans established under Federal law and submit such revised water management plan to the Contracting Officer for review and evaluation. The Contracting Officer will then determine if the water conservation plan meets Reclamation's then-current conservation and efficiency criteria for evaluating water conservation plans established under Federal law.

(e) If the Contractor is engaged in direct groundwater recharge, such activity shall be described in the Contractor's water conservation plan.

EXISTING OR ACQUIRED WATER OR WATER RIGHTS

27. Except as specifically provided in Article 17 of this Contract, the provisions of this Contract shall not be applicable to or affect non-Project water or water rights now owned or hereafter acquired by the Contractor or any user of such water within the Contractor's Service Area. Any such water shall not be considered Project Water under this Contract. In addition, this Contract shall not be construed as limiting or curtailing any rights which the Contractor or any water user within the Contractor's Service Area acquires or has available under any other contract pursuant to Federal Reclamation law.

OPERATION AND MAINTENANCE BY OPERATING NON-FEDERAL ENTITY

28. (a) The O&M of a portion of the Project facilities which serve the Contractor, and responsibility for funding a portion of the costs of such O&M, have been transferred to the Operating Non-Federal Entity by separate agreement between the United States and the Operating Non-Federal Entity. That separate agreement shall not interfere with or affect the rights or obligations of the Contractor or the United States hereunder.

(b) The Contracting Officer has previously notified the Contractor in writing that the O&M of a portion of the Project facilities which serve the Contractor has been transferred to the Operating Non-Federal Entity, and therefore, the Contractor shall pay directly to the Operating Non-Federal Entity, or to any successor approved by the Contracting Officer under the terms and conditions of the separate agreement between the United States and the Operating Non-Federal Entity described in subdivision (a) of this Article, all rates, charges, or assessments of any kind, including any assessment for reserve funds, which the Operating Non-Federal Entity or such successor

1007 determines, sets, or establishes for (i) the O&M of the portion of the Project facilities operated and
1008 maintained by the Operating Non-Federal Entity or such successor, or (ii) the Friant Division's share
1009 of the operation, maintenance, and replacement costs for physical works and appurtenances
1010 associated with the Tracy Pumping Plant, the Delta-Mendota Canal, the O'Neill Pumping/Generating
1011 Plant, the Federal share of the O'Neill Forebay, the Mendota Pool, and the Federal share of San Luis
1012 Unit joint use conveyance and conveyance pumping facilities. Such direct payments to the Operating
1013 Non-Federal Entity or such successor shall not relieve the Contractor of its obligation to pay directly
1014 to the United States the Contractor's share of the Project Rates, Charges, and Tiered Pricing
1015 Component(s) except to the extent the Operating Non-Federal Entity collects payments on behalf of
1016 the United States in accordance with the separate agreement identified in subdivision (a) of this
1017 Article.

1018 (c) For so long as the O&M of any portion of the Project facilities serving the
1019 Contractor is performed by the Operating Non-Federal Entity, or any successor thereto, the
1020 Contracting Officer shall adjust those components of the Rates for Water Delivered under this
1021 Contract representing the cost associated with the activity being performed by the Operating
1022 Non-Federal Entity or its successor.

1023 (d) In the event the O&M of the Project facilities operated and maintained by the
1024 Operating Non-Federal Entity is re-assumed by the United States during the term of this Contract, the
1025 Contracting Officer shall so notify the Contractor, in writing, and present to the Contractor a revised
1026 Exhibit "B" which shall include the portion of the Rates to be paid by the Contractor for Project
1027 Water under this Contract representing the O&M costs of the portion of such Project facilities which

have been re-assumed. The Contractor shall, thereafter, in the absence of written notification from the Contracting Officer to the contrary, pay the Rates, Charges, and Tiered Pricing Component(s) specified in the revised Exhibit "B" directly to the United States in compliance with Article 7 of this Contract.

CONTINGENT UPON APPROPRIATION OR ALLOTMENT OF FUNDS

29. The expenditure or advance of any money or the performance of any obligation of the United States under this Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations under this Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

BOOKS, RECORDS, AND REPORTS

30. (a) The Contractor shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Contract, including: the Contractor's financial transactions, water supply data, and Project land and right-of-way agreements; water use data; and other matters that the Contracting Officer may require. Reports thereon shall be furnished to the Contracting Officer in such form and on such date or dates as the Contracting Officer may require. Subject to applicable Federal laws and regulations, each party to this Contract shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Contract.

(b) Notwithstanding the provisions of subdivision (a) of this Article, no books, records, or other information shall be requested from the Contractor by the Contracting Officer unless such books, records, or information are reasonably related to the administration or performance of this Contract. Any such request shall allow the Contractor a reasonable period of time within which to provide the requested books, records, or information.

(c) At such time as the Contractor provides information to the Contracting Officer pursuant to subdivision (a) of this Article, a copy of such information shall be provided to the Operating Non-Federal Entity.

ASSIGNMENT LIMITED--SUCCESSORS AND ASSIGNS OBLIGATED

31. (a) The provisions of this Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest therein shall be valid until approved in writing by the Contracting Officer.

(b) The assignment of any right or interest in this Contract by either party shall not interfere with the rights or obligations of the other party to this Contract absent the written concurrence of said other party.

(c) The Contracting Officer shall not unreasonably condition or withhold approval of any proposed assignment.

SEVERABILITY

32. In the event that a person or entity who is neither (i) a party to a Project contract, nor (ii) a person or entity that receives Project Water from a party to a Project contract, nor (iii) an association or other form of organization whose primary function is to represent parties to Project contracts, brings an action in a court of competent jurisdiction challenging the legality or enforceability of a provision included in this Contract and said person, entity, association, or organization obtains a final court decision holding that such provision is legally invalid or unenforceable and the Contractor has not intervened in that lawsuit in support of the plaintiff(s), the parties to this Contract shall use their best efforts to (i) within 30 days of the date of such final court decision identify by mutual agreement the provisions in this Contract which must be revised and

(ii) within three months thereafter promptly agree on the appropriate revision(s). The time periods specified above may be extended by mutual agreement of the parties. Pending the completion of the actions designated above, to the extent it can do so without violating any applicable provisions of law, the United States shall continue to make the quantities of Project Water specified in this Contract available to the Contractor pursuant to the provisions of this Contract which were not found to be legally invalid or unenforceable in the final court decision.

RESOLUTION OF DISPUTES

33. Should any dispute arise concerning any provisions of this Contract, or the parties' rights and obligations thereunder, the parties shall meet and confer in an attempt to resolve the dispute. Prior to the Contractor commencing any legal action, or the Contracting Officer referring any matter to Department of Justice, the party shall provide to the other party 30 days' written notice of the intent to take such action: Provided, That such notice shall not be required where a delay in commencing an action would prejudice the interests of the party that intends to file suit. During the 30-day notice period, the Contractor and the Contracting Officer shall meet and confer in an attempt to resolve the dispute. Except as specifically provided, nothing herein is intended to waive or abridge any right or remedy that the Contractor or the United States may have.

OFFICIALS NOT TO BENEFIT

34. No Member of or Delegate to Congress, Resident Commissioner, or official of the Contractor shall benefit from this Contract other than as a water user or landowner in the same manner as other water users or landowners.

CHANGES IN CONTRACTOR'S SERVICE AREA

35. (a) While this Contract is in effect, no change may be made in the Contractor's Service Area, by inclusion or exclusion of lands, dissolution, consolidation, merger, or otherwise, except upon the Contracting Officer's written consent.

(b) Within 30 days of receipt of a request for such a change, the Contracting Officer will notify the Contractor of any additional information required by the Contracting Officer for processing said request, and both parties will meet to establish a mutually agreeable schedule for timely completion of the process. Such process will analyze whether the proposed change is likely to: (i) result in the use of Project Water contrary to the terms of this Contract; (ii) impair the ability of the Contractor to pay for Project Water furnished under this Contract or to pay for any Federally-constructed facilities for which the Contractor is responsible; and (iii) have an impact on any Project Water rights applications, permits, or licenses. In addition, the Contracting Officer shall comply with the NEPA and the ESA. The Contractor will be responsible for all costs incurred by the Contracting Officer in this process, and such costs will be paid in accordance with Article 25 of this Contract.

FEDERAL LAWS

36. By entering into this Contract, the Contractor does not waive its rights to contest the validity or application in connection with the performance of the terms and conditions of this Contract of any Federal law or regulation: Provided, That the Contractor agrees to comply with the terms and conditions of this Contract unless and until relief from application of such Federal law or regulation to the implementing provision of the Contract is granted by a court of competent jurisdiction.

NOTICES

37. Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given, on behalf of the Contractor, when mailed, postage prepaid, or delivered to the Area Manager, South-Central California Area Office, 1243 "N" Street, Fresno, California 93721, and on behalf of the United States, when mailed, postage prepaid, or delivered to the City of Fresno, Public Utilities Director, 2600 Fresno Street, Room 3065, Fresno, California 93721-3624. The designation of the addressee or the address may be changed by notice given in the same manner as provided in this Article for other notices.

CONFIRMATION OF CONTRACT

38. The Contractor, after the execution of this Contract, shall furnish to the Contracting Officer evidence that pursuant to the laws of the State of California the Contractor is a legally constituted entity, and the Contract is lawful, valid, and binding on the Contractor. This Contract shall not be binding on the United States until such evidence has been provided to the Contracting Officer's satisfaction.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

APPROVED AS TO LEGAL FORM AND SUFFICIENCY
James E Jackson
OFFICE OF REGIONAL SOLICITOR
DEPARTMENT OF THE INTERIOR

By: _____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

(SEAL)

CITY OF FRESNO

By: _____
City Manager

Attest:

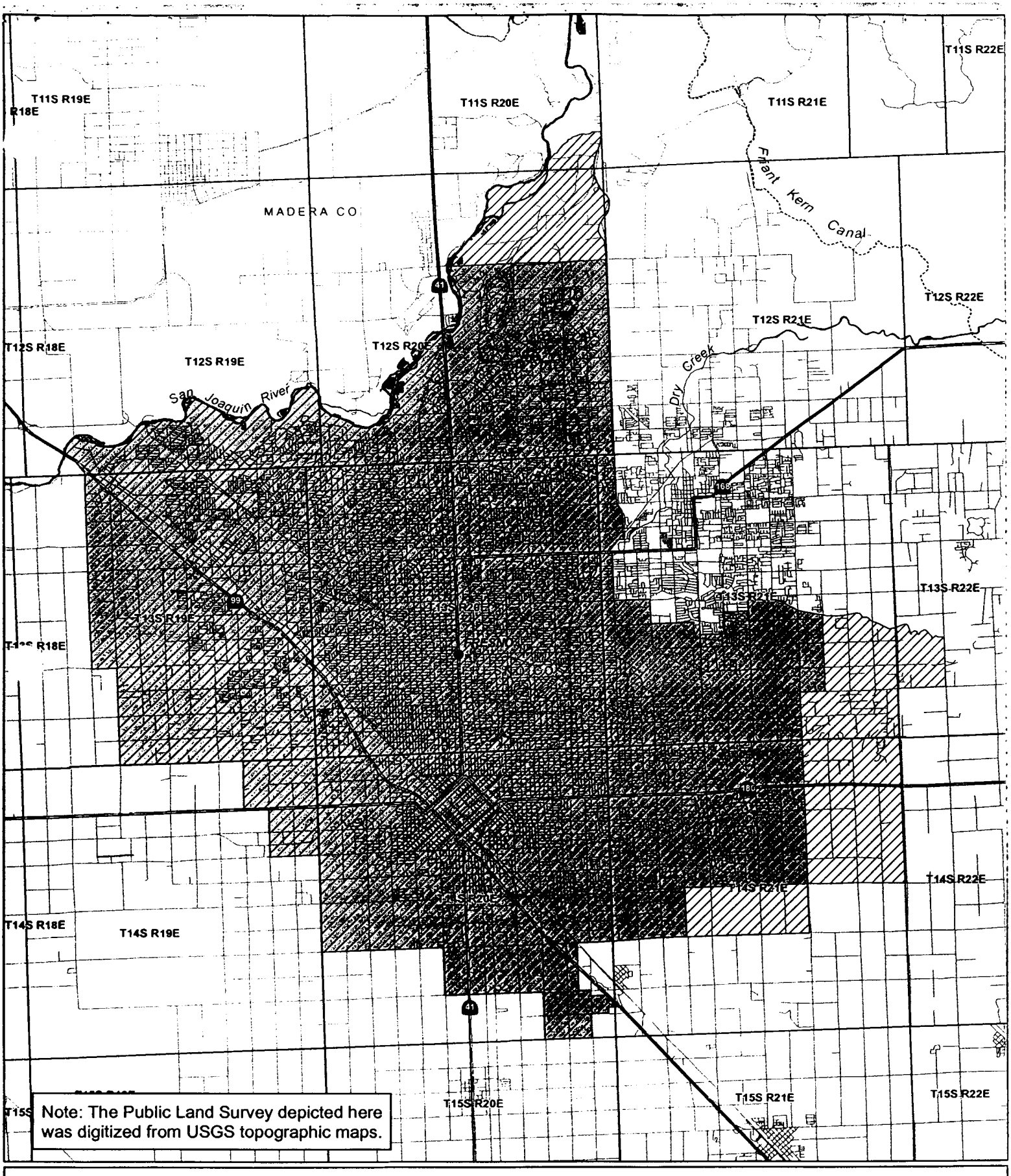
By: Rebecca E Klisch
City Clerk 7-25-05

By: _____
Public Utilities Director

Approved as to form:

Hilda Cantu Montez
City Attorney

(I:\LTRC\Final Draft LTRC's – Fresno, Tracy\City of Fresno R. O. Final Draft Contract 05-04-2005.doc)



Contractor's Proposed Service Area (Sphere of Influence)

Contractor's Current Service Area

City of Fresno

Contract No. 14-06-200-8901-LTR1

EXHIBIT A

Miles

0 0.5 1 2 3 4

Date: October 26, 2004

File Name: N:\districts\contracts\city_of_fresno\city_of_fresno2.mxd

214-208-12705

EXHIBIT B
CITY OF FRESNO
WATER RATES AND CHARGES

	2005 Rates Per Acre-Foot M&I Water
O&M AND COST-OF-SERVICE RATES:	
Capital Rates:	$20.04
O&M Rates:	
Water Marketing	$ 3.89
Storage	$ 6.67
Conveyance	*
Deficit Rates:	
Non-Interest Bearing	
Interest Bearing	$53.53
CFO/PER Adj. Rate **	$ 1.70
TOTAL COST-OF-SERVICE RATES (COS):	$85.83
M&I FULL-COST RATE	$97.15
Tiered Pricing Component>80%<=90% of Contract Total [Full Cost Rate – COS Rate /2]:	$ 5.66
Tiered Pricing Component>90% of Contract Total [Full Cost Rate – COS Rate]:	$11.32
SURCHARGES UNDER PUB. L. 102-575 TO RESTORATION FUND***	
Friant Surcharge [3406(c)(1)]	$ 7.00
Restoration Payments [3407(d)(2)(A)]	$15.87

* Conveyance and Conveyance Pumping Operation and Maintenance Costs were removed for ratesetting purposes and are to be billed directly to the water authorities.

** Chief Financial Officer (CFO) Adjustment and Provision for Replacement (PFR) Credit are being distributed over a 5-year period beginning in FY2003 for the contractors that requested that the costs be deferred.

*** The surcharges are payments in addition to the water rates and were determined pursuant to Title XXXIV of Public Law 102-575. Restoration fund surcharges under P. L. 102-575 are on a fiscal year basis (10/1-9/30).

EXHIBIT C
METERING PLAN

Completion Date	Item	Comments
03/05*	Contract effective	
01/06	Implementation study	Select and obtain consultant study re implementation
01/06	Submit progress report to Bureau	
12/06	Confirmation of existing meters	Verify integrity and servicing of existing meters
01/07	Submit progress report to Bureau	
06/07	Secure installation contract	Begin implementation of consultant recommendations
12/07	Draft rate ordinance	Initial development of tiered rate structure
01/08	Submit progress report to Bureau	
01/08	Initiate retrofit	Begin installation of meters on existing dwellings
12/08	Meter installation progress	29% (30,000 of approximately 105,000 units installed)
01/09	Submit progress report to Bureau	
12/09	Meter installation progress	43% (45,000 units)
01/10	Submit progress report to Bureau	
03/10	Impose new rate ordinance (fees based on metered use)	New rate structure applicable to currently metered customers. Rates to be effective as new meter installations occur.
12/10	Meter installation progress	62% (65,000 units)
01/11	Submit progress report to Bureau	
12/11	Adopt new rate ordinance	81% (85,000 units)
01/12	Submit compliance report to Bureau	
12/12	Meter installation progress	100% (105,000 units)
01/13	Submit completion report	Retrofit complete.

Schedule subject to change due to unforeseen circumstances.

*This date will be revised at the time the contract is executed on behalf of the United States.

Amendment to Contract
No. 14-06-200-8901-LTR1

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Central Valley Project, California

AMENDMENT TO LONG-TERM RENEWAL CONTRACT BETWEEN
THE UNITED STATES
AND
CITY OF FRESNO
PROVIDING FOR PROJECT WATER SERVICE FROM FRIANT DIVISION

THIS CONTRACT AMENDMENT, is made this 6th day of April, 2007, in pursuance generally of the Act of Congress of June 17, 1902 (32 Stat. 388), and the acts amendatory thereof or supplementary thereto, including, but not limited to, the Acts of August 26, 1937 (50 Stat. 844), as amended and supplemented, August 4, 1939 (53 Stat. 1187), as amended and supplemented, July 2, 1956 (70 Stat. 483), June 21, 1963 (77 Stat. 68), October 12, 1982 (96 Stat. 1263), October 27, 1986 (100 Stat. 3050), as amended, and Title XXXIV of the Act of October 30, 1992 (106 Stat. 4706), all collectively hereinafter referred to as Federal Reclamation law, between THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, and, CITY OF FRESNO, hereinafter referred to as the Contractor, a public agency of the State of California, duly organized, existing, and acting pursuant to the laws thereof;

WITNESSETH, That:

EXPLANATORY RECITALS

[1st] WHEREAS, the United States and the Contractor entered into a contract dated August 18, 2005, designated Contract No. 14-06-200-8901-LTR1, providing for water service from the Central Valley Project, hereinafter referred to as the "Existing Contract;" and

[2nd] WHEREAS, pursuant to subdivision (b) of Article 14 of the Existing Contract, the terms of the Existing Contract are subject to any enforceable order, judgment and/or settlement in *NRDC* v. *Patterson*, No. CIVS 88-1658-LKK-EM (now styled *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH) and that the Existing Contract shall be timely modified as necessary to effectuate or facilitate any final order, judgment or settlement in said litigation; and

[3rd] WHEREAS, the parties to said litigation have reached agreement on a global resolution of all Claims for Relief in the Seventh Amended Complaint, on the terms and conditions stated in the Stipulation of Settlement dated September 13, 2006, designated Exhibit 1 in the Order Approving Stipulation dated October 23, 2006; and

[4th] WHEREAS, the parties hereto desire to amend the Existing Contract as required by said Stipulation of Settlement.

NOW, THEREFORE, in consideration of the mutual and dependent covenants herein contained, it is hereby agreed as follows:

1. Subdivision (a) of Article 3 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(a) During each Year, consistent with all applicable State water rights, permits, and licenses, Federal law, and the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, and the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH, and subject to the provisions set forth in Articles 11 and 12 of this Contract, the Contracting Officer shall make available for delivery to the Contractor 60,000 acre-feet of Class 1 Water for M&I purposes. The quantity of Water Delivered to the Contractor in accordance with this subdivision shall be scheduled and paid for pursuant to the provisions of Articles 4 and 7 of this Contract."

2. Subdivision (a) of Article 11 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(a) Subject to: (i) the authorized purposes and priorities of the Project and the requirements of Federal law, and the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH and (ii) the obligations of the United States under existing contracts, or renewals thereof, providing for water deliveries from the Project, the Contracting Officer shall make all reasonable efforts to optimize Project Water deliveries to the Contractor as provided in this Contract."

3. Subdivision (b) of Article 12 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(b) If there is a Condition of Shortage because of errors in physical operations of the Project, drought, other physical causes beyond the control of the Contracting Officer or actions taken by the Contracting Officer to meet legal obligations, including but not limited to obligations pursuant to the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH then, except as provided in subdivision (a) of Article 18 of this Contract, no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom."

4. Subdivision (b) of Article 14 of the Existing Contract is deleted in its entirety, and the following is substituted in lieu thereof:

"(b) The terms of this Contract are subject to the Stipulation of Settlement dated September 13, 2006, the Order Approving Stipulation of Settlement, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement in *Natural Resources Defense Council, et al.* v. *Rodgers, et al.*, No. CIV-S-88-1658 LKK/GGH. Nothing in this Contract shall be interpreted to limit or interfere with the full implementation of this Settlement, Order, the Judgment and further orders issued by the Court pursuant to terms and conditions of the Settlement."

5. Except as specifically amended herein, the Existing Contract is valid and shall continue in full force and effect as originally written and executed.

IN WITNESS WHEREOF, the parties hereto have executed this Contract Amendment as of the day and year first above written.

APPROVED AS TO LEGAL FORM AND SUFFICIENCY
James E. Turner
OFFICE OF REGIONAL SOLICITOR
DEPARTMENT OF THE INTERIOR

THE UNITED STATES OF AMERICA

By: _____
Regional Director, Mid-Pacific Region
Bureau of Reclamation

CITY OF FRESNO

(SEAL)

By: _____
City Manager

By: _____
Public Utilities Director

Attest:

By: Elvira Sommerville (3/26/07)
City Clerk

Approved as to form:

By: _____
City Attorney

City of Fresno and Fresno Irrigation District Agreements

REVISED, AMENDED AND RESTATED COOPERATIVE AGREEMENT BETWEEN FRESNO IRRIGATION DISTRICT AND CITY OF FRESNO FOR WATER UTILIZATION AND CONVEYANCE

THIS AGREEMENT is entered into as of December 20, 2016 by and between the Fresno Irrigation District, an irrigation district (herein called "District") and City of Fresno, a municipal corporation (herein called "City").

WITNESSETH:

WHEREAS, District is an irrigation district organized and existing under the laws of the State of California and is the owner of certain water supplies, water rights and a water distribution system that can convey water to lands both within and outside District boundaries; and

WHEREAS, City is a municipal corporation with boundaries largely overlapping those of District and is the owner of a water distribution system for the distribution of water to lands both in and outside the exterior boundaries of City; and

WHEREAS, District and City have heretofore entered into a cooperative program of water utilization between said parties evidenced by a written agreement for such water utilization and conveyance dated August 12, 1970, which by its terms and by the terms of amendments thereto terminated on May 30, 1976; and

WHEREAS, District and City continued with said cooperative program and entered into a replacement contract for water utilization and conveyance dated May 25, 1976 ("1976 Agreement"); and

WHEREAS, District and City wish to amend and restate the 1976 Agreement in its entirety in order to continue with and expand said cooperative program to recognize changed circumstances affecting them via this Revised, Amended and Restated Cooperative Agreement between Fresno Irrigation District and City of Fresno for Water Utilization and Conveyance ; and

WHEREAS, certain provisions of this Agreement are specifically authorized by, and entered into pursuant to, Chapter 9 (commencing with Section 26670), Part 10, Division 11 of the California Water Code; and

WHEREAS, by agreement dated December 22, 2010 between City and the United States of America identified as Contract No. 14-06-200-8901D (the "City Bureau Contract"), City is entitled to purchase certain water from the United States; and

WHEREAS, by agreement dated December 22, 2010 between District and the United States of America identified as Contract No. 14-06-200-1122D (the "District Bureau Contract"), District is entitled to purchase certain water from the United States; and

WHEREAS, District holds rights to Kings River water and storage in Pine Flat Reservoir on the Kings River, subject to various contracts with the United States of America, water supply schedules and agreements by and among members of the Kings River Water Association and others, judicial and regulatory decrees, and the water rights governing the diversion and use of Kings River water, all as they may be amended or supplemented from time to time (collectively, the "Kings River Agreements"); and

WHEREAS, it is recognized by District and City that District is primarily charged with the distribution and delivery of water within District for Agricultural Use and that its canals and distribution system must primarily be used for that purpose; and

WHEREAS, it is recognized by both District and City that many inhabitants of District also require water for domestic, industrial or fire protection purposes supplied to them by City; and

WHEREAS, under the 1976 Agreement, Kings River water was available to City once lands within District boundaries with surface water allotments were annexed into City and were covered by the 1976 Agreement's contract rate for surface water delivery to City by District for those lands; and

WHEREAS, City and District now wish to limit the amount of Kings River water available to City to provide more certainty regarding water supply availability and to address City's current and anticipated needs and circumstances; and

WHEREAS, City and District are both committed to working cooperatively under the Sustainable Groundwater Management Act ("SGMA") so that the groundwater basin shared by City and District is sustainable and so that undesirable results (as defined in SGMA) are minimized or avoided; and

WHEREAS, City and District recognize that changes to the operations of the Central Valley Project have impacted the availability of water from said project; and

WHEREAS, City has heretofore used much of the water delivered to it under the 1976 Agreement for groundwater recharge because of City's historical reliance on groundwater, and therefore did not require delivery of water year around; and

WHEREAS, City desires to use more of its surface water for direct delivery to its water users and ratepayers while limiting its reliance on groundwater; and

WHEREAS, with the development of its surface water treatment facilities ("SWTFs") City now requires a long-term, reliable and certain surface water supply, deliverable continuously year around; and

WHEREAS, conveyance of raw surface water to the SWTFs on a continuous year around basis will require, among other things, (i) new conveyance infrastructure built by City to overcome certain operational challenges and/or interruptions to District's infrastructure to accommodate normal and routine maintenance of District's canals and pipelines than have historically delivered surface water to City, (ii) District to alter its operations and incur additional

costs to make Out of Season Deliveries, and (iii) the use of new management techniques by District, with the attendant costs, including without limitation water sales, purchases, transfers and exchanges, to meet the need for a continuous supply of surface water to City's SWTFs, all while addressing SGMA and other legal and regulatory requirements that impact the groundwater basin shared by District and City; and

WHEREAS, providing Out of Season Deliveries by District to City may also require the development of new water supplies and projects to provide the water being sought by City; and

WHEREAS, City acknowledges that District has a great depth of experience, knowledge and expertise in the management of surface water supply resources (including but not limited to water supply sales, purchases, transfers and exchanges); and

WHEREAS, City recognizes that the coordinated management of both District's and City's water supplies by District is desirable to maximize the use of the current water supplies and the future development of water supplies for both parties; and

WHEREAS, City has determined that it is in City's interest, and in the interest of its water users and ratepayers, to engage District to employ District's experience, knowledge and expertise on behalf of City in the management of City's Surface Water pursuant to the terms hereof in order to achieve City's and District's goals described herein and to accommodate City's desire for a continuous year around surface water supply, and District has agreed to be so engaged; and

WHEREAS, the changing conditions and manner of management of water supplies throughout the State of California, and other factors beyond the control of City and District, will require increased vigilance on the part of water purveyors in the Fresno area to cooperate with each other on long-range implementation strategies to improve the availability, reliability, and drought resiliency of water supplies; and

WHEREAS, through this Agreement and additional cooperative efforts, City, District and other entities in the region intend to capture of flood released waters, optimize existing water supply storage assets, develop new water supply storage assets, expand groundwater recharge capacities, engage in strategic water supply sales, transfers and exchanges and enhance the utilization of recycled and/or treated waters; and

WHEREAS, in light of SGMA, environmental regulations, water supply challenges and competition with other users and regions in the State for water supplies, City and District wish to further enhance their cooperative working relationship for the benefit of the water users and ratepayers they serve by entering into this Agreement to provide for strategic, long-range and coordinated water supply planning and management that will optimize water conservation, the efficient uses of water for agricultural and municipal uses, the capture of flood released water, the use of existing water supply storage assets, the development of new water supply storage assets, the expansion of groundwater recharge capacity, the effectiveness of strategic water supply sales, transfers, exchanges and purchases, and the enhancement of recycled water utilization.

NOW, THEREFORE, adopting the foregoing recitals as being applicable to this Agreement, it is mutually agreed as follows:

1. Term. The term of this Agreement shall be for a period commencing on the date it is executed by both District and City and ending at 12:00 o'clock p.m. on the last day of June in the year 2035, and thereafter until terminated by either party as of the last day of February of any subsequent year by written notice to the other party mailed prior to September 1st of the previous year. Upon the execution of this Agreement the 1976 Agreement and all amendments thereto shall be of no further force or effect, except that City agrees to pay District any monies owing or to become owing to District under and according to the terms of the 1976 Agreement, if any.

2. Agreement Subject to Other Obligations. This Agreement shall be at all times subject to all of the terms and conditions of the City Bureau Contract, the District Bureau Contract and the Kings River Agreements, and to the extent that any agreement contained herein is contrary to or inconsistent with any term or condition of those contracts or agreements, that contrary provision of this Agreement shall be unenforceable. In the event any such agreement contained herein shall become unenforceable, the entire Agreement may be terminated by the party adversely affected as of the last day of February of the next succeeding year, by written notice served upon the other party on or before the first day of September of the year preceding such termination.

3. Definitions. For the purpose of this Agreement, the following terms shall be defined as follows:

(a) "Agricultural Use" means the use of water primarily in the production of agricultural crops or livestock including but not restricted to domestic use incidental to such agricultural purposes, the watering of livestock, and underground water replenishment conducted by District.

(b) "City's Friant Supply" means all water to which City is entitled under the City Bureau Contract or otherwise as a result of City's status as a long-term repayment contractor for water service from the Friant Division of the Central Valley Project (CVP), including without limitation Class 1 water, Section 215 water, uncontrolled season water, unreleased restoration flows and recirculated water. City's Friant Supply shall not include any water available to District under the District Bureau Contract or as a result of District's status as a long-term repayment contractor in the Friant Division of the CVP, which water is not governed by this Agreement.

(c) "City's Kings River Supply" means the percentage of District's Kings River Supply available to be delivered to City in a Water Year under this Agreement.

(d) "District's Kings River Supply" means the Kings River water District may deliver to its water users under the Kings River Agreements and applicable judicial and regulatory decrees in a Water Year as the result of the calculated natural flow of the Kings River during that Water Year.

(e) "City's Surface Water" means all water available to City in a Water Year by means other than pumping from the underground water supply, including without limitation

City's Kings River Supply and City's Friant Supply and any surface water supply acquired or developed after the date of this Agreement.

(f) "City's Water Service Area" means all lands within the exterior boundaries of City, and also all lands outside such boundaries that are within the exterior boundaries of District, to which City now delivers water or hereafter consents to deliver water by means of the City Water System and that are not hereafter designated or assessed by District as lands receiving or to receive District Water Service.

(g) "City Water System" means the conduits, pipes and other facilities (including without limitation the SWTFs) owned by City and used by City to convey water to lands whether in or outside City.

(h) "District Water Service" means the furnishing of water by District directly to lands within District by means of the District Water System other than pumping conducted by a landowner or water user directly from the underground water supply upon the lands receiving such water.

(i) "District Water System" means the conduits, pipes, canals, pumping stations and other facilities owned and/or used by District to convey water to lands or facilities whether in or outside of District.

(j) "Excluded Areas" means those acres within the City's Water Service Area that are outside of the District's boundaries.

(k) "Included Acres" means those acres within the City's Water Service Area that are within the District's boundaries.

(l) "Municipal, Industrial and Domestic Uses" means the use of water other than for Agricultural Use, and underground water replenishment conducted by City.

(m) "Out of Season Deliveries" means deliveries of City's Surface Water via the District Water System during periods when District is not otherwise delivering irrigation water to its landowners or water users via the portions of the District Water System used to convey City's Surface Water to the points on the District Water System where City will assume physical control of the delivered water.

(n) "Point of Delivery" means, for water delivered to City via the District Water System, the headworks of the Gould Canal and the Fresno Canal as specified in the applicable schedule, for water delivered to City via the Friant-Kern Canal Raw Water Pipeline, the headworks of the Friant-Kern Canal Raw Water Pipeline, for water delivered to City via the South Raw Water Pipeline, the headworks of the Fresno Canal, and such other location(s) as City and District may mutually agree.

(o) "Transfer" means a water sale, transfer or exchange involving any of City's Friant Supply.

(p) "Water Year" means March 1 of one year through the last day of the following February when used in reference to City's Friant Supply and October 1 of one year through September 30 for the following year when used in reference to City's Kings River Supply or District's Kings River Supply.

4. Management of City's Surface Water. To fulfill the purposes of this Agreement, and to facilitate the continuous and year around supply of water to City's Water System and facilities, District shall undertake, and is hereby appointed by City as City's exclusive agent for the management of City's Surface Water pursuant and subject to the terms of this Agreement, including but not limited to subsection 4(f) below. District's management authority and responsibilities shall terminate with respect to any of City's Surface Water upon delivery of that water to City.

(a) The management authority hereby granted to District shall include without limitation the exclusive right to:

i. Direct the storage and release of City's Surface Water;

ii. Schedule, order and provide for the delivery of City's Surface Water to District's points of diversion;

iii. Facilitate the reasonable and beneficial use of City's Surface Water and other water supplies available to City, while also providing for delivery of water to the applicable Point(s) of Delivery as specified in this Agreement;

iv. Pursue and implement Transfers pursuant to this Agreement; and

v. Take all other actions associated with the management and administration of City's Surface Water prior to its delivery to the applicable Point of Delivery in furtherance of the goals provided in subsection 4(f).

(b) District shall not voluntarily take any action that would:

i. Breach City's Bureau Contract or any other agreement governing any of City's Surface Water;

ii. Result in a long-term reduction in amount of City's Surface Water; or

iii. Result in management or use of City Surface Water inconsistent with the goals provided in subsection 4(f) below, unless City provides prior written authorization of such management or use.

(c) Notwithstanding District's management of City's Surface Water, City shall be solely responsible for, and shall timely pay, all charges and other amounts payable in connection with any of City's Surface Water.

(d) Subject to the express rights of City under this Agreement, City shall take no action that interferes with District's management of City's Surface Water as long as District provides the deliveries thereof in accordance with Section 5.

(e) District shall coordinate with City to define and identify uses of City's Surface Water that benefit City's water users and ratepayers. This coordination shall be performed as described in this subsection.

i. As frequently as appropriate and necessary, and at least annually, City and District shall confer to review available water supply information and data, including without limitation: precipitation, snow pack, and runoff conditions; water storage conditions; relevant environmental programs and projects; forecasted Municipal, Industrial and Domestic Uses; surface water delivery priorities for City; forecasted groundwater pumping required to meet City's forecasted Municipal, Industrial and Domestic Uses; and other pertinent information and data related to water supply availability and water demands for the relevant Water Year(s). City and District shall also confer regarding the anticipated availability of City's Friant Supply, if any, for Transfers.

ii. City will be responsible for providing periodic updates to the City Council and City administration. At least annually, City staff shall provide an informational workshop to the City Council, summarizing ongoing water supply conditions, the implementation of this Agreement and fulfillment of the water supply goals as listed in 4(f), as well as any anticipated water supply issues of concern for the relevant Water Year(s). District shall make reasonable efforts to coordinate with City staff to provide any data, information, and materials required for this annual informational workshop to the City Council.

iii. It is understood that during any given Water Year it may be necessary to adjust the water supply planning forecast established pursuant to the above described process as water supply availability and demands change, and additional information and data are obtained, reviewed, and assessed. City and District shall employ reasonable efforts to meet and confer as necessary to keep each party informed to the extent water supply conditions and plans may change through the relevant Water Year. City shall be responsible for providing informational updates to the City administration to the extent there are material changes to the water supply conditions in any given Water Year.

(f) District's management of City's Surface Water shall at all times be in furtherance of one or more of the following water supply goals:

i. Providing continuous year around water supply to City's SWTFs;

ii. Improving the water supply reliability and drought-resiliency for City;

iii. Improving the operation and utilization of City-owned recharge basins;

iv. Implementing conjunctive-use water management strategies to comply with the SGMA that directly benefit City's water users and ratepayers and indirectly benefit groundwater users in the North Kings Subbasin.

(g) Included as a part of the management of City's Surface Water as described above, District shall diligently pursue Transfers of any of City's Friant Supply that City advises District that City will not require during a particular Water Year ("Temporarily Unused Friant Water").

i. Upon identifying a potential Transfer opportunity, and prior to executing the Transfer, District shall notify City of the potential Transfer opportunity, and the water quantity, unit price, delivery dates and terms, and any other material matters associated with the Transfer. This is a notification procedure and not an approval procedure.

ii. All Transfers of Temporarily Unused Friant Water pursued by District shall be in full conformance with City's water supply goals as described in Section 4(f) or otherwise agreed by City and District, and shall be limited to supporting Agricultural Use rather than urban growth or development in other jurisdictions.

iii. City shall not be prohibited from unilaterally pursuing Transfers of Temporarily Unused Friant Water; provided, that any such Transfers shall first be discussed and coordinated with District before they are implemented and shall not be undertaken over District's reasonable objection and the benefits of any such Transfer shall be allocated in accordance with subsections (h), (i) and (j) below.

iv. For avoidance of doubt, District's obligations under this Section 4(g) are limited to making reasonable and diligent efforts to pursue Transfers of Temporarily Unused Friant Water, and City acknowledges that no assurances can be provided by District that such Transfers can be made or arranged.

(h) The benefits resulting from Transfers shall be allocated in accordance with this subsection. For purposes of this Section 4, "benefits" of a Transfer include, without limitation:

i. The difference between all costs incurred in connection with a Transfer and the amount(s) received as a result of the Transfer,

ii. Water returned as a result of a Transfer, and

iii. Water supply storage or conveyance capacities made available as a result of a Transfer.

To the extent benefits include payments, City shall be reimbursed for its actual and reasonable out of pocket expenses incurred for City's Friant Supply involved in the Transfer,

and each of the parties shall next be reimbursed for any actual and reasonable out of pocket expenses incurred in connection with the Transfer. The net revenue associated with a Transfer shall be the revenue remaining after all parties have been reimbursed their actual and reasonable expenses incurred for the Transfer.

(i) To the extent benefits of a Transfer consist of water supplies, water supply storage or conveyance capacities, the allocation of such benefits as between the parties shall be negotiated by the parties before the Transfer is implemented. In the event the parties cannot negotiate such allocation, the Transfer shall not be pursued.

(j) For each Transfer that generates net revenue, City and District agree that the net revenue shall be distributed and used as follows:

i. 25-percent of the net revenue shall be deposited with City's water enterprise fund;

ii. 25-percent of the net revenue shall be deposited with District for the inspection, operations, maintenance and repair of the District's Conveyance System, which City acknowledges provides a benefit to City ratepayers;

iii. 50-percent off the net revenue shall be deposited into a Water Supply Development Fund to be used to finance water supply development programs and projects that mutually-benefit City and District.

The Water Supply Development Fund shall be a restricted-use fund to be used exclusively for water supply programs and projects that improve water supply availability, reliability and drought resiliency for both District and City. Programs and projects that may be financed from the Water Supply Development Fund include, but are not limited to, water supply purchases, transfers, and exchanges; groundwater storage; and groundwater recharge. Expenditures for water supply purchases, transfers, and exchanges may include any carryover charges and conveyance charges that may be assessed by the State of California, the United States, or other agency, to store, transport and deliver surface water, for the mutual benefit of City and District, using state or federal storage and conveyance facilities.

The Water Supply Development Fund may receive contributions from City, District, and other public agencies approved by both City and District. The Water Supply Development Fund may not receive contributions from private persons, companies, businesses, or organizations.

Prior to encumbering funds from the Water Supply Development Fund, District and City shall mutually agree in writing on the recommended expenditure and the amount to be financed with the Water Supply Development Fund.

District shall serve as the fiscal agent for the Water Supply Development Fund and implement generally accepted public agency or governmental accounting practices in managing the fund assets. District shall subject the fund to an annual audit by independent auditors during the course of District's annual audit of its financial statements. The audit shall

be conducted in accordance with the generally accepted auditing standards by the independent certified public accountant auditing District's financial statements. Upon presentation of District's comprehensive audit report to the District Board of Directors, District shall provide City with a copy of District's audit report. At any time during the term of this Agreement, City may, at its own cost, request to review and audit the financial and accounting records associated with the Water Supply Development Fund. District shall have 30 working days to submit the requested records to City for review and audit.

In the event this Agreement terminates and uncommitted amounts remain in the Water Supply Development Fund, one half of all such amounts shall be promptly distributed free of any restrictions to each of the parties.

(k) By the 25th day of each month, District shall provide City with a written summary of District's utilization of City's Friant Supply for the previous month in substantially the form attached hereto as **Exhibit A**. The written summary will identify water volumes delivered to recharge basins, surface water treatment facilities, other Points of Delivery designated by City, and Transfers. The written summary may be delivered to City by email, facsimile or U.S. mail. For Transfers, the monthly report shall include information regarding the parties involved in the Transfer, the water quantity, unit price, delivery dates and terms, and any other material matters associated with the Transfer.

5. Water Made Available to City.

(a) Subject to all other provisions of this Agreement, District shall deliver to City during each applicable Water Year, for distribution and use by City within City's Water Service Area, each day of each year on a continuous basis in accordance with Section 8 of this Agreement, the City's Surface Water available during relevant Water Year(s) that can be diverted by District at the headworks of the Gould Canal, the Fresno Canal or the Friant-Kern Canal Raw Water Pipeline. City acknowledges that the water delivered may not be City's Surface Water, but rather other water controlled by District in the District Water System of similar quality and equal quantity, including without limitation water recovered from water banks, other water for which City's Surface Water is exchanged, and/or water purchased by District for delivery to City at District's cost, and that references in this Agreement to deliveries of City's Surface Water shall include deliveries thereof of a substitute supply by means of one or more exchanges, transfers, purchases or combinations thereof. At all times, District shall have the right to exchange and to convey for City in place thereof other water of similar quality and equal quantity (except sewer effluent or industrial wastes) available to District.

(b) City's Surface Water shall be deemed delivered to City when it reaches the Point of Delivery specified in the applicable schedule provided and approved under Section 8 of this Agreement, provided that for deliveries made via the District Water System, District shall thereafter convey such water to the points on the District Water System where City will assume physical control of the delivered water.

(c) The parties acknowledge that there may be times when the City Water System is undergoing routine or emergency repairs and maintenance, or subject to other conditions, that preclude City from accepting deliveries under this Agreement. Similarly, the parties

acknowledge that there may be times when the District Water System is undergoing routine or emergency repairs and maintenance, or subject to other conditions, that preclude District from delivering water to City under this Agreement. The parties shall cooperate with the other to minimize the impacts of such events, but neither shall be in breach of this Agreement as a result thereof.

(d) Water delivered to City under this Agreement shall be used by City within City's Water Service Area only for Municipal, Industrial and Domestic Uses, Agricultural Uses incidental thereto, and within the boundaries of District for recharge of the underground water supply by percolation.

City shall not sell, transfer, deliver or exchange any surface water or groundwater to or with any other person or entity without written consent of District first had and obtained.

However, this provision shall not prevent City from entering into separate agreements with any other entity which may have a similar agreement with District for the distribution and use of water received from District under such agreements, provided such separate agreements are entered into with the written consent of District first had and obtained and are subject to all the terms and conditions of this Agreement and District's agreements with such other entities.

(e) District has entered into this Agreement with the understanding that it is, and will continue to be, City's policy to (i) require urban growth to occur sequentially in designated growth areas around City, (ii) promote infill development with City's existing boundaries and (iii) facilitate the successful implementation of SGMA within the groundwater basin shared by City and District by conditioning land use and annexation decisions on the existence of an available water supply to support new development in annexed areas. Consistent with that understanding, for the term of this Agreement, as a condition of the provision of City water service, City shall require the proponent of any proposed development project located outside of City's Water Service Area boundary as of the date of this Agreement to:

i. Define the peak water demands, plus fire protection demands, required to meet the total water supply demands of the entire project at build-out conditions;

ii. Obtain a perpetual surface water supply allocation, right, entitlement or similar from District, or other surface water supply agency, to meet the peak water demands, plus fire protection demands, at build out conditions; and

iii. Dedicate, transfer or assign the perpetual surface water supply allocation, right, entitlement or similar to City.

Once the perpetual water supply has been dedicated, transferred, or assigned to City, the water supply shall be incorporated into City's Surface Water managed by District for City under this Agreement.

In addition, to improve, restore, and maintain the availability, reliability, and drought resiliency of the groundwater and surface water resources in the North Kings Subbasin,

City and District shall jointly advocate that all public water supply systems in the North Kings Subbasin should require the proponents of new development projects to obtain perpetual surface water supply rights, allocations, entitlements, and similar, in sufficient quantity, to meet the all demands at full build out.

(f) In furtherance of the parties' goals under this Agreement, City shall utilize City's Friant Supply to provide water to the City's SWTF served by the South Raw Water Pipeline (as defined below) for the purpose of serving the Excluded Area.

6. Raw Water Pipelines. As soon as reasonably practicable, City shall construct, at its sole cost and expense, two raw water pipelines to serve City's SWTFs (the "Raw Water Pipelines"). One Raw Water Pipeline shall be a direct connection from the Friant-Kern Canal to City's SWTF located at Mile Point 7.58 (the "Friant-Kern Canal Raw Water Pipeline"). The other Raw Water Pipeline shall be a direct connection from the Fresno Canal downstream of the headworks for such canal to City's SWTF located at Trimmer Spring Road (the "South Raw Water Pipeline"). City's T3 SWTF shall continue to be served by the Enterprise and Jefferson Canals that are a part of the District Water System. Once operational, the Raw Water Pipelines shall be used to convey portions of City's Surface Water directly to the SWTFs, and all costs of the operation, maintenance, repair and replacement of the Raw Water Pipelines shall be borne by City; provided, that District shall be entitled to utilize for its own purposes any capacity in the Raw Water Pipelines not required to deliver City's Surface Water, and District shall reimburse City upon demand for any operational costs incurred as a result of District's use of the Raw Water Pipelines. Any third-party property damages resulting from City's efforts and activities related to the operation, maintenance, repair, and replacement of the Raw Water Pipelines shall be received and processed by City in accordance with City's Risk Management policies and procedures.

7. City's Friant Supply. While this Agreement is in effect, City (i) shall not convey any interest in the City Bureau Contract to any party other than District, (ii) shall at all times maintain the City Bureau Contract in effect and (ii) shall not voluntarily decrease the quantity of City's Friant Supply to be made available to City thereunder without the written consent of District. City will use every effort to obtain its maximum entitlement to City's Friant Supply annually as it may become available, and will seek to maximize any other surface water opportunities that may be available to City via the Friant Division of the Central Valley Project. Nothing in this Agreement conveys any ownership interest in the City Bureau Contract to District, which shall at all times remain the sole property of City, nor does this Agreement convey any interest in the District Bureau Contract to City, which shall at all times remain the sole property of District.

8. Schedules of Delivery and Conveyance of Water.

(a) District shall deliver City's Surface Water to City in accordance with schedules provided from time to time by City for approval by District, which approval shall not be unreasonably withheld, delayed or conditioned. Such schedules shall set forth the amounts of water desired by City, the desired timing of deliveries, the facilities by which such water is to be delivered, and the point(s) on the District Water System where City will assume physical control of the delivered water. Deliveries of water by District will take into consideration all relevant

factors, including without limitation (i) the capacity and condition the applicable portions of the District Water System, (ii) City's Bureau Contract, (iii) the District Bureau Contract, (iv) the Kings River Agreements, (v) actual and anticipated water supply conditions, (vi) the requirements of other contracts between the District and third parties (including without limitation the City of Clovis and Fresno County Waterworks District No. 19) and (vii) all other factors pertaining to the distribution, apportionment and use of water available to District.

(b) All schedules submitted by City during each Water Year shall provide for the delivery during that Water Year of all of City's Surface Water that becomes available to City during that Water Year. Notwithstanding the foregoing, City may schedule up to 10,000 acre feet of City's Surface Water that becomes available to City during one Water Year for delivery in the succeeding Water Year ("Rescheduled Water"). City shall timely pay in full all costs imposed by third parties, including without limitation the United States Bureau of Reclamation, as the result of any Rescheduled Water requests or deliveries.

9. Conveyance Losses. City shall bear all losses incurred in the District Water System downstream of the applicable Point of Delivery; provided, that no such losses shall be assessed against City when District is delivering irrigation water to its landowners or water users via the portions of the District Water System used to convey City's Surface Water to the points on the District Water System where City will assume physical control of the delivered water. Conveyance losses chargeable to City shall be computed by multiplying the losses in that portion of any canal used for conveyance of City's Surface Water during the period such water is being so conveyed by the total amount of water being conveyed for City in that canal during such time, divided by the total amount of water flowing in that portion of that canal during the same period.

10. Use by District of Water Not Used by City.

(a) Except for Rescheduled Water, in the event City is unable to use or does not use any of City's Kings River Supply in any Water Year, City shall lose the right to receive such water, and District shall have the right to take and use such water for Agricultural Use in such manner as it may determine.

(b) Except for Rescheduled Water, in the event City is unable to use or does not use any part of City's Friant Supply and District reasonably concludes that it cannot effect a Transfer for all of such unused water as Temporarily Unused Friant Water as described in Section 4(g), City shall nevertheless take and pay for such unused water and District shall have the right to use such water for Agricultural Use, but City may require District to so use such water at such locations as City may direct; provided, however, in the event City does not direct the location at which said water shall be used in time that it may be so used or in the event the District Water System will not permit the conveyance of such water to such location when so directed, or if for any other reason the conveyance of such water to such location at that time is not feasible or practicable, District shall have the right to use such water upon the same conditions as are provided in Section 10(a). Such use of any such water by District shall not relieve City from any payments required to be made by it under the City Bureau Contract or under the terms of this Agreement and its use by District shall not require any payment from District to City.

(c) Except for Rescheduled Water, in the event City is unable to use or does not use any of City's Surface Water that is neither City's Kings River Supply or City's Friant Supply in any Water Year, City shall lose the right to receive such water, and District shall have the right to take and use such water for Agricultural Use in such manner as it may determine. In such event, insofar as the District Water System will permit, and insofar as otherwise may be practicable and equitable as to other landowners, District will use such water for irrigation or percolation in areas in City or east or northeast of City, and will discuss its use with City before it is used elsewhere. However, the ultimate decision concerning such use of such water shall be within the discretion of District.

11. Water Rights Not Transferred. As was the case under the 1976 Agreement, City acknowledges that its rights to City's Kings River Supply under this Agreement are contractual rights and not water rights. Nothing in this Agreement authorizes or shall be construed or deemed to constitute the sale or transfer of a water right from either party to the other and nothing in this Agreement shall constitute the dedication by either party of water or storage to a public use. No right in any water, storage right or water right owned by District or City shall be acquired or lost by virtue of this Agreement or the actions contemplated hereby. At no time shall City make any claim, assert any right or otherwise seek, confirm or perfect in any forum any legal or beneficial interest, right or title to any of District's water supply or storage rights except as expressly set forth herein.

12. City's Sewage Effluent. City shall retain its sewage effluent and recycled water within the boundaries of District for the term of this Agreement, except with the written consent of District first had and obtained. It is the intent of City and District to develop and execute a new agreement addressing such effluent and recycled water use, and this Agreement is to be interpreted so as to be consistent with such new agreement if and when it is executed by the parties.

13. Acreages and City's Kings River Supply.

(a) City's Water Service Area consists of Included Acres and Excluded Acres, and on an annual basis City and District shall prepare a map showing the total number of acres in each area as of the first day of March of each year. When so approved, said map shall be incorporated herein by reference as **Exhibit B** and shall become a part hereof. Said map shall be amended and reapproved by both parties as of the first day of March each year and added to this Agreement as an updated **Exhibit B**. However, City shall keep the District currently advised during the year of any new lands outside of City's Water Service Area to which it commences or consents to deliver water, and District shall keep City so advised as to any new lands designated or assessed by it as lands receiving or to receive District Water Service. When so amended and reapproved as of the first day of March of each year, said map shall conclusively establish the boundaries of and the acreage in each area for all purposes of this Agreement.

(b) City's Kings River Supply shall be the herein-contracted for percentage of District's Kings River Water Supply. Such percentage shall be based on the ratio of Included Acres within City's Water Service Area to the total acres within District's boundaries. In computing the acreage within the Included Acres, the entire acreage shall be measured including properties that may be exempt from assessment for taxation and including adjacent streets,

alleys, roads, highways and other public ways to the center lines thereof. As of the execution of Agreement, and based on the land area sizes defined above, City's Kings River Supply is 25.54 percent of the District's Kings River Supply.

(c) Notwithstanding any other provision of this Agreement, and notwithstanding increases in the Included Acres, City's Kings River Supply shall be limited to 29.00 percent of District's Kings River Supply. At such time when the ratio of Included Acres within City's Water Service Area to the total acres within District equals 29.00 percent, City's Kings River Supply shall remain fixed at 29.00 percent. City and District mutually agree that the increase percentages reflected in this Section 13 include allowances for moderate growth in Growth Area 1 of City's Sphere of Influence as shown in **Exhibit C** (as depicted as Figure IM-2 of the Fresno General Plan).

(d) To improve, restore, and maintain the availability, reliability, and drought resiliency of the groundwater and surface water resources in the North Kings Subbasin, District shall support, and to the extent it has the legal authority to do so shall require, the establishment of water supply limits on all municipal water systems in the North Kings Subbasin.

District acknowledges that it may enter into surface water utilization and conveyance agreements similar to this one with other municipalities in the Kings Subbasin that provide for the delivery of portions of District's Kings River Supply. Subject to the following paragraph of this Agreement, all such agreements entered into after the date of this Agreement shall provide that the percentage of District's Kings River Supply made available to the municipality entering into such agreement shall be determined in a manner similar and comparable to that applied to City in this Agreement.

Should the District enter into such a water utilization and conveyance agreement with another municipality in the Kings River Subbasin after the date of this Agreement that makes available a percentage of District's Kings River Supply to such municipality determined in a manner that is not similar and comparable to that applied to City in this Agreement, at City's request the parties shall negotiate in good faith an adjustment in City's Kings River Supply to apply the same methodology used, and provide the same percentage increase, as granted to the other municipality; provided, that to the extent such other municipality provides additional consideration to District for such different methodology, City shall provide comparable consideration if it requests that such different methodology be used for this Agreement. Any disputes arising as a result of such negotiation shall be resolved pursuant to Section 19.

14. Payment by City to District. In consideration of the water supplies and services provided by District to City under this Agreement, City shall pay to District each Water Year in which this Agreement is effective the following:

(a) The sum calculated by multiplying the number of Included Acres by the per acre assessment imposed as of March 1 of that Water Year on lands in District receiving District Water Service, plus the sum calculated by multiplying the number of Excluded Acres by the per acre assessment imposed as of March 1 of that Water Year on lands in District not receiving District Water Service. Amounts payable to District pursuant to this Section 14(a) shall be paid by City 60% on or before the 20th day of December preceding the Water Year for which such

amounts are due, and the remaining 40% shall be paid on or before the 20th day of June of the following Water Year. City and District acknowledge that during the term of this Agreement, District may convert its rate structure to include a volumetric charge. Concurrently with such a rate structure modification, the parties shall negotiate modifications to this Section 14 so that charges imposed on City under the revised District rate structure are equitable and comparable in proportion and magnitude to the charges imposed on other District customers receiving water for Agricultural Use. Without limiting the foregoing, any volumetric charges imposed on City shall be determined in the same manner as volumetric charges imposed on other District customers receiving water for Agricultural Use.

(b) An out of season water delivery fee determined in accordance with the procedure described in the attached **Exhibit D** for each acre foot of water delivered to City under this Agreement as an Out of Season Delivery (the "Water Delivery Fee"). The Water Delivery Fee shall be payable within 30 days after District delivers City an invoice for such fee indicating the amount of water delivered during the invoice period and the total Water Delivery Fee due. City acknowledges that such fee is in part to compensate District for additional costs and risks incurred for operating its system to make Out of Season Deliveries. No such fee shall be due for water deliveries to City under this Agreement that are not Out of Season Deliveries.

(c) A rescheduling fee for each acre foot of Rescheduled Water determined in accordance with the procedure described in the attached **Exhibit E** (the "Rescheduling Fee"). The Rescheduling Fee shall be payable annually after March 1 of each Water Year within 30 days after District delivers City an invoice for such fee indicating the amount of Rescheduled Water for the applicable Water Year and the total Rescheduling Fee due. City acknowledges that the Rescheduling Fee is necessary to compensate District for additional costs and risks incurred to reschedule water for City from one Water Year to the succeeding Water Year. The Rescheduled Water Fee shall not be applied to any of City's Friant Supply carried over in Millerton Lake, as the Bureau has established a separate fee schedule for City to reschedule City's Friant Water Supply from one Water Year to the succeeding Water Year.

(d) While this Agreement is in effect, District shall not impose District assessments or other charges on landowners within City's Water Service Area or adopt special "municipal and industrial" assessments, rates or charges that would be imposed on or as a result of water deliveries to City under this Agreement. Only the amounts described in this Agreement shall be imposed on any party as a result of deliveries of City's Surface Water by District to City.

(e) Time shall be of the essence for the making of the payments described in this Section 14. If any such payment is not made on the date provided, City shall pay to District in addition to said payment costs, penalties and interest equal to those provided by law to be paid by landowners within District for the late payment of assessments. Such costs, penalties and interest are in addition to any other remedy which District may have against City because of City's failure to pay said payment as above provided.

(f) City acknowledges and agrees that the amounts payable by City pursuant to this Section 14 will vary from year to year and may increase over time. City further acknowledges that, while some of such amounts will be determined with reference to District assessments on its landowners, no amounts payable by City under this Agreement are assessments on City's

landowners. City further agrees that, as they relate to City, such amounts will be imposed as a matter of contract and are not assessments, fees or charges to which Article XIIID of the California Constitution applies. City shall be permitted to participate in public hearings and meetings held in connection with rate-setting, but City shall not assert that Article XIIID of the California Constitution applies to payments required under this Agreement. If City makes such an assertion, this Agreement may be terminated by District in its entirety as of the last day of February of the next succeeding year by written notice served upon City. City shall be responsible to set its rates to its utility users in accordance with applicable law, and shall indemnify and defend District against any claims or legal actions commenced by City's water users or ratepayers to challenge the amounts payable by or to City.

15. Re-negotiations. City and District acknowledge that changed circumstances in the future may:

i. Result in material changes in the size of City's Water Service Area, the number of Excluded Acres and/or the number of Included Acres, and/or

ii. Render the amount of City's Kings River Supply as an increasing percentage of District's Kings River Water Supply inequitable.

Such changed circumstances could result from, among other causes:

i. Annexations or detachments from City and/or District;

ii. Updates in City's Urban Water Management Plan or the Fresno General Plan;

iii. Significant regional economic development projects that require the extension of the City Water System outside of City's Water Service Area. Significant regional economic development projects shall be those that qualify for federal, state, county, or local economic development incentives; or

iv. New legal, regulatory, or environmental requirements placed on water supply agencies by a state or federal government agency.

Should either party to this Agreement determine after January 1, 2036 that such changed circumstances have arisen, it may notify the other of such determination and request that the parties meet to discuss mutually acceptable changes in the number of Excluded Acres, the number of Included Acres and/or the percentage used to determine City's Kings River Supply. Neither party shall be required to engage in such discussions prior to January 1, 2036.

The parties shall thereupon meet in good faith in an attempt to reach agreement on such changes; provided, that if no such agreement is reached within 180 days of the initial meeting, neither party shall be obligated to continue such meetings.

The number of Excluded Acres, the number of Included Acres and City's Kings River Supply shall remain unchanged pending agreement on the changes, and therein documented by a written amendment to this Agreement and executed by both parties.

16. Protection of District Facilities. City shall not permit the development of any parcel of land or the use of any public utility or other easements affecting land within its boundaries if any of the District Water System is located on, under or adjacent to such parcel until City, the landowner and/or the developer enters into an agreement acceptable to District for the repair, rehabilitation, relocation, replacement, reconfiguration or pipelining of the facilities on the parcel, and on any adjacent parcels, all as District determines is necessary or appropriate in order to (i) avoid disruption of District operations or maintenance activities as a result of the development, (ii) make District facilities suitable for operation within a developed area, or (iii) address public safety concerns.

17. No Warranty of Quality. City recognizes that City's Surface Water will be "raw," non-potable and untreated, and that the amount of water included in City's Surface Water will vary from year to year due to a variety of factors beyond the control of District. City further recognizes that wastewater (both treated and untreated) and drainage water are sometimes discharged into the District's canals, and that such discharges from a number or sources will occur and/or continue during the term of this Agreement. Accordingly, except as expressly set forth in this Agreement, District makes no representations or warranties regarding the quality of the water or the amount of water to be delivered to City each Water Year. City recognizes that the treatment of City's Surface Water to make it potable shall be the sole responsibility of City, and City shall assume all risk and responsibility therefor. The character or quality of the water furnished or conveyed hereunder may vary from time to time for reasons including, but not restricted to, the application by District of chemicals to control aquatic and ditch bank weeds, and the open canals of District are always subject to possible pollution from outside sources. District does not guarantee in any respect or assume any responsibility for the chemical, bacterial or other quality of the water made available to City through the District Water System.

18. Indemnity. City and District each agree to indemnify the other and save the other free and harmless of and from any and all liability, damage, loss, cost or expense, incurred or suffered by the other, by reason of damage to the property of the other or injury to any other person or property arising out of its own conduct, acts, omissions or faults, in connection with any matter related to this contract.

19. Dispute Resolution.

(a) District and City staff shall exercise every effort to resolve disputes through the development of a consensus.

(b) To the extent District and City staff cannot promptly resolve an issue in dispute; the parties shall promptly convene a meeting of senior party representatives to attempt to resolve the dispute. Either party may request a dispute resolution meeting pursuant to this section by providing written notice to the other party, including a summary of the issue in dispute. District representatives shall be its Board chair or president and another Board member. City representatives shall be the Mayor and City Council President. These senior party representatives shall make reasonable efforts to meet as frequently and as promptly as possible to negotiate the terms and conditions of a resolution. If these party representatives are unable to resolve the dispute through this informal process within a reasonable period, either party may pursue any remedy it may have under law or equity.

(c) The dispute resolution process described above shall be limited to material disputes regarding matters related to Transfers, expenditures from the Water Supply Development Fund, changes in City's Kings River Supply, revisions of this Agreement pursuant to Section 13(d), City's Friant Supply, changes proposed for **Exhibits B or C**, calculation procedures for fees for Out Of Season Deliveries and Rescheduling Fees, and similar matters.

(d) In cases where a dispute arises between the parties that, if unresolved, may result in imminent danger to the public, health, safety or welfare, the parties shall not be obligated to engage in dispute resolution pursuant to this Section 19.

20. Defense of Agreement. In the event of litigation this Agreement, the parties shall cooperate to provide a joint defense of the litigation. Each party shall bear its own costs of such litigation, including attorneys' fees and expert witness fees.

21. No New Agency. This Agreement is not intended to create a new joint powers authority or other entity. Each party shall conduct itself under this Agreement in good faith, using its diligent best efforts to comply with this Agreement and to achieve the objectives of the parties set forth herein. Each party shall make its personnel and resources reasonably available as required to achieve the purposes of this Agreement.

22. Approvals. Except as expressly provided in this Agreement, compliance with all legal/regulatory requirements and governmental or other third party restrictions on the use or delivery of City's Surface Water to it City water users shall be the responsibility of City. District shall be excused from delivering any water supply under this Agreement if, by so doing, District would become subject to additional legal requirements or third party restrictions imposed on deliveries of water to City's water users.

23. Entire Agreement. This Agreement and each of the exhibits referred to herein, which are incorporated by this reference, constitute the entire agreement between the parties pertaining to the subject matter hereof and supersede all prior and contemporaneous agreements and/or obligations concerning these obligations which are merged into this Agreement. Each party has made its own independent investigation of the matters settled and is not relying upon any representation not specified herein.

24. Applicable Law. This Agreement shall be construed under and shall be governed by the laws of the State of California. Any action to interpret or enforce any aspect of this Agreement shall be brought in the California Superior Court of Fresno County, California. City and District hereby expressly waive any right to remove any action to a county other than Fresno County as permitted pursuant to California Code of Civil Procedure Section 394.

25. Construction of Agreement. This Agreement is the product of negotiation and preparation by and among each party hereto and its attorneys, and the parties agree that this Agreement shall not be deemed to have been prepared or drafted by any one party. Accordingly, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement.

26. Modification of Agreement. No supplement, modification, waiver, or amendment with respect to this Agreement shall be binding unless executed in writing by the party against whom enforcement of such supplement, modification, waiver or amendment is sought.

27. Counterparts. This Agreement may be signed in any number of counterparts by the parties, each of which shall be deemed to be an original, and all of which together shall be deemed one and the same instrument. Facsimile or other electronic signatures shall be binding.

28. Further Acts. The parties shall reasonably cooperate with each and take such further actions as may be necessary, including the execution of all necessary further documents, to carry out the purpose and intent of this Agreement. Each of the parties shall diligently and in good faith proceed to negotiate such other agreements as may be necessary to implement this Agreement.

29. Binding Effect. This Agreement shall be of binding legal effect only when it has been executed by all of the parties. No rights or duties under this Agreement may be assigned or delegated by a party without the express written consent of the other party, which may be withheld in the sole and absolute discretion of such other party. Subject to the foregoing, this Agreement shall be binding upon and inure to the benefit of the successors and assigns of the parties.

30. Notice to Parties. Any notice or other communication given under the terms of this Agreement shall be in writing and shall be given personally, by facsimile or by certified mail, postage prepaid and return receipt requested. Any notice shall be delivered or addressed to the parties at the addresses or facsimile numbers set forth below or at such other address or facsimile numbers as shall be designated by notice in writing in accordance with the terms of this Agreement. The date of receipt of the notice shall be the date of actual personal service or facsimile transmission with written confirmation of successful transmission, or three days after the postmark on certified mail. All notices required under or regarding this Agreement shall be made in writing addressed as follows:

Fresno Irrigation District 2907 S Maple Avenue Fresno, CA 93725 Attn: General Manager Facsimile No.: 559-233-8227	City of Fresno 2600 Fresno Street Fresno, CA, 93721 Attn: Director of Public Utilities Facsimile No.: 559-498-1304

31. Attorneys' Fees. In the event of any action or arbitration between the parties seeking enforcement or interpretation of any of the terms and conditions of this Agreement, the prevailing party in such action shall be awarded, in addition to damages, injunctive or other relief, its reasonable costs and expenses, including, but not limited to, taxable costs and reasonable attorneys' fees.

32. Cumulative Rights; Waiver. No failure by any party to exercise, and no delay in exercising any rights, shall be construed or deemed to be a waiver thereof, nor shall any single or partial exercise by any party preclude any other or future exercise thereof or the exercise of any other right. Any waiver of any provision or of any breach of any provision of this Agreement

must be in writing, and any waiver by a party of any breach of any provision of this Agreement shall not operate as or be construed to be a waiver of any other breach of that provision or of any breach of any other provision of this Agreement.

33. Severability. Subject to the parties' rights under Section 2 of this Agreement, if any provision of this Agreement is determined by a court of competent jurisdiction to be invalid, illegal or unenforceable, such provision shall be automatically reformed so as to be valid, legal and enforceable to the maximum extent permitted and the balance of this Agreement shall remain in full force and effect notwithstanding such invalidity, illegality or unenforceability.

34. No Third Party Beneficiaries. This Agreement does not create, and shall not be construed to create, any rights enforceable by any person, partnership, corporation, joint venture, limited liability company, district or other form of organization or association of any kind that is not a party. Without limiting the generality of the foregoing, landowners, residents, water users and ratepayers of the parties are not intended to be third party beneficiaries of this Agreement.

35. Force Majeure. Notwithstanding any other provision of this Agreement, neither party shall be liable for any failure to perform resulting from any cause outside the reasonable control of that party. For purposes of this Agreement, routine and emergency repairs and maintenance of the District Water System shall be deemed causes outside of the reasonable control of District (including without limitation the annual shut down of the Enterprise Canal for maintenance), provided that District shall use reasonable efforts to schedule routine maintenance so as to avoid interference with deliveries of City's Surface Water.

//

IN WITNESS WHEREOF, the parties have executed this Agreement to be effective as of the date first above written.

"District"

The Fresno Irrigation District, a California irrigation district

By _____
Ryan Jacobsen, President

By _____
Gary R. Serrato, General Manager

ATTEST:

_____
Secretary

"City"

The City of Fresno, a municipal corporation

By: _____
Ashley Swearengin, Mayor

By _____
Bruce Rudd, City Manager

ATTEST:
Yvonne Spence, CMC
City Clerk

By: _____ 1/11/17
Deputy

APPROVED AS TO FORM:
City Attorney, Douglas Sloan

By: _____ 12/22/16
AMANDA FREEMAN, DEPUTY

ATTACHMENTS:

EXHIBITS

Exhibit A – Monthly Water Supply Utilization Report
Exhibit B – City Water Service Area Map
Exhibit C – Fresno General Plan Map
Exhibit D – Out of Season Delivery Cost Methodology
Exhibit E – Rescheduled Water Cost Methodology

EXHIBIT A

EXHIBIT A

CITY OF FRESNO FMFCD BASINS
MONTHLY REPORT (AC.FT.)
2015-2016

FMFCD BASINS IN FRESNO	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR TO DATE
Basin A													
Basin AB													
Basin AC													
Basin AD													
Basin AE													
Basin AF													
Basin AG													
Basin AH													
Basin AJ													
Basin AL													
Basin AO													
Basin AW2													
Basin AZ													
Basin BE													
Basin BF													
Basin BH													
Basin BM													
Basin BO													
Basin BQ													
Basin BU													
Basin BV													
Basin BW													
Basin BZ													
Basin CC													
Basin CL													
Basin CM													
Basin CN													
Basin CO2													
Basin CS													
Basin CW													
Basin CX													
Basin CY													
Basin CZ													
Basin DD													
Basin DH													
Basin EE													
Basin EF													
Basin EG													

CITY OF FRESNO FMFCD BASINS
MONTHLY REPORT (AC.FT.)
2015-2016

FMFCD BASINS IN FRESNO	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR TO DATE
Basin EL													
Basin EM													
Basin FF													
Basin GG													
Basin HH													
Basin II1													
Basin II2													
Basin J													
Basin JJ													
Basin K													
Basin KK													
Basin L													
Basin LL													
Basin MM													
Basin N													
Basin O													
Basin OO													
Basin P													
Basin R													
Basin RR1													
Basin RR2													
Basin RR3													
Basin S													
Basin T													
Basin TT													
Basin U													
Basin UU2													
Basin UU3													
Basin Y													
Basin Z													
Basin ZZ													
Fresno's FMFCD Total													

CITY OF FRESNO RECHARGE
MONTHLY REPORT (AC.FT.)
2015-2016

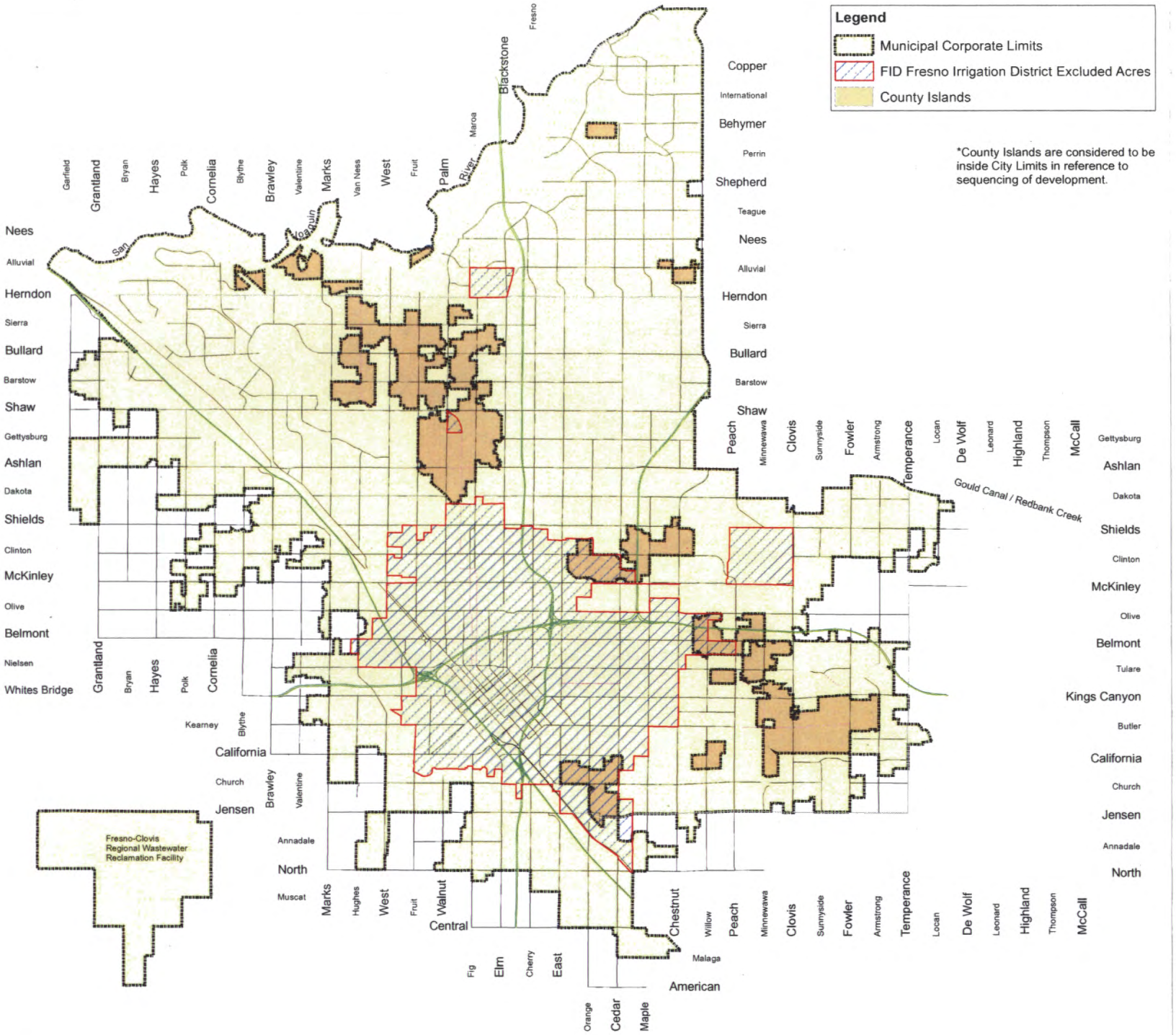
OTHER FRESNO RECHARGE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR TO DATE
Leaky Acres													
Woodward Park													
Copper River Country Club													
Big Dry Detention													
Fancher Basin (South)													
Chestnut Ave. Basin													
North Central Basin													
Kearney Basin													
Big Dry Creek West of Winery Ave.													
Delivery System Recharge Fresno													
Copper River Country Club total is the amount exceeding the Phillips Ditch entitlement of 77 ac ft per month (during FID's irrigation season).													
Basin BF Water comes from Chestnut Ave. Basin													
Fresno's Total Recharge													
Fresno's SWTP N/E & T-3													
Fresno's Total Usage													

EXHIBIT B

City of Fresno
Water Service Area Boundary
Exhibit "B"
December 13, 2016

"The City's Water Service Area consists of Included Acres and Excluded Acres, and on an annual basis City and District shall revised this Exhibit B map to show the total number of acres in each area as of the first day of March of each year."

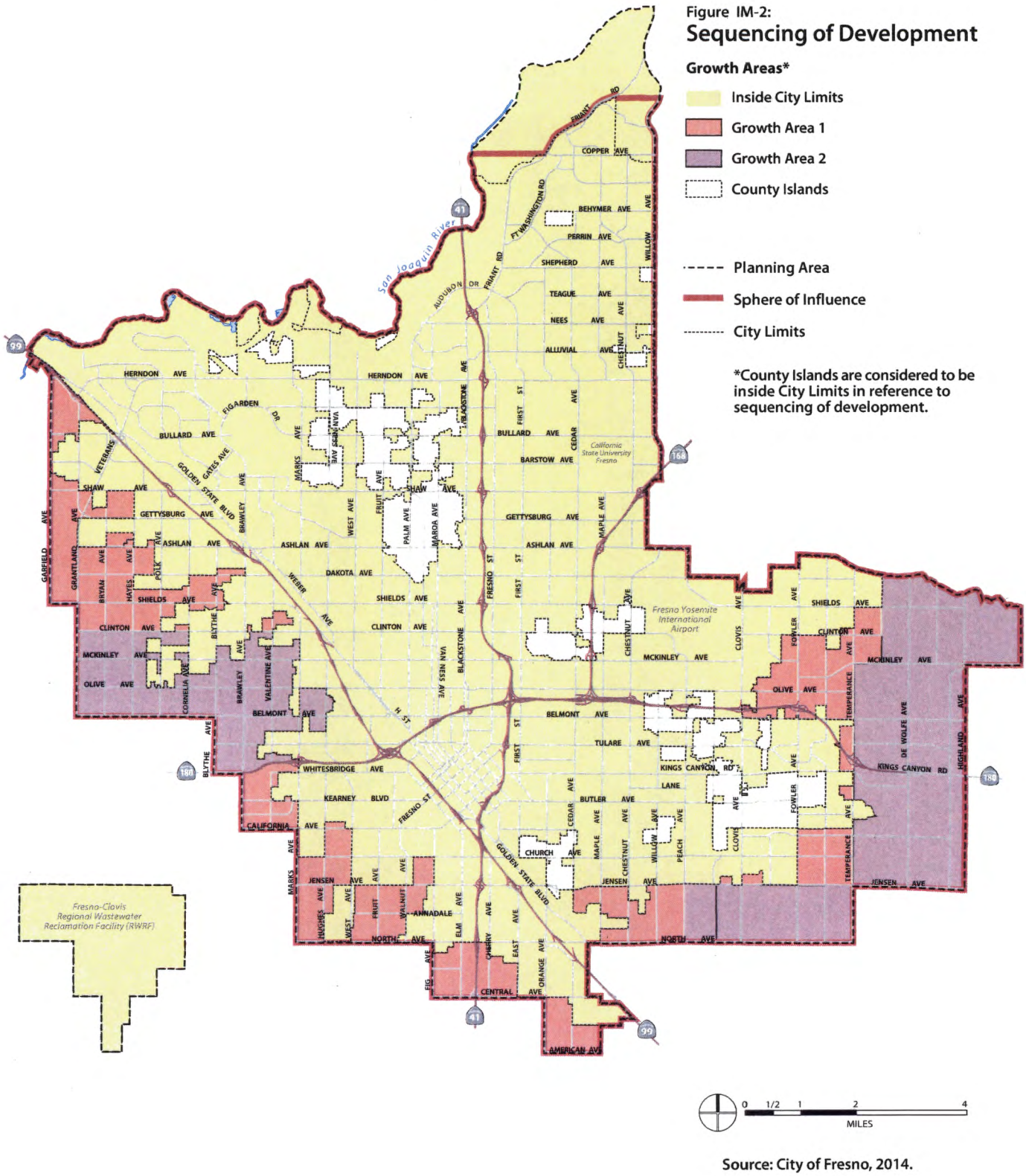
Miles
0 0.5 1 2 3



S:\USERS\PET\2016\Thomas Esqueda\Water Service Areas Map\Water Service Area Boundary Ex B Map.mxd

EXHIBIT C

EXHIBIT C



Source: City of Fresno, 2014.

EXHIBIT D

EXHIBIT D

The City will be responsible for paying the District for all costs associated with delivering water Out of Season Deliveries which will include but not limited to:

i. Staff time to deliver water (includes salary wage, labor burden and overhead.
ii. Cost to operate vehicles to operate and inspect the canal system.
iii. Power costs associated with running District's SCADA/Telemetry system, automated gate valves, flow meters, automated trash screens, etc.
iv. Repairs to the canals system which are caused by water running outside the normal irrigation season. Repairs may include but not limited to canal lining, gate replacement, structure replacement, earthwork (grading, dredging, etc.) weed treatment (aquatic or terrestrial), all-weather road maintenance, trash/debris removal, etc.

EXHIBIT E

EXHIBIT E

The Rescheduling Fee for each rescheduling request here under shall be equal to the last Friant carry over charge assessed for a water year prior to the date to the request.

47087

RECORDED IN OFFICIAL RECORDS OF FRESNO COUNTY, CALIFORNIA
AT 41 MIN. PAST 3 P.M.
JUN 24 1974
H. L. MASINI, County Recorder
FEE $

6316 PAGE 31

AGREEMENT BETWEEN FRESNO IRRIGATION DISTRICT AND CITY OF FRESNO FOR EXCHANGE OF RECYCLED WATER

This agreement entered into this 20th day of June 1974, by and between FRESNO IRRIGATION DISTRICT, a public corporation (herein called "District"), and the CITY OF FRESNO, a municipal corporation (herein called "City");

WITNESSETH:

WHEREAS, Fresno Irrigation District is the owner of water rights on the Kings River and a water distribution system for the distribution of irrigation waters for agricultural use within the District and has entered into contracts with the United States for an additional supply of water from the Friant-Kern Canal and for storage in Pine Flat Reservoir on the Kings River for the purpose of supplementing the water available for such use within the District; and

WHEREAS, the City of Fresno is located entirely within the exterior boundaries of the District and is the owner of a water distribution system used by City for delivering water to persons and lands both within and outside its City limits for municipal, industrial and domestic uses and is also the owner of a liquid waste treatment plant located within the District southwest of the city limits which is used for the treatment, percolation, purification, recycling and other disposition of liquid effluent from the City and intends to enlarge and improve said facilities and to produce by such treatment, percolation, purification and recycling, water which is of a quality suitable for agricultural use; and

WHEREAS, the entire area represented by the District and by the City is a water deficient area and the District is in need of additional waters for agricultural use and the City is in need of additional water for municipal, industrial and domestic uses; and

To be recorded without fee on behalf of Fresno Irrigation District

WHEREAS, the amount of water available to the District for agricultural use may be increased by the use of water recycled by the City as above described and the amount of water available to the City for use in its water distribution system for municipal, industrial and domestic uses may be increased by the exchange of such recycled water for the use by District of additional Kings River and/or Friant-Kern Canal water in that portion of the District northeast of the City; and

WHEREAS, City is desirous of maintaining a water level under its liquid waste treatment plant that will provide for maximum efficiency in the operation of its said plant; and

WHEREAS, a greater beneficial use and more economical utilization of all of the waters available to both the District and to the City can be obtained by the use of such waters as herein provided and both parties believe it is in the best interests of all the landowners and inhabitants within the District and within the City to enter into such an agreement;

NOW, THEREFORE, it is mutually agreed as follows:

1. Approval by United States and State Water Quality Board. Immediately upon the approval of this contract by the parties hereto, it shall be presented to the United States, and also to the California Regional Water Quality Control Board, or its successor agency, for their approval and shall not become effective for any purpose until such approval has been obtained.

This contract shall be at all times subject to all of the terms and conditions of the City Bureau Contract, the District Bureau Contracts and the District Kings River Intra-Association Agreements and to the extent that any agreement contained herein is contrary to or inconsistent with any term or condition of those contracts or agreements, this contract shall be unenforceable. In the event the performance of any agreement contained herein shall become unenforceable or shall be in violation of any Federal,

State or local statute or ordinance or of any decision of any court of competent jurisdiction, the entire contract may be terminated by either party upon written notice mailed to the other party.

2. Definitions. For purposes of this agreement the following words and phrases shall be defined as follows:

(a) "Agricultural use" means the use of water primarily in the production of agricultural crops, including the irrigation of lands and underground water replenishment.

(b) "Recycled water" means water which has been treated and percolated into the underground water supply under the City's liquid waste treatment plant in the southwest portion of the District which is thereafter pumped from said underground water supply.

(c) "City Bureau Contract" means that certain contract between the United States and the City of Fresno providing for water service dated January 12, 1961.

(d) "District Bureau Contracts" means those certain contracts between the United States and Fresno Irrigation District more particularly described as follows:

Contract between the United States of America and Fresno Irrigation District Providing for the Payment of the District's Share of the Cost of Pine Flat Dam and Reservoir Allocated to Irrigation, dated December 23, 1963.

Contract for Operation and Maintenance of Irrigation Storage Space of Pine Flat Reservoir dated December 23, 1963.

Kings River Allocation Contract, dated December 23, 1963.

Conveyance and Covenants in Compromise and Settlement of Fresno Slough Claims, dated April 23, 1965.

Contract between the United States and Fresno Irrigation District Providing for Water Service, dated July 20, 1964.

(e) "District Kings River Intra-Association Agreements" means those certain contracts relating to Kings River and storage in Pine Flat Reservoir more particularly described as follows:

Water Right Indenture, dated May 3, 1927.

Administrative Agreement and Monthly Diversion Schedule dated May 3, 1927.

Agreement Supplementing and Amending Water Right Indenture Dated May 3, 1927, and Supplementing and Amending Administrative Agreement Dated May 3, 1927, Relating to Kings River Water Association, and Amended Monthly Diversion Schedule, dated June 1, 1949.

Agreement Admitting Kings River Water District As a Member of Kings River Water Association and Agreement Re: Centerville Bottoms Schedule, dated September 10, 1963.

Agreement Supplementing and Amending Water Right Indenture Dated May 3, 1927, and Administrative Agreement Dated May 3, 1927, Each as Amended and Supplemented June 1, 1949, Relating to Kings River Water Association, dated September 10, 1963.

3. Agreement to Deliver and Accept Recycled Water. During the term of this agreement City agrees to deliver and District agrees to accept from City recycled water pumped by City from the area under its liquid waste treatment plant in amounts and under the terms and conditions hereinafter provided. When so delivered to District said water shall become the property of the District to be used for agricultural purposes and for underground water replenishment in the southwest portion of the District as the District shall see fit.

4. Water Quality. The City shall not deliver to District or discharge into District's canals any such recycled water which is not of a quality suitable for all agricultural use or which shall be deleterious to plant or animal life and all water so delivered shall meet all the quality standards of the California Regional Water Quality Control Board, or its successor agency, for agriculture and irrigation use and any other federal, state or local agency having jurisdiction or control over water quality standards. City agrees at its expense to make such periodical tests to determine the quality of the water discharged into District's canals at the point where said water is so discharged as may be required by any such board or agency or as may be required by the District's manager and to submit the results

of such tests in writing to the District forthwith after such tests are made. City further agrees that any complaint that said recycled water does not meet the above standards, including but not limited to complaints from any such board or agency, the County of Fresno, any mosquito abatement district or any user of such recycled water, must be corrected and resolved to the satisfaction of District before any further discharge of water into said canals shall be made without the express consent of the District.

5. Exhibit A. A map showing the exterior boundaries of the District, the District's canal system, the city limits of the City of Fresno, the location of City's liquid waste treatment plant site, the exact locations at which City may discharge water into the District's canal system, the type and capacity of the discharge facilities by which each such discharge may be made, the location of observation wells as provided in Paragraph 9, and those portions of the District designated by the parties as the "easterly" and "westerly" portions of the District for purposes of this agreement shall be prepared by the District's engineering department and approved in writing upon said map by the authorized representatives of the District and the City. When so approved said maps shall be incorporated herein by reference as Exhibit A and shall become a part hereof. One duplicate so approved shall be kept in the office of the City and one in the office of the District. Said map may be amended in writing upon said map and reapproved in writing as above set forth.

6. Place and Time of Delivery. City will deliver all such water to the District during the District's irrigation season which may at the election of the District be extended to accommodate the recycled water received under this agreement. Said water delivered by the City to the District shall be discharged by the City into the District's Dry Creek Canal No. 77 and/or Houghton-

Canal No. 78 at the locations approved by the District and shown on the map marked Exhibit A and at no other location or locations.

7. Amount to be Delivered. The City shall deliver to the District under this agreement, subject to District's acceptance as provided herein, recycled water pumped by the City, which shall be delivered at a minimum rate of delivery of 100,000 acre feet in each ten-year period of this contract, provided, however, such delivery will not exceed the amount of 30,000 acre feet in any one year except that such maximum may be increased upon agreement between the District's manager and the Director of Public Works of the City. At least 10 days prior to the first day of each calendar month during the term of this agreement City will submit to District in writing a schedule of the daily amount of such water proposed to be delivered to District at each discharge point during that month and the rate of flow indicated in cubic feet per second at which said water will be delivered. Upon receiving said schedule District's manager will approve the amount of such water the District is willing to accept at each said discharge point during each day of that month and thereafter City shall deliver to District the daily amount of such water so approved. Said daily deliveries shall be at a continuous and constant rate of flow during the entire 24 hour period of each said day. In no event shall the discharge into Dry Creek Canal No. 77 in any one month be in excess of one-half of the total amount delivered to District in that month or the discharge into the Houghton Canal No. 78 in any one month be more than two-thirds of the total amount delivered to the District in that month and in no event shall the rate of discharge of water into Dry Creek Canal No. 77 exceed 60 c.f.s. or the rate of discharge into Houghton Canal No. 78 exceed 120 c.f.s. No such discharges shall be made into District's canals until said discharges have been approved

gives immediate notice thereof to the District. In such event City shall use all reasonable effort to immediately restore the delivery of water to the level approved by District's manager as provided in paragraph 7. District's manager may refuse to agree to any such change in schedule or to accept water under such changed schedule if he reasonably determines that such change may result in damage to a District canal or to other property of the District or any other person or will interfere with the operation, alteration, repair or maintenance of the canal into which said discharge is to be made or will interfere with some other operation or function of the District.

9. Ground Water Level. City shall not pump said recycled water from the underground water reservoir in such a manner or to the extent that it will adversely affect the elevation of the water table in the area surrounding its liquid waste treatment plant as determined by the District. Such effect shall not be deemed to be adverse if the ground water level is not lowered below the gradients established by the District as existing on August 1 of the previous year. City agrees to monitor ground water levels in the area from which said recycled water is pumped on a monthly basis by means of observation wells located within an area surrounding its liquid waste treatment plant. The number and location of said wells shall be agreed upon by the City and the District, and when so agreed upon shall be shown on Exhibit A as provided in paragraph 5. Each month at the time City submits its schedule of proposed discharges, City shall supply District with the results of said observations and shall also supply District with a statement of the amounts discharged into District's canals during the previous month. Said schedule and said information shall be given to District upon a standard form approved by District's manager.

10. Construction and Maintenance of Facilities. All

discharge facilities to be used by City in discharging said water into said canals and suitable measuring devices required to measure the amount of water discharged into District's canals shall be constructed by City at its expense according to plans and specifications approved by District and shall thereafter be maintained in good operating and working condition by and at the expense of City. Said discharge facilities shall have a discharge capacity not greater than that shown on said map marked Exhibit A and shall be equipped with positive shut-off controls by which any and all discharges of water into District's canal system may be shut off immediately and at any time. City shall at all times protect said canals and their banks from any damage, injury or erosion at the locations of said facilities into said canals and any such damage or injury at such locations shall be repaired at the expense of City. If City fails to do so District shall be entitled to make said repairs and the expense thereof shall forthwith be reimbursed by City.

11. Use of Water Available to District. In consideration of the agreements of the City herein contained, District agrees that insofar as feasible and practical, it will make available from its Kings River water or from the water received by it under its Bureau Contracts an additional amount of water equivalent to 46% of the water received by it from the City under this agreement for agricultural use and for ground water replenishment in the easterly portion of the District as indicated on Exhibit A. The term "additional amount of water" as above used shall mean water in addition to the amount of water which would have been made available for use in that area if said recycled water had not been received by the District and used in the westerly portion of the District as indicated on Exhibit A. If the District shall determine that the use of said water in said area is not feasible or practicable it may, after discussion with the City, use such

water elsewhere. If in the future it is deemed desirable to do so, City, with the approval of District, may cause the dividing line between the easterly portion of the District and the westerly portion of the District to be moved to the west and the percentage of water to be made available in said easterly portion of the District to be increased in proportion to the increase in the area of land within said easterly portion.

12. District's Representative. Wherever it is provided in this agreement that District's manager shall do and act or exercise his discretion in respect to any particular matter said act and said exercise of discretion may be performed by any other representative of the District to whom such authority shall be delegated either by the District's Board of Directors or by said manager. In exercising his said discretion, the District's manager or his authorized representative shall weigh and balance the equities of the parties in respect to the interests of each and the necessities of District's operations in relation to those of the City. However, in any such case, his decision shall be final.

13. Ownership of District's Water Rights, Canals and Storage. Nothing contained in this agreement shall in any way affect District's ownership of its canal system or of its water right or its right to storage in Pine Flat Reservoir or give City any right or interest therein.

14. Expense of Performance. The performance of all terms and conditions of this agreement to be performed by City shall be at the expense of City and the performance of all terms of this agreement to be performed by District shall be at the expense of District.

15. Indemnity. City agrees to indemnify District and save District harmless of, from and against any loss, cost, expense, liability or attorney's fees incurred by District as the result of

any claim made by any third party because of the City's pumping from the underground water supply as above described or in any way arising out of the execution or performance of this agreement unless such loss, cost, expense or liability is caused by independent negligence on the part of the District in performing the terms and conditions of this agreement on its part to be performed.

16. Successors and Assigns. This agreement shall be binding upon the successors and assigns of the parties hereto provided that City's right to discharge water into District's canal system is not transferable or assignable and shall not pass to any successor in interest without the consent of District. This agreement is not made for the benefit of any person, firm, corporation or public entity not a party hereto and no person, firm, corporation or public entity except a party hereto or its successor or assign shall have any right to enforce said agreement under California Civil Code §1559 or otherwise.

17. Amendments. Except as otherwise provided herein this agreement may not be amended except by the written agreement of the parties hereto.

18. Term, Termination. The term of this contract shall be twenty years from its date, except that it may be cancelled upon mutual agreement between the parties hereto. The contract shall continue in effect after the end of said term except that it may be terminated thereafter by either party upon one year's written notice of such termination. Notwithstanding the foregoing, this contract may be terminated at any time, upon sixty days' written notice by either party, given on and because of substantial breach by the other party, which breach is not repaired or corrected before the end of said sixty-day period.

IN WITNESS WHEREOF, the parties hereto have executed this

agreement the day and year first above written.

FRESNO IRRIGATION DISTRICT

By Winston Strong
President

By Ardys T. Gorder
Secretary

ATTEST:

Corbin Douglass
City Clerk Deputy

CITY OF FRESNO

By F. W. Hanley
Chief Administrative Officer

State of California)
County of Fresno) ss.

On this 20th day of June in the year one thousand nine hundred and seventy-four, before me, Paul H. Willison a Notary Public in and for said County and State, residing therein, duly commissioned and sworn, personally appeared ..... known to me to be the President and Winston Strong known to me to be the Secretary of the Fresno Irrigation District the corporation that executed the within instrument, and known to me to be the person S who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in said County, the day and year in this Certificate first above written.

Paul H. Willison
Notary Public in and for said County and State

OFFICIAL SEAL
PAUL H. WILLISON
NOTARY PUBLIC - CALIFORNIA
PRINCIPAL OFFICE IN
FRESNO COUNTY
My Commission Expires November 19, 1977

CORPORATION ACKNOWLEDGMENT
Kilner Stationery Co.
1916 Echo

FORM K108

APPROVED AS TO FORM
SPENCER THOMAS, JR., City Attorney

By Assistant Macomber
Senior Deputy

Mail to: City of Fresno Waste Water Treatment Plant
5607 W Jensen Avenue
Fresno, Ca. 93706
Attn: Mr. Joel Dolker

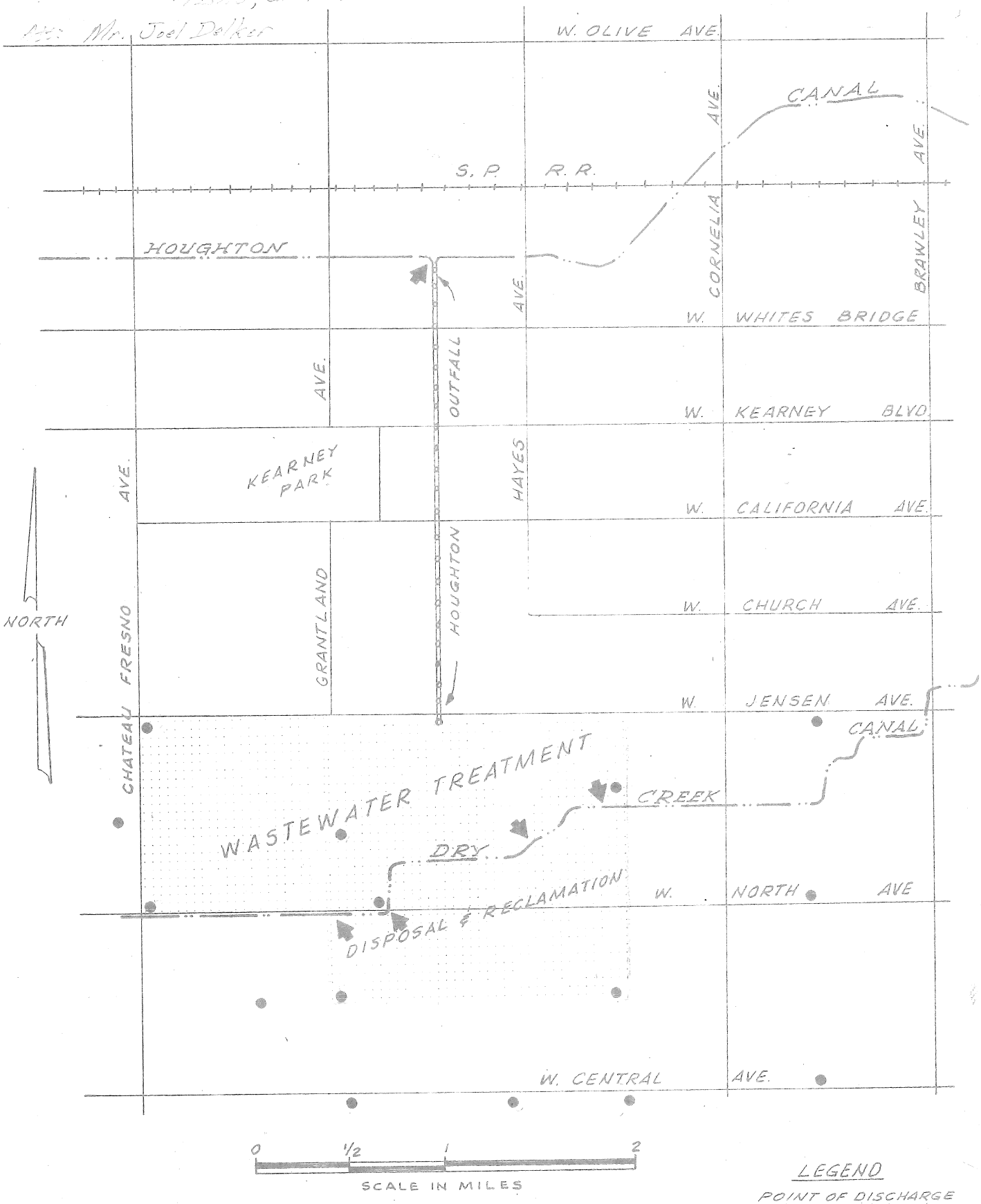


EXHIBIT A-1

J

Water Shortage Contingency Plan

City of FRESNO
Department of Public Utilities

2020 Water Shortage Contingency Plan

Final

JULY 2021 | CITY OF FRESNO

Photo Credit: Downtown Fresno Partnership

WSC

City of FRESNO
Department of Public Utilities

CITY OF FRESNO

Final
2020 Water Shortage Contingency Plan

JULY 2021

Prepared by Water Systems Consulting, Inc.

WSC

ACKNOWLEDGMENTS

The 2020 Water Shortage Contingency Plan was prepared by Water Systems Consulting, Inc. The primary authors are listed below.

Jeff Szytel, PE
Rob Morrow, PE
Lauren Cetin, EIT
Heather Freed, PE

Water Systems Consulting, Inc. would like to acknowledge the significant contributions of the City of Fresno, including the following staff.

Director of Public Utilities Michael Carbajal

Utilities Planning & Engineering Division

Assistant Director Brock Buche, PE, PLS
Supervising Professional Engineer Glenn Knapp, PE
Professional Engineer Peter Maraccini, PE

Water Division

Assistant Director Bud Tickel
Water System Manager Chris Carroll
Water System Manager Russell Guilliams
Business Manager Henry McLaughlin
Water Conservation Supervisor Conrad Braganza

Wastewater Division

Wastewater Manager Rosa Staggs
Operations Supervisor Cory Asher
Reclamation Coordinator Setrag Cherchian

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS & ABBREVIATIONS

AMI	advanced metering infrastructure
City	City of Fresno
CWC	California Water Code
DPU	Department of Public Utilities
DRA	Drought Risk Assessment
DWR	Department of Water Resources
FID	Fresno Irrigation District
FMC	Fresno Municipal Code
SWTF	Surface Water Treatment Facility
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water Storage Investment Program

1.1 Introduction

The Water Shortage Contingency Plan (WSCP) is a detailed plan on how the City of Fresno (City) intends to respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support typical demand at any given time. The WSCP is used to provide guidance to the City's governing body and staff and the public by identifying response actions to allow for responsible 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 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

This WSCP was prepared in conjunction with the City's 2020 Urban Water Management Plan (UWMP) and is a standalone document that can be modified as needed. This document is compliant with the California Water Code (CWC) Section 10632 and incorporated guidance from the State of California Department of Water Resources (DWR) UWMP Guidebook.

Water purveyor planning for possible water supply shortages has become an increasingly important subject considering the drought conditions over the last several years. The City adopted its first WSCP in 1994 in response to the 1991 Assembly Bill 11X, which mandated all water purveyors with more than 3,000 connections develop a WSCP. The WSCP was revised as part of the 2005 UWMP and adopted by the City in 2008. The WSCP was further refined in 2016 during preparation of the 2015 UWMP and is being updated in 2021 as a standalone document, developed in parallel with the 2020 UWMP. The 2020 WSCP is still based on the original 1994 plan. The revisions are intended to meet new CWC requirements and streamline the plan's usefulness and enable the City to manage the necessary conservation measures to be enacted if a water shortage condition exists. The 2020 WSCP will be reviewed and adopted in conjunction with the 2020 UWMP.

The plan is intended to provide guidance, rather than absolute direction, for City action in response to water shortages and provide the City with options to responsibly manage water shortages.

1.2 Water Supply Reliability Analysis

This section is consistent with CWC Section 10632(a)(1) and describes the key findings of the water supply reliability analysis conducted pursuant to CWC Section 10635, which is presented in **Chapter 7** of the City's 2020 UWMP. As part of the 2020 UWMP, water suppliers must perform long-term (2025-2045) water service reliability assessment to evaluate reliability under normal, single dry year, and five-year consecutive dry year periods and a short-term (2021-2025) Drought Risk Assessment (DRA) to evaluate reliability under a five-year consecutive dry year period. Water supply reliability reflects the City's ability to meet the water needs of its customers with water supplies under varying conditions. The analysis considers plausible hydrological and regulatory variability, infrastructure capacity, climate conditions, and other factors that affect the City's water supply and demand.

The City's current water supply portfolio includes groundwater from the Kings Subbasin, surface water from the Central Valley Project Friant Division through a contract with the United States Bureau of Reclamation (USBR), and surface water from the Kings River through a contract with Fresno Irrigation District (FID), as well as recycled water produced at the Fresno-Clovis Regional Water Reclamation Facility and North Fresno Water Reclamation Facility. The City manages the surface water supplies and groundwater conjunctively such that surface water supplies are used more heavily for direct use and recharge during wet periods and groundwater is used more heavily during dry periods. Over the long term, the City aims to maximize recharge to store water for future use and help groundwater levels recover. Key issues that may create a shortage conditions include reduced surface water availability due to dry hydrologic conditions, reduction in groundwater due to contamination issues, or emergency conditions that reduce the City's water supply.

The water supply reliability analysis concluded that the City's supply portfolio is highly reliable and allows the City flexibility to use a majority of surface water when available in normal years and switch to a majority of groundwater in dry years, when surface water supplies are reduced.

The City is projected to meet potable demands with its existing supplies in all year types through conjunctive use of its groundwater and the City is projected to recharge water in most years to help store water for dry years.

1.3 Annual Water Supply and Demand Assessment

As established by CWC Section 10632.1, urban water suppliers must conduct an Annual Water Supply and Demand Assessment (Annual Assessment) and submit an Annual Water Shortage Assessment Report to DWR, with the first deadline July 1, 2022[1]. The Annual Assessment is an evaluation of the short-term outlook for supplies and demands for the current year and one projected single dry year conditions to determine whether the potential for a supply shortage exists and whether there is a need to trigger a WSCP shortage stage, appropriate response actions, compliance and enforcement actions, and communication protocols.

1.3.1 Key Data Inputs

Key data inputs and their sources for the Annual Assessments are summarized in **Table 1,** and described below**.**

Table 1. Key Data Inputs for the Annual Assessment

KEY DATA INPUT	DESCRIPTION	SOURCE
Customer demands	Estimates current year unconstrained demand plus a modest growth factor	Customer billing data, 2020 UWMP projections, input from City staff
Recharge demands	Estimates current year recharge demand	Surface water allocations, historical recharge, groundwater levels
State mandates	Reflects State orders and mandatory compliance with water use efficiency standards	Executive orders from the governor, orders and policies from the State Water Resources Control Board, input from City staff, or other sources
Surface water allocation	Reflects the City's available surface water supplies for treatment, recharge, and potential exchanges and transfers	Initial allocations from USBR and FID, typically available in April
Groundwater conditions	Reflects status of groundwater conditions	Production data, static water levels, and input from City staff
Infrastructure capacity	Reflects production and distribution capacity due to a variety of factors, including human-caused or natural catastrophic events	Production data, well production capacity, wells impacted by contamination, surface water treatment facilities' capacity, distribution system constraints, input from City staff

[1] For USBR contractors, the assessment is due by July 1 or within 14 days of receiving final USBR water allocation, whichever is later.

1.3.1.1 Customer Demands

Upcoming year customer demands will be estimated based on the previous year's demand, with increases to address: (1) near-term projected growth of customers; (2) unconstrained water use if the previous year included any water use restrictions; and (3) potential water losses not accounted for in the previous year's demand.

1.3.1.2 Recharge Demands

Upcoming year recharge demands will be estimated by (1) availability of surface water not used at the surface water treatment facilities (SWTFs) and (2) projected availability of recharge basins.

1.3.1.3 State Mandates

The City has historically been required by the State to reduce demand regardless of supply reliability at the given time. As described previously, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the governor's drought declarations in the 2012–2016 drought with subsequent Executive Order B-37-16 and related legislation for Making Conservation a California Way of Life. The City may consider State mandates and mandatory compliance with water use efficiency standards in determining water shortage levels.

1.3.1.4 Surface Water

The City has contracts for surface water with USBR and FID. The available surface water is dependent on hydrology, and in dry years less surface water is available to the City. Final allocations from both USBR and FID are known in April of each year, following the rainy season. In April, the City works with FID to develop a delivery schedule of surface water supplies and submits it USBR. The surface water allocation and delivery schedule will determine the City's operation of its SWTFs for the year, recharge operations, and if it will engage in any exchanges or transfers of supplies. In dry years, when less surface water is available, the City will also plan for increased groundwater use to meet its demands.

1.3.1.5 Groundwater Conditions

Groundwater level and production trends will be compiled and considered by the City staff, or with a hydrogeologist, based on the following actions:

- Plot static groundwater levels on hydrographs to determine trends.
- Plot historic and projected production data to determine trends.
- Compare historic and projected groundwater levels against production data for average and dry years.

1.3.1.6 Infrastructure Capacity

Infrastructure capabilities and overall production will be analyzed to determine if a possible power outage or deficiency may occur or continue in the coming year due to a variety of factors, potentially including human-caused or natural catastrophic events. This analysis may include well replacement, evaluation of wells for possible contamination, SWTFs capacities, and other considerations.

1.3.2 Evaluation Criteria

Staff will use the key data inputs to develop and compare supply and demand projections to determine if water shortage actions may be necessary. A preliminary Annual Assessment template is included in **Attachment 1**. Note that supply projections will incorporate infrastructure constraints and an operational buffer factor of 10% will be added to the demand estimate to account for supply and demand projection uncertainties. The estimated amount of supply available versus the estimated demand will be compared with the water shortage condition triggers presented in **Table 2**. Various trigger conditions, which summarize specific evaluation criteria for each shortage level and can be used to determine a water shortage level, are described in the following sections. Triggers are based on current conditions, and the City will evaluate these triggers and modify them as needed.

A shortage emergency may be declared when it is demonstrated that conditions threaten the ability to provide water for public health, safety, and welfare of the community. Furthermore, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the governor's drought declarations in the 2012–2016 drought with subsequent Executive Order B-37-16 and related legislation for "Making Conservation a California Way of Life".

Short-term and long-term supply shortages may be caused by constrained production capacity or natural or human-caused catastrophic emergencies, such as: power outages, winter storms, wildfires, earthquakes, structural failures, contamination, and bomb threats. These types of emergencies may limit the City's immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation, and fire protection. Impacts of such emergencies vary in duration. Thus, consumption reduction measures and prohibitions may differ for short-term and long-term conditions or shortages.

1.3.3 Annual Assessment Procedures

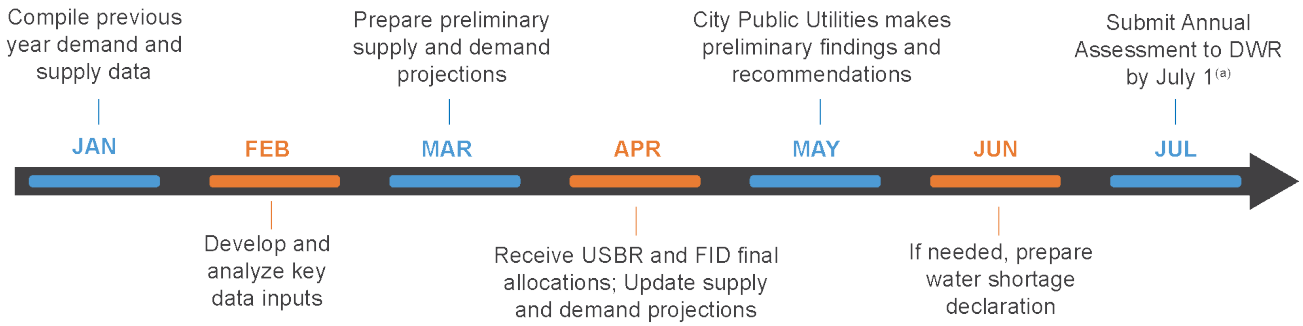
City staff will perform the Annual Assessment following initial allocations from USBR and initial projections for Kings River entitlements by FID, which is typically at the end of rainy season in April. The Annual Assessments are due to DWR by July 1 of each year[2] with the first Annual Assessment Report due to DWR by July 1, 2022. A preliminary annual assessment timeline is shown in **Figure 1.** The City may update the assessment after submission if key data inputs substantially change or other new information becomes available.

[2] For USBR contractors, the assessment is due by July 1 or within 14 days of receiving final USBR water allocation, whichever is later.

Steps to conduct the Annual Assessment are as follows:

1. Staff gathers the key inputs, compiles historical data, and analyzes potential supply and demand gaps.
2. Demand trends, water supply conditions, and production capacity are analyzed.
3. A hydrogeologist may be consulted to provide additional groundwater condition information.
4. City Public Utilities staff will review findings and, if necessary, determine a recommended level of conservation required at the implementation or termination of each stage that will then be brought to the City Manager or Mayor for approval.
5. The City Manager, or designee, will declare and implement the level of conservation required at the implementation or termination of each level, and the declaration shall remain in effect until the City Manager, or designee, so otherwise declares. If a conservation level declaration is made, the declaration shall be published at least once in a newspaper of general circulation.
6. The City will develop and/or implement appropriate communication protocols and applicable response actions.

Figure 1. Annual Assessment Approximate Timeline



[a] For USBR contractors, the assessment is due by July 1 or within 14 days of receiving final USBR water allocation, whichever is later.

1.4 Standard Water Shortage Levels

This section is consistent with CWC Section 10632(a)(2) and describes the City's water shortage levels. New to the 2020 UWMP, water suppliers must now consider six standard water shortage levels. Shortage levels indicate the gap between supply and demand compared to normal-year conditions. DWR standardized six shortage levels to provide a consistent regional and statewide approach to measure water supply shortage conditions. The six shortage levels correspond to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage in supplies compared to demands under normal conditions. However, a water supplier may use its own shortage levels if a crosswalk is included, relating its existing shortage levels to the six standard levels.

The City has elected to keep the previously established four water shortage stages from the 2016 WSCP and add a fifth stage to classify supply shortage greater than 50%. A crosswalk between the City's stages and DWR's standard levels is shown in **Figure 2**.

Figure 2. Water Shortage Stages Crosswalk

City of Fresno Shortage Stage	Percent Shortage Range	Standard WSCP Level	Percent Shortage Level
1	10%	1	10%
2	10 - 25%	2	20%
3	25 - 35%	3	30%
4	35 - 50%	4	40%
5	>50%	5	50%
		6	>50%

Although the water shortage stages are classified by the same percentages as the 2015 UWMP, the City has reevaluated the supply conditions and criteria to enter that stage to better reflect its supply portfolio in comparison to demand. **Table 2** lists the water shortage stages and the conditions that would trigger each stage. Any stage listed within the WSCP may be enacted by the City Manager, or designee, as deemed appropriate based on the water shortage condition.

Table 2. Water Shortage Contingency Plan Levels (DWR 8-1)

SHORTAGE LEVEL	PERCENT SHORTAGE[a]	WATER SHORTAGE CONDITION
0		No water shortage condition. Corresponds with year-round water use measures listed in Section 1.5.1 and demand reduction measures listed for "All" stages in Table 3.
1	0-10%	Stage 1 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **100%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 2 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
2	10-25%	Stage 2 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **90%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 3 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
3	25-35%	Stage 3 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **75%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 4 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
4	35-50%	Stage 4 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **65%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment; or • After having been in a Stage 5 classification from drought conditions, the upcoming water year USBR and FID allocations results in normal-dry water year type[b] or higher; or • After having been in a higher classification as a result of emergency, original trigger for a previous higher-stage classification has been rectified to a point that is consistent with the above conditions for this stage.
5	>50%	Stage 5 may be triggered by any of the following conditions: • The available water supplies for the next year are projected to be less than **50%** of projected demand considering infrastructure constraints and an operational buffer. The available water supplies, infrastructure constraints, projected demand, and operational buffer will be estimated at least once per calendar year – and more often as appropriate - as part of the Annual Water Supply and Demand Assessment. Section 1.3 of the City's Water Shortage Contingency Plan describes the key data inputs, evaluation criteria, and procedures for the annual assessment.

[a] Shortage levels indicate the gap between supply and demand compared to normal-year conditions. The Annual Assessment incorporates a 10% buffer on top of projected demands for conservative planning.

[b] Water year types were defined 2006 San Joaquin River Restoration Settlement Agreement for USBR allocations and characterized in Section 6.2 of the City's 2020 UWMP.

1.5 Shortage Response Actions

The Fresno Municipal Code (FMC) contains sections on water conservation that are to take place under normal water supply conditions. Regulations in place under normal water supply conditions encourage smart water use and help the City manage its water supply. Some of those regulations include year-round outdoor water schedules; turf type restrictions; turf irrigation methods; and prohibition of willful or negligent water wasting, flood irrigating, washing hardscape with potable water, and frequent draining of pools. Additional details of these regulations can be found in FMC Section 6-520(a) (**Attachment 2**). These restrictions are mandated year-round by the City and must be observed. In addition to the normal restrictions on water usage, the City developed shortage response actions to implement during a water shortage on the City level and consumer level in order to reduce demands that are described in **Section 1.5.2** and detailed in **Table 3**.

In the event of a potential water shortage, the City will evaluate the cause of the shortage to help inform which response actions should be implemented. Depending on the nature of the water shortage, the City can elect to implement one or several response actions to mitigate the shortage and reduce gaps between supply and demand. The City has identified actions that fall within the demand reduction, supply augmentation, operational changes, and additional mandatory restrictions, as stated by DWR. It should be noted that all prohibitions listed for Stage 1 will apply to Stage 2 and, likewise, all restrictions that apply to Stage 2 will apply to Stage 3 and so on, until Stage 5 is reached. Also, due to the City's diverse supply portfolio, Stage 1 imposes only voluntary consumer reductions, while Stages 2–5 all include mandatory reduction actions. If necessary, the City may adopt additional actions not listed here in extreme circumstances.

1.5.1 Year-Round Measures

FMC Section 6-520(a) lists actions that are prohibited at all times, whether or not there is a shortage condition and include:

- Use of potable water to irrigate or water outdoor landscaping in a manner that causes runoff.
- Keep, maintain, operate, or use any water connection, hose, faucet, hydrant, pipe, outlet, or plumbing fixture which is not tight and free from leakage.
- Willfully or negligently waste water as defined in FMC Section 6-501.
- Sprinkle or irrigate any yard, ground, premise, or vegetation except as set forth in the City's Outdoor Water Use Schedule.
- Sprinkle or irrigate any yard, ground, premise, or vegetation, unless watering device used is controlled by a shutoff device or a person is in immediate attendance of the hose or watering device.
- Prohibit use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground, or other hard-surfaced areas, except where necessary for public health or safety.
- Use potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.
- Irrigation of ornamental turf on public street medians with potable water, except where the turf serves a community or neighborhood function, there is incidental irrigation by an irrigation system designed to irrigate trees, or the turf is irrigated with recycled water.

- Irrigating outdoor landscapes with potable water during and within 48 hours after measurable rain.
- Serve drinking water other than upon request in eating or drinking establishments, including but not limited to, restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served or purchased.
- Irrigate landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- Automatically changing towels and linens in hotels and motels daily. Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily.
- Drain swimming pools more than once every three years, except as necessary to complete structural repairs or to comply with public health standards, as determined by the County Health Officer.
- Prohibit filling new or refurbished swimming pools without obtaining a pool fill permit from the City.
- Refill (top off) established swimming pools except during times when outdoor water use is allowed at the property address pursuant to the Outdoor Water Use Schedule

The City may update these year-round restrictions in the future as needed. For the latest permanent restrictions refer to FMC Section 6-520(a) (**Attachment 2**) and the latest WSCP Resolution (**Attachment 3**).

1.5.2 Demand Reduction

The City has identified a variety of demand reduction actions to offset supply shortages. Demand reduction measures are strategies intended to decrease water demand to close the gap between supply and demand. Demand reduction actions available to the City that may be considered during water shortage conditions are summarized in **Table 3**. Although it is difficult to estimate the volume of savings for each action, the City expects to meet required reductions through a combination of response actions in conjunction with outreach and communication efforts to the extent necessary to mitigate any impacts from a water shortage.

Table 3. Demand Reduction Actions by City (DWR 8-2)

SHORTAGE LEVEL	DEMAND REDUCTION ACTIONS	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?[a]	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT[b]
All	Expand Public Information Campaign	Not Applicable	Community outreach includes classroom presentations, outreach educational information, and water tours. Increase communication as drought stages increase.	Not Applicable
All	Improve Customer Billing	Not Applicable	Water bills show customer usage vs. average usage for the customer category. Increase customer notifications of high water use based on advanced metering infrastructure data as drought stages increase.	Not Applicable
All	Offer Water Use Surveys	Not Applicable	Use water leak surveys with all community members.	Not Applicable
All	Provide Rebates for Landscape Irrigation Efficiency	Not Applicable	The City offers rebates for micro-irrigation conversions, soil moisture sensors, smart irrigation controller, and rain sensors to improve efficiencies.	Not Applicable
All	Provide Rebates for Turf Replacement	Not Applicable	The City provides rebates for community members who wish to replace their turf with a drought-resistant garden.	Not Applicable
All	Provide Rebates on Plumbing Fixtures and Devices	Not Applicable	The City offers rebates on a variety of high-efficiency plumbing fixtures, such as washers, toilets, and urinals.	Not Applicable
All	Decrease Line Flushing	Not Applicable	The City uses NO-DES for regular pipe flushing to eliminate discharging water.	Not Applicable
All	Reduce System Water Loss	Not Applicable	The City has a comprehensive system water loss reduction program in place. Increase efforts to correct water system losses as drought stages increase.	Not Applicable
1	Decrease Line Flushing	0 to 100% of shortage gap	For dead-end flushing where the NO-DES truck cannot be used, reduce normal flushing time.	Not Applicable
1	Increase Water Waste Patrols	0 to 100% of shortage gap	Increase monitoring of AMI reporting and communication with customers; Conduct patrols based on public input.	Not Applicable
1	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Voluntary limits: Summer: three days/week Winter: one day/week	No
2	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: three days/week Winter: one day/week	Yes
3	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: two days/week Winter: one day/week	Yes
4	Landscape — Limit landscape irrigation to specific times	0 to 100% of shortage gap	Summer: one day/week Winter: one day/week	Yes
4	Other — Prohibit use of potable water for construction and dust control	0 to 100% of shortage gap	Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, and building washdowns where non-potable or recycled water is sufficient.	Yes

SHORTAGE LEVEL	DEMAND REDUCTION ACTIONS	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?[a]	ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT[b]
4	Other — Prohibit vehicle washing except at facilities using recycled or recirculating water	0 to 100% of shortage gap	Prohibit washing cars, boats, trailers, aircraft, or other vehicles, except at commercial or fleet vehicle-washing facilities using water recycling equipment.	Yes
4	Pools and Spas - Require covers for pools and spas	0 to 100% of shortage gap	Require covers for swimming pools when not in use.	No
4	Other	0 to 100% of shortage gap	Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City manager.	Not Applicable
4	Other	0 to 100% of shortage gap	Prohibit use of outdoor misters.	No
5	Landscape — Prohibit all landscape irrigation	0 to 100% of shortage gap	Prohibit outdoor irrigation year-round.	Yes
5	Moratorium or Net Zero Demand Increase on New Connections	0 to 100% of shortage gap	The City will temporarily limit or ban new water service connections within the service area.	Not Applicable

[a] Reduction in the shortage gap is estimated and can vary significantly.
[b] Refer to Section 1.7 for Penalties for Water Wastage.

1.5.3 Supply Augmentation

Given the consistent supply of groundwater through pumping, the City has no immediate plan to augment supply. However, the City could purchase additional USBR or FID surface water, if available. Also, the Cities of Fresno and Clovis have an agreement for interconnection of their potable water systems to provide service during emergencies and other times of hardship in either community. Although these options are discretionary and quantifying their ability to reduce the shortage gap can vary significantly, they are readily available if needed, as indicated in **Table 4**.

Table 4. Supply Augmentation & Other Actions (DWR 8-3R)

SHORTAGE LEVEL	SUPPLY AUGMENTATION METHODS AND OTHER ACTIONS BY WATER SUPPLIER	HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP?	ADDITIONAL EXPLANATION OR REFERENCE
1 to 5	Transfers	As Needed	Purchase or exchange available USBR or FID surface water
1 to 5	Other Purchases	As Needed	Interconnection with City of Clovis for use in emergencies

1.5.4 Operational Changes

Operational changes to address a short-term water shortage may be implemented based on the severity of the reduction goal. The City can maximize its supply by implementing operational strategies and demand reduction measures. As part of the Annual Assessment process, the City will consider their operational procedures at the time of a shortage to identify changes that can be implemented to address water shortage on a short-term basis, including but not limited to:

- Utilization of a SWTF to treat pumped groundwater to offset lack of surface water supply
- Expansion of public information campaign to educate and inform customers of the water shortage emergency and required water savings
- Decrease line flushing to only on a compliant basis strictly using the currently operational NO DES truck
- Use water patrols and increase frequency of meter reading by recruiting staff from other departments if necessary
- Offer water use surveys
- Implementing or modifying drought rate structure or surcharge or water emergency tiered pricing, pursuant to the requirements of Proposition 218 and in accordance with California Law
- Prohibit any new permits for hydrant-construction or temporary construction meters.
- Monitoring construction meters and fire hydrant meters for efficient water use in the event that a meter identified wastes water.

- Moratorium on issuing any new building permit unless the: (a) Project is found by the City Manager, or designee, to be necessary for public health, safety. (b) Project will use recycled water for construction. (c) Project will not result in a net increase in non-recycled water use. (d) Project has adequate Conservation Offsets
- Suspending the consideration of annexation to its service area unless the annexation increases the water supply available more than the anticipated demands of the property to be annexed
- Reducing overhead in the short-term and mid-term by deferring non-critical Capital Improvement Plan projects and major maintenance expenditures, and in the long-term by adjusting operational and staffing levels and retail water rate structures to incorporate the reality of lower retail water sales than previously anticipated.
- Decrease in the level or, if need be, even a total interruption in the expenditures for the agency's facility replacement program. Non-critical replacement projects will have little or no impact on the agency or its customers and would only extend the master planned replacement schedule.

1.5.5 Emergency Response Plan

In addition to responding to drought conditions, the City's WSCP can be used to respond to emergency or catastrophic conditions that impact the availability of the City's water supplies, and/or the ability to deliver water within the City's service area. Potential events are listed below:

- Loss of surface water supply
- Loss of groundwater supply
- Area-wide electrical power failure
- Natural disaster — earthquake or flood

In the event of a supply interruption, there are several measures that could be taken that would mitigate the overall negative impacts of a water shortage. The following discussion indicates possible events and actions to maintain water service to the service area.

The City has an agreement with the City of Clovis that discusses an intertie system between the two cities that could 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 Leonard 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 connection through 2015. However, the Behymer interconnection has yet to be constructed.

The City also cooperates with the County of Fresno's Office of Emergency Services, and the WSCP is included in the County's Disaster Plan. The goal during any emergency scenario is to maintain water supply such that the health and safety of the community is protected.

In the event of contamination of either the surface or ground water supplies, the non-impacted water supply could be used more heavily or the intertie with the City of Clovis could be activated. Additionally, overall demand reduction and the use of other wells or treated surface water would help meet demands.

If a regional power outage were to occur, the City could use backup power generators to operate wells. This measure, in conjunction with demand reduction, could supply sufficient water for health and safety purposes. The City has more than 35 wells with backup power sources. The

City has budgeted for the installation of a backup generator for the Northeast Wastewater Reclamation Facility. The Southeast SWTF and T-3 SWTF are also equipped with backup power generators.

If a natural disaster occurs, in addition to the actions discussed above, the City will isolate any areas of the system that were compromised for emergency repairs and, potentially, use of the intertie with the City of Clovis. Implementing the WSCP could also occur to reduce demands.

For more information on actions during an emergency, refer to the City of Fresno's Risk and Resilience Assessment Report finalized in September 2020 (AARC Consultants, LLC, 2020) and the City of Fresno Emergency Response Plan finalized in March 2020 (AARC Consultants, LLC, 2020).

1.5.6 Seismic Risk Assessment and Mitigation Plan

Refer to Fresno County Multi-Jurisdictional Hazard Mitigation Plan implemented in May 2018, Annex E: City of Fresno attached in **Attachment 4**, for appropriate Seismic Risk Assessment and Mitigation Plan procedures.

1.5.7 Shortage Response Action Effectiveness

The City of Fresno has assessed its overall water reduction by evaluating the water usage trends that were discussed in SBX7-7 in conjunction with the American Water Works Association water loss calculator. See Chapters 5 and 4 of the 2020 UWMP, respectively, for additional information.

The overall decrease of water use per capita and compliance with the 2020 per capita water use target indicate that the reduction measures have been effective in the community. All of the City's customers are metered and the City will use these devices to monitor actual reductions in water use during enacted shortage levels compared to normal year conditions. This data allows the City to determine the effectiveness of the implemented shortage response actions. If reduction goals are not being met, the City Manager, or designee, can make the necessary decisions for corrective action to be taken.

1.6 Communication Protocols

The City's Department of Public Utilities (DPU) currently has a contract with JP Marketing to manage communication and outreach to the customers. The firm's services include strategic planning, creative concepts, public relations, marketing, promotion, research, advertising, media design, copywriting, event creation, and online services. The City also has a public information officer and communications team whose purpose is to communicate water shortage procedures or general utility information effectively and efficiently to the customers.

During normal supply conditions, the Water Division implements informational campaigns to customers that emphasize user-level changes in water use and overall mindfulness of water waste while promoting voluntary conservation. Over the past few years, DPU has increased use of social media to communicate with customers quickly and organically. The City uses Facebook, Twitter, and Instagram to promote water saving tips, notify of shortage conditions, and spotlight DPU employees to foster a sense of community centered around the water supply. The City strives to be proactive in communicating work strategy and conservation efforts with customers.

This WSCP includes a staged plan to communicate the declaration of a shortage stage, inform restrictions, and provide updates during a water shortage emergency. A summary of actions the City could potentially take during a specific shortage stage is outlined in **Table 5**.

Table 5. Communication Protocol During Water Shortage Conditions

SHORTAGE STAGE	ACTION
1	Information posted on the City's website
1	Social media posts (Facebook, Twitter, Instagram, and Nextdoor)
2	Information included in utility bill inserts on a regular basis
2	Promotion of rebates and water conservation services
2	Letters, postcards, and flyers mailed to customers impacted by water use regulations
2	Targeted outreach and technical assistance to highest water users in each use class
2	Engage City councilmembers with resources to share with constituents
3	Increased paid advertising — print, online, radio, TV, streaming, social media, etc.
3	Messaging printed directly on utility bills
3	Press releases to local media (online and print newspapers, TV, radio, etc.)
3	Assembly and promotion of the speaker's bureau for water shortage presentations for neighborhood groups, gardening clubs, homeowners' associations, churches, senior centers, neighborhood associations, business associations, community groups, property management companies, etc.
4	Increased coordination with the local landscaping industry, including water shortage information in their newsletters, publications, and facilities; local wholesale and retail nurseries; and irrigation supply stores
4	Signage posted at nurseries and irrigation supply stores
4	Outreach materials and drought notices mailed to the hospitality industry, including restaurants and lodging

Note: If a water shortage progresses through multiple stages all measures in the previous stage(s) are implemented in addition to current stage actions.

1.7 Compliance and Enforcement

The City has penalties for violation of the water use restrictions in **Table 3**. The City tracks customer usage through advanced metering infrastructure (AMI) in order to enforce water wastage during shortage conditions as detailed in **Section 1.10**. The fines are noted in **Table 6**. Penalties for water waste are based on FMC, Section 6-520(e).

Table 6. Penalties for Water Wastage

INCIDENT MONTH[(a)]	PENALTY AND FINE
1	$0 – Issued a Notice of Water Waste
2	$25
3	$50
4-12	$100
6	If a customer has more than six incident months of water wastage within a one-year period, the City may implement any or all of the following measures: • Require the customer to get a landscape evaluation, lawn water audit, and water budget, as appropriate, in order to learn efficient water use. This work shall be completed at the customer's expense by landscape irrigation auditors certified by the Irrigation Association. • Installation by the City of flow restrictors or termination of water service. • Require a customer to repair any defects in their watering system within 14 days of notice by the City.

Note:
[a] Number of incident months are based on a calendar year.

1.8 Legal Authorities

CWC Section 375 provides the City with the statutory authority to adopt and enforce water conservation restrictions, and CWC Sections 350 et seq. authorize the City to declare a water shortage emergency and impose water conservation measures when it is determined that the City may not be able to satisfy ordinary demands without depleting supplies to an insufficient level.

If necessary, the City will declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. Once having declared a water shortage, the City is provided with broad powers to implement and enforce regulations and restrictions for managing a water shortage. For example, CWC section 375(a) provides the following:

> *"Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity."*

Water Code Section 375(a). CWC Section 375(b) grants the City with the authority to set prices to encourage water conservation.

Under California law, including CWC Chapter 3.3 and Chapter 3.5 of Division 1, Parts 2.55 and 2.6 of Division 6, Division 13, and Article X, Section 2 of the California Constitution, the City is authorized to implement the water shortage actions outlined in this WSCP. Prior to enacting a shortage level, the resolution providing the Council with authority to enact each level of the WSCP will be adopted. Resolutions to enact the WSCP can be adopted at any meeting of the City Council. The resolution providing the City Manager, or designee, with authority to enact each stage of the WSCP is included in **Attachment 6**.

The City shall also coordinate with any city or county within which it provides water supply services, as listed below, for the possible proclamation of a local emergency under California Government Code, California Emergency Services Act (Article 2, Section 8558).

1.9 Financial Consequences of WSCP

This section is in accordance with CWC Section 10632(a)(8) and describes the financial consequences of implementing the WSCP and potential mitigation strategies. The City anticipates reduced revenue while implementing the WSCP because of decreased water use by its customers and additional costs associated with implementing water use restrictions and associated reduction actions. The incurred cost may vary depending on the shortage stage and duration of the water shortage emergency. The cost of compliance may be tracked when a shortage is declared. The City may track the staff time and resources used to implement the WSCP, including reduced revenue, implementation and enforcement of shortage response actions, and communication and outreach efforts. Impacts of implementing the WSCP include:

- Impact of quantity of water sales on revenue
- Increased staff, salaries, and overtime required for implementing and enforcing restrictions
- Increased costs of new supplies, transfers, or other exchanges

In 2015, the mandatory conservation goal for the City was 28%, however the corresponding revenue reductions were less than 28% due to the City having a two-component water rate structure that includes the fixed “water meter service charge” for all service connections and a volumetric-based “water quantity charge.” Therefore, the reduction in revenues was affected by a lesser percentage than the overall total reduction in water use. In general, revenue impacts specified in the WSCP would be offset with a combination of the following:

- An increase in water commodity and service charges
- A reduction in annual operating expenses due to decreased demands
- Reserves currently earmarked for long range capital
- General tax fund revenues currently earmarked for future capital improvements

Methods to mitigate revenue/expenditure impacts are discussed in detail below.

1.9.1 Drought Rate Structures and Surcharges

At present, the City does not have in place a drought rate structure. The City plans to hire a rate consultant to review existing water rates and, if appropriate, develop new future water rates. As an additional task to this effort, the consultant will review, develop, and recommend a drought rate structure for the City’s consideration. With such a rate structure in place, should a water shortage take place, the City will be able to institute an alternate water rate structure that may

apply and change depending on the stage of drought that the community is experiencing. At this time, there are no details as to how the rate structure will be developed, but conceptually each of the five stages specified in the WSCP would have a water rate increase associated with it.

The use of this type of structure during a drought will minimize expenditure impacts that are incurred during a drought. The effects of the decrease in revenue due to the drought, with a corresponding increase in expenditure, will allow for the City to function without going into debt.

1.9.2 Use of Financial Reserves

The City of Fresno Water System maintains two reserve funding sources that can be used to meet a portion of the utility's revenue requirements during emergency or drought conditions. They are as follows:

- **Water Operating Reserves** – This is cash set aside in the Water Enterprise Fund that provides a "rainy day savings account" for unexpected cash flow shortages and large, unexpected expenses or losses. Normally, these reserves are not intended to be used to make up income shortfalls. However, in an emergency situation, they can be transferred to the Water Rate Stabilization Fund (see below) for transfer back to the Water Enterprise Fund to meet revenue requirements, including debt coverage ratios.
- **Water Rate Stabilization Fund** – Indentures from previous bond issuances required the establishment of the Water Rate Stabilization Fund. These funds can be drawn on to meet a portion of the utility's revenue requirements through unexpected low-revenue periods and may be applied to debt coverage ratio calculations to help avoid technical default of bond covenants and loan agreements.

In addition, the City maintains funding in the Emergency Reserve Fund for the purpose of meeting unforeseen emergencies (see Section 1212 of the City's Charter for more information). This funding may be used by an affirmative vote of at least five members of the City Council upon presentation of a statement declaring the reason for use of the funding. This funding would be used only if the Water System reserves were insufficient to meet revenue requirements.

1.9.3 Other Measures

If the funding mentioned above is not sufficient to compensate for loss of revenue during a water shortage, the City may temporarily suspend components of its operations and maintenance activities.

1.10 Monitoring and Reporting

As described in **Section 1.3**, the City will track its supplies and project demands annually as part of the Annual Water Supply and Demand Assessment, and, if conditions described in **Table 2** are projected, the City will enact its WSCP. Monitoring demands is essential to ensure the WSCP response actions are adequately meeting reductions and decreasing the supply/demand gap. This will help to analyze the effectiveness of the WSCP or identify the need to activate additional response actions.

The City currently has AMI technology to monitor customer water usage and uses its AMI system to automatically enforce demand reduction measures and restrictions. The AMI system is currently set up to monitor and enforce outdoor watering restrictions. The program monitors customer meter flows against an "excessive use" flowrate, which will vary based on the WSCP stage. The system flags customer meters exceeding the excessive use flowrate during a

day/time outside of permitted outdoor watering hours as excessive use and an incident of water waste. If a customer has one or more incidents of water waste during a month, the customer shall be issued a Notice of Water Waste and, if applicable, be charged fines and penalties. The City may expand this monitoring program in the future to monitor other uses beyond outdoor watering restrictions.

The City can also use the detailed water usage data to monitor customers' response and demand reduction due to restrictions for each stage in the WSCP. The many restrictions and prohibitions assigned to each stage in **Table 3** are inherently flexible so the City can implement certain the restrictions, monitor customer usage, and implement additional restrictions if the demand reductions are not sufficient to close the supply and demand gap. The City also intends to provide reporting to the State based on forthcoming regulations for monthly reporting of water production and other water uses, along with associated enforcement metrics.

1.11 WSCP Refinement Procedures

The City intends to use this WSCP as an adaptive management plan to respond to foreseeable and unforeseeable water shortages. The 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. To maintain a useful and efficient standard of practice in water shortage conditions, the requirements, criteria, and response actions need to be continually evaluated and improved on to make sure the WSCP provides the tools to maintain reliable supplies and reduce the impacts of supply shortages.

This 2020 WSCP accounts for the latest analysis of the City's robust supply portfolio in relation to demand and adjusted percentage reduction stages to reflect a more appropriate supply shortage that should trigger stages. This is a process that should be reevaluated annually and updated as necessary. Potential changes to the WSCP that would warrant an update include any changes to shortage level triggers, changes to the shortage level structure, and changes to the response actions. Any prospective changes to the WSCP would need to be presented at a public hearing; staff would obtain any comments and adopt the updated WSCP. The steps to formally amend the WSCP are discussed in **Section 1.13**.

Potential refinements will be documented and integrated into the next WSCP update. If new response actions are identified by staff or the public, these could be advertised as voluntary actions until they are formally adopted as mandatory.

1.12 Special Water Feature Distinction

CWC Section 10623 (b) requires that suppliers analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code. As listed in **Table 3 and Section 1.5.1**, there are separate requirements for decorative water features — including decorative fountains, lakes, or ponds — and for pools and spas. The City has separate response actions, enforcement actions, and monitoring programs for both decorative water features and pools and spas. Non-pool or non-spa water features may use or be able to use recycled water, whereas pools and spas must use potable water for health and safety considerations. Limitations to pools and spas may require different considerations compared to non-pool or non-spa water features.

1.13 Plan Adoption, Submittal and Availability

This WSCP update was prepared in tandem with the 2020 UWMP. The City held a public hearing and adopted the 2020 WSCP on July 15, 2021. A copy of the published Notice of Public Hearing is included in **Attachment 5** and a copy of the adopting resolution is included in **Attachment 6**. Before the public hearing, notices were published notifying the public of the date and time of the hearing.

Once the 2020 WSCP has been adopted, a copy will be submitted to DWR, the State Library, and the County of Fresno. Also, a hard copy will be made available for public reference at the City of Fresno Department of Public Utilities office at City Hall (located at 2600 Fresno Street) and the Water Division office (located at 1910 E. University Avenue). Additionally, an electronic copy will be uploaded to the City of Fresno website[1] and made available for public reference.

Based on DWR's review of the WSCP, the City will make any amendments in its adopted WSCP, as required and directed by DWR. If the City revises its WSCP after the UWMP is approved by DWR, then an electronic copy of the revised WSCP will be submitted to DWR within 30 days of its adoption.

[1] www.fresno.gov/Government/DepartmentDirectory/PublicUtilities/Watermanagement/importantdocuments.htm

References

AARC Consultants, LLC. (2020). *City of Fresno Department of Public Utilites Risk and Resilience Assessment for the America's Water Infrastructure Act 2018.* Fresno, California.

AARC Consultants, LLC. (2020). *City of Fresno Water Divsion All Hazards Emergency Response Plan.*

Attachment 1
Preliminary Annual Assessment Template

DWR ASSESSMENT TABLE TEMPLATE - EXAMPLE VALUES FOR 2021 SHOWN

City of Fresno
DWR Annual Water Supply and Demand Assessm
Supply and Demand Estimates

Current Year: <YEAR>
Updated: <DATE>

	Current Year	Following Year	
Demand Use Type	**2021**	**2022**	**Notes**
Single Family	60,666	61,272	1% annual increase from 2020
Multi-Family	19,030	19,221	1% annual increase from 2020
Commercial	17,141	17,312	1% annual increase from 2020
Industrial	5,786	5,844	1% annual increase from 2020
Landscape	9,583	8,680	1% annual increase from 2020; Reduced by increased recycled water use
Other	343	347	1% annual increase from 2020
Losses	9,664	9,760	1% annual increase from 2020
Recycled Water	1,912	2,911	Estimates per 2020 UWMP Table 7-4
M&I Demand Subtotal	**124,125**	**125,347**	
Operational Buffer (10%)	12,410	12,530	To account for supply and demand uncertainties
M&I Demand Total	**136,535**	**137,877**	
Groundwater Recharge	-	-	No recharge assumed due to low surface water supply availability
Total Demand	**136,535**	**137,877**	

Supply	**2021**	**2022**	
Groundwater, Sustainable Yield	73,062	73,644	Sustainable groundwater yield per 2020 UWMP Table 6-1
Groundwater, Allocated from Storage	-	-	Groundwater in storage built up over time from recharge and reduced pumping; Not used since supply is greater than demand
USBR Contract Allocation	17,612	19,025	Current Year: USBR Allocation = 20% plus 5,612 AF of carryover Following Year: Average of "Critical" year per 2020 UWMP Table 6-2
FID Contract Allocation	51,580	61,000	Current Year: FID Kings River Allocation = 26% Following Year: Average of "Critical" year per 2020 UWMP Table 6-3
Recycled Water, RWRF	1,802	2,801	Estimates per 2020 UWMP Table 6-6
Recycled Water, NFWRF	110	110	Estimates per 2020 UWMP Table 6-6
Total Supplies	**144,166**	**156,580**	

Supply vs. Demand	**2021**	**2022**
Supply minus Demand (AF)	**7,631**	**18,703**
Supply divided by Demand (%)	**106%**	**114%**

WATER SHORTAGE STAGE TEMPLATE - EXAMPLE VALUES FOR 2021 SHOWN

City of Fresno
DWR Annual Water Supply and Demand Assessment
Water Shortage Stage Comparison

Current Year: <YEAR>
Updated: <DATE>

2021 Water Supplies (AFY)

Supplies	Maximum Available Supplies	Projected Available Supplies
GW, Sustainable Yield	73,062	73,062
GW, from Storage	*Not Used*	
Surface Water	176,055	69,192
Recycled Water	1,912	1,912
Total	**251,029**	**144,166**

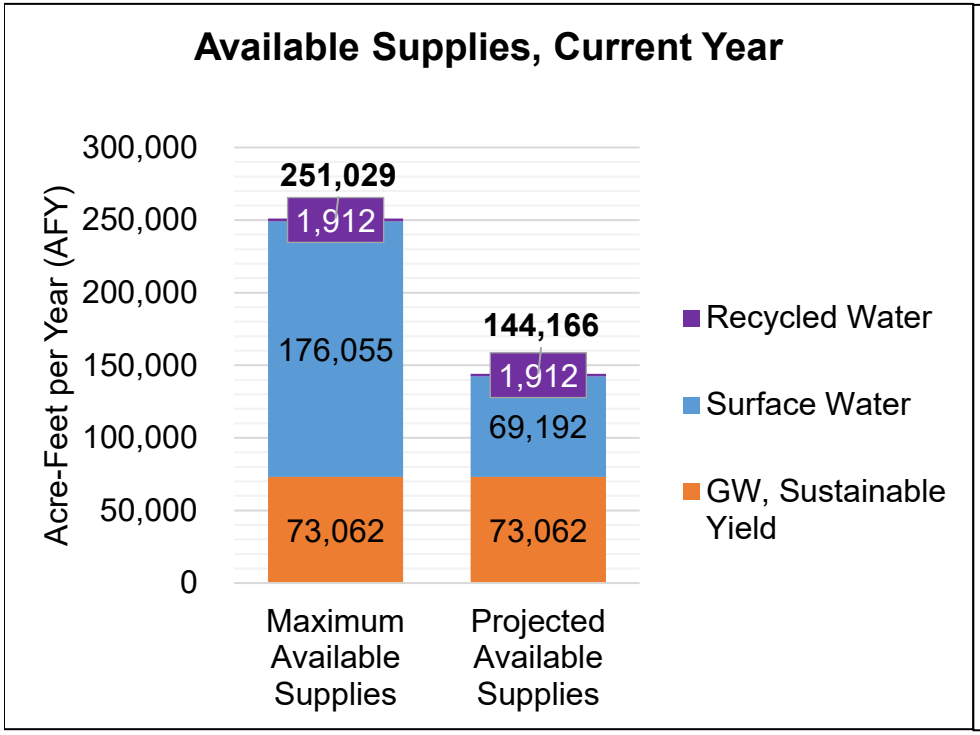
2021 Water Demands (AFY)

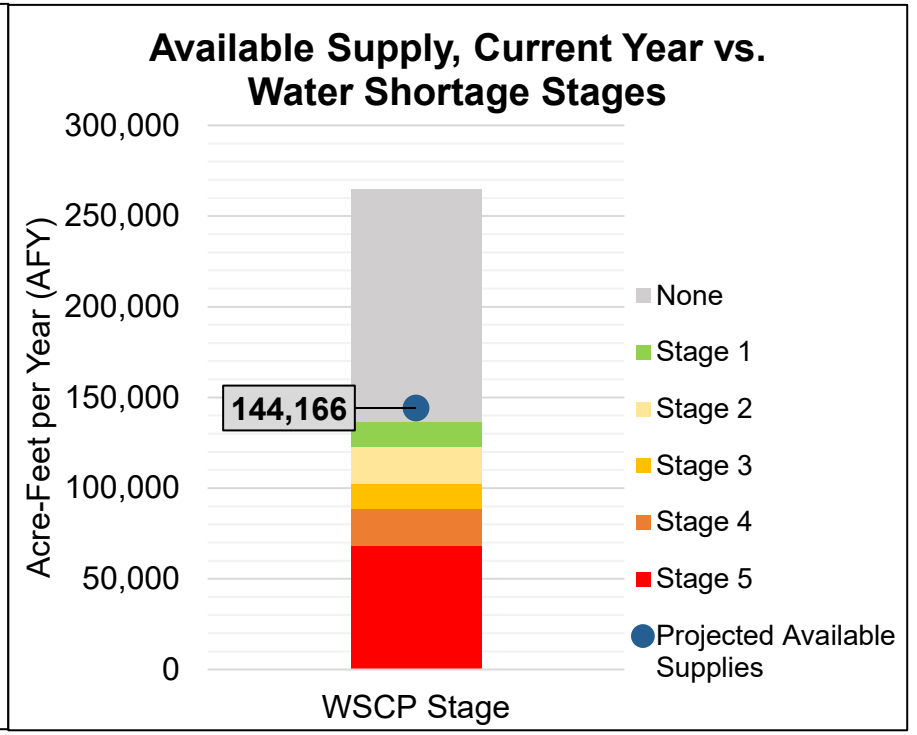
Demand Type	Estimated Demands
M&I	124,125
Buffer	12,410
Retail Subtotal	**136,535**
Recharge	0
Total	**136,535**

Note: Refer to seperate Supply and Demand projections table for assumptions.

Water Shortage Stages

WSCP Stage	Reduction Upper End	Reduction Lower End	(AFY) Upper End	(AFY) Lower End
None				136,500
Stage 1	0%	10%	136,500	122,900
Stage 2	10%	25%	122,900	102,400
Stage 3	25%	35%	102,400	88,700
Stage 4	35%	50%	88,700	68,300
Stage 5		> 50%	68,300	





Attachment 2
City of Fresno Municipal Code Chapter 6-520

SEC. 6-520. - WATER CONSERVATION.

(a) In the use of potable water supplied by the city, no customer shall do or permit any of the following:

(1) Use potable water to irrigate or water outdoor landscaping in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures,

(2) Keep, maintain, operate, or use any water connection, hose, faucet, hydrant, pipe, outlet, or plumbing fixture which is not tight and free from leakage,

(3) Willfully or negligently waste water,

(4) Flood any part of the premises of another,

(5) Sprinkle the premises of another so as to prevent the normal use thereof or unreasonably wet objects thereon which should not be subjected to a spray of water except as naturally caused by the elements or by action of the owner of the object,

(6) Sprinkle or irrigate any yard, ground, premise, or vegetation except as set forth in the City's Outdoor Water Use Schedule,

(i) Annual Exemptions. The following properties may submit an application for a one-year exemption to the Outdoor Water Use Schedule in effect at the time of the application:

a. Properties with multiple addresses, and

b. Properties with turfed or landscaped areas of two acres or larger, and

c. Properties without street addresses.

The owners of such properties shall submit a proposed modified Outdoor Water Use Schedule in writing to the Director or designee for approval or modification. The Director may approve a modified Outdoor Water Use Schedule for with more frequent watering or different watering days than allowed by the Outdoor Water Use Schedule in effect at the time the application for an exemption is submitted for consideration. If the Director determines the proposed exemption will adversely impact system water pressures in the service area, the proposed exemption will be denied. All Annual Exemptions approved by the Director shall automatically expire on December 31 of each year, and the property owners must re-apply for an exemption to the Outdoor Water Use Schedule.

(ii) Short-term Exemptions. The following properties may submit an application for an exemption from the Outdoor Water Use Schedule for a specific time period not to exceed one month.

a. Properties with new lawns not yet established.

b. Properties seeking to use water for a bona fide use, such as solar panel cleaning or other use necessary for health or preservation of property.

The owners of such properties shall submit a proposed modified Outdoor Water Use Schedule in writing to the Director or designee for approval or modification no less than 48 hours before the proposed non-compliant water usage. The Director may approve a modified Outdoor Water Use Schedule that may provide for more frequent outdoor water use or different outdoor water use days than allowed by the Outdoor Water Use Schedule in effect at the time the application for an exemption is submitted for consideration. If the Director determines the proposed exemption will adversely impact system water pressures in the service area, the proposed exemption will be denied. All Short-term Exemptions approved by the Director shall automatically expire on the date set forth on the Short-Term Exemption permit.

(7) Sprinkle or irrigate any yard, ground, premise, or vegetation unless the watering device used is controlled by an shut-off device, or a person is in immediate attendance of the hose or watering device,

(8) Wash any privately owned motor vehicle, trailer, or boat except from a bucket or in a commercial car wash, provided a hose equipped with a shut-off nozzle may be used for a quick rinse without causing water to flow onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures,

(9) Wash or rinse with a hose or watering device any sidewalk, driveway, parking area, tennis court, patio, or any other exterior paved area, except for public health and safety reasons at public gathering places, or

(10) Use potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

(11) Irrigate ornamental turf on public street medians with potable water, except where:

(i) The turf serves a community or neighborhood function, including but not limited to, recreational uses and civic or community events;

(ii) The turf is irrigated incidentally by an irrigation system primarily intended to irrigate trees;

(iii) The turf is irrigated with recycled water.

This prohibition does not include trees and shrubs on public medians, which may be irrigated.

(12) Irrigate outdoor landscapes with potable water during and within 48 hours after measurable rainfall.

(13) Serve drinking water other than upon request in eating or drinking establishments, including but not limited to, restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served or purchased.

(14) Irrigate landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

(15) Automatically change towels and linens in hotels and motels daily. Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.

(16) Drain swimming pools more than once every three years, except as necessary to complete structural repairs or to comply with public health standards, as determined by the County Health Officer. Residents with private swimming pools shall file a written application for a permit with the City of Fresno Water Division at least 48 hours prior to draining the pool. Any customer whose swimming pool is drained by order of the Department of Health for failure to maintain it properly will also be issued a notice of violation of the City of Fresno Municipal Code. The draining of pools for reasons of health and safety hazards as determined by the City of Fresno Water Division and/or the Department of Health is permitted. The application shall include the results of a pool water test conducted by an independent testing organization which shows a cyanuric acid level above 100 parts per million, total dissolved solids over 2,500 parts per million, or calcium over 450 parts per million, or stating the nature and duration of repairs to be made and the date on which the pool will be drained.

(17) Fill newly constructed or refurbished swimming pools without a pool fill permit from the City of Fresno Water Division.

(18) Refill (top off) established swimming pools except during times when outdoor water use is allowed at the property address pursuant to the Outdoor Water Use Schedule.

(b) Notwithstanding the foregoing, drip irrigation of community and residential fruit and vegetable gardens and fruit tr permitted any day of the week; for this subsection, "drip irrigation system" means a non-spray, low-pressure, and lc volume irrigation system in good working order utilizing emission devices with a flow rate of less than four gallons p hour, designed to slowly apply small volumes of water at or near the root zone of plants, when used primarily for ir of fruit and vegetable gardens and fruit trees; should any city water customer be cited for excessive water use, the customer may contact the Water Division and request an exemption from the Outdoor Water Use Schedule for a hc community garden that is irrigated with a drip irrigation system. Upon being contacted, the Water Division will sche visit to the subject property to inspect the garden and the drip irrigation system used to irrigate the garden. The Wa Division shall grant an exemption for home or community garden with the following conditions:

(1) The property must limit water use to an amount equal to, or less than, the average monthly water use for the single-family residential customer class. The monthly average water use for the single-family residential customer class is printed on monthly utility bills issued by the City.

(2) The drip irrigation system must be in good working order with no leaks, line breaks, or other deficiencies that will contribute to water waste. Exemptions shall be withheld until corrective action is taken to address system deficiencies.

(3) The drip irrigation system must be used primarily for the home or community garden, and not for other landscape on the property- Exemptions shall be withheld until the drip irrigation system for the home or community garden can be isolated from other landscape on the property.

(4) No flood irrigation will be allowed with the drip irrigation system, and water must remain on the subject property with no runoff to sidewalks, driveways, pavements, or adjacent properties.

(5) The home and community garden exemption is provided exclusively for drip irrigation systems only, and will not be allowed for other types of irrigation systems.

(6) This exemption shall only apply to properties ¼ acre or smaller. For properties greater than ¼ acre, the property owner may apply to the Director or designee for an exemption.

(c) Lawn sprinkling systems shall be properly designed, installed, maintained, and operated to prevent waste of water.

(d) Repealed.

(e) The provisions of this section are conditions of service.

(1) Each incident of Excessive Use as defined in section 6-501, or use of water inconsistent with the provisions of this section, is an incident of water waste.

(2) If a customer has one or more incidents of water waste during a month, as observed by City staff or as recorded by the City's water meter reading system, the customer shall be issued a Notice of Water Waste and, if applicable, charged a fine as set forth in the Master Fee Schedule. Such fines shall be added to the customer's monthly utility bill and shall be due and payable with that utility bill and subject to the FMC 6-106, Late Payment of Municipal Service Bills.

(3) Incident counts for water waste shall be monitored, recorded, documented and enforced on a monthly basis during the calendar year for individual customers, and the incident counts shall be reset January 1 of each year.

(4) If a customer performs or permits incidents of water waste more than six consecutive months, the water service to the customer may be terminated unless in the opinion of the Director such termination would result in an unreasonable risk to the health and safety of persons. If water service is terminated for

successive incident of water waste, the water service may only be restored upon execution of an agreement with the customer to adhere to the conditions of service described in this section.

(5) If a customer objects to a fine imposed for an incident of water waste pursuant to this section, the following appeal process may be used.

Step 1.

(a) Within thirty days of issuance of the utility bill including the fine, the customer may contact the Water Conservation Program to appeal an incident of water waste resulting in a fine with the staff person who initiated the enforcement measure. The staff person shall gather the facts about the incident.

(b) The customer may provide staff with evidence there was no incident of water waste, or of a bona fide reason for the incident of water waste, including evidence of a water leak, or another reasonable justification for the water use, within ten business days of the customer's first communication with the Water Conservation Program regarding the alleged incident of water waste.

(c) Within ten business days of the initiation of an appeal, staff shall provide the customer with documentation demonstrating the incident of water waste, if applicable.

(d) The staff will provide the facts and evidence related to the appeal to the Water Conservation Program Supervisor, who will determine whether to rescind the enforcement measure. The Water Conservation Program Supervisor will provide a written decision to the customer within fifteen business days of the customer's appeal, or receiving any applicable evidence from the customer, whichever comes later.

Step 2. If the customer is not satisfied with the decision of the Water Conservation Program Supervisor, they may appeal to the Director or designee within ten business days of the date of the Water Conservation Program Supervisor's decision. The Director or designee shall review the appeal and any evidence the customer previously submitted, and provide a written decision within thirty days of receiving the appeal.

Step 3. If the customer is not satisfied with the decision of the Director of Public Utilities, the customer may appeal to the City's Administrative Hearing Officer in the manner provided in Chapter 1, Article 4 of this code. Such decision shall be final.

(Orig. Ord. 4481; Am. Ord. 6486, 1964; Am. Ord. 73-120, § 6, eff. 8-16-73; Am. Ord. 77-99, § 1, eff. 9-23-77; Am. Ord. 78-74, §§ 1, 2, eff. 5-26-78; Am. Ord. 80-115, § 149, eff. 8-8-80; Am. Ord. 89-48, §§ 1, 2, eff. 4-18-89; Am. Ord. 89-77, § 1, eff. 6-7-89; Am. Ord. 89-102, § 1, eff. 9-22-89; Am. Ord. 90-72, § 1, eff. 8-24-90; Am. Ord. 90-97, § 1, eff. 10-12-90; Am. Ord. 91-104, § 1, eff. 10-18-91; Am. Ord. 91-112, § 1, eff. 11-22-91; Am. Ord. 93-14, § 1, eff. 2-23-93; Am. Ord. 93-20, § 2, eff. 4-30-93; Am. Ord. 2015-13, § 1, eff. 5-21-15; Am. Ord. 2015-29, § 1, eff. 8-27-15; Am. Ord. 2017-56, § 3, eff. 11-19-17; Am. Ord. 2018-45, § 1, eff. 8-10-18; Am. Ord. 2019-011, § 3, eff. 5-31-19).

Editor's note— The provisions in subsection 6-520(e) regarding the enforcement program for incidents of water waste are effective January 1, 2018.

Attachment 3
Water Shortage Resolution

RESOLUTION NO. 2019-073

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO AMEND THE WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act requires the City of Fresno (City) to describe its water conservation measures within its Water Shortage Contingency Plan (WSCP);

WHEREAS, the City adopted its current WSCP on June 23, 2016, as part of the City's 2015 Urban Water Management Plan (UWMP);

WHEREAS, the City Council adopted amendments to the WSCP on October 12, 2017;

WHEREAS, in response to water conservation mandates from the State of California and to provide flexibility to its customers, the City has prepared further amendments to the WSCP to update water conservation requirements and watering restrictions in different water conservation stages in the City of Fresno.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Fresno as follows:

1. The City hereby adopts the amended Water Shortage Contingency Plan, as attached in Tables 1-3 of Exhibit A herein.

2. Resolution 2018-253 shall be repealed on the effective date of this Resolution.

* * * * * * * * * * * * * * *

Date Adopted: 4/11/2019
Date Approved: 4/16/2019
Effective Date: 4/16/2019

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, YVONNE SPENCE, MMC CRM, City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 11th day of April, 2019.

AYES : Arias, Bredefeld, Chavez, Esparza, Soria, Caprioglio
NOES : None
ABSENT : None
ABSTAIN : None

Mayor Approval: April 16th, 2019
Mayor Approval/No Return: N/A, 2019
Mayor Veto: N/A, 2019
Council Override Vote: N/A, 2019

YVONNE SPENCE, MMC CRM
City Clerk

By: Yvonne Spence
Deputy

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

By: Amanda Freeman 04/18/19
Amanda B Freeman Date
Senior Deputy City Attorney

Attachment:
Exhibit A – Revised Water Shortage Contingency Plan, Tables 1-3

EXHIBIT A

Revised Water Shortage Contingency Plan

Table 1: Stages of Water Shortage Contingency Plan (WSCP)

Stage	Percent Supply Reduction	Water Supply Condition
1	10%	Stage 1 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the second of two consecutive years, the volume of surface water available to the City through USBR and FID is projected to be less than the long-term average and the reduction in supply, averaged over the consecutive years, is equal to 10% or greater, or • Groundwater contamination conditions exists (DDW required the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 10% loss in water production capacity, or • Localized groundwater cones of depression develop exceeding historic low water levels and, to avoid possible litigation with responsible parties of point source contaminant plumes, the City must shut down existing wells that result in a 10% loss in groundwater production capacity, or • A combination of the above mentioned circumstances or a disaster reduced the City's overall water supply or production capabilities by 10% or more. • After having been in a Stage 2 classification, the following water year results in a declaration by the jurisdictional authority in determining entitlements for the respective surface water supply of normal or above normal water deliveries; or the original trigger for a previous higher stage classification has been rectified to a point that is consistent with the above conditions for this stage.
2	10 - 25%	Stage 2 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the third of three consecutive years, the projected volume of surface water available to the City through USBR or FID is less than the long term average and the reduction in supply, averaged over the three consecutive years equals 10% or greater, or • The volume of surface water available to the City through FID is reduced by 25% of the long-term average, or • The volume of surface water available to the City through USBR is reduced by 25% of the long-term average, or • One-year change in average groundwater level in 30 key City wells exceeds 3 feet or two-year change in average groundwater level in 30 key City wells exceeds 6 feet and exceeds historic low groundwater levels, or • Groundwater contamination condition exists (DDW requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 25% loss in water production capacity, or • A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities

Stage	Percent Supply Reduction	Water Supply Condition
		by 25% or more. • After having been in a Stage 3 classification, the following water year results in a declaration by the jurisdictional authority in determining entitlements for the respective surface water supply of normal or above normal water deliveries on the Friant-Kern system; or the original trigger for a previous higher stage classification has been rectified to a point consistent with the above conditions for this stage.
3	25 to 35%	Stage 3 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the fourth of four consecutive years, the projected volume of surface water available to the City through USBR or FID is less than the long term average and the reduction in supply, averaged over the four consecutive years equals 10% or greater, or • The volume of surface water available to the City through FID is reduced by 35% of the long-term average, or • The volume of surface water available to the City through USBR is reduced by 35% of the long-term average, or • One-year change in average groundwater level in 30 key City wells exceeds 5 feet or two-year change in average groundwater level in 30 key City wells exceeds 10 feet and exceeds historic low groundwater levels, or • Groundwater contamination condition exists (DDW requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 35% loss in water production capacity, or • A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 35% or more. • After having been in a Stage 4 classification, the following water year results in a declaration by the jurisdictional authority in determining entitlements for the respective surface water supply of normal or above normal water deliveries on the Friant-Kern system; or the original trigger for a previous higher stage classification has been rectified to a point that is consistent with the above conditions for this stage.

Stage	Percent Supply Reduction	Water Supply Condition
4	35 - 50%	Stage 4 of the Water Shortage Contingency Plan may be triggered by any of the following conditions: • In the fifth of five consecutive years, the projected volume of surface water available to the City through USBR or FID is less than the long term average and the reduction in supply, averaged over the five consecutive years equals 10% or greater, or • The volume of surface water available to the City through FID is reduced by 50% of the long-term average, or • The volume of surface water available to the City through USBR is reduced by 50% of the long-term average, or • One-year change in average groundwater level in 30 key wells exceeds 7.5 feet or two-year change in average groundwater level in 30 key City wells exceeds 12 feet and exceeds historic low groundwater levels, or • Groundwater contamination condition exists (DDW requires the City to shut down wells) or a large-scale infrastructure failure occurs that results in a 50% loss in water production capacity, or • A combination of the above mentioned circumstances or disaster reduces the City's overall water supply or production capabilities by 50% or more.

Table 2: Restrictions and Prohibitions on End Uses

(#)	Stage	Restrictions and Prohibitions	Additional Explanation or Reference	Penalty, Charge or Other Enforcement
a	1-4	Landscape – Limit landscape irrigation to specific times (Outdoor Water Use Schedule)	See Outdoor Water Use Schedule, Table 2a.	Yes See Table 3
b	1-3	Other	Prohibit car washing except with a bucket only (a hose equipped with a shut off nozzle may be used for a quick rinse)	Yes See Table 3
c	1-4	Other – Prohibit use of potable water for washing hard surfaces	Prohibit use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety	Yes See Table 3
d	1-4	Landscape – Prohibit certain types of landscape irrigation	Prohibit irrigating outdoor landscapes with potable water during and within 48 hours after measurable rainfall	Yes See Table 3
e	1-4	Landscape – Prohibit certain types of landscape irrigation	Sprinkle or irrigate any yard, ground, premise, or vegetation unless the watering device used is controlled by an automatic shut-off device, or a person is in immediate attendance of the hose or watering device	Yes See Table 3
f	1-4	Landscape – Prohibit certain types of landscape irrigation	Prohibit using potable water to irrigate or water outdoor landscaping in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures	Yes See Table 3
g	1-4	Landscape – Prohibit certain types of landscape irrigation	Prohibit irrigation of ornamental turf on public street medians with potable water, except where the turf serves a community or neighborhood function, it's irrigated incidentally by an irrigation systems designed to irrigate trees, or the turf is irrigated with recycled water	Yes See Table 3

h	4	Other	Prohibit car washing	Yes See Table 3
i	1-4	Other – Restaurants may only serve water upon request	No restaurant, hotel, café, cafeteria, or other public place where food is sold is served or offered for sale, shall serve drinking water to any customer unless expressly requested	Yes See Table 3
j	1-4	Landscape – Prohibit certain types of landscape irrigation	Irrigate landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development	Yes See Table 3
k	1-4	Water Features – Restrict water use for decorative water features, such as fountains	Prohibit use of potable water to clean, fill or maintain decorative fountains, lakes, or ponds unless such water is reclaimed	Yes See Table 3
l	4	Other – Prohibit use of potable water for construction and dust control	Prohibit use of potable water for construction, compaction, dust control, street or parking lot sweeping, building wash down where non-potable or recycled water is sufficient	Yes See Table 3
m	1-4	Other – Prohibit automatic linen service in hotels and motels	Prohibit automatically changing towels and linens in hotels and motels daily. Operators of hotels and motels shall provide guests the option of choosing not to have towels and linens laundered daily	Yes See Table 3
n	4	Other	Prohibit use of potable water for sewer system maintenance or fire protection training without prior approval by the City Manager	No
o	4	Other – Customers must repair leaks, breaks, and malfunctions in a timely manner	Prohibit allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break	Yes See Table 3

p	4	Other – Prohibit vehicle washing except at facilities using recycled or recirculating water	Prohibit washings cars, boats, trailers, aircraft, or other vehicles except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment	Yes See Table 3
q	1-4	Swimming Pools – Prohibit draining swimming pools more than once every three years	Prohibit draining swimming pools more than once every three years, except as necessary to complete structural repairs or to comply with public health standards, as determined by the County Health Officer	Yes See Table 3
r	1-4	Swimming Pools – Limit filling new or refurbished pools by requiring a pool fill permit	Prohibit filling new or refurbished swimming pools without obtaining a pool fill permit from the City	Yes See Table 3
s	1-4	Swimming Pools – limit filling (topping off) established pools to times and days permitted by the Outdoor Water Use Schedule	Prohibit filling (topping off) swimming pools during times when outdoor irrigation is allowed according to the Outdoor Water Use Schedule	Yes See Table 3
t	4	Pools and Spas – Require covers for pools and spas	Require covers for swimming pools when not in use	No
u	4	Other	Prohibit Use of Outdoor Misters	No

Table 2a: Outdoor Water Use Schedule

Stage	Summer (April 1 – October 31)	Summer Outdoor Water Use days	Winter (November 1 – March 31)	Winter Outdoor Water Use days	Outdoor Water Use Times
1	3 days/week recommended	Even addresses: Wednesday, Friday, Sunday Odd addresses: Tuesday, Thursday, Saturday	1 day/week recommended	Even addresses: Sunday Odd addresses: Saturday	Outdoor Water Use allowed 12:00 AM – 9:59 AM & 6:00 PM – 11:59 PM Outdoor Water Use is prohibited all days 10:00 AM – 6:00 PM
2	3 days/week	Even addresses: Wednesday, Friday, Sunday Odd addresses: Tuesday, Thursday, Saturday	1 day/week	Even addresses: Sunday Odd addresses: Saturday	
3	2 days/week	Even: Wednesday and Sunday Odd: Tuesday and Saturday	1 day/week	Even addresses: Sunday Odd addresses: Saturday	
4	1 day/week	Even addresses: Sunday Odd addresses: Saturday	No outdoor water use		

Table 3: Penalties for Incidents of Water Waste

Incident Month	Incident Fine	Enforcement Schedule
1	$0	The first month an incident of water waste is recorded during the calendar year, the City shall issue a Notice of Water Waste to the customer for the incident observed by City staff or as recorded directly by the City's water meter reading system.
2	$25	The second month an incident of water waste is recorded is recorded for a customer during the calendar year, the City shall assess a fine of $25 to the customer, and the fine shall be applied to the customer's monthly utility bill.
3	$50	The third month an incident of water waste is recorded for a customer during the calendar year, the City shall assess a fine of $50 to the customer, and the fine shall be applied to the customer's monthly utility bill.
4	$100	The fourth month an incident of water waste is recorded for a customer during the calendar year, the City shall assess a fine of $100 to the customer, and the fine shall be applied to the customer's monthly utility bill.
5 -12	$100	For the fifth month an incident of water waste is recorded during the calendar year, and every month thereafter for the remainder of the calendar year during which an incident of water waste is recorded, the City shall assess a fine of $100 to the customer, and the fine shall be applied to the customer's monthly utility bill.
After 6	N/A	If a customer has more than six consecutive months of documented water waste incidents, the water service to the customer may be restricted or terminated unless in the opinion of the Director such restriction or termination would result in an unreasonable risk to the health and safety of persons. If water service is terminated for excessive violations of the water waste provisions as defined herein, the water service may only be restored upon execution of an agreement with the customer to adhere to the conditions of service described in this section.

April 12, 2019

Council Adoption: 4/11/19
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR LEE BRAND

FROM: YVONNE SPENCE, MMC
City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of 4/11/19, Council adopted the attached Resolution No. 2019-073, entitled **Amending the City of Fresno Water Shortage Contingency Plan.** Item No. 3-B (3), File ID19-1472, by the following vote:

Ayes	:	Arias, Bredefeld, Caprioglio, Chavez, Esparza, Soria
Noes	:	None
Absent	:	None
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before April 22, 2019. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval

****

Thank you.

APPROVED/NO RETURN: _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____
Lee Brand, Mayor

Date: 4-16-19

COUNCIL OVERRIDE ACTION:

Date: _____

Ayes :
Noes :
Absent :
Abstain :

CITY OF FRESNO
CITY CLERK'S OFFICE
2019 APR 17 P 1:57

RECEIVED

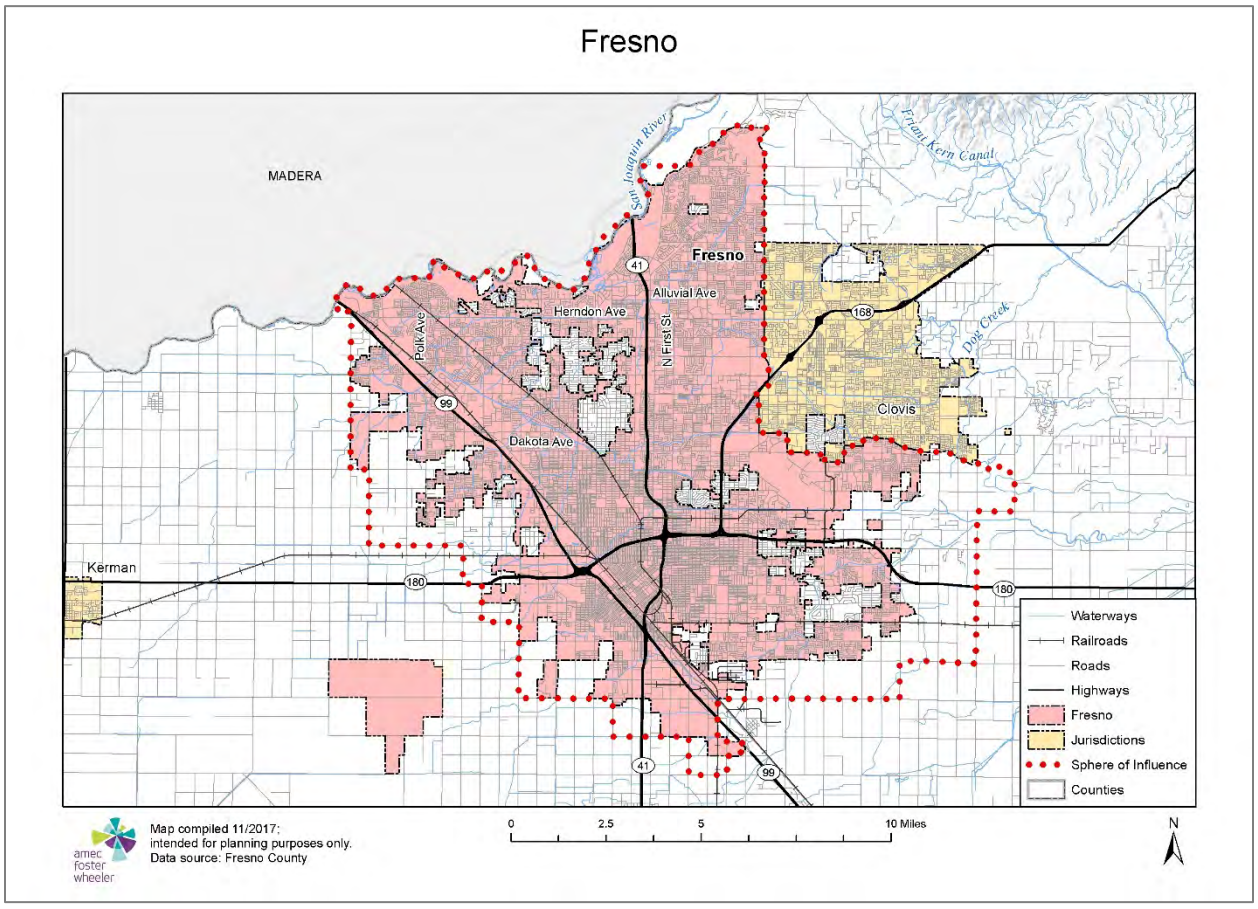
Attachment 4
Fresno County Multi-Jurisdictional Hazard Mitigation Plan, Annex E: City of Fresno

Reference the complete Fresno County Multi-Jurisdictional Hazard Mitigation Plan online:
https://www.fresno.gov/darm/wp-content/uploads/sites/10/2020/12/FresnoCountyHMPFinal.pdf

E.1 Community Profile

Figure E.1 displays a map and the location within Fresno County of the City of Fresno and its Sphere of Influence.

Figure E.1: The City of Fresno



E.1.1 Geography and Climate

The City of Fresno and its Sphere of Influence encompass a 100,400-acre area in central Fresno County. Over the past decade, the City has expanded into the northern, northwestern, and eastern reaches of its Sphere of Influence. Except for the deep channel of the San Joaquin River at the northern boundary of the City, Fresno's topography is generally level and slopes gently to the southwest. The upper San Joaquin River lies at the City's northerly boundary and has carved a deep channel, confining the river between steep bluffs that range from 20 to approximately 100 feet in height.

Fresno has a Mediterranean climate, averaging over 262 sunny days per year and little or no measurable precipitation from June through September. Annual rainfall typically totals 12-14 inches in episodic events lasting up to a few days at most. Fresno's prevailing winds are typically light and from the northwest.

Storms with strong weather disturbances (lightning and very agitated winds) may occur from autumn months through the spring, with the strength of the storm dependent upon temperature gradients between moving weather fronts.

Winter mornings in December and January approach freezing but only rarely reach as low as, or below, 32ºF; winter daytime high temperatures almost always approach or exceed 40ºF. Snowfall is an extremely rare and transient phenomenon; the last recorded snowfall in Fresno was ½ inch on December 20, 1998. The Tule fog, a thick ground fog that settles in the San Joaquin Valley from late fall through early spring, is the leading cause of weather-related accidents in California. In addition to causing visibility issues, "black ice" from precipitated fog may temporarily affect some roadways and bridges during the winter.

Summer daytime peak temperatures are high in Fresno. Some heat waves last over a week with daytime highs well over 100ºF and issuance of health advisories. Summer evenings provide for some cooling of 10-15ºF with the early morning daybreak hours cooling by 20-30ºF, depending on humidity (low humidity allows for more radiant cooling).

Geography and climate combine to create a general accumulation of air pollutants in the San Joaquin Valley (and in the City of Fresno) that occasionally result in unhealthy air quality conditions. Air quality problems are exacerbated by dust storms, human activities (e.g., vehicle emissions and fireplace and wood stove use), atmospheric photochemical processes, and forest fires from local and regional fires. The City has chronically failed to attain some of the national and state ambient air quality standards, but due to the efforts of the California Air Resources Board and the regional San Joaquin Valley Unified Air Pollution Control District, progress toward attainment of ozone (oxidant) and particulate matter standards is being made. Carbon monoxide standards were deemed to have been attained in the 1990s.

E.1.2 History

Development of what today is the City of Fresno began in 1871, when the Central Pacific Railroad chose the Fresno Station for its San Joaquin Valley rail line. The City soon became the County seat and the shipping and distribution hub for the region's agricultural industry. An economic boom across California in the 1880s helped transform Fresno from a village to a city, and helped drive its incorporation in 1885. Today, the City of Fresno is the center of trade, commerce, finance, and transportation for the San Joaquin Valley.

E.1.3 Economy

The most comprehensive economic data available for the City of Fresno comes from the U.S. Census Bureau by way of the American Community Survey (ACS). Select estimates of economic characteristics for the City of Fresno are shown in Table E.1.

Table E.1: City of Fresno's Economic Characteristics, 2015

Characteristic	City of Fresno
Families below Poverty Level	24.4%
All People below Poverty Level	29.8%
Median Family Income	$45,806
Median Household Income	$41,531
Per Capita Income	$19,465
Population in Labor Force	231,332
Population Employed*	198,113
Unemployment	14.3%

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/
*Excludes armed forces

Tables E.2 and E.3 show how the City of Fresno's labor force breaks down by occupation and industry based on 5-year estimates from the 2015 American Community Survey.

Table E.2: City of Fresno's Employment by Occupation, 2015

Occupation	# Employed	% Employed
Management, Business, Science and Arts Occupations	57,374	29.0
Management, Business, and Financial Occupations	*(20,767)*	*(10.5)*
Computer, Engineering, and Science Occupations	*(6,018)*	*(3.0)*
Education, Legal, Community Service, Arts, and Media Occupations	*(20,262)*	*(10.2)*
Healthcare Practitioner and Technical Occupations	*(10,327)*	*(5.2)*
Sales and Office Occupations	49,752	25.1
Service Occupations	41,528	21.0
Production, Transportation, and Material Moving Occupations	26,738	13.5
Natural Resources, Construction, and Maintenance Occupations	22,721	11.5
Total	**198,113**	**100.00**

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/

Table E.3: City of Fresno's Employment by Industry, 2015

Industry	# Employed	% Employed
Educational Services, and Health Care, and Social Assistance	48,557	24.5
Retail Trade	23,337	11.8
Arts, Entertainment, and Recreation, and Accommodation, and Food Services	20,643	10.4
Professional, Scientific, and Management, and Administrative and Waste Management Services	16,742	8.5
Manufacturing	14,869	7.5

Industry	# Employed	% Employed
Public Administration	12,030	6.1
Finance and Insurance, and Real Estate and Rental and Leasing	10,875	5.5
Other Services, Except Public Administration	10,710	5.4
Construction	10,586	5.3
Agriculture, Forestry, Fishing and Hunting, and Mining	10,446	5.3
Transportation and Warehousing, and Utilities	9,476	4.8
Wholesale Trade	7,158	3.6
Information	2,684	1.4
Total	**198,113**	**100.00**

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/

With the depressed real estate and construction market and economic recession toward the end of the 2000-2010 decade, unemployment rates increased to a peak of 18.0 percent in 2010. Since then, the unemployment rate has steadily decreased. The most recent annual data from the State of California Employment Development Department indicates that in 2016 there were 238,400 people in the City of Fresno labor force. Of these, 214,000 were employed; 24,400 were not. The unemployment rate was 10.2 percent.

E.1.4 Population

According to the California Department of Finance, Fresno's population was estimated to be 520,778 in 2016. Select demographic and social characteristics for the City from the U.S. Census Bureau's 2015 American Community Survey 5-year estimates are shown in Table E.4.

Table E.4: City of Fresno's Demographic and Social Characteristics, 2015*

Characteristic	City of Fresno
Gender/Age	
Male	49.2%
Female	50.8%
Median age	30.0
Under 5 years	8.9%
Under 18 years	29.5%
65 years and over	9.9%
Race/Ethnicity**	
White	52.2%
Asian	13.0%
Black or African American	7.9%
American Indian/Alaska Native	1.1%
Hispanic or Latino (of any race)	48.5%
Education	
High school graduate or higher	75.2%
Disability Status	
Population 5 years and over	11.75%

Source: U.S. Census Bureau American Community Survey 2011-2015 5-Year Estimates, www.census.gov/
*Based on a 2015 estimated population of 510,451
**Of the 95.4% reporting one race

For information about how some of these demographics affect social vulnerability and how they compare to other Fresno County jurisdictions, California, and the United States, see "Social Vulnerability" in Section 4.3.1 Fresno County Vulnerability and Assets at Risk of the main plan. A more in-depth look at the population of the City of Fresno, including the City's special needs populations, is available in the City of Fresno General Plan 2015-2023 Housing Element commissioned by the City of Fresno Development and Resource Management Department and prepared by MIG, Inc (available at www.fresno.gov/housingelement).

E.2 Hazard Identification and Summary

The City of Fresno's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Fresno (see Table E.5). In the context of the plan's planning area, there are no hazards unique to Fresno.

Table E.5: City of Fresno—Hazard Summaries

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Agricultural Hazards	Limited	Highly Likely	Critical	Low
Avalanche	N/A	N/A	N/A	N/A
Dam Failure	Significant	Unlikely	Limited	Medium
Drought	Significant	Likely	Critical	High
Earthquake	Extensive	Occasional	Critical	Medium
Flood/Levee Failure	Significant	Occasional	Critical	High
Hazardous Materials Incident	Significant	Likely	Critical	High
Human Health Hazards:				
Epidemic/Pandemic	Extensive	Occasional	Critical	Medium
West Nile Virus	Limited	Highly Likely	Negligible	Low
Landslide	Limited	Unlikely	Negligible	Low
Severe Weather				
Extreme Cold/Freeze	Significant	Occasional	Negligible	Low
Extreme Heat	Extensive	Highly Likely	Limited	Medium
Fog	Extensive	Likely	Limited	Medium
Heavy Rain/Thunderstorm/ Hail/Lightning	Extensive	Highly Likely	Limited	Low
Tornado	Extensive	Occasional	Negligible	Low
Windstorm	Extensive	Likely	Limited	Medium
Winter Storm	Extensive	Highly Likely	Negligible	Low
Soil Hazards:				
Erosion	No Data	Likely	No Data	Low
Expansive Soils	No Data	Occasional	No Data	Low
Land Subsidence	Limited	Occasional	No Data	Low
Volcano	Extensive	Unlikely	Negligible	Low
Wildfire	Extensive	Highly Likely	Critical	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Magnitude/Severity
Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid **Significance** Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact

E.3 Vulnerability Assessment

The intent of this section is to assess the City of Fresno's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area.

The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide, which was distributed to each participating municipality or special district to complete during the original outreach process in 2009. Information collected was analyzed and summarized in order to identify and rank all the hazards that could impact anywhere within the County, as well as to rank the hazards and identify related vulnerabilities unique to each jurisdiction. In addition, the City of Fresno's HMPC team members were asked to validate the matrix that was originally scored in 2009 based on the experience and perspective of each planning team member relative to the City of Fresno.

Each participating jurisdiction was in support of the main hazard summary identified in the base plan (See Table 4.1). However, the hazard summary rankings for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction (See Table E.5). Identifying these differences helps the reader to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Note: The hazard "Significance" reflects overall ranking for each hazard, and is based on the City of Fresno's HMPC member input from the Data Collection Guide and the risk assessment developed during the planning process (see Chapter 4 of the base plan), which included a more detailed qualitative analysis with best available data.

The hazard summaries in Table E.5 reflect the hazards that could potentially affect the City. Those of Medium or High significance for the City of Fresno are identified below. The discussion of vulnerability for each of the following hazards is located in Section E.3.2 Estimating Potential

Losses. Based on this analysis, the priority hazards (High Significance) for mitigation include drought, flood/levee failure, and hazardous materials incidents.

- dam failure
- drought
- earthquake
- epidemic/pandemic
- extreme heat
- flood/levee failure
- fog
- hazardous materials incidents
- wildfire
- windstorm

Other Hazards

Hazards assigned a Significance rating of Low and which do not differ significantly from the County ranking (e.g., Low vs. High) are not addressed further in this plan, and are not assessed individually for specific vulnerabilities in this section. In the City of Fresno, those hazards ranked Low are as follows:

- agricultural hazards*
- human health hazards: West Nile Virus
- landslide
- severe weather: heavy rain/thunderstorm/hail/lightning, tornado
- soil hazards
- volcano
- extreme cold
- winter storm

Note on Agricultural Hazards*: Agricultural hazards are ranked Low in the City of Fresno than for the County overall (ranked High) because very little land in the City is used for agricultural purposes.

Additionally, the City's Committee members decided to rate several hazards as Not Applicable (N/A) to the planning area due to a lack of exposure, vulnerability, and no probability of occurrence. **Avalanche** is considered Not Applicable (N/A) to the City of Fresno.

E.3.1 Assets at Risk

This section considers Fresno's assets at risk, including values at risk; critical facilities and infrastructure; historic, cultural, and natural resources; economic assets; and growth and development trends.

Values at Risk

The following data on property exposure is derived from the Fresno County 2017 Parcel and Assessor data. This data should only be used as a guideline to overall values in the City as the

information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties. It is also important to note that in the event of a disaster it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. Table E.6 shows the 2017 values at risk broken down by property type for the City of Fresno.

Table E.6: 2017 Property Exposure for the City of Fresno by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value
Agricultural	76	53	$2,887,304	$2,887,304	$5,774,608
Commercial	6,110	24,004	$5,471,778,084	$5,471,778,084	$10,943,556,168
Exempt	1,012	3,881	$0	$0	$0
Industrial	2,575	5,630	$1,420,216,900	$2,130,325,350	$3,550,542,250
Multi-Residential	5,793	52,504	$2,416,885,833	$1,208,442,917	$3,625,328,750
Open Space	1	1	$150,882	$150,882	$301,764
Residential	113,468	117,771	$15,122,142,902	$7,561,071,451	$22,683,214,353
Unknown	2	2	$530,082	$530,082	$1,060,164
Total	**129,037**	**203,846**	**$24,434,591,987**	**$16,375,186,070**	**$40,809,778,057**

Source: Fresno County 2017 Parcel and Assessor data

Since the 2009 Plan, the City of Fresno has experienced notable increases in agricultural, commercial, and residential properties and property values at risk. Compared to improved values from the Fresno County Assessor's Office's 2007 Certified Roll Values, agricultural improved value has increased by 254.2 percent, commercial improved value has increased by 299.8 percent and total residential improved value has increased by 265.8 percent. Part of this dramatic increase in exposure of commercial and residential properties can be attributed to annexations of previously unincorporated County land that have occurred within the last decade.

Critical Facilities and Infrastructure

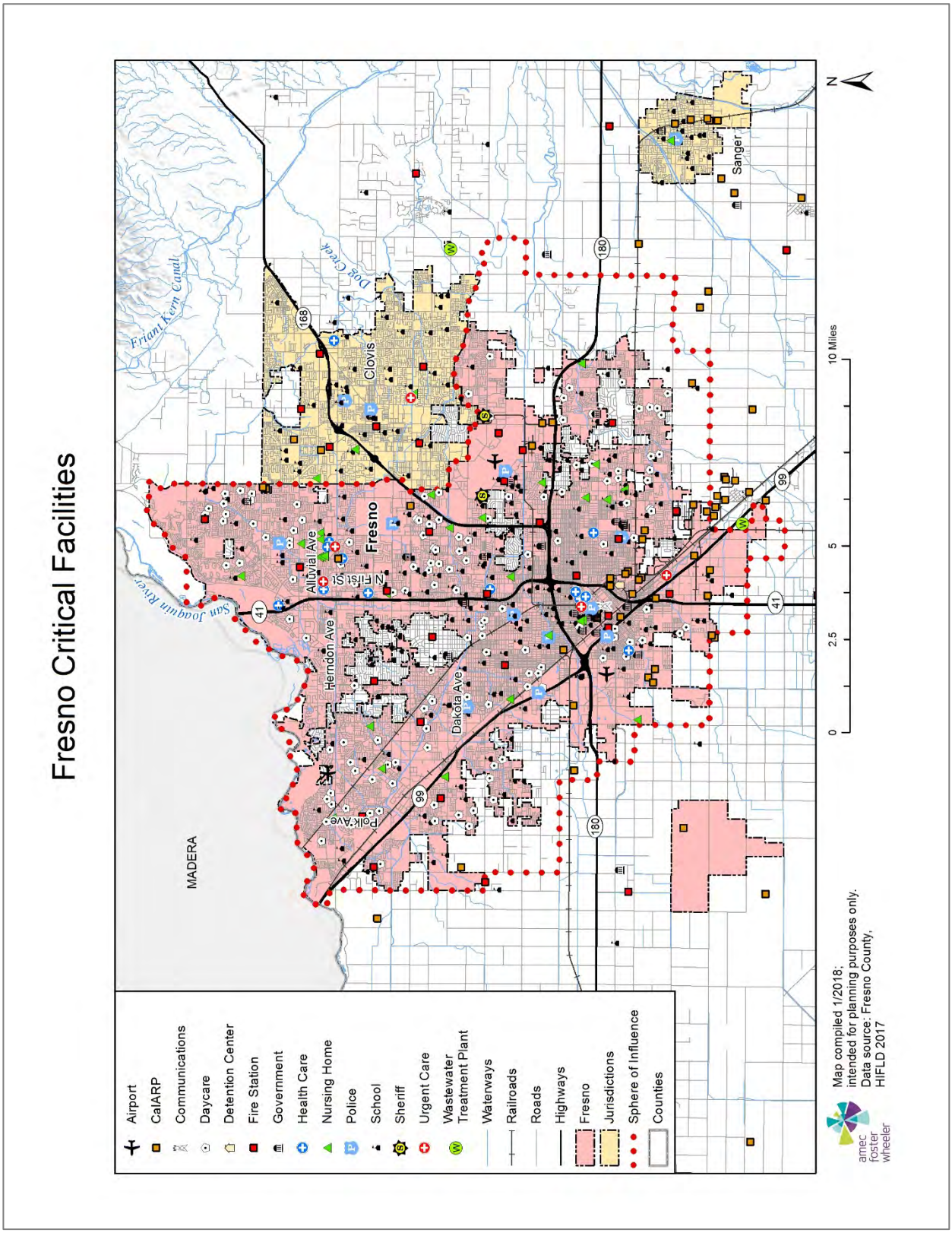
A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. An inventory of critical facilities in the City of Fresno from Fresno County GIS is provided in Table E.7 and mapped in Figure E.2.

Table E.7: City of Fresno's Critical Facilities

Critical Facility Type	Number
Airport	3
Behavioral Health	4
CalARP	28
Colleges & Universities	14
Communications	1
County Government	4
Courthouse	1
Daycare	155
Department of Agriculture	2
Department of Public Health	4
Department of Public Works	1
Department of Social Services	9
Detention Center	4
District Attorney	2
Fire Station	21
General Services	3
Health Care	12
Nursing Home	27
Police	10
School	183
Sheriff	3
Supplemental College	4
Urgent Care	4
Total	**499**

Source: Fresno County, HIFLD 2017

Figure E.2: City of Fresno's Critical Facilities



The list of specific critical facilities and community assets is maintained by the City of Fresno Police Department. The Fresno Urban Area Critical Infrastructure List is considered confidential and may be accessed through the Fresno Police Department Homeland Security Division.

Historic, Cultural, and Natural Resources

Historic and Cultural Sites

The Cultural Resource Facility located on the California State University, Bakersfield campus maintains a database, maps, and descriptive surveys of prehistoric sites in the Fresno area. Details of the locations are kept confidential due to the risk of theft or vandalism of artifacts. The general location of these sites is along the San Joaquin River and its bluffs, where permanent Native American settlements were established near a permanent water supply and seasonal salmon fishery.

The City of Fresno maintains a local official register of historic resources (available from the historic preservation officer in the City's Planning and Development Department). There are approximately 284 properties on the register. Twenty-one of the properties were demolished or destroyed by fire after being placed on the list, and three other properties have been relocated to sites outside the City of Fresno. The local register includes 31 properties that are on the National Register of Historic Places (see Table E.8).

Table E.8: City of Fresno's Properties on the National Register of Historic Places

Property Name	Address	Date Listed
Azteca Theater	836-840 F Street	4/21/2017
Bank of Italy	1015 Fulton Mall	10/29/1982
Brix, H. H., Mansion	2844 Fresno Street	9/15/1983
Einstein House	1600 M Street	1/31/1978
Forestiere Underground Gardens	5021 W. Shaw Avenue	10/28/1977
Fresno Bee Building	1555 Van Ness Avenue	11/1/1982
Fresno Brewing Company Office and Warehouse	100 M Street	1/5/1984
Fresno County Hall of Records	2281 Tulare Street	12/22/2011
Fresno Memorial Auditorium	2425 Fresno Street	5/10/1994
Fresno Republican Printery Building	2130 Kern Street	1/2/1979
Fresno Sanitary Landfill	West and Jensen Avenues	8/7/2001
Holy Trinity Armenian Apostolic Church	2226 Ventura Street	7/31/1986
Hotel Californian	851 Van Ness Avenue	4/21/2004
Kearney, M. Theo, Park and Mansion	7160 Kearney Boulevard	3/13/1975
Kindler, Paul, House	1520 E. Olive Avenue	10/29/1982
Maulbridge Apartments	2344 Tulare Street	5/6/1982
Meux House	1007 R Street	1/13/1975
Old Administration Building, Fresno City College	1101 University Avenue	5/1/1974
Old Fresno Water Tower	2444 Fresno Street	10/14/1971
Pantages, Alexander, Theater	1400 Fulton Street	2/23/1978
Physicians Building	2607 Fresno Street	11/20/1978

Property Name	Address	Date Listed
Rehorn House	1050 S Street	1/8/1982
Romain, Frank, House	2055 San Joaquin Street	1/11/1982
San Joaquin Light & Power Corporation Building	1401 Fulton Street	1/3/2006
Santa Fe Hotel	935 Santa Fe Avenue	3/14/1991
Santa Fe Passenger Depot	2650 Tulare Street	11/7/1976
Southern Pacific Passenger Depot	1033 H Street	3/21/1978
Tower Theatre	1201 N. Wishon Avenue	9/24/1992
Twining Laboratories	2527 Fresno Street	3/26/1991
Warehouse Row	722, 744, and 764 P Street	3/24/1978
YWCA Building	1660 M Street	9/21/1978

Source: National Register of Historic Places, www.nps.gov/nr/

Other historic resources in the City of Fresno include the following historic districts:

- The Porter Tract Historic District (45 homes)
- The Chandler Field/Fresno Municipal Airport Historic District (four historic structures)
- The Wilson Island Historic District (78 homes)
- The Huntington Boulevard Historic Districts (81 homes)

As comprehensive as the City's register may be, it does not include all properties in the City with potential historic or cultural significance. The list is continually being expanded as sites are discovered through routine analysis of proposed development areas and through proposed new listings of historic districts. The pool of potentially historic properties also changes through time, since federal law provides for a 50-year retrospective review, which now encompasses the post-World War II building boom era. Ten properties that were recommended for the City's register but were denied inclusion by the Fresno City Council are still recognized for their historic/cultural significance (heritage properties), which is taken into account when any actions are undertaken on them pursuant to provisions of the California Environmental Quality Act. (Three of these properties have been since been demolished.)

While a detailed assessment of seismic and flood risks for the listed properties in Fresno is currently beyond the available staff resources of the City's Historic Preservation Office, it can be generally assumed that most of the structures have not been seismically reinforced and that their masonry is vulnerable to strong ground shaking.

While many of the structures are in Fresno's old downtown and were built when this area was largely within the 100-year floodplain of the Fresno Stream Group, efforts by the Fresno Metropolitan Flood Control District in conjunction with the U.S. Army Corps of Engineers and the City of Fresno have provided for flood detention structures and ponding basins that have greatly reduced the size and extent of the floodplain in the downtown, helping to preserve these historic resources.

Natural Resource Areas

San Joaquin River Corridor

While the City maintains many community and neighborhood parks, its natural resources are primarily along the San Joaquin River. Owing to the year-round presence of water, the river bottom and bluffs host the richest aquatic and riparian forest biota in the City. It is in this area where migratory waterfowl and federally and state-listed endangered wildlife are most likely be encountered. These species include the valley elderberry longhorn beetle, the giant garter snake, and the American bald eagle (recently recommended for delisting from the National Endangered Species list).

Over past decades, land in the river corridor has been purchased and aggregated by state agencies (Department of Fish and Game, San Joaquin River Conservancy), by nonprofit groups (San Joaquin River Parkway Trust, Fresno Sportsmen's Club), and by the City and County (the City's Woodward Park and Milburn Unit, the County's Lost Lake Park). The ultimate goal of the San Joaquin River Conservancy Plan is to fashion a regional parkway with continuity of wildlife corridors and to manage it for joint recreational, habitat conservation, and floodplain protection uses.

Due to its location, this natural resource area is flood-prone. In some areas, this risk has been increased due to removal of massive amounts of sand and gravel (from mining), which lowered the ground surface over past decades. While the native riparian plants and animals have largely evolved with coping mechanisms for periodic severe flooding, any developed recreation facilities would be at risk. The face of the bluff is also very vulnerable to wildfire because of its vegetative overgrowth and nearly vertical slopes. Fire prevention efforts are difficult here because the soils are too unstable for vegetative removal projects or for irrigation that would keep the plants well-watered.

Vernal Pool Areas

In the northerly parts of the City, outside the river corridor, certain clay soils have the capacity to form impermeable hardpans and layers that do not allow rapid percolation of rainwater. During the rainy season, shallow vernal pools form that are populated by a host of specialized plants and animals. Many species associated with vernal pools are federally and state-listed species (e.g., the California tiger salamander, various types of fairy shrimp crustaceans, orcutt grass, button celery species, meadowfoam, and owl clover). Vernal pools are also heavily utilized by nonlisted species, such as migratory waterfowl, rodents, furbearing predators, and raptors that prey on other animals.

Wildfire is not considered a major risk to these natural communities, because they evolved with dry season fires as a common occurrence (the plants have very resistant seeds and the crustaceans and amphibians go into protected parts of their life cycles such as deep dormancy). Human encroachment through agriculture and land development is the greatest risk to vernal pool areas. If the clay layers are disrupted by "deep ripping" plowing, water cannot accumulate on the surface and the pools will not form. If the land is subjected to year-round irrigation, specially adapted

vernal pool species will be out-competed by other species. Conversion of land to urban development with structures, paving, lawns, pets, and people will destroy vernal pool natural communities.

Economic Assets

The City of Fresno's economic sector includes both private and public entities that have been compiled into clusters in order to identify key economic assets. These ten clusters, known as the Regional Job Initiative (RJI) clusters, are Advanced Manufacturing, Clean Energy, Construction, Food Processing, Healthcare, Info Processing (Call Centers, Logistics, and Distribution), Software Development, Tourism, and Water Technology. Among these clusters are major employers like Saint Agnes, Pelco, Gottschalks, and Ruiz Foods that both boost Fresno's economic growth and provide employment opportunities.

If a disaster struck the City, it could have a severe impact on Fresno's economic assets. Sectors of greatest concern include all the RJI clusters, but in particular Food Processing, which includes the agricultural industry, and Healthcare.

Growth and Development Trends

The City of Fresno is growing at a rapid pace. Its expansion from incorporation in 1885 to the present day (August 2017) is illustrated in Figure E.3. Even more growth is anticipated in the years to come, based on current trends.

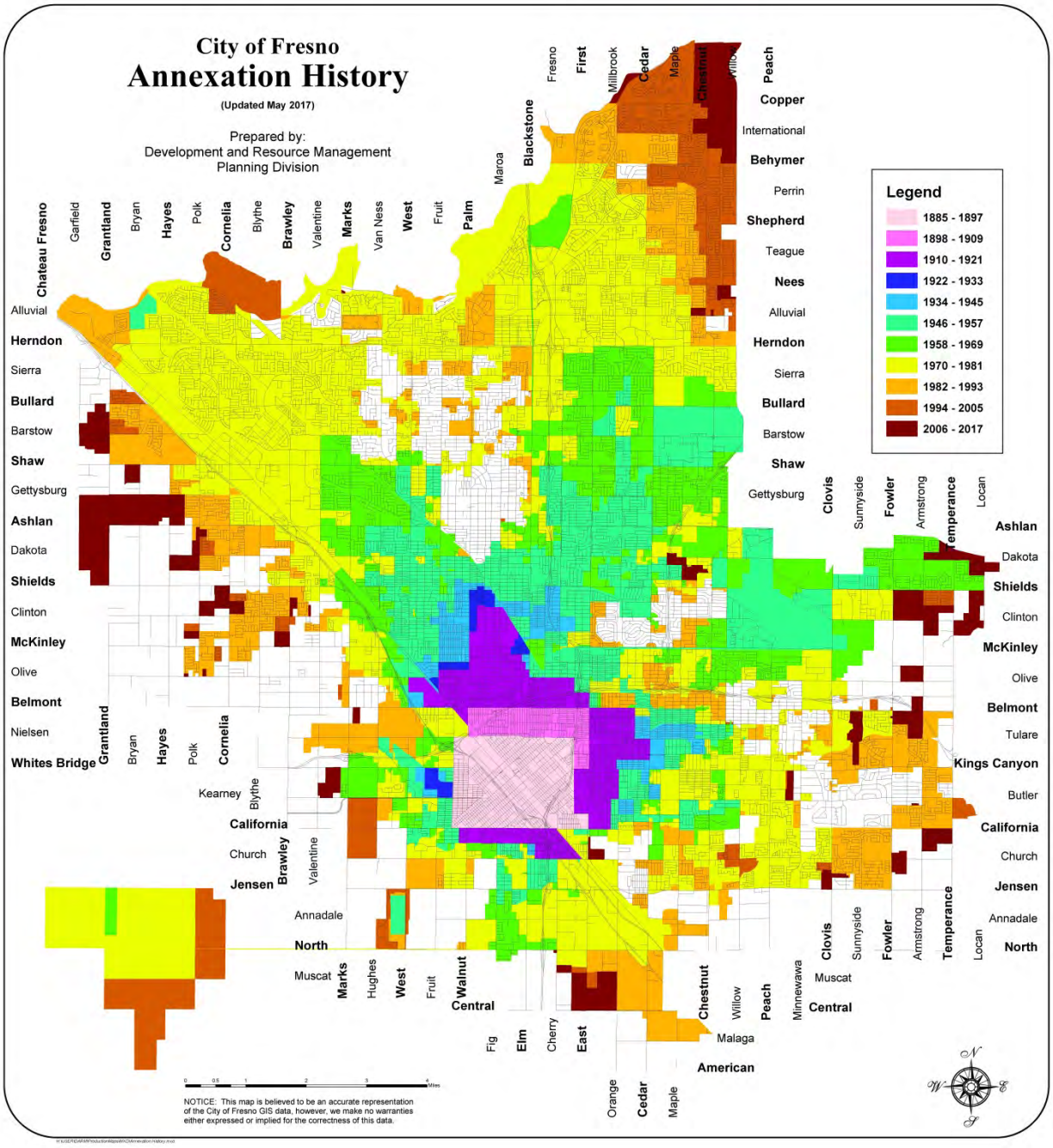
Table E.9 illustrates how the City has grown in terms of population and number of housing units between 2011 and 2017 alone.

Table E.9: City of Fresno's Change in Population and Housing Units, 2011-2017

2011 Population	2017 Population Estimate	Estimated Percent Change 2011-2017	2011 # of Housing Units	2017 Estimated # of Housing Units	Estimated Percent Change 2011-2017
498,664	525,832	+5,49	172,171	178,819	+3.86

Source: California Department of Finance, www.dof.ca.gov/Forecasting

Figure E.3: City of Fresno's Annexation History



Source: City of Fresno Development Department. This map is believed to be an accurate representation of the City of Fresno GIS data, however, we make no warranties either expressed or implied for the correctness of this data.

By December 31, 2035 (the "Horizon" year of the most recent Fresno General Plan), it is estimated that 771,000 people will reside in the Fresno Metropolitan Area (which would include County islands and areas inside the City's Sphere of Influence but not yet annexed). This figure of 771,000 would be 64 percent of the projected 2035 Fresno County population of 1,201,416 (State of California Department of Finance population projections).

As of August of 2017, the City of Fresno comprised 115.3 square miles of annexed (incorporated) land within its 161.8-square mile Sphere of Influence. Development had reached the natural and political northerly boundary of the City, the San Joaquin River, and began expanding to the west and southeast through conversion of rural residential and agricultural land. Within the Sphere of Influence, there continued to be "County islands" and partially urbanized fringe areas. An urban unification annexation program may reduce the numbers and sizes of these enclaves in the coming decade.

The Fresno General Plan made a concerted effort to revitalize the City's downtown by balancing new growth areas to geographically recenter the downtown. With construction of a major sewer trunk along the Grantland Avenue alignment and proposed construction of new wastewater and water treatment plants in the southeastern area, the City's future growth is expected to concentrate primarily to the west and southeast.

The Fresno Metropolitan Flood Control District (FMFCD) has commenced major flood control facility construction on Fancher Creek in the eastern portion of the City's Sphere of Influence. Since the Fresno General Plan was completed in December 2014, the FMFCD will compile technical studies and update its master service plan in conjunction with the City's land use plan for this new growth area.

The Fresno General Plan also directed that new development be more compact and that single-family residential densities be higher than the City's traditional 4± dwelling units/acre pattern for subdivisions. The recently adopted Fulton Corridor Specific Plan and Downtown Neighborhoods Community Plan and other plan amendments and projects in process (and proposed in the future) feature smaller lots, multi-story housing, multi-family units, and reduced setbacks.

Unless the cost of manufactured housing units would provide a substantial savings over site-built homes, it is not expected that the proportion of manufactured housing in the City of Fresno will greatly increase. It is possible that there will be some increase as producers of these units create models with appropriate roof pitches and other features to meet the City's design review standards.

More information about the City of Fresno's growth and current housing stock is available in the City of Fresno General Plan 2015-2023 Housing Element commissioned by the City of Fresno Development and Resource Management Department and prepared by MIG, Inc (available at www.fresno.gov/housingelement). More general information on growth and development in Fresno County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Fresno County Vulnerability and Assets at Risk of the main plan.

E.3.2 Estimating Potential Losses

Note: This section details vulnerability to specific hazards, where quantifiable, and/or where (through HMPC member input) it differs from that of the overall County.

Table E.6 above shows Fresno's exposure to hazards in terms of number and value of structures. Fresno County's parcel and assessor data was used to calculate the improved value of parcels. The most vulnerable structures are those in the floodplain (especially those that have been flooded in the past), unreinforced masonry buildings, and buildings built prior to the introduction of modern day building codes. No further information on vulnerable structures is available. Impacts of past events and vulnerability to specific hazards are further discussed below (see Section 4.1 Hazard Identification for more detailed information about these hazards and their impacts on Fresno County).

Agricultural Hazards

Agricultural hazards are ranked with a Low significance in the City of Fresno; lower than for the County overall (ranked High) because very little land in the City is used for agricultural purposes. Agricultural losses due to hazard events have greater economic impact on the small communities and rural areas of the County than on the City of Fresno. However, ornamental and garden plants in the City, and pets and incidental livestock kept within City limits, may become involved in any countywide responses to crop pests or infectious agents, because these urban plants and animals provide reservoirs for the diseases and crop pests that threaten the County's agriculture.

Dam Failure

The National Inventory of Dams lists five dams located in the City of Fresno, including the Redbank Creek Detention basin, Fancher Creek Detention, Friant Millerton Road Embankment A, Redbank, and Friant Dike 3.

Drought

Annual rainfall in the City of Fresno is typically 12-14 inches. This makes the region vulnerable to episodic drought and to chronic drawdown of aquifer levels (the U.S. Environmental Protection Agency has designated the groundwater below Fresno as a sole source aquifer). Water in this aquifer has historically flowed through permeable strata from north and northeast toward the south and west, but the aquifer has been so affected by drawdown that a "cone of depression" has been created, reversing the historic flow directions (the "groundwater gradient") in portions of west and south Fresno.

In the last 10 years the City of Fresno has made strides to reduce dependence on groundwater by setting a course to implement water plans, which include the Urban Water Management Plan, Recycled Water Waster Plan, and the recently adopted Water Capital Program. A surface water treatment plant is currently under construction in Southeast Fresno and should be completed by 2018. When operational, the plant will maximize use of Fresno's surface water allocations during

normal years and allow the City to reduce overuse of groundwater. Recycled water use will also grow in Fresno with the new recycled water mains now being constructed. The City has plans to use 25,000 acre-feet per year of recycled water for irrigating open spaces, parks, street medians and golf courses.

Earthquake

The seismic hazard in the City of Fresno is low relative to California coastal and mountain communities and is lower than in the Sierra and western areas of Fresno County. There are no known earthquake faults underlying Fresno, and the City has never been the epicenter of a known seismic event. However, Fresno is considered to have a moderate risk of earthquake damage due to the presence of major fault systems to the west, south, and east and due to Fresno's large population and number of buildings, critical facilities, and infrastructure and other development that could be vulnerable to more severe ground shaking.

Historically, Fresno has sustained very little damage from major earthquakes occurring on California's major faults: the Owens Valley earthquake of 1872 toppled an unreinforced masonry (brick) church steeple. More recent major earthquakes in the past four decades (with epicenters near Coalinga and the Bay Area) have resulted in perceptible tall building swaying in Fresno, minor injuries (attributable to shelved items falling), and slight damage (e.g., minor cracked plaster, etc.). To date, no soil liquefaction has been observed in Fresno from any seismic event.

The most serious impacts of an earthquake in Fresno would probably arise from damage to large dams in the Sierra Nevada on the upper reaches of the San Joaquin River very close to active Long Valley Caldera-related faults. Should either of the two most easterly (and largest) dams in this area be severely damaged or breached, the resulting sequential dam failures could cause floodwaters to overtop Friant Dam northeast of the City. While the dam failure inundation map for Friant shows that most of the flooded area would be expected in the northwest part of town (where the confining river bluffs are not as high), there are some residences and important infrastructure in the river channel itself that would be inundated and gravely damaged (or destroyed), including highway bridges and the inlet of the Friant-Kern Canal, which supplies Bureau of Reclamation surface water to the Fresno area and to other communities in the southern San Joaquin Valley.

Epidemic/Pandemic

Fresno's population includes many residents who have limited access to health care, with causes related to low household income levels, lack of insurance coverage, a limited number of primary health care facilities and acute care beds, a low ratio of public health and medical professionals to population, and language barriers. Highly communicable diseases tend to affect a large percentage of the City, perhaps due to large household size and the mobility of the population. If a highly communicable disease outbreak occurred that caused serious or life-threatening illness for most infected persons, health care and other public service systems would experience disruption or breakdown and would require outside intervention with resources from other communities, the state, or the federal government.

Extreme Cold/Freeze

Freeze events occur occasionally in Fresno, but impacts are greater to the agriculture industry in the County than to the City. In January 2007, overnight minimum temperatures fell below freezing between January 6 and 10. The event led to a presidential disaster declaration due to the estimated $710 million in agricultural damage in the Central and South Valley. The 2007 event occurred in another eight-year interval after the devastating citrus freezes of 1998 and 1990. The event caused frozen pipes in Fresno but little other property damage. The City also has a plan for freezing temperature events and opens warming centers. These centers are primarily geared toward the homeless population.

Extreme Heat

Fresno uses a local version of the California State Plan for Extreme Heat. This plan was used during the extreme heat event during the summer of 2006 and worked well. The City operates cooling centers, which are primarily geared toward the homeless. Public notification for extreme heat events is conducted through the Public Affairs office in coordination with Fresno County.

Expansive Soils

These types of soils occur in northern Fresno in the far northeastern portions of its Sphere of Influence (in the "Copper River" area). Expansive clay soils can cause cavitation over time and require special construction standards for foundations.

Flood

As noted in the preceding section, there is some flood risk to the City from San Joaquin River major dam failure inundation, but the more common flood risk, repetitively experienced in Fresno, is that of shallow "sheet" flooding from major precipitation events. Except for the San Joaquin River, streams in the Fresno-Clovis Metropolitan Area originate in the Sierra foothills to the east and extend into the valley floor west of State Route 99 by way of dual-use irrigation and storm runoff channels and disperse into numerous smaller irrigation canals. Overflow from these canals and urban stormwater from intense precipitation events is sent back to the San Joaquin River or to farmland southwest of Fresno via spillway channels.

In the City of Fresno, these canals and channels are under control of the Fresno Irrigation District, an independent public agency, but their use during storm events is shared by another independent district, the Fresno Metropolitan Flood Control District (FMFCD). The FMFCD was created to develop flood control facilities to prevent further repetitive losses created by the Fresno Stream Group and to provide an urban drainage network. This District is responsible for administering a Storm Drainage and Flood Control Master Plan. The City's municipal code supports these efforts by including a Drainage Fee Ordinance to ensure that grading and development comply with the FMFCD's Master Plan and standards and provide proportionate shares of storm drain and ponding basin infrastructure.

The City of Fresno's Floodplain Ordinance further coordinates and supports FMFCD efforts. This ordinance and the Fresno General Plan Safety Element policies require conformance to FEMA floodplain management policies and to those of California's Central Valley Flood Prevention Board (which regulates the designated floodway along the San Joaquin River channel). Still, in areas not completely developed to urban standards, areas where the urban drainage network is not yet completed, and in some County "island" areas (land within the City that the County has authority over), stormwater drainage facilities may not prevent localized shallow flooding during intense runoff events.

According to FEMA's 2016 Flood Insurance Study (FIS), the following major canals and ditches run through the City:

- **Central Canal** flows southwest through the southeastern part of the City of Fresno.
- **Dry Creek Canal** begins at the confluence of Mill Ditch and Herndon Canal, just downstream of North Millbrook Avenue, and flows southwest through the southwestern portion of the City.
- **Fancher Creek Canal** flows southwest along the eastern corporate limits of the City of Fresno and joins Central Canal at the southeast corner of the City.
- **Herndon Canal** begins at the confluence of Mill Ditch and Dry Creek Canal. It flows west through the center of the City of Fresno, then flows northwest through the northwestern part of the City.
- **Mill Ditch** flows west along East McKinley Avenue to its confluence with Herndon and Dry Creek Canals.

The FIS details the City of Fresno's flood history as follows:

In February 1884, flood flows from streams of the Fresno-Clovis group inundated the business section of the City of Fresno. Frequent flooding was a problem in the City throughout the 1880. Suburban areas of the City were flooded in spring 1920; the downtown area was inundated in 1923; flooding occurred in the Fig Garden area in 1936; and parts of the City, especially in the northeast section, were flooded in March 1938. Since the 1938 flood, which had an estimated discharge of 2,700 cubic feet per second (cfs) on Dry Creek at the Big Dry Creek Dam site, high flows occurred on that stream in December 1955 (3,800 cfs), January 1969 (5,700 cfs), and February 1969 (4,500 cfs). During December 1955, approximately 500 acres of agricultural and suburban land were flooded by overflow from irrigation canals, and damage, mostly to public facilities, totaled approximately $50,000. The largest and most damaging flood period was January and February 1969, when the combined discharges of Dry, Dog, Redbank, Fancher, and Mud Creeks flooded an estimated 14,500 acres and caused almost $4.7 million in damage. Most of the flooding was in the eastern and northeastern parts of the City. It occurred because many of the streams in the Fresno-Clovis group discharged floodwater into various irrigation canals, causing them to overflow.

Values at Risk

Following the methodology described in Section 4.3.2 Vulnerability of Fresno County to Specific Hazards, a flood map for the City of Fresno was created (see Figure E.4). Tables E.10 and E.11 summarize the values at risk in the City's 100-year and 500-year floodplain, respectively. These tables also detail loss estimates for each flood.

Figure E.4: City of Fresno's 100- and 500-Year Floodplains

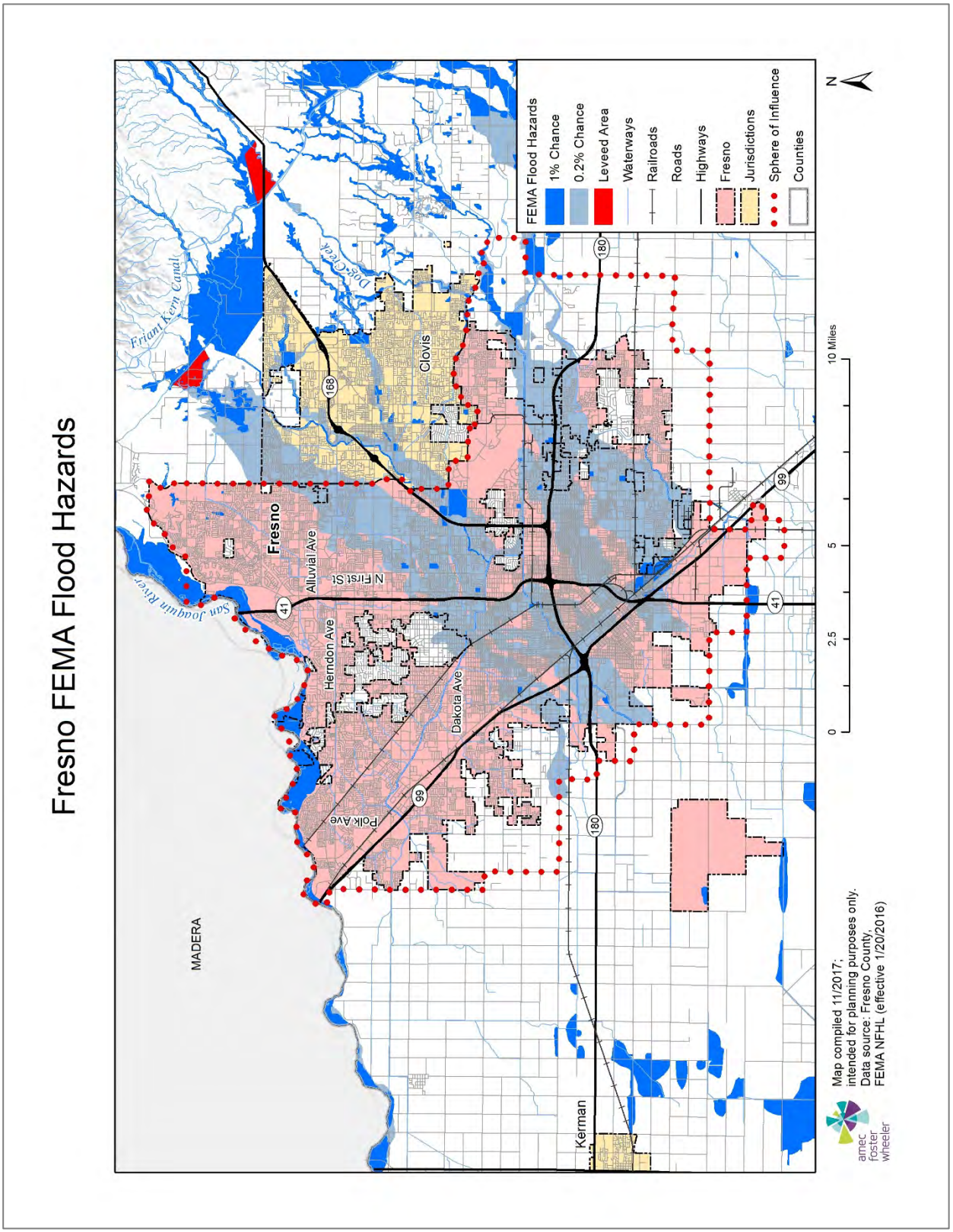


Table E.10: City of Fresno's FEMA 1% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	1	0	$60,933	$60,933	$121,866	$30,467
Commercial	23	210	$6,222,246	$6,222,246	$12,444,492	$3,111,123
Exempt	29	35	$0	$0	$0	$0
Industrial	70	107	$30,681,072	$46,021,608	$76,702,680	$19,175,670
Multi-Residential	11	84	$2,529,983	$1,264,992	$3,794,975	$948,744
Residential	97	120	$23,269,875	$11,634,938	$34,904,813	$8,726,203
Total	**231**	**556**	**$62,764,109**	**$65,204,716**	**$127,968,825**	**$31,992,206**

Sources: Fresno County 2017 Parcel and Assessor data; FEMA 2009 FIRM

Table E.11: City of Fresno's FEMA 0.2% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	29	29	$746,974	$746,974	$1,493,948	$373,487
Commercial	2,814	9,030	$1,574,492,657	$1,574,492,657	$3,148,985,314	$787,246,329
Exempt	381	1,404	$0	$0	$0	$0
Industrial	745	1,435	$309,126,790	$463,690,185	$772,816,975	$193,204,244
Multi-Residential	2,299	20,013	$797,001,401	$398,500,701	$1,195,502,102	$298,875,525
Residential	31,581	32,817	$2,677,387,750	$2,677,387,750	$5,354,775,500	$1,338,693,875
Total	**37,849**	**64,728**	**$5,358,755,572**	**$5,114,818,267**	**$10,473,573,839**	**$2,618,393,460**

Sources: Fresno County 2017 Parcel and Assessor data; FEMA 2009 FIRM

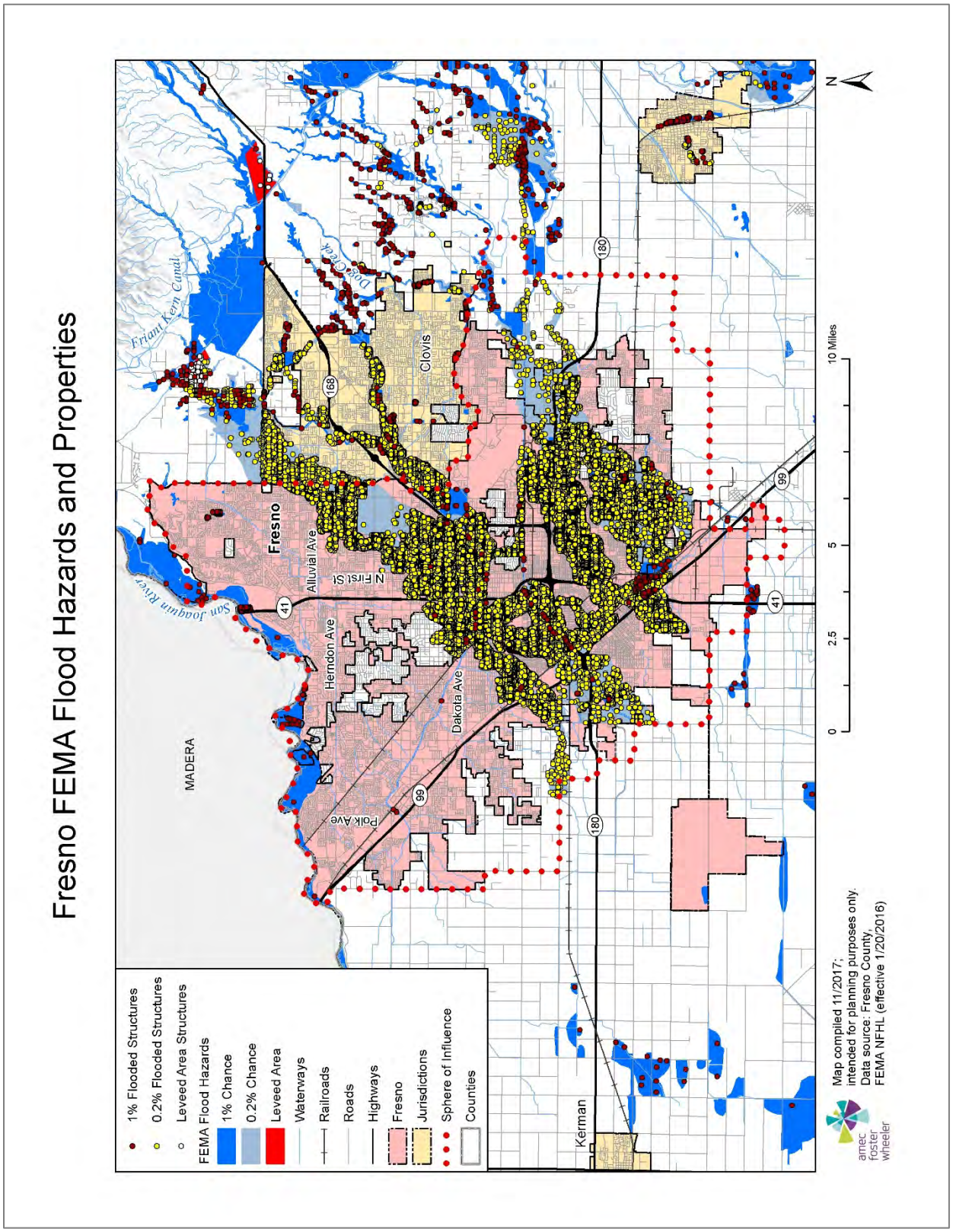
Based on this analysis, the City of Fresno has significant assets at risk to the 100-year and greater floods. There are 231 improved parcels within the 100-year floodplain for a total value of roughly $128 million, including building and content value. An additional 37,849 improved parcels valued at roughly $10.5 billion fall within the 500-year floodplain.

Applying the 25 percent damage factor as described in Section 4.3.2, there is a 1 percent chance in any given year of a 100-year flood causing roughly $32.0 million in damage in the City of Fresno and a 0.2 percent chance in any given year of a 500-year flood causing roughly $2.65 billion in damage (combined damage from both floods).

Properties at risk to flooding are shown in relation to the mapped floodplains in Figure E.5.

Limitations: This model may include structures in the floodplains that are elevated at or above the level of the base-flood elevation, which will likely mitigate flood damage. Also, the assessed values are well below the actual market values. Thus, the actual value of assets at risk may be significantly higher than those included herein.

Figure E.5: City of Fresno's Properties at Risk in the 100- and 500-Year Floodplains



In addition to the 100-year and 500-year floodplains mapped by FEMA, the California Department of Water Resources maintains Best Available Maps (BAM) which include the floodplains in the Sacramento and San Joaquin River Basins, based on a study performed in 2002 by the U.S. Army Corps of Engineers (USACE). Though limited to the San Joaquin River as a flood source and thus not as comprehensive as the FEMA FIRM, the USACE study shows additional differentiation in flood risk by modeling the 200-year floodplain (the flood with a 0.5 percent annual chance of occurring). Table E.12 summarizes the values at risk by property type within the 200-year floodplain and loss estimates to the 200-year storm using the same methodology described above.

Table E.12: City of Fresno's FEMA 0.5% Annual Chance Flood Hazard by Property Type

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value	Loss Estimate
Agricultural	1	0	$60,933	$60,933	$121,866	$30,467
Commercial	3	139	$4,322,495	$4,322,495	$8,644,990	$2,161,248
Exempt	5	5	$0	$0	$0	$0
Residential	18	19	$12,103,507	$6,051,754	$18,155,261	$4,538,815
Total	**27**	**163**	**$16,486,935**	**$10,435,182**	**$26,922,117**	**$6,730,529**

Sources: Fresno County 2017 Parcel and Assessor data; CA DWR BAM; USACE

Based on this analysis, there are 27 parcels within the 200-year floodplain valued at nearly $10.5 million. Applying the 25 percent damage factor, there is a 0.5 percent annual chance of a 200-year flood causing $6.73 million in damage in the City of Fresno.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Fresno joined the National Flood Insurance Program (NFIP) on December 1, 1982. In addition to providing insurance for properties at risk of flooding, the program collects and publishes statistics on flood-related losses in participating jurisdictions.

NFIP insurance data for the City of Fresno indicates that as of March 30, 2017, there were 323 flood insurance policies in force in the City with $99,316,700 in coverage. This coverage represents a decline of nearly 200 policies over the last decade. Of the 323 policies, 277 were residential (267 for single-family homes) and 46 were nonresidential. 56 of the policies were in A zones (including A01-30, AE, AO, and AH), and the remaining 267 policies were in B, C, and X zones. Policies in B, C, and X zones have increased slightly over the past decade, while policies in the 100-year floodplain have dramatically declined.

There have been 81 historical claims for flood losses totaling $765,183; 73 were for residential properties; 37 were in A zones and 36 were in B, C, or X zones; and 54 were pre-FIRM structures (17 of the 19 post-FIRM structures with reported losses were in a B, C, or X zone). According to the FEMA Community Information System accessed 9/17/2018 there was one Repetitive Loss and no Severe Repetitive Loss properties located in the jurisdiction.

Population at Risk

Using parcel data from the County, the digital flood insurance rate map, population at risk was calculated for the 100-year and 500-year floods based on the number of residential properties at risk and the U.S. Census Bureau 2016 estimate for the average number of persons per household (3.17). The following are at risk to flooding in the City of Fresno:

- 100-year flood—342 people
- 500-year flood—107,400 people
- **Total flood**—107,742 people

Critical Facilities at Risk

Critical facilities are those community components that are most needed to withstand the impacts of disaster as previously described. Table E.13 lists the critical facilities in the City's 100- and 500-year floodplains.

Table E.13: Critical Facilities in the 100- and 500-Year Floodplains: City of Fresno

Critical Facility Type	100-Year Floodplain	500-Year Floodplain
Airport	-	1
Behavioral Health	-	1
CalARP	1	12
Colleges & Universities	-	5
Communications	-	1
County Government	-	2
Daycare	-	52
Department of Agriculture	-	2
Department of Public Health	-	2
Department of Social Services	-	6
District Attorney	-	1
Fire Station	-	7
General Services	-	3
Health Care	-	1
Nursing Home	-	12
Police	-	5
School	-	68
Urgent Care	-	2
Total	**1**	**183**

Source: Fresno County, HIFLD 2017

Hazardous Materials Incident

The following are the primary concerns for the City of Fresno related to hazardous materials release:

- Train derailments

- Kinder-Morgan pipeline
- Chevron petroleum pipelines
- Storage facilities

There are 28 CalARP hazardous materials facilities located in the City of Fresno. As detailed in Table E.14, there are 62 critical facilities located within a half mile of a CalARP facility.

Table E.14: Critical Facilities within ½ mile of CalARP Facility: City of Fresno

Critical Facility Type	Count
Colleges & Universities	1
Communications	1
County Government	4
Courthouse	1
Daycare	11
Department of Public Health	2
Department of Social Services	4
Detention Center	4
District Attorney	2
Fire Station	4
Health Care	3
Nursing Home	4
Police	1
School	17
Sheriff	1
Supplemental College	1
Urgent Care	1
Total	**62**

Source: Fresno County, HIFLD 2017

For more information on this hazard please refer to the main plan, Section 4.

Severe Weather: Fog

The risk and vulnerability factors for fog in the City is not unique from the County at large. Please refer to the main plan's discussion of the fog hazard in section 4.

Severe Weather: Windstorm

Fresno's prevailing winds are typically light and from the northwest. High wind conditions are occasionally created by strong weather fronts. Occasionally, there are funnel clouds of low intensity. Past structural damage has been light, infrequent, and very limited in geographic extent. Injuries have been extremely rare. Most of this damage has occurred secondary to large trees being blown over. The City's design wind load, the level of wind force that new structures are required to be engineered to withstand, is 70 mph.

Soil Hazards: Land Subsidence

Despite long-term over-drafting of groundwater that has lowered the static water table under Fresno by as much as 100 feet over the past century, ground level subsidence has not been noted in the vicinity of the City (this is probably due to the geologic strata underlying the City, which features layers of clay and hardpan interleaved with sand and gravel layers).

Wildfire

Similar to many areas of the County, Fresno has high temperatures in the summer with low rainfall creating fire hazard conditions. There is some wildfire risk in the San Joaquin River Bluff area in northern Fresno due to vegetation and steep slopes.

Following the methodology described in Section 4.3.2 Vulnerability of Fresno County to Specific Hazards, a wildfire map for the City of Fresno was created (see Figure E.6). An analysis was performed using GIS software to determine where populations, values at risk, and critical facilities are located within wildfire threat zones. Table E.15 shows the values at risk in the moderate wildfire threat zone (there are no values at risk in the high or very high threat zones). There are not any critical facilities in wildfire threat zones in the City of Fresno.

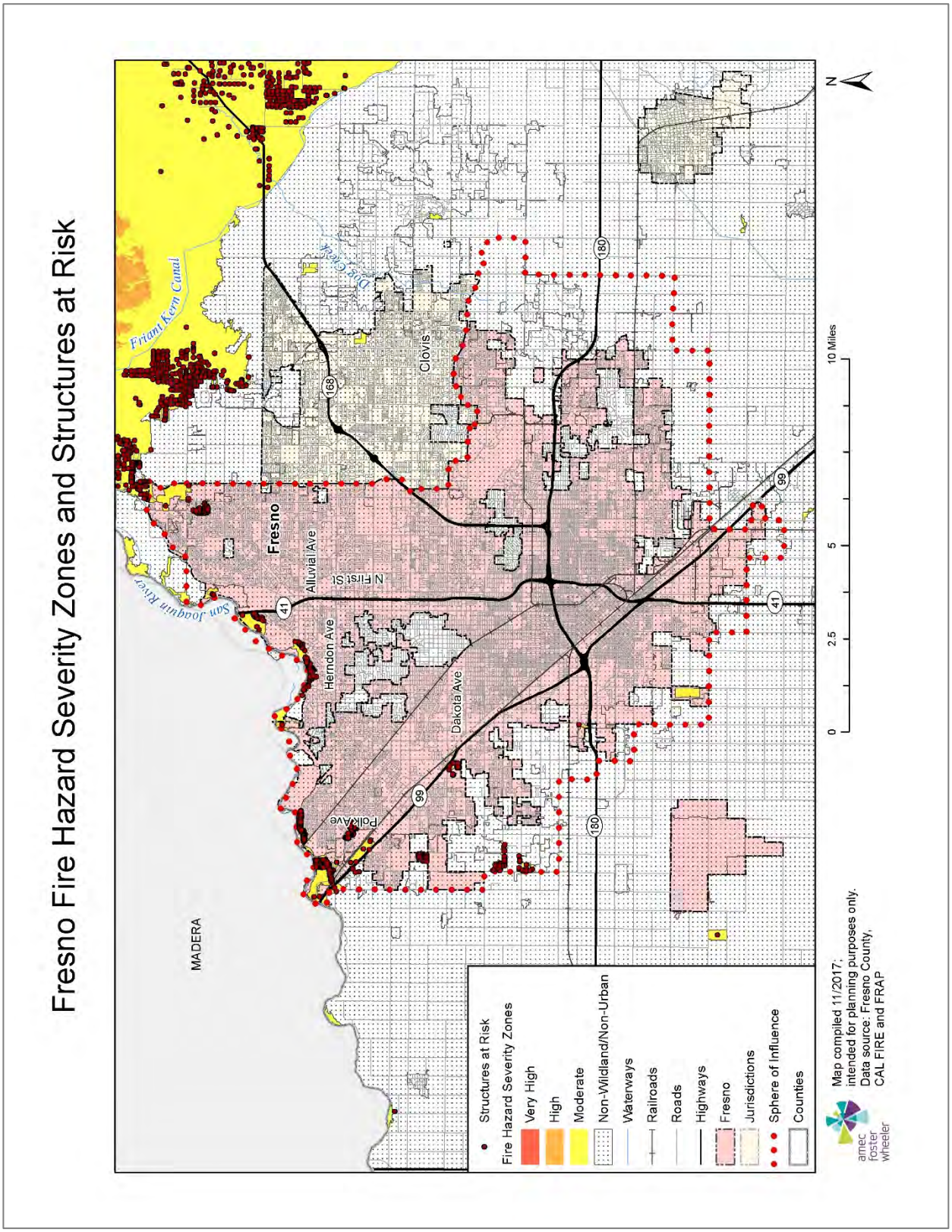
Table E.15: Values at Risk to Wildfire (Moderate Threat) in the City of Fresno

Property Type	Parcel Count	Building Count	Improved Value	Content Value	Total Value
Agricultural	1	0	$60,933	$60,933	$121,866
Commercial	13	36	$24,379,836	$24,379,836	$48,759,672
Exempt	12	13	$0	$0	$0
Industrial	4	4	$2,105,480	$3,158,220	$5,263,700
Multi-Residential	1	16	$255,200	$127,600	$382,800
Residential	772	779	$180,172,709	$90,086,355	$270,259,064
Total	**803**	**848**	**$206,974,158**	**$117,812,944**	**$324,787,102**

Sources: Fresno County 2017 Parcel and Assessor data

Based on this analysis, the City of Fresno's moderate wildfire threat affects 2,450 people and 803 improved parcels valued at roughly $324,787,102. Almost all of the parcels at risk are in the San Joaquin River corridor, where development is very restricted due to flood risk and bluff instability. Other parcels are in industrial areas along the western edge of the City, where the City's weed abatement ordinances (requiring vegetation control by April) would reduce the wildfire risk.

Figure E.6: City of Fresno's Wildfire Threat



E.4 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

To develop this capability assessment, the jurisdictional planning representatives used a matrix of common mitigation activities to inventory which of these policies or programs were in place. The team then supplemented this inventory by reviewing additional existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses.

During the plan update process, this inventory was reviewed by the jurisdictional planning representatives and Amec Foster Wheeler consultant team staff to update information where applicable and note ways in which these capabilities have improved or expanded. Additionally, in summarizing current capabilities and identifying gaps, the jurisdictional planning representatives also considered their ability to expand or improve upon existing policies and programs as potential new mitigation strategies. The City of Fresno's updated capabilities are summarized below.

E.4.1 Regulatory Mitigation Capabilities

Table E.16 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Fresno.

Table E.16: City of Fresno's Regulatory Mitigation Capabilities

Regulatory Tool	Yes/No	Comments
General Plan	Yes	The Fresno General Plan has a Noise and Safety Element with policies for wildland fire hazards, seismic/geologic hazards, storm drainage and flood control, hazardous materials, airport safety, and emergency response
Zoning Ordinance	Yes	Fresno Municipal Code Chapter 15; Zoning Ordinance has requirements related to health and safety (e.g., dwelling unit density controls, building setbacks for fire protection, masonry walls along major streets)
Subdivision Ordinance	Yes	Fresno Municipal Code Chapter 15 requires multiple points of access for ingress/egress, fire protection provisions, etc.
Development Permit (formerly Site Plan Review) requirements	Yes	Required for all nonresidential development projects and multi-family projects over two units; required for duplexes in some zone districts; plot plan review required for even single-family residential construction
Growth Management Ordinance	Yes	Fresno Municipal Code Chapter 12 provides for extension of urban infrastructure and services including sewer treatment, water supply, and fire protection
Floodplain Ordinance	Yes	Fresno Municipal Code Chapter 13 (local building codes) includes the Flood Damage Prevention Ordinance
Other special purpose ordinance (stormwater, water conservation, wildfire)	Yes	- Within the Zoning Ordinance, there is a Bluff Preservation Overlay district with requirements for soil stability analysis and setbacks from the San Joaquin bluff edge

Regulatory Tool	Yes/No	Comments
		- Pretreatment Ordinance and environmental control program for wastewater system to prevent and abate any hazardous material releases
Building Code	Yes	Version: 2016 California Building Code with a few City modifications: fire sprinkler ordinance, swimming pool ordinance, and security ordinance
Fire Department ISO Rating	Yes	Rating: 3
Erosion or Sediment Control Program	Yes	The Bluff Preservation Ordinance, as well as grading plan review and stormwater pollution prevention plans, which are required for all development projects through project conditions and CEQA review
Stormwater Management Program	Yes	In conjunction with Cal-EPA, Regional Water Quality Control Board, and Fresno Metropolitan Flood Control District
Capital Improvements Plan	Yes	Public Works Department and Department of Public Utilities formulate and administer these plans
Economic Development Plan	Yes	Fresno Redevelopment Agency and Economic Development Division of the Planning and Development Department
Local Emergency Operations Plan	Yes	Ratified by City Council in 2005 and last updated in 2015
Flood Insurance Study or other engineering study for streams	Yes	FEMA Flood Insurance Study, 2005

Fresno General Plan (Adopted December 18, 2014)

The Fresno General Plan is a blueprint of how the City anticipates directing and managing growth while minimizing potential impacts for existing and future generations. It provides long-range planning strategies for the continued development, enhancement, and revitalization of the Fresno Metropolitan Area. The plan goals are the guiding principles and provide the framework for the objectives and policies that can be found in the plan elements. The following general plan goals directly or indirectly mitigate hazards identified in this plan:

- **Goal 9**—Promote a city of healthy communities and improve quality of life in established neighborhoods.
  - *Emphasize supporting established neighborhoods in Fresno with safe, well maintained, and accessible streets, public utilities, education and job training, proximity to jobs, retail services, health care, affordable housing, youth development opportunities, open space and parks, transportation options, and opportunities for home grown businesses.*
- **Goal 12**— Resolve existing public infrastructure and service deficiencies, make full use of existing infrastructure, and invest in improvements to increase competitiveness and promote economic growth.
  - *Emphasize the fair and necessary costs of maintaining sustainable water, sewer, streets, and other public infrastructure and service systems in rates, fees, financing and public investments to implement the General Plan. Adequately address accumulated deferred maintenance, aging infrastructure, risks to service continuity, desired standards of service to meet quality-of-life goals, and required infrastructure to support growth, economic competitiveness and business development.*
- **Goal 16**— Protect and improve public health and safety.

Some of the elements of the General Plan also contain objectives and policies relevant to protecting human health and safety (e.g., supporting objectives and policies in the Public Utilities and Services Element direct that amendments to construction and fire codes to reduce the level of risk to life and property from fire commensurate with the City's fire suppression capabilities and that fire and police services be provided). Because the Noise and Safety Element is the portion of the General Plan most relevant to hazard mitigation, select objectives and policies are extracted and included below.

The Noise and Safety Element

The Noise and Safety Element seeks to reduce deaths, injuries, illnesses, damage to property, and economic and social dislocation that could result from hazards. Of specific relevance to this plan, it addresses seismic and geologic conditions, flooding, hazardous materials, and emergency response.

Seismic and Geologic Hazards

NS-2. Objective: Minimize risks of property damage and personal injury posed by geologic and seismic risks.
NS-2-a. Policy: Seismic Protection. Ensure seismic protection is incorporated into new and existing construction, consistent with the Fresno Municipal Code.
NS-2-b. Policy: Soil Analysis Requirement. Identify areas with potential geologic and/or soils hazards, and require development in these areas to conduct a soil analysis and mitigation plan by a registered civil engineer (or engineering geologist specializing in soil geology) prior to allowing on-site drainage or disposal for wastewater, stormwater runoff, or swimming pool/spa water.
NS-2-c. Policy: Landfill Areas. Require proposed land uses on or near landfill areas to be designed and maintained to comply with California Code of Regulations, Title 27, Section 21190, Post Closure Land Use.
NS-2-d. Policy: Bluff Preservation Overlay Zone. Per the requirements of the Bluff Preservation Overlay Zone District and Policy POSS-7-f (Chapter 5, Parks and Open Space), the following standards shall be applicable for property located within the Bluff Preservation zone: • Require proposed development within 300 feet of the toe of the San Joaquin River bluffs to undertake an engineering soils investigation and evaluation report that demonstrates that the site is sufficiently stable to support the proposed development, or provide mitigations to provide sufficient stability; and • Establish a minimum setback of 30 feet from the San Joaquin River bluff edge for all buildings, structures, decks, pools and spas (which may be above or below grade), fencing, lighting, steps, etc. o An applicant may request to reduce the minimum setback to 20 feet from the bluff edge if it can be demonstrated, to the satisfaction of the City's Building Official and the Planning Director, that the proposed building, structure, deck, pool and/or spas (which may be above or below grade), fencing, steps, etc., will meet the objectives of the Bluff Preservation Overlay Ordinance. In no case shall the setback be reduced to less than 20 feet.

Flooding Hazards

NS-3. Objective: Minimize the risks to property, life, and the environment due to flooding and stormwater runoff hazards.
NS-3-a. Policy: Stormwater Drainage and Flood Control Master Plan. Support the full implementation of the FMFCD Storm Drainage and Flood Control Master Plan, the completion of planned flood control and drainage system facilities, and the continued maintenance of stormwater and flood water retention and conveyance facilities and capacities. Work with the FMFCD to make sure that its Storm Drainage and Flood Control Master Plan is consistent with the General Plan.

NS-3-b. Policy: Curb and Gutter Installation. Coordinate with Fresno Metropolitan Flood Control District (FMFCD) to install curbing, gutters, and other drainage facilities with priority to existing neighborhoods with the greatest deficiencies and consistent with the Storm Drainage and Flood Control Master Plan.
NS-3-c. Policy: Dual Use Facilities. Support multiple uses of flood control and drainage facilities as follows: • Use, wherever practical, FMFCD facilities for groundwater management and recharge; and • Promote recreational development of ponding basin facilities located within or near residential areas, compatible with the stormwater and groundwater recharge functions.
NS-3-d. Policy: Landscaped Buffer. City will support the development of FMFCD ponding basins including the landscaping and irrigation for the top one third of the side sloped areas consistent with the FMFCD Basin Design Criteria.
NS-3-e. Policy: Pollutants. Work with FMFCD to prevent and reduce the existence of urban stormwater pollutants pursuant to the requirements of the National Pollution Discharge Elimination Systems Act.
NS-3-f. Policy: Flooding Emergency Response Plans. Work with responsible agencies to update emergency dam failure inundation plans, evacuation plans and other emergency response plans for designated flood-prone areas, including the San Joaquin river bottom.
NS-3-g. Policy: Essential Facilities Siting Outside of Floodplains. Avoid siting emergency response and essential public facilities, such as fire and police stations, within a 100-year floodplain, unless it can be demonstrated that the facility can be safely operated and accessed during flood events.
NS-3-h. Policy: Runoff Controls. Implement grading regulations and related development policies that protect area residents from flooding caused by urban runoff produced from events that exceed the capacity of the Storm Drainage and Flood Control Master Plan system of facilities. Place all structures and/or flood-proofing in a manner that does not cause floodwaters to be diverted onto adjacent property, increase flood hazards to other property, or otherwise adversely affect other property.
NS-3-i. Policy: New Development Must Mitigate Impact. Require new development to not significantly impact the existing storm drainage and flood control system by imposing conditions of approval as project mitigation, as authorized by law. As part of this process, closely coordinate and consult with the FMFCD to identify appropriate conditions that will result in mitigation acceptable and preferred by FMFCD for each project. *Commentary: The City recognizes the expertise and significant role of the FMFCD, and will give the highest deference to its recommendations for mitigation measures, consistent with applicable law.*
NS-3-j. Policy: National Flood Insurance Program. Continue to participate in the National Flood Insurance Program (NFIP) by ensuring compliance with applicable requirements. Review NFIP maps periodically to determine if areas subject to flooding have been added or removed and make adjustments to the Land Use Diagram Figure LU-1.
NS-3-k. Policy: 100-Year Floodplain Policy. Require developers of residential subdivisions to preserve those portions of development sites as open space that may be subject to 100-year flood events, unless the flood hazard can be substantially mitigated by development project design.
NS-3-l. Policy: 200-Year Floodplain Protection. Promote flood control measures that maintain natural conditions within the 200-year floodplain of rivers and streams and, to the extent possible, combine flood control, recreation, water quality, and open space functions. Discourage construction of permanent improvements that would be adversely affected by periodic floods within the 200-year floodplain, particularly in the San Joaquin river bottom.
NS-3-m. Policy: Flood Risk Public Awareness. Continue public awareness programs to inform the general public and potentially affected property owners of flood hazards and potential dam failure inundation. Remind households and businesses located in flood-prone areas of opportunities to purchase flood insurance.
NS-3-n. Policy: Precipitation Changes. Work with FMFCD to evaluate the planned and existing stormwater conveyance system in light of possible changes to precipitation patterns in the future.

Hazardous Materials

NS-4. Objective: Minimize the risk of loss of life, injury, serious illness, and damage to property resulting from the use, transport, treatment, and disposal of hazardous materials and hazardous wastes.
NS-4-a. Policy: Processing and Storage. Require safe processing and storage of hazardous materials, consistent with the California Building Code and the Uniform Fire Code, as adopted by the City.
NS-4-b. Policy: Coordination. Maintain a close liaison with the Fresno County Environmental Health Department, Cal-EPA Division of Toxics, and the State Office of Emergency Services to assist in developing and maintaining

hazardous material business plans, inventory statements, risk management prevention plans, and contingency/emergency response action plans.
NS-4-c. Policy: Soil and Groundwater Contamination Reports. Require an investigation of potential soil or groundwater contamination whenever justified by past site uses. Require appropriate mitigation as a condition of project approval in the event soil or groundwater contamination is identified or could be encountered during site development.
NS-4-d. Policy: Site Identification. Continue to aid federal, State, and County agencies in the identification and mapping of waste disposal sites (including abandoned waste sites), and to assist in the survey of the kinds, amounts, and locations of hazardous wastes.
NS-4-e. Policy: Compliance with County Program. Require that the production, use, storage, disposal, and transport of hazardous materials conform to the standards and procedures established by the County Division of Environmental Health. Require compliance with the County's Hazardous Waste Generator Program, including the submittal and implementation of a Hazardous Materials Business Plan, when applicable.
NS-4-f. Policy: Hazardous Materials Facilities. Require facilities that handle hazardous materials or hazardous wastes to be designed, constructed, and operated in accordance with applicable hazardous materials and waste management laws and regulations.
NS-4-g. Policy: Hazmat Response. Include policies and procedures appropriate to hazardous materials in the City's disaster and emergency response preparedness and planning, coordinating with implementation of Fresno County's Hazardous Materials Incident Response Plan.
NS-4-h. Policy: Household Collection. Continue to support and assist with Fresno County's special household hazardous waste collection activities, to reduce the amount of this material being improperly discarded.
NS-4-i. Policy: Public Information. Continue to assist in providing information to the public on hazardous materials.

Emergency Response

NS-6. Objective: Foster an efficient and coordinated response to emergencies and natural disasters.
NS-6-a. Policy: County Multi-Jurisdiction Hazard Mitigation Plan. Adopt and implement the Fresno County Multi-Jurisdiction Hazard Mitigation Plan and City of Fresno Local Hazard Mitigation Plan Annex. *Commentary: The federal Disaster Mitigation Act of 2000 requires that cities, counties, and special districts have a Local Hazard Mitigation Plan to be eligible to receive FEMA hazard mitigation funds. Cities and counties can adopt and use all or part of a regional multi-jurisdictional plan, such as the one prepared by Fresno County, in lieu of preparing all or part of a Local Hazard Mitigation Plan.*
NS-6-b. Policy: Disaster Response Coordination. Maintain coordination with other local, State, and Federal agencies to provide coordinated disaster response.
NS-6-c. Policy: Emergency Operations Plan. Update the City's Emergency Operations Plan periodically, using a whole community approach which integrates considerations for People with access and functional needs in all aspects of planning.
NS-6-d. Policy: Evacuation Planning. Maintain an emergency evacuation plan in consultation with the Police and Fire Departments and other emergency service providers, which shows potential evacuation routes and a list of emergency shelters to be used in case of catastrophic emergencies. Commentary: The evacuation plan will be flexible in order to consider many scenarios and multiple modes of transportation beyond private automobiles. It will provide special provisions for disadvantaged populations, such as those with physical disabilities or those with low or very low incomes, and for areas with fewer resources through neighborhood emergency preparedness programs.
NS-6-e. Policy: Critical Use Facilities. Ensure critical use facilities (e.g. City Hall, police and fire stations, schools, hospitals, public assembly facilities, transportation services) and other structures that are important to protecting health and safety in the community remain operational during an emergency. • Site and design these facilities to minimize their exposure and susceptibility to flooding, seismic and geological effects, fire, and explosions. • Work with the owners and operators of critical use facilities to ensure they can provide alternate sources of electricity, water, and sewerage in the event that regular utilities are interrupted in a disaster.
NS-6-f. Policy: Emergency Vehicle Access. Require adequate access for emergency vehicles in all new development, including adequate widths, turning radii, hard standing areas, and vertical clearance.

NS-6-g. Policy: Emergency Preparedness Public Awareness Programs. Continue to conduct programs to inform the general public, including people with access and functional needs, of the City's emergency preparedness and disaster response procedures.

Fresno Flood Plain Ordinance

The City of Fresno's Flood Plain Ordinance was revised in the late 1990s and formally adopted by the Fresno City Council on September 20, 2005. (In late 2007, the Fresno Municipal Code was republished with its chapters somewhat reorganized. There was no change in the text of the Flood Plain Ordinance at that time, but due to the reorganization of its content, its most recent adoption effective date is January 17, 2008.) The Fresno Flood Plain Ordinance is Article 6 of Chapter 11 of the Fresno Municipal Code.

The purpose of this ordinance is to promote the public health, safety, and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone, and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of flood hazard; and
- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purposes, the ordinance includes the following methods and provisions:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction
- Control filling, grading, dredging, and other development which may increase flood damage
- Prevent or regulate the construction of flood barriers which will unnaturally divert flood water or which may increase flood hazards in other areas
- Control the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters

This ordinance applies to all areas of special flood hazards within the jurisdiction of the City as identified by FEMA's Flood Insurance Study for Fresno County, California and incorporated areas dated September 30, 2005, with accompanying Flood Insurance Rate Maps, and all subsequent amendments and/or revisions. It appoints the building official to administer, implement, and enforce the ordinance by granting or denying development permits in accord with its provisions.

This ordinance includes the following standards of construction related to special flood hazard areas:

- Anchoring
- Construction materials and methods
- Elevation and floodproofing
- Residential construction
- Nonresidential construction
- Flood venting
- Standards for utilities
- Standards for subdivisions
- Standards for manufactured homes
- Standards for recreational vehicles
- Floodways
- Standards for storage of materials and equipment

In conjunction with Fresno's Drainage Fee Ordinance (Fresno Municipal Code Chapter 12, Article 19), which requires local grading and development to conform to the Fresno Metropolitan Flood Control District Master Drainage Plan and to provide proportionate shares of drainage infrastructure, the Fresno Flood Plain Ordinance and its preceding Flood Damage Prevention Ordinance have reduced flood damage losses in the City.

National Flood Insurance Program/Community Rating System

The City of Fresno joined the National Flood Insurance Program (NFIP) on December 1, 1982. It has been a member of the Community Rating System (CRS) since October 1, 1992. The City's Floodplain Administrator duties are assigned to the building official. The Building and Safety Division of the Planning and Development Department works to improve the City's CRS rating, which determines the price paid for flood insurance policies issued in the jurisdiction. The rating is based on detailed biannual audits conducted by FEMA and/or a designee agency (currently, the California Department of Water Resources). The primary means of improving and maintaining a good CRS rating is through administration of the Fresno Flood Plain Ordinance. As part of its efforts to improve its community rating, the City of Fresno has hosted periodic FEMA Region IX NFIP/CRS training.

The City's current CRS rating from October 2016 is Class 8, which reflects the loss of two class levels in the most recent audit.

San Joaquin River Bluff Preservation Ordinance, 1980

After an interagency San Joaquin River Reconnaissance Plan was completed in the late 1970s, the City of Fresno adopted the San Joaquin River Bluff Specific Plan to preserve this important open space and habitat feature and to safeguard the bluff face, which is the most unstable geologic feature in the City. The San Joaquin River Bluff Specific Plan was later subsumed by the 1988 Bullard Community Plan, which carried forward protective policies for this area of Fresno.

The regulation of land use, development, and grading in this portion of Fresno is ongoing pursuant to the Bluff Preservation Ordinance. This ordinance, part of the City's zoning regulations, delineates an overlay zone district along the river bluff (the Bluff Preservation Overlay District), established allowable and prohibited land uses, and set forth conditions and requirements for using or modifying property in the district. The regulations of the district are deemed to be necessary for the preservation of the special qualities of the bluffs and for the protection of the health, safety, and general welfare of owners and users of property in the area.

The Bluff Preservation Ordinance is administered by the Fresno Development and Resource Management Department through its special permit process and grading plan checks. Anyone applying for a building permit is required to submit a site plan review with accompanying soil investigation and evaluation report (prepared by an appropriately licensed professional engineer or registered geologist). The Department's Code Enforcement Division also conducts periodic surveillance of bluff properties for grading and construction done without permits and institutes abatement actions when these conditions are discovered.

Hazardous Material Incident Safeguards

The Fresno Fire Department works with Fresno County Environmental Health to review hazardous material business plans that detail flammable, explosive, toxic, and otherwise hazardous materials used by businesses in the City. The Fire Department has its own permitting requirement for liquid and gaseous fuel tanks to ensure that they are installed and maintained safely. The City's Hazardous Materials Response Unit (housed in a City fire station) maintains the capability to quickly characterize material releases and spills, to evaluate risks to life and property, and to implement appropriate controls and evacuation measures.

Fire Prevention Policy

The City of Fresno has some of the most progressive and effective fire prevention policies and regulations in the nation relating to water supply (fire flow) required for development, ingress and egress from developed buildings and subdivisions, on-site automatic fire suppression systems (sprinkler and on-site private hydrants), building addressing to facilitate rapid emergency response, marking of unsafe buildings (those older structures with hazardous conditions or a lack of water supply), and instant aid/mutual aid with adjacent fire departments belonging to Fresno County special districts and the City of Clovis.

In addition to its extensive network of well-trained and well-equipped firefighting stations, the Fresno Fire Department has a Fire Prevention Bureau, under supervision of the City's fire marshal, to administer regulations adopted and referenced by the Fresno Municipal Code Chapter 6, Article 5 relating to fire prevention. The Fire Prevention Bureau carries out these responsibilities by conducting routine inspections of all public and commercial buildings, performing detailed development permit and construction plan checks, and investigating arson.

Another component of the City's overall fire protection program is the administration of its public nuisance ordinances to require properties to be kept clean and free of flammable debris and to annually abate weeds and overgrown vegetation before these materials can dry out in the spring to pose a wildfire hazard (Fresno Municipal Code Chapter 10, Article 6 relating to public nuisance abatement). The Planning and Development Department Code Enforcement Division and Department of Public Utilities Community Sanitation Division coordinate their efforts to enforce the nuisance abatement regulations and provide cleanup services when property owners do not take care of matters themselves.

City of Fresno Emergency Operations Plan, 2015, Updated 2015

The City of Fresno Emergency Operations Plan (EOP) addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, excessive heat/cold, power outages, and national security emergencies in or affecting the City of Fresno. The Plan, which was updated in 2015, does the following:

- Establishes the emergency management organization required to mitigate any significant emergency or disaster affecting the City of Fresno.
- Identifies the policies, responsibilities, and procedures required to protect the health and safety of City communities, public and private property, and the environment from natural or technological disasters.
- Establishes the operational concepts and procedures associated with initial response operations to emergencies, the extended response operations, and the recovery process.

The EOP is designed to establish the framework for implementation of the California Standardized Emergency Management System/National Incident Management System for the City of Fresno, which is located within the California Governor's Office of Emergency Services' Mutual Aid Region V. It is intended to facilitate multi-agency and multi-jurisdictional coordination, particularly between the City of Fresno and the Fresno County Operational Area, including special districts and state agencies, in emergency operations. This plan will be used in conjunction with the Fresno County EOP and the State of California Emergency Plan. The plan is designed to guide the reader or user through each phase of an emergency: preparedness, response, recovery, and mitigation.

Other Plans and Policies

Other hazard mitigation-related policies and plans in place in and observed by the City of Fresno include the following:

- California Code of Regulations Title 23 administrative law for development and use of land in designated floodway areas along the San Joaquin River administered by the Central Valley Flood Protection Board, staffed by the California Department of Water Resources.
- Standards for constructing and maintaining drainage basins and ponds to prevent mosquito breeding and to provide for mosquito control district access for inspection and abatement activities (jointly promulgated by the Planning and Development Department and Public Works Department in fall of 2005).
- Dam failure inundation plans prepared and administered by the U.S. Bureau of Reclamation, the U.S. Army Corps of Engineers, Fresno Metropolitan Flood Control District, Southern California Edison, and Pacific Gas and Electric Company.
- The California Environmental Quality Act, overseen by the Fresno City Attorney's Office and administered by several City departments, requires consideration of health and safety impacts as they may relate to projects, which are defined as any action that may result in a change in the physical environment and that would include public facilities, and private development, and even adoption/amendment of land use plans and ordinances. An analysis of every project is conducted by the appropriate City department (the Development and Resource Management Department does the bulk of these analyses). Inquiries regarding project sites and features are distributed to departments and outside agencies that may have knowledge of, or which may regulate, aspects of the proposed project. The information obtained from these requests for comment and from other staff research is compiled into an informational document for decision-makers and the public. The information is also used to develop a list of mitigation actions to reduce or abate potential adverse impacts of the project. For those projects which may involve federal funds or require federal approvals, a parallel National Environmental Policy Act assessment is also prepared by the City.
- The Development and Resource Management Department administers regulations in the California Building Code and in Uniform Electrical, Plumbing, and Mechanical Codes as those codes are modified through adoption by the state and City. Plan check and inspection activities of the Department ensure structural soundness and compliance with seismic and other regulations.

E.4.2 Administrative/Technical Mitigation Capabilities

Table E.17 identifies the personnel responsible for activities related to mitigation and loss prevention in Fresno.

Table E.17: City of Fresno's Administrative and Technical Mitigation Capabilities

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Planning and Development Department (planners), Department of Public Utilities (engineers), Public Works Department (engineers), Fresno Metropolitan Flood Control District (engineers)
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Planning and Development Department (engineers), Department of Public Utilities (engineers), Public Works Department (engineers), Fresno Metropolitan Flood Control District (engineers)
Planner/engineer/scientist with an understanding of natural hazards	Yes	Planning and Development Department (planners and engineers), Department of Public Utilities (engineers), Public Works Department (engineers), Fresno Metropolitan Flood Control District (engineers)
Personnel skilled in GIS	Yes	Planning and Development Department, Department of Public Utilities, Public Works Department, Information Services Department
Full time building official	Yes	Planning and Development Department
Floodplain administrator	Yes	Planning and Development Department
Emergency manager	Yes	Fresno Fire Department
Grant writer	Yes	Planning and Development Department, Police Department, Public Works Department, Fire Department
Other personnel	Yes	California registered geologist (Department of Public Utilities), California registered environmental health specialist (Planning and Development Department), licensed water and wastewater treatment operators
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	State Emergency Alert System is coordinated by emergency management team through the National Weather Service
Other	Yes	Emergency notification of San Joaquin River bottom residents in conjunction with the U.S. Bureau of Reclamation and Fresno County

E.4.3 Fiscal Mitigation Capabilities

Table E.18 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table E.18: City of Fresno's Fiscal Mitigation Capabilities

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	Geographically restricted to designated portions of Fresno based on area income
Capital improvements project funding	Yes	Budgeted out of utility fees and often related to issuance of bonds; City also obtains grants, shares of state gas tax and sales taxes, ballot measure tax revenue, etc.
Authority to levy taxes for specific purposes	Yes	Subject to California Proposition 218 restrictions on new and increased assessments
Authority to levy fees and fines, and to recover costs through lien processes, for nuisance abatement	Yes	Subject to an appeal process that involves administrative law judges retained by the City
Fees for water, sewer, gas, or electric services	Yes	Water, sewer, solid waste, code enforcement (cleanup)

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Impact fees for new development	Yes	Master Fee Schedule as originally chartered under the City's Urban Growth Management Ordinance
Incur debt through general obligation bonds	Yes	Would need vote of the taxpayers to enact.
Incur debt through special tax bonds	Yes	Special Assessment Districts that issue debt and incur the debt but the City only administers
Incur debt through private activities	Yes	The City has the capability of doing them and have in the past
Withhold spending or public infrastructure investment in hazard prone areas	Yes	The Department of Public Utilities retains jurisdiction over water and sewer services and determines its appropriate service areas with risk to facilities being one of the factors leading to a decision not to extend services to River bottom properties

E.4.4 Mitigation Outreach and Partnerships

The Fresno Department of Public Utilities, in conjunction with other agencies, provides water conservation and stormwater quality protection public information programs. The Fire Department provides personal preparedness outreach for heat and freeze emergencies and shelter-in-place information for hazardous materials emergencies. Additionally, the City has developed public service announcements for smoke detector battery life, canal safety, and fireworks safety.

The City's Joint Information System disseminates information in Spanish, and the City can obtain translation services for other languages when necessary. A Joint Information Center plan is an annex to the City of Fresno Emergency Operations Plan and provides comprehensive guidance for early warning notification in all languages and specifically the Americans with Disabilities Act (ADA) community.

Preparedness Exercises afford the opportunity to include the City of Fresno ADA Committee. Members of the committee and volunteers from the ADA community role play for realistic first responder training.

E.4.5 Other Mitigation Efforts

- The City is a certified StormReady community through the National Weather Service.
- The Fire Department, Police Department, and Solid Waste Division are nationally accredited.
- The City has installed security systems for the wastewater treatment facility and for its surface water treatment plant. Generators are installed in critical groundwater pumping stations and these facilities are secured.

E.4.6 Opportunities for Enhancement

Based on the capabilities assessment, the City of Fresno has several existing mechanisms in place that already help to mitigate hazards. In addition to these existing capabilities, there are also opportunities for the City to expand or improve on these policies and programs to further protect

the community. Future improvements may include providing training for staff members related to hazards or hazard mitigation grant funding in partnership with the County and Cal OES. Additional training opportunities will help to inform City staff members on how best to integrate hazard information and mitigation projects into their departments. Continuing to train City staff on mitigation and the hazards that pose a risk to the City of Fresno will lead to more informed staff members who can better communicate this information to the public. In addition, the City could work to improve the CRS rating through additional floodplain management program enhancements. This could further lower the cost of flood insurance for residents.

E.5 Mitigation Strategy

E.5.1 Mitigation Goals and Objectives

The City of Fresno adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

Incorporation into Existing Planning Mechanisms

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies. The Public Works Department may utilize the hazard information when implementing Capital Improvement projects and the Planning and Development Department may utilize the hazard information when reviewing a site plan or other type of development applications. The City will also incorporate this LHMP into the Safety Element of their General Plan, as recommended by Assembly Bill (AB) 2140.

As noted in Chapter 7 Plan Implementation, the HMPC representatives from Fresno will report on efforts to integrate the hazard mitigation plan into local plans, programs and policies and will report on these efforts at the annual HMPC plan review meeting.

Continued Compliance with the National Flood Insurance Program

In addition to the mitigation actions identified herein the City will continue to comply with the National Flood Insurance Program as specified in General Plan Policy NS-3-j: *"National Flood Insurance Program. Continue to participate in the National Flood Insurance Program (NFIP) by ensuring compliance with applicable requirements."*

E.5.2 Completed 2009 Mitigation Actions

The City of Fresno did not complete any of the mitigation actions identified in the 2009 plan. However, implementation is in progress for several of these actions and will be continued as part of the mitigation strategy for this plan update.

E.5.3 Mitigation Actions

The planning team for the City of Fresno identified and prioritized the following mitigation actions based on the risk assessment. Background information as well as information on how each action will be implemented and administered, such as ideas for implementation, responsible office, partners, potential funding, estimated cost, and schedule are also included.

In addition to implementing the mitigation actions below the City of Fresno will be participating in the county-wide, multi-jurisdictional action of developing and conducting a multi-hazard seasonal public awareness program. The county-wide project will be led by the County in

partnership with all municipalities and special districts. The City agrees to help disseminate information on hazards provided by the County. More information on the action can be found in the base plan Chapter 5 Mitigation Strategy (see Section 5.3.3 Multi-Jurisdictional Mitigation Actions, Action #1. Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program).

1. Establish Post-Disaster Action Plan for City Continuity of Operations Plan

Hazard(s) Addressed: Multi-Hazard: dam failure, earthquake, flood, severe weather, wildfire, hazardous materials

Issue/Background: Establish a post-disaster action plan to be part of the City of Fresno Continuity of Operations Plan (COOP) that will include the following elements:

- Procedures for public information
- Post-disaster damage assessment
- Grant writing
- Code enforcement
- Redundant operations

The plan will also include annexes from local businesses and large employers to improve economic and employment recovery. The plan will also identify a mechanism for the City to help businesses without COOPs develop a COOP to be incorporated, as an annex, into the City's Emergency Operations Plan.

Other Alternatives: No action

Responsible Office: City of Fresno Emergency Preparedness Officer

Priority (High, Medium, Low): High

Cost Estimate: $150,000

Potential Funding: Local funds, grants

Benefits (Avoided Losses): This will improve response/recovery during an event through pre-planning. A City COOP and local business COOPs will reduce the impact of a disaster to the local economy and employment.

Schedule: Long term

Status: 2009 project, implementation in progress

2. Improve the City's Capabilities for Sheltering Animals in a Disaster

Hazard(s) Addressed: Multi-Hazard: dam failure, earthquake, flood, severe weather, wildfire, hazardous materials

Issue/Background: During a disaster, not only do people need to be rescued, but their pets do also. Hurricane Katrina showed the nation that shelters do not typically allow pets, so pets may be left behind when their owners evacuate. The care of the animals left behind falls to local animal shelters. Currently, the SPCA Animal Shelter does not have the supplies to handle a large scale animal emergency. The City has approximately 18,000 licensed dogs. If a disaster occurred, they would only be able to house a small percentage of them. Overcrowding of animals usually causes diseases and loss of animal life. Purchasing new cages would alleviate some of the overcrowding created by a disaster.

Other Alternatives: Ask other agencies for supplies, if they have them available.

Responsible Office: City of Fresno Emergency Preparedness Officer

Priority (High, Medium, Low): High

Cost Estimate: $50,000

Potential Funding: General fund

Benefits (Avoided Losses): This will cut down on the spread of disease and animal loss during an emergency or disaster.

Schedule: Short term

Status: 2009 project, implementation in progress

3. Train and Certify City Inspectors to Conduct Post-Disaster Damage Assessment

Hazard(s) Addressed: Multi-Hazard: dam failure, earthquake, flood, severe weather, wildfire, hazardous materials

Issue/Background: City inspectors play a vital role in post-disaster building assessment and damage assessment. Pre-training and certification is vital in response and recovery to reduce loss of life, relocate populations, and ensure the rebuilding of local economies.

Other Alternatives: No action

Responsible Office: City of Fresno Emergency Preparedness Officer and Planning and Development Department

Priority (High, Medium, Low): High

Cost Estimate: $250,000

Potential Funding: Grants

Benefits (Avoided Losses): This will improve response/recovery during an event through pre-training and certification of individuals responsible for performing assessment of structures and facilities impacted by disasters. Certification will also allow qualified staff to mobilize with the State of California Office of Emergency Services (Region 5) Urban Search and Rescue Task Force.

Schedule: Long term

Status: 2009 project, implementation not yet started

4. Implement a Flood Awareness Program for the Public

Hazard(s) Addressed: Flood

Issue/Background: The City needs a program to educate flood-prone property owners along the San Joaquin River and in frequent annual flooding areas about the flood threat and how best to prepare, mitigate, and insure their properties.

Other Alternatives: No action

Responsible Office: City of Fresno Emergency Preparedness Officer and Planning and Development Department

Priority (High, Medium, Low): Medium

Cost Estimate: $15,000/year

Potential Funding: General fund, grants

Benefits (Avoided Losses): This will prevent the loss of human life and economic and property losses.

Schedule: Long term

Status: 2009 project, implementation not yet started

5. Southwest Fresno – Recycled Water Distribution System Construction

Hazard(s) Addressed: Drought

Issue/Background: In 2009, the State of California adopted a recycled water policy establishing a mandate to increase the use of recycled water in California by 200,000 acre-feet per year by 2020 and an additional 300,000 acre-feet per year by 2030. The Recycled Water Master Plan prepared by the City of Fresno, Department of Public Utilities (DPU), identifies opportunities to assist with compliance of this law by reducing groundwater pumping and replacing groundwater with recycled water for non-potable purposes (i.e. outdoor irrigation, dust control, fountains, etc.). On April 11, 2013, the Council adopted the Recycled Water Master Plan and associated environmental documents.

In 2017, the DPU commissioned a 5 MGD Tertiary Treatment Facility at the Fresno-Clovis Regional Wastewater Treatment Facility. DPU is currently constructing a Recycled Water Distribution System in Southwest Fresno to deliver recycled water to parks, cemeteries, schools, agricultural uses, etc., to offset potable water irrigation demands. This will help mitigate drought by enabling the use of recycled water for certain uses instead of tapping potable water supplies.

Other Alternatives: DPU has a Water Shortage Contingency Plan (WSCP) which was updated in the City of Fresno's 2015 Urban Water Management Plan to manage water shortages including drought conditions. The WSCP consists of four stages allowing the City to ultimately reduce its water demand to a level commensurate with the water supplies available to a maximum reduction of 50 percent.

Responsible Office: City of Fresno Department of Public Utilities

Priority (High, Medium, Low): High

Cost Estimate: $75,000,000

Potential Funding: California State Water Resources Control Board – Clean Water State Revolving Fund

Benefits (Avoided Losses): Reduced ground water pumping by using recycled water for non-potable purposes.

Schedule: Ongoing with completion in 2019

Status: New project

6. Sustainable Groundwater Management Act Compliance including Groundwater Sustainability Planning and Implementation

Hazard(s) Addressed: Drought

Issue/Background: The Kings subbasin underlays the City of Fresno and like many groundwater basins throughout the State, this subbasin is in overdraft condition with underground aquifers adversely impacted by overuse. Such impacts include significant decline in water storage and water levels, degradation of water quality, and land subsidence resulting in the permanent loss of storage capacity. The Sustainable Groundwater Management Act (SGMA) provides for the establishment of local Groundwater Sustainability Agencies (GSAs) to manage groundwater sustainability within groundwater subbasins defined by the California Department of Water Resources (DWR). The City of Fresno has become a joint power authority of the North Kings Groundwater Sustainability Agency, other members of the Agency include the County of Fresno, City of Kerman, City of Clovis, Biola Community Services District, Garfield Water District and International Water District. As a member of the North Kings GSA, the City of Fresno is required to participate in the development and implementation, no later than January 31, 2020, of a

Groundwater Sustainability Plan (GSP) to ensure a sustainable yield of groundwater, without causing undesirable results. Failure to comply with that requirement could result in the State asserting its power to manage local groundwater resources. Participation in the North Kings GSA and the implementation of a GSP will allow the City to maintain sustainable groundwater supplies while providing insurance against periods of long-term drought, a high significance hazard for the City of Fresno.

Other Alternatives: None, compliance required by law, failure to meet requirements will result in State intervention and oversight.

Responsible Office: City Engineer and North Kings GSA

Priority (High, Medium, Low): High

Cost Estimate: Varies by GSA for preparation of the required GSP. Further expenses are anticipated to be accrued for the planning and construction of groundwater recharge projects.

Potential Funding: Property owner assessments along with grant funding opportunities from the State.

Benefits (Avoided Losses): Preparation and implementation of the GSP by the respective GSAs will result in the management of groundwater in a manner that is sustainable and avoids undesirable results as defined by the California State Department of Water Resources.

Schedule: GSAs must complete and submit the required GSP to DWR by January 31, 2020, which is to be fully implemented and result in sustainability of the groundwater basin, with no undesirable effects, by the year 2040.

Status: New project in 2018

Attachment 5
Notice of Public Hearing

Notice of Public Hearing

City of Fresno

Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

The City of Fresno (City) will hold a public hearing at 10:05 A.M. on Thursday, July 15, 2021, at the City Council Chambers at the City Hall located at 2600 Fresno Street to receive public comments on the City's Draft 2020 Urban Water Management Plan (2020 UWMP), the City's Draft 2020 Water Shortage Contingency Plan (2020 WSCP), and a Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" (Addendum). The Draft 2020 UWMP addresses current and projected water supply availability and reliability and provides a comparison with current and projected water demands through the year 2045. The Draft 2020 WSCP details the City's potential actions in response to a severe water shortage or water supply emergency. Sections 1.3, 1.4, 1.5, and 1.8 of the Draft 2020 WSCP were revised from a version of the document that was previously released on Monday, July 28, 2021. The Draft Addendum discusses the City's reduced reliance on the Sacramento-San Joaquin River Delta surface water.

Interested citizens are invited to make public comments on the three documents at the public hearing. Services of an interpreter and additional accommodations such as assistive listening devices can be made available. Requests for accommodations should be made more than five working days but no later than 48 hours prior to the scheduled hearing. Please contact Mr. Peter Maraccini at 559-621-1603 or Peter.Maraccini@Fresno.gov.

The three documents will be made available for public review starting July 1, 2021. Physical copies of the three documents can be found at the following Fresno County Libraries: Central Library (2420 Mariposa St.), Woodward Park Regional Library (944 E Perrin Ave.), Betty Rodriguez Regional Library (3040 N Cedar Ave.), and Sunnyside Regional Library (5566 E Kings Canyon Rd.). Electronic copies of the three documents are available online at https://www.fresno.gov/publicutilities/about-dpu/plans-reports-resources/. Documents can be provided in alternate formats upon request.

Comments may be submitted by calling Utilities Planning & Engineering at 559-621-1603, by writing to Mr. Peter Maraccini, Utilities Planning & Engineering Division, 2101 G Street

Bldg. A, Fresno, CA 93706, or by emailing at Peter.Maraccini@Fresno.gov. All written comments must be received no later than July 14, 2021, at 11:59 P.M.

Attachment 6
Resolution Approving the WSCP

RESOLUTION NO. 2021-197

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT THE 2020 WATER SHORTAGE CONTINGENCY PLAN AND AUTHORIZE THE CITY MANAGER TO DECLARE THE APPROPRIATE WATER CONSERVATION STAGES AND IMPLEMENT THE ASSOCIATED SHORTAGE RESPONSE ACTIONS

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Sections 10610, et seq., requires every urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) and update said plan at least once every five years; and

WHEREAS, Water Code Section 10632 requires every urban water supplier to prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its UWMP; and

WHEREAS, the WSCP details intended City actions to respond to water shortages; and

WHEREAS, as an urban water supplier, the City of Fresno has prepared a WSCP that complies with the requirements of the Urban Water Management Planning Act; and

WHEREAS, the City consulted with, and requested comments from, regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, etc., as required by Water Code Section 10641; and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft 2020 WSCP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library,

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021, and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft 2020 WSCP would be held in Council Chambers at which time public comment on the plan would be received, as required by Water Code Section 10642; and

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the 2020 WSCP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts the 2020 Water Shortage Contingency Plan.

2. The City Manager, or designee, is hereby authorized and directed to file the City of Fresno 2020 Water Shortage Contingency Plan with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

3. The City Manager, or designee, is hereby authorized to declare the appropriate Water Conservation Stages outlined in the 2020 Water Shortage Contingency Plan and implement the associated shortage response actions specified for the appropriate Water Conservation Stage in the Water Shortage Contingency Plan.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-197, entitled ***RESOLUTION – **Adopting 2020 Water Shortage Contingency Plan and authorizing the City Manager to declare the appropriate water conservation stages and implement the associated shortage response actions (Subject to Mayor's veto).** Item 10:05 A.M. (4), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes	:	
Noes	:	
Absent	:	
Abstain	:	

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CITY CLERK'S OFFICE

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Outreach Events

2015 Outreach Events		
Date	Name of Event	Description
Jan	"Creating a Water-wise Landscape: Seven Steps to Follow our Climate"	Landscape Workshop by Susan Stiltz as SPEAKER for City employees at City Hall 2600 Fresno St 93721.Distribute literature E. Social media: sent email with flier to City employees. Contact: Melany Felton. LITERATURE
Jan	Fresno Chinese New Year Parade	Outreach booth providing water saving info & rebate information
March	Spring Festival - Clovis Botanical Garden	Outreach booth providing water saving info & rebate information
April	Home Depot - Riverpark Kid's Day Spring Event	Hands on activity for kids, drought tolerant plants planting, literature for adults
April	America's Party for the Planet	Outreach booth providing water saving info & rebate information
April	Sequoia Middle School Outdoor Club	Outreach booth providing water saving info & rebate information
May	Spring Fling - Master Gardener	Provided literature for event held at Garden of the Sun
May	Madden Library Water-wise Plant Exchange event	Water wise garden speaker, materials handed out
May	Water-Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
June	Kids Water Camp	Large one day event, hands on activites, educational for kids 3rd grade (all elementary schools invited to participate)
July	Fresno Home Remodeling & Decorating Show	Fresno Fairgrounds 3 day event. Outreach booth with visual displays & information
Sept	Carnaval Children's Festival	Mosqueda Center Outreach booth, providing water saving information & rebates
Sept	Fresno State partnership	Susan Hawksworth extended education. Began planning for Feb classes with landscape specialists
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information
Nov	Fresno Fall Improvement Show	Inspiration Park Grand opening
Nov	Inspiration Park Grand opening	Outreach booth providing water saving info & rebate information

2016 Outreach Events		
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days

March	Spring Into Your Garden	Outreach booth providing water saving info & rebate information. Visual displays
April	Water Planet Day	Outreach booth providing water saving info & rebate information. Visual displays
April	8th Annual Water-Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
May	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual displays
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Dec	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Orchard St. & Grant Ave

2017 Outreach Events		
Jan	Hmong New Year	Outreach booth providing water saving info & rebate information. Hmong translator & printed materials in Hmong
Feb	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Hildago Elementary 3550 E Thomas 93702
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
March	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Leavenworth Elementary School, 4420 E Thomas

April	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Webster Elementary School, 2600 E Tyler 93701
April	9th Annual Water-Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
April	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information
May	Fresno Neighborhood Revitalization	Work with FNR team to reach customers in lower income areas about City services. Slater Elementary school 4472 N Emerson 93705
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual displays
Oct	Make A Difference Day @ Chukchansi Park	Outreach booth providing water saving info & rebate information. Visual displays
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event

2018 Outreach Events		
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event
March	Spring Into Your Garden Festival	Outreach booth providing water saving info & rebate information. Visual displays
April	10th Annual Water Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
May	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days

Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual Display
Sept	Central California Women's Conference	Outreach booth providing water saving info & rebate information. Visual Display
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual Display
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event

2019 Outreach Events		
March	Fresno Home & Garden Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event
March	Spring Into Your Garden Festival	Outreach booth providing water saving info & rebate information. Visual displays
April	Outreach booth @ Manchester Mall	Outreach booth providing water saving info & rebate information. Visual displays
April	Party for the Planet @ Chaffee Zoo	Outreach booth providing water saving info & rebate information. Visual displays
May	Senior Spring Fling @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
May	11th Annual Water Wise Plant Exchange	Large community event collaborating with several agencies to share water-wise plants & information, hands on activities
July	Fresno Remodeling & Decorating Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 days
Sept	Carnaval @ Mosqueda Community Center	Outreach booth providing water saving info & rebate information. Visual displays
Oct	Clovis Botanical Plant Sale & Fair	Outreach booth providing water saving info & rebate information. Visual displays
Nov	Fresno Fall Home Improvement Show	Outreach booth providing water saving info & rebate information. Visual displays. 3 day event

2020 Outreach Events
All Outreach Suspended

L

Notification Letters

City of FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Shay Bakman
Bakman Water Company
PO Box 7965
Fresno, CA 93747

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Bakman:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Scott Redelfs
City of Clovis Public Utilities
155 N. Sunnyside Ave
Clovis, CA 93611

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Redelfs:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Bill Stretch
Fresno Irrigation District
2907 South Maple Ave
Fresno, CA 93725

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Stretch:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Peter Sanchez
Fresno Metropolitan Flood Control District
5469 East Olive Ave
Fresno, CA 93727

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Sanchez:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Steven White
Fresno County Public Works
2220 Tulare St, 6th Floor
Fresno, CA 93721

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. White:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

We invite your agency's participation in the City's preparation of the 2020 UWMP and WSCP. A draft of the updated 2020 UWMP will be made available for public review and a public hearing will be scheduled for mid-June 2021 to hear public comments, discuss and consider adoption of the 2020 UWMP and WSCP. The City will notify you when the draft documents are released and of the date, time, and location of the subsequent public hearing.

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Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Jason Phillips
Friant Water Authority
4969 E. McKinley Ave, Suite 201
Fresno, CA 93727

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Phillips:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Nick Keller
Garfield Water District
PO Box 337
Clovis, CA 93613

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Keller:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Moises Ortiz
Malaga County Water District
3580 South Frank Street
Fresno, CA 93725-2511

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Ortiz:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Kassy D. Chauhan, PE
North Kings Groundwater Sustainability Agency
2907 S. Maple Avenue
Fresno, CA 93725

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mrs. Chauhan:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of FRESNO

Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Jason Franklin
Pinedale County Water District
480 West Birch Ave
Pinedale, CA 93650

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Franklin:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

City of
FRESNO
Department of Public Utilities

Utilities Planning & Engineering
2101 G Street, Bldg. A
Fresno, California 93706
559-621-8600 – FAX 559-498-4126
www.fresno.gov

March 16, 2021

ELECTRONIC MAIL and sent USPS

Michael P. Jackson, PE
United States Bureau of Reclamation South-Central California Area Office
1243 N Street
Fresno, CA 93721-1813

SUBJECT: NOTICE OF PREPARATION FOR CITY OF FRESNO 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

Dear Mr. Jackson:

In accordance with the Urban Water Management Planning Act (California Water Code Sections 10610 to 10656), the City of Fresno (City) is required to update its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to meet the California Department of Water Resources (DWR) requirements for a 2020 UWMP and WSCP.

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Until that time, if you would like more information regarding the City's 2020 UWMP and WSCP, please contact Mr. Peter Maraccini by telephone at 559-621-1603 or by email at Peter.Maraccini@Fresno.gov.

Sincerely,

Brock D. Buche, PE, PLS
Assistant Director

Notice of Public Hearing

City of Fresno

Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

The City of Fresno (City) will hold a public hearing at 10:05 A.M. on Thursday, July 15, 2021, at the City Council Chambers at the City Hall located at 2600 Fresno Street to receive public comments on the City's Draft 2020 Urban Water Management Plan (2020 UWMP), the City's Draft 2020 Water Shortage Contingency Plan (2020 WSCP), and a Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" (Addendum). The Draft 2020 UWMP addresses current and projected water supply availability and reliability and provides a comparison with current and projected water demands through the year 2045. The Draft 2020 WSCP details the City's potential actions in response to a severe water shortage or water supply emergency. Sections 1.3, 1.4, 1.5, and 1.8 of the Draft 2020 WSCP were revised from a version of the document that was previously released on Monday, July 28, 2021. The Draft Addendum discusses the City's reduced reliance on the Sacramento-San Joaquin River Delta surface water.

Interested citizens are invited to make public comments on the three documents at the public hearing. Services of an interpreter and additional accommodations such as assistive listening devices can be made available. Requests for accommodations should be made more than five working days but no later than 48 hours prior to the scheduled hearing. Please contact Mr. Peter Maraccini at 559-621-1603 or Peter.Maraccini@Fresno.gov.

The three documents will be made available for public review starting July 1, 2021. Physical copies of the three documents can be found at the following Fresno County Libraries: Central Library (2420 Mariposa St.), Woodward Park Regional Library (944 E Perrin Ave.), Betty Rodriguez Regional Library (3040 N Cedar Ave.), and Sunnyside Regional Library (5566 E Kings Canyon Rd.). Electronic copies of the three documents are available online at https://www.fresno.gov/publicutilities/about-dpu/plans-reports-resources/. Documents can be provided in alternate formats upon request.

Comments may be submitted by calling Utilities Planning & Engineering at 559-621-1603, by writing to Mr. Peter Maraccini, Utilities Planning & Engineering Division, 2101 G Street Bldg. A, Fresno, CA 93706, or by emailing at Peter.Maraccini@Fresno.gov. All written comments must be received no later than July 14, 2021, at 11:59 P.M.

McClatchy

Beaufort Gazette
Belleville News-Democrat
Bellingham Herald
Bradenton Herald
Centre Daily Times
Charlotte Observer
Columbus Ledger-Enquirer
Fresno Bee
The Herald - Rock Hill
Herald Sun - Durham
Idaho Statesman
Island Packet
Kansas City Star
Lexington Herald-Leader
Merced Sun-Star
Miami Herald
el Nuevo Herald - Miami
Modesto Bee
Raleigh News & Observer
The Olympian
Sacramento Bee
Fort Worth Star-Telegram
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The News Tribune Tacoma
The Telegraph - Macon
San Luis Obispo Tribune
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AFFIDAVIT OF PUBLICATION

Account #	Order Number	Identification	Order PO	Amount	Cols	Depth
59161	92995	Print Legal Ad - IPL0030763		$861.84	2	5.31

Attention: City of

City of Fresno Dept. Public Utilities
2101 G Street Bldg A
Fresno, CA 93706

PUBLIC NOTICE

Notice of Public Hearing

City of Fresno
Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

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IPL0030763
Jul 1 2021

COUNTY OF DALLAS
STATE OF TEXAS

The undersigned states:

McClatchy Newspapers in and on all dates herein stated was a corporation, and the owner and publisher of The Fresno Bee.
The Fresno Bee is a daily newspaper of general circulation now published, and on all-the-dates herein stated was published in the City of Fresno, County of Fresno, and has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of November 28, 1994, Action No. 520058-9.
The undersigned is and on all dates herein mentioned was a citizen of the United States, over the age of twenty-one years, and is the principal clerk of the printer and publisher of said newspaper; and that the notice, a copy of which is hereto annexed, marked Exhibit A, hereby made a part hereof, was published in The Fresno Bee in each issue thereof (in type not smaller than nonpareil), on the following dates.

No. of Insertions: 1

Beginning Issue of: 07/01/2021

Ending Issue of: 07/01/2021

Isabel Capps

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: 07/01/2021

Amanda Grisham

Notary Public in and for the state of Texas, residing in Dallas County

AMANDA DAWN GRISHAM
My Notary ID # 132031326
Expires May 30, 2023

Extra charge for lost or duplicate affidavits.
Legal document please do not destroy!

McClatchy

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Idaho Statesman
Island Packet
Kansas City Star
Lexington Herald-Leader
Merced Sun-Star
Miami Herald
el Nuevo Herald - Miami
Modesto Bee
Raleigh News & Observer
The Olympian
Sacramento Bee
Fort Worth Star-Telegram
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The News Tribune Tacoma
The Telegraph - Macon
San Luis Obispo Tribune
Tri-City Herald
Wichita Eagle

AFFIDAVIT OF PUBLICATION

Account #	Order Number	Identification	Order PO	Amount	Cols	Depth
59161	95606	Print Legal Ad - IPL0031437		$861.84	2	53 L

Attention: City of

City of Fresno Dept. Public Utilities
2101 G Street Bldg A
Fresno, CA 93706

PUBLIC NOTICE

Notice of Public Hearing

City of Fresno
Draft 2020 Urban Water Management Plan,

Draft 2020 Water Shortage Contingency Plan, &

Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed"

The City of Fresno (City) will hold a public hearing at 10:05 A.M. on Thursday, July 15, 2021, at the City Council Chambers at the City Hall located at 2600 Fresno Street to receive public comments on the City's Draft 2020 Urban Water Management Plan (2020 UWMP), the City's Draft 2020 Water Shortage Contingency Plan (2020 WSCP), and a Draft Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" (Addendum). The Draft 2020 UWMP addresses current and projected water supply availability and reliability and provides a comparison with current and projected water demands through the year 2045. The Draft 2020 WSCP details the City's potential actions in response to a severe water shortage or water supply emergency. Sections 1.3, 1.4, 1.5, and 1.8 of the Draft 2020 WSCP were revised from a version of the document that was previously released on Monday, July 28, 2021. The Draft Addendum discusses the City's reduced reliance on the Sacramento-San Joaquin River Delta surface water.

Interested citizens are invited to make public comments on the three documents at the public hearing. Services of an interpreter and additional accommodations such as assistive listening devices can be made available. Requests for accommodations should be made more than five working days but no later than 48 hours prior to the scheduled hearing. Please contact Mr. Peter Maraccini at 559-621-1603 or **Peter.Maraccini@Fresno.gov**.

The three documents will be made available for public review starting July 1, 2021. Physical copies of the three documents can be found at the following Fresno County Libraries: Central Library (2420 Mariposa St.), Woodward Park Regional Library (944 E Perrin Ave.), Betty Rodriguez Regional Library (3040 N Cedar Ave.), and Sunnyside Regional Library (5566 E Kings Canyon Rd.). Electronic copies of the three documents are available online at **https://www.fresno.gov/publicutilities/about-dpu/plans-reports-resources/**. Documents can be provided in alternate formats upon request.

Comments may be submitted by calling Utilities Planning & Engineering at 559-621-1603, by writing to Mr. Peter Maraccini, Utilities Planning & Engineering Division, 2101 G Street Bldg. A, Fresno, CA 93706, or by emailing at **Peter.Maraccini@Fresno.gov**. All written comments must be received no later than July 14, 2021, at 11:59 P.M.
IPL0031437
Jul 8 2021

COUNTY OF DALLAS
STATE OF TEXAS

The undersigned states:

McClatchy Newspapers in and on all dates herein stated was a corporation, and the owner and publisher of The Fresno Bee.
The Fresno Bee is a daily newspaper of general circulation now published, and on all-the-dates herein stated was published in the City of Fresno, County of Fresno, and has been adjudged a newspaper of general circulation by the Superior Court of the County of Fresno, State of California, under the date of November 28, 1994, Action No. 520058-9.
The undersigned is and on all dates herein mentioned was a citizen of the United States, over the age of twenty-one years, and is the principal clerk of the printer and publisher of said newspaper; and that the notice, a copy of which is hereto annexed, marked Exhibit A, hereby made a part hereof, was published in The Fresno Bee in each issue thereof (in type not smaller than nonpareil), on the following dates.

No. of Insertions: 1

Beginning Issue of: 07/08/2021

Ending Issue of: 07/08/2021

Isabel Capps

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: 07/08/2021

Amanda Grisham

Notary Public in and for the state of Texas, residing in Dallas County

AMANDA DAWN GRISHAM
My Notary ID # 132031326
Expires May 30, 2023

Extra charge for lost or duplicate affidavits.
Legal document please do not destroy!

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Adopting Resolutions

RESOLUTION NO. 2021-196

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Sections 10610, et seq., requires every urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) and update said plan at least once every five years; and

WHEREAS, the City adopted its current UWMP on June 23, 2016; and

WHEREAS, the requirements of an UWMP are to generally: (1) assess current and projected water supplies, (2) evaluate water demand and customer types, (3) evaluate reliability of water supplies, (4) compare demand and supply projections for a 20-year period, and (5) detail response actions in the event of a water shortage; and

WHEREAS, as an urban water supplier, the City of Fresno has prepared the UWMP to comply with the requirements of the Urban Water Management Planning Act; and

WHEREAS, the City consulted with, and requested comments from, regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, etc., as required by Water Code Section 10641; and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft 2020 UWMP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library, Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021, and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft 2020 UWMP would be held in Council Chambers at which public comment on the plan would be received, as required by Water Code Section 10642; and

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the 2020 UWMP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts the 2020 Urban Water Management Plan.

2. The City Manager, or designee, is hereby authorized and directed to file the City of Fresno 2020 Urban Water Management Plan with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-196, entitled ***RESOLUTION – Adopting 2020 Urban Water Management Plan (Subject to Mayor's veto).** Item 10:05 A.M. (3), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes	:	
Noes	:	
Absent	:	
Abstain	:	

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2021 JUL 19 P 4:52
CITY OF FRESNO
CITY CLERK'S OFFICE

RESOLUTION NO. 2021-197

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT THE 2020 WATER SHORTAGE CONTINGENCY PLAN AND AUTHORIZE THE CITY MANAGER TO DECLARE THE APPROPRIATE WATER CONSERVATION STAGES AND IMPLEMENT THE ASSOCIATED SHORTAGE RESPONSE ACTIONS

WHEREAS, the Urban Water Management Planning Act, codified at California Water Code Sections 10610, et seq., requires every urban water supplier to prepare and adopt an Urban Water Management Plan (UWMP) and update said plan at least once every five years; and

WHEREAS, Water Code Section 10632 requires every urban water supplier to prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its UWMP; and

WHEREAS, the WSCP details intended City actions to respond to water shortages; and

WHEREAS, as an urban water supplier, the City of Fresno has prepared a WSCP that complies with the requirements of the Urban Water Management Planning Act; and

WHEREAS, the City consulted with, and requested comments from, regional water related agencies such as the County of Fresno, Fresno Irrigation District, the City of Clovis, etc., as required by Water Code Section 10641; and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft 2020 WSCP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library,

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021, and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft 2020 WSCP would be held in Council Chambers at which time public comment on the plan would be received, as required by Water Code Section 10642; and

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the 2020 WSCP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts the 2020 Water Shortage Contingency Plan.

2. The City Manager, or designee, is hereby authorized and directed to file the City of Fresno 2020 Water Shortage Contingency Plan with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

3. The City Manager, or designee, is hereby authorized to declare the appropriate Water Conservation Stages outlined in the 2020 Water Shortage Contingency Plan and implement the associated shortage response actions specified for the appropriate Water Conservation Stage in the Water Shortage Contingency Plan.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-197, entitled ***RESOLUTION – **Adopting 2020 Water Shortage Contingency Plan and authorizing the City Manager to declare the appropriate water conservation stages and implement the associated shortage response actions (Subject to Mayor's veto).** Item 10:05 A.M. (4), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes	:	
Noes	:	
Absent	:	
Abstain	:	

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CITY OF FRESNO
CITY CLERK'S OFFICE

RESOLUTION NO. 2021-198

A RESOLUTION OF THE COUNCIL OF THE CITY OF FRESNO, CALIFORNIA, TO ADOPT APPENDIX L - ADDENDUM TO THE CITY OF FRESNO'S 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, the City of Fresno (City) contracts with the United States Bureau of Reclamation (USBR) Central Valley Project (CVP) Friant Division for an annual supply of 60,000 acre-feet of Class 1 surface water; and,

WHEREAS, the CVP was developed through an agreement with the Exchange Contractors that have historic pre-1914 San Joaquin River water rights; and,

WHEREAS, the Exchange Contractors receive water from the Sacramento-San Joaquin River Delta (Delta) in exchange for the CVP Friant Division water; and,

WHEREAS, during times of severe drought when the Exchange Contractors don't receive their full allocations from the Delta, the Exchange Contractors can call on their historic pre-1914 San Joaquin River water rights to fulfill their allocations, which reduces CVP Friant Division allocations to the City; and,

WHEREAS, due to the indirect connection of the City's Class 1 surface water allocation from the CVP Friant Division to the Exchange Contractors allocation from the Delta, the City is required to demonstrate consistency with the Delta Plan established via the Sacramento-San Joaquin Delta Reform Act of 2009; and,

WHEREAS, Delta Plan Policy WR P1 requires urban water suppliers to demonstrate reduced Delta reliance in the 2015 and 2020 Urban Water Management Plans (UWMPs); and,

WHEREAS, the City's 2015 UWMP did not include information regarding Delta

Date Adopted: 07/15/2021
Date Approved: 07/19/2021
Effective Date: 07/19/2021

Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self -Reliance; and

WHEREAS, the City prepared the 2015 UWMP following the Department of Water Resources (DWR) UWMP Guidebook 2015, which made such reporting optional; and,

WHEREAS, the DWR UWMP Guidebook 2020 instructs urban water suppliers to amend 2015 UWMP with reporting on reduced Delta reliance if not already included; and,

WHEREAS, the City has prepared Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" that follows the instructions of the DWR UWMP Guidebook 2020, fulfills the requirements of the Delta Plan Policy WR P1, and complies with the requirements of the Urban Water Management Planning Act; and,

WHEREAS, the City desires to amend its 2015 UWMP to incorporate Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed;" and

WHEREAS, prior to the public hearing on July 15, 2021, the City made the draft Appendix L – Addendum to the 2015 UWMP available for public inspection and placed copies for public review at the following Fresno County Libraries: Central Library, Woodward Park Regional Library, Betty Rodriguez Regional Library, and Sunnyside Regional Library, as well as making electronic copies available to agencies and the public, as required by Water Code Section 10642; and

WHEREAS, on July 1, 2021 and July 8, 2021, respectively, the City published notices on the City Clerk's website and in the Fresno Bee that on July 15, 2021 at 10:05 a.m. a public hearing regarding the draft Appendix L – Addendum to the 2015 UWMP would be held in Council Chambers at which time public comment on the draft Addendum would be received, as required by Water Code Section 10642; and,

WHEREAS, on July 15, 2021, at 10:05 a.m. the public hearing was conducted in Council Chambers at which the public was provided the opportunity to comment on the draft Appendix L Addendum to the 2015 UWMP.

NOW, THEREFORE, BE IT RESOLVED BY THE Council of the City of Fresno as follows:

1. The City hereby adopts Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed."

2. The City Manager, or designee, is hereby authorized and directed to file Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan, "Quantifying Regional Self Reliance and Reduced Reliance on Water Supplies from the Delta Watershed" with the California Department of Water Resources, the California State Library, and the County of Fresno within 30 days after adoption.

* * * * * * * * * * * * * * *

STATE OF CALIFORNIA)
COUNTY OF FRESNO) ss.
CITY OF FRESNO)

I, BRIANA PARRA, Interim City Clerk of the City of Fresno, certify that the foregoing resolution was adopted by the Council of the City of Fresno, at a regular meeting held on the 15th day of July, 2021.

AYES :Arias, Esparza, Karbassi, Maxwell, Chavez
NOES :None
ABSENT :Bredefeld, Soria
ABSTAIN :None

Mayor Approval: July 19th, 2021
Mayor Approval/No Return: N/A, 2021
Mayor Veto: N/A, 2021
Council Override Veto: N/A, 2021

BRIANA PARRA, CMC
Interim City Clerk

BY: Briana Parra 7/20/2021
Deputy Date

APPROVED AS TO FORM:
DOUGLAS T. SLOAN
City Attorney

BY: 7/20/21
Jennifer M. Quintanilla Date
Senior Deputy

July 19, 2021

Council Adoption: 07/15/2021
Mayor Approval:
Mayor Veto:
Override Request:

TO: MAYOR JERRY DYER

FROM BRIANA PARRA, CMC
Interim City Clerk

SUBJECT: TRANSMITTAL OF COUNCIL ACTION FOR APPROVAL OR VETO

At the City Council meeting of July 15, 2021, Council adopted the attached Resolution No. 2021-198, entitled ***RESOLUTION – Adopting Appendix L – Addendum to the City of Fresno's 2015 Urban Water Management Plan (Subject to Mayor's veto). Item 10:05 A.M. (5), File ID21-22925, by the following vote:

Ayes	:	Arias, Esparza, Karbassi, Maxwell, Chavez
Noes	:	None
Absent	:	Bredefeld, Soria
Abstain	:	None

Please indicate either your formal approval or veto by completing the following sections and executing and dating your action. Please file the completed memo with the Clerk's office on or before July 29, 2021. In computing the ten day period required by Charter, the first day has been excluded and the tenth day has been included unless the 10th day is a Saturday, Sunday, or holiday, in which case it has also been excluded. Failure to file this memo with the Clerk's office within the required time limit shall constitute approval of the ordinance, resolution or action, and it shall take effect without the Mayor's signed approval.

APPROVED / **NO RETURN:** _____

VETOED for the following reasons: (Written objections are required by Charter; attach additional sheets if necessary.)

_____

_____

_____ Date: 7/19/2021

Jerry Dyer, Mayor

COUNCIL OVERRIDE ACTION: Date: _____

Ayes	:	
Noes	:	
Absent	:	
Abstain	:	

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